2023 – 4th 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 - III

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U. S. Environmental Protection Agency

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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
SLT	State Local and Tribal
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 Local and Tribal (SLT) air monitoring stations 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 more than 85 CASTNET sites measure ground-level ozone concentrations. Annual performance evaluation (PE), ozone audit data are submitted to the Air Quality System (AQS) database.

As of December 2023, the network is comprised of 92 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 Fourth Quarter 2023

This report consists of the systems and performance, and other audit results from the CASTNET sites visited during the fourth quarter (October through December) 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	MET	FSA	O3 PE	SO2	CO	NOy	FLOW	Sponsor
KNZ184	10/10/2023		**1**					**1**	EPA
VOY413	10/10/2023		**1**	**1**				**1**	NPS
DEN417	10/11/2023			**1**					NPS
THR422	10/13/2023		**1**					**1**	NPS
GLR468	10/18/2023		**1**	**1**				**1**	NPS
HOX148	10/19/2023			**1**					EPA
UVL124	10/19/2023			**1**					EPA
ANA115	10/20/2023			**1**					EPA
CAV436	10/23/2023		**1**	**1**					NPS
CHA467	10/24/2023			**1**					NPS
GRC474	10/25/2023			**1**					NPS
PET427	10/26/2023			**1**					NPS
STK138	10/29/2023		**1**	**1**				**1**	EPA
PND165	10/31/2023		**1**	**1**				**1**	EPA / BLM-WSO

Site ID	Date	MET	FSA	O3 PE	SO2	CO	NOy	FLOW	Sponsor
GRB411	11/6/2023			**1**					NPS
SHE604	11/6/2023		**1**					**1**	BLM-WSO
BUF603	11/7/2023		**1**					**1**	BLM-WSO
CTH110	11/8/2023			**1**					EPA
WFM105	11/9/2023		**1**					**1**	EPA
BAS601	11/9/2023			**1**					BLM-WSO
NIC001	11/11/2023		**1**					**1**	EPA
DUK008	11/14/2023			**1**					EPA
LAV410	11/14/2023		**1**	**1**				**1**	NPS
BFT142	11/15/2023		**1**	**1**				**1**	EPA
DEV412	11/20/2023		**1**	**1**					NPS
SAN189	11/27/2023		**1**	**1**				**1**	EPA
KIC003	11/28/2023		**1**					**1**	EPA
SPD111	12/5/2023			**1**					EPA
SND152	12/6/2023			**1**					EPA
CND125	12/22/2023		**1**	**1**				**1**	EPA
COW137	12/26/2023			**1**					EPA

1.4 CASTNET 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://www.epa.gov/castnet/documents-reports#QuarterlyQualityAssuranceReports

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 audits 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 Fourth Quarter 2023

This report presents the NADP sites audited during the fourth quarter (October through December) of 2023. The station locations, sponsors, network. and dates of the surveys are presented in Table 3.

Table 3. NADP Site Audit Visits

Site ID	Date	NTN	MDN	AMON	Site Sponsor	Site Name
WI10	10/5/2023	**1**	**1**		Forest County Potawatomi Community	Potawatomi
MI99	10/6/2023	**1**			USDA-FS	Chassell
MN97	10/9/2023		**1**		Unknown	Grand Portage Band of Chippewa
AK01	10/10/2023	**1**			USDA-FS	Poker Creek
KS31	10/10/2023			**1**	WSP - EPA	Konza Prairie
MN32	10/10/2023	**1**			National Park Service - NIFA	Voyageurs National Park-Sullivan Bay
AK03	10/11/2023	**1**			National Park Service - NIFA	Denali National Park-Mt. McKinley
MN23	10/12/2023	**1**	**1**		USGS / Minnesota Pollution Control Agency	Camp Ripley
ND00	10/13/2023	**1**			National Park Service - NIFA	Theodore Roosevelt National Park-Painted Canyon
ID11	10/16/2023	**1**			USGS	Reynolds Creek
ID02	10/17/2023	**1**			USDA-FS	Priest River Experimental Forest
MT05	10/18/2023	**1**	**1**		National Park Service - NIFA	Glacier National Park-Fire Weather Station
MI51	10/19/2023			**1**	WSP -EPA	Unionville
MI95	10/19/2023			**1**	WSP -EPA	Hoxeyville
MT96	10/19/2023	**1**			Fort Peck Tribes	Poplar River
MI52	10/20/2023		**1**		Lake Michigan Air Directors Consortium (LADCO)	Ann Arbor
IL37	10/29/2023			**1**	WSP -EPA	Stockton
WY06	10/31/2023		**1**	**1**	Unknown / WSP-EPA	Pinedale
NY67	11/8/2023			**1**	WSP -EPA	Ithaca
NY98	11/9/2023			**1**	WSP -EPA	Whiteface Mountain
WY93	11/9/2023			**1**	Air Resource Specialists, Inc.	Basin - Big Horn

Site ID	Date	NTN	MDN	AMON	Site Sponsor	Site Name
NY94	11/11/2023			**1**	WSP -EPA	Nick's Lake
NY43	11/13/2023	**1**	**1**		New York State Department of Environmental Conservation	Rochester
NC06	11/15/2023			**1**	WSP -EPA	Beaufort
CA88	11/15/2023	**1**			USGS - NIFA	Davis
NE98	11/27/2023			**1**	WSP -EPA	Santee
KS97	11/28/2023			**1**	WSP -EPA	Kickapoo Tribe-Powhattan
TN04	12/5/2023	**1**		**1**	WSP -EPA	Speedwell
AL99	12/6/2023			**1**	WSP -EPA	Sand Mountain Research & Extension Center
NC26	12/22/2023		**1**		North Carolina Department of Environmental Quality	Candor
NC25	12/26/2023			**1**	WSP -EPA	Coweeta

2.4 NADP Audit Results

NADP site audit 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 audits (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 audit 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*
KNZ184-Tim Mendenhall-10/10/2023						
1	10/10/2023	Computer	Dell	07014	Inspiron 15	313MC12
2	10/10/2023	DAS	Campbell	000361	CR3000	2139
3	10/10/2023	Elevation	Elevation	None	1	None
4	10/10/2023	Flow Rate	Apex	000925	AXMC105LPMDPCV	illegible
5	10/10/2023	Infrastructure	Infrastructure	none	none	none
6	10/10/2023	Modem	Digi	07182	LR54	Illegible
7	10/10/2023	Sample Tower	Aluma Tower	missing	B	none
8	10/10/2023	Shelter Temperature	Campbell	none	107-L	none
9	10/10/2023	Siting Criteria	Siting Criteria	None	1	None
10	10/10/2023	Temperature	RM Young	06541	41432VC	14082

DAS Data Form

DAS Time Max Error: 0.05

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2139	KNZ184	Tim Mendenhall	10/10/2023	DAS	Primary

Das Date: 10/10/2023
Das Time: 07:53:23
Das Day: 284

Audit Date 10/10/2023
Audit Time 07:53:26
Audit Day 284

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0000	0.0000	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
4	0.0000	0.0000	0.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	KNZ184	Tim Mendenhall	10/10/2023	Flow Rate	000925

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
0.78%	1.35%			**Cal Factor Full Scale**	0
				Rotometer Reading:	3

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.00	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	2.961	2.960	2.97	0.000	3.00	l/m	l/m	1.35%
primary	test pt 2	2.989	2.990	2.97	0.000	3.00	l/m	l/m	0.33%
primary	test pt 3	2.993	2.990	2.96	0.000	3.01	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**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**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**	360 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14082	KNZ184	Tim Mendenhall	10/10/2023	Temperature	06541

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**
0.05	0.14		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.16	0.08	0.000	0.1	C	0
primary	Temp Mid Range	24.84	24.47	0.000	24.3	C	-0.14
primary	Temp High Range	47.92	47.28	0.000	47.3	C	0.02

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	none	KNZ184	Tim Mendenhall	10/10/2023	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.13	0.38		

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	23.72	23.36	0.000	23.4	C	0.01
primary	Temp Mid Range	24.29	23.93	0.000	23.9	C	-0.01
primary	Temp Mid Range	23.76	23.40	0.000	23.8	C	0.38

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
KNZ184	Tim Mendenhall	10/10/2023

Shelter Make	Shelter Model	Shelter Size
Wells Cargo	EW1211 (s/n 1WC200E1623048028)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	Fair	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	Fair	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	Fair	Status	pass
Sensor Component	Shelter Floor	Condition	Poor	Status	Fail
Sensor Component	Shelter walls	Condition	Fair	Status	pass
Sensor Component	Excessive mold present	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Fair	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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	KNZ184	Tim Mendenhall	10/10/2023	Moisture Present	Apex	4778	☐	☐

The filter sample tubing has drops of moisture in low sections outside the shelter.

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is located at a Long Term Ecological Research site operated by KSU.

2 **Parameter:** ShelterCleanNotes

The shelter is very clean, neat an well organized. Although patched, he shelter floor is deteriorated and in poor condition.

3 **Parameter:** MetSensorComme

The temperature sensor is mounted on the north side of the sample tower.

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
VOY413-Eric Hebert-10/10/2023						
1	10/10/2023	DAS	Environmental Sys Corp	90632	8816	2505
2	10/10/2023	Elevation	Elevation	None	1	None
3	10/10/2023	Filter pack flow pump	Thomas	none	illegible	illegible
4	10/10/2023	Flow Rate	Alicat	none	MC-10SLPM-D-PCV	Unknown
5	10/10/2023	Infrastructure	Infrastructure	none	none	none
6	10/10/2023	Ozone	ThermoElectron Inc	90714	49C	49C-66828-354
7	10/10/2023	Ozone Standard	ThermoElectron Inc	90569	49C	49C-59260-322
8	10/10/2023	Sample Tower	Aluma Tower	none	B	AT-51159-11-G
9	10/10/2023	Shelter Temperature	ARS	none	none	none
10	10/10/2023	Siting Criteria	Siting Criteria	None	1	None
11	10/10/2023	Temperature2meter	RM Young	none	41342VC	029199
12	10/10/2023	Zero air pump	Twin Tower Engineering	90719	TT70/E4	526294

DAS Data Form

DAS Time Max Error: 0.75

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2505	VOY413	Eric Hebert	10/10/2023	DAS	Primary

Das Date: 10/10/2023
Das Time: 11:00:45
Das Day: 284

Audit Date 10/10/2023
Audit Time 11:00:00
Audit Day 284

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

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2023	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
4	0.0000	0.0000	0.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Alicat	Unknown	VOY413	Eric Hebert	10/10/2023	Flow Rate	none

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
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**	-0.06
1.93%	2.05%			**Cal Factor Full Scale**	4.899
				Rotometer Reading:	3

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.05	l/m	l/m	
primary	leak check	0.000	0.000	0.03	0.000	0.08	l/m	l/m	
primary	test pt 1	2.932	2.930	1.45	0.000	2.99	l/m	l/m	2.05%
primary	test pt 2	2.934	2.930	1.45	0.000	2.99	l/m	l/m	2.05%
primary	test pt 3	2.935	2.940	1.45	0.000	2.99	l/m	l/m	1.70%

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**	6.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 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	49C-66828-354	VOY413	Eric Hebert	10/10/2023	Ozone	90714

Slope:	1.01225	Slope:	0.00000
Intercept	0.10569	Intercept	0.00000
CorrCoff:	0.99999	CorrCoff:	0.00000

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	1180930075	Tfer Desc.	Ozone primary stan
Tfer ID	01115		
Slope	1.00450	Intercept	-0.25270
Cert Date	4/24/2023	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	-0.49	-0.19	0.18	ppb		0.37
primary	2	18.86	19.00	19.22	ppb		0.22
primary	3	32.46	32.49	32.91	ppb	1.28	
primary	4	68.57	68.32	68.98	ppb	0.96	
primary	5	112.11	111.51	113.20	ppb	1.5	

Sensor Component	Condition	Status
Audit Pressure	721 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	1.016	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	99.0 kHz	pass
Cell A Noise	1.0 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	707.9 mmHg	pass
Cell A Tmp.	34.0 C	pass
Cell B Freq.	84.5 kHz	pass
Cell B Noise	1.4 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	708.4 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	029199	VOY413	Eric Hebert	10/10/2023	Temperature2meter	none

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
0.41	0.58		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.23	0.06	0.000	0.37	C	0.31
primary	Temp Mid Range	24.05	23.66	0.000	24.00	C	0.34
primary	Temp High Rang	49.60	48.97	0.000	49.55	C	0.58

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	VOY413	Eric Hebert	10/10/2023	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.97	1.92		

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	19.79	19.44	0.000	19.5	C	0.02
primary	Temp Mid Range	19.36	19.02	0.000	20.9	C	1.92

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
VOY413	Eric Hebert	10/10/2023

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2880-2)	640 cuft

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

The site operator handles the filter barehanded.

2 **Parameter:** DasComments

The sample tower itself is not grounded, however it is bolted to the shelter which is grounded. The roof leak above the instrument rack may have been repaired, it is dry at this time.

3 **Parameter:** SitingCriteriaCom

The site is located at the top of a hill in a forest. There are trees surrounding the site which are below the tower height, but within 10 m of the inlet.

4 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, and is neat and well organized.

5 **Parameter:** PollAnalyzerCom

There are no trees violating the 22.5 degree cone above the ozone sample inlet. However, there is a communication tower which is above the 22.5 degree threshold.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	KNZ184	**Technician**	Tim Mendenhall	**Site Visit Date**	10/10/2023

Site Sponsor (agency)	EPA	**USGS Map**	Swede Creek
Operating Group	Kansas State University	**Map Scale**	
AQS #	20-161-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	39.1021
Deposition Measurement	dry, wet	**QAPP Longitude**	-96.6096
Land Use	range	**QAPP Elevation Meters**	348
Terrain	gently rolling	**QAPP Declination**	4.5
Conforms to MLM	Yes	**QAPP Declination Date**	01/07/2005
Site Telephone	(785) 770-8426	**Audit Latitude**	39.10216
Site Address 1	Konza Prairie Lane	**Audit Longitude**	-96.609583
Site Address 2	CR 901	**Audit Elevation**	346
County	Riley	**Audit Declination**	4.2
City, State	Manhattan, KZ		
Zip Code	66502	**Fire Extinguisher** ☑	New in 2015
Time Zone	central	**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** ☑	

Present

Shelter Working Room	☑	**Make**	Wells Cargo	**Model**	EW1211 (s/n 1WC20	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is very clean, neat an well organized. Although patched, he shelter floor is deteriorated and in poor condition.				
Site OK	☑	**Notes**					

Driving Directions From Manhattan take route 177 south. At the east edge of town, immediately after crossing the Kansas river, turn right onto CR901 (McDowell Creek Road). Continue approximately 6.2 miles and turn left into the Konza Prairie Biological Station. The site is through the gate and up the hill past the three-story stone farm house.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	KNZ184	Technician	Tim Mendenhall	Site Visit Date	10/10/2023

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?	☐	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:

The temperature sensor is mounted on the north side of the sample tower.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	KNZ184	Technician	Tim Mendenhall	Site Visit Date	10/10/2023

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	KNZ184	Technician	Tim Mendenhall	Site Visit Date	10/10/2023

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?	☑	N/A
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	N/A
3	Describe ozone sample tube.		N/A
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)	☑	N/A
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	N/A
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:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID KNZ184 **Technician** Tim Mendenhall **Site Visit Date** 10/10/2023

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?	☑	N/A
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 KNZ184 **Technician** Tim Mendenhall **Site Visit Date** 10/10/2023

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 2014	☐
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?	☑	
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?	☑	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-S8-rev002

Site ID	KNZ184	Technician	Tim Mendenhall	Site Visit Date	10/10/2023

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?	☐	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?	☑	
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	☑	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	☐	N/A	☑
Automatic Zero/Span Tests	☐	N/A	☑
Manual Zero/Span Tests	☐	N/A	☑
Automatic Precision Level Tests	☐	N/A	☑
Manual Precision Level Test	☐	N/A	☑
Analyzer Diagnostics Tests	☐	N/A	☑
In-line Filter Replacement (at inlet)	☐	N/A	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☐	N/A	☑
Zero Air Desiccant Check	☐	N/A	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☑	N/A
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	N/A
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	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-S9-rev002

Site ID	KNZ184	Technician	Tim Mendenhall	Site Visit Date	10/10/2023

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, 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	☑	Weekly	☑
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 KNZ184 **Technician** Tim Mendenhall **Site Visit Date** 10/10/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	313MC12	07014
DAS	Campbell	CR3000	2139	000361
Elevation	Elevation	1	None	None
Flow Rate	Apex	AXMC105LPMDPC	illegible	000925
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	Illegible	07182
Sample Tower	Aluma Tower	B	none	missing
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41432VC	14082	06541

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	VOY413	**Technician**	Eric Hebert	**Site Visit Date**	10/10/2023

Site Sponsor (agency)	NPS	**USGS Map**	Ash River NE
Operating Group	NPS	**Map Scale**	
AQS #	27-137-0034	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**	48.4128
Deposition Measurement	dry, wet	**QAPP Longitude**	-92.8292
Land Use	woodland - mixed	**QAPP Elevation Meters**	429
Terrain	rolling	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	48.412518
Site Address 1	CR 129	**Audit Longitude**	-92.829225
Site Address 2	Ash River Visitor Center Rd.	**Audit Elevation**	427
County	St. Louis	**Audit Declination**	0.5
City, State	Orr, MN		**Present**
Zip Code	55771	**Fire Extinguisher**	☐
Time Zone	Central	**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 2880-2)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in fair condition, and is neat and well organized.				
Site OK	☑	**Notes**					

Driving Directions

From Duluth take route 53 north towards International Falls. Approximately 20 miles south of International Falls and just north of Orr, turn right (east) on County Road 129. Continue approximately 9.5 miles and turn left toward the Ash River Visitor Center. Continue approximately 1.5 miles and look for a closed gate on the right. The site is approximately 1 mile up the trail from the road.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	VOY413	Technician	Eric Hebert	Site Visit Date	10/10/2023

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	VOY413	Technician	Eric Hebert	Site Visit Date	10/10/2023

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	VOY413	Technician	Eric Hebert	Site Visit Date	10/10/2023

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 have been cut

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?	☐	
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:

There are no trees violating the 22.5 degree cone above the ozone sample inlet. However, there is a communication tower which is above the 22.5 degree threshold.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID	VOY413	Technician	Eric Hebert	Site Visit Date	10/10/2023

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:

The sample tower itself is not grounded, however it is bolted to the shelter which is grounded. The roof leak above the instrument rack may have been repaired, it is dry at this time.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	VOY413	Technician	Eric Hebert	Site Visit Date	10/10/2023

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	☑	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?	☑	Flow section only
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	VOY413	Technician	Eric Hebert	Site Visit Date	10/10/2023

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	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☐	N/A	☑
Manual Rain Gauge Test	☑	N/A	☑
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	☐	Weekly	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐	Weekly	☐
Analyzer Diagnostics Tests	☑	Alarm values only	☑
In-line Filter Replacement (at inlet)	☑	Every 3 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	VOY413	Technician	Eric Hebert	Site Visit Date	10/10/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings
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?	☐	gloves not used
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:

The site operator handles the filter barehanded.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID VOY413 **Technician** Eric Hebert **Site Visit Date** 10/10/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Environmental Sys Corp	8816	2505	90632
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	illegible	illegible	none
Flow Rate	Alicat	MC-10SLPM-D-PCV	Unknown	none
Infrastructure	Infrastructure	none	none	none
Ozone	ThermoElectron Inc	49C	49C-66828-354	90714
Ozone Standard	ThermoElectron Inc	49C	49C-59260-322	90569
Sample Tower	Aluma Tower	B	AT-51159-11-G	none
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342VC	029199	none
Zero air pump	Twin Tower Engineering	TT70/E4	526294	90719

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
DEN417-Martin Valvur-10/11/2023						
1	10/11/2023	DAS	Environmental Sys Corp	90600	8816	2274
2	10/11/2023	Ozone	ThermoElectron Inc	90835	49C	0520012327
3	10/11/2023	Ozone Standard	ThermoElectron Inc	none	49C	49C-71310-368
4	10/11/2023	Zero air pump	Werther International	none	PC70/4	526281

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	0520012327	DEN417	Martin Valvur	10/11/2023	Ozone	90835

Slope:	1.02530	**Slope:**	0.00000
Intercept	0.11634	**Intercept**	0.00000
CorrCoff:	0.99998	**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	-0.20	-0.40	-0.06	ppb		0.34
primary	2	14.81	14.49	14.98	ppb		0.49
primary	3	34.79	34.95	35.42	ppb	1.34	
primary	4	65.18	64.48	66.52	ppb	3.11	
primary	5	114.78	113.71	116.70	ppb	2.6	

Sensor Component	Condition	Status
Audit Pressure	699 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	-0.2	pass
Span	1.029	pass
Zero Voltage	-0.0007	pass
Fullscale Voltage	0.9998	pass
Cell A Freq.	92.9 kHz	pass
Cell A Noise	0.5 ppb	pass
Cell A Flow	0.61 lpm	pass
Cell A Pressure	691.1 mmHg	pass
Cell A Tmp.	29.6 C	pass
Cell B Freq.	80.6 kHz	pass
Cell B Noise	0.5 ppb	pass
Cell B Flow	0.64 lpm	pass
Cell B Pressure	690.6 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*
THR422-Tim Mendenhall-10/13/2023						
1	10/13/2023	Computer	Hewlett Packard	none	65606	5CB1520H68
2	10/13/2023	DAS	Environmental Sys Corp	90656	8816	2600
3	10/13/2023	Elevation	Elevation	None	1	None
4	10/13/2023	Filter pack flow pump	Thomas	none	107CAB18	Illegible
5	10/13/2023	Flow Rate	Alicat	none	MC-10SLPM-D-PCV	301232
6	10/13/2023	Infrastructure	Infrastructure	none	none	none
7	10/13/2023	Met tower	Rohn	none	unknown	none
8	10/13/2023	Sample Tower	Aluma Tower	none	B	AT-81077-J5
9	10/13/2023	Shelter Temperature	ARS	none	none	none
10	10/13/2023	Siting Criteria	Siting Criteria	None	1	None
11	10/13/2023	Temperature2meter	RM Young	none	41342VC	29200

DAS Data Form

DAS Time Max Error: 1.92

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2600	THR422	Tim Mendenhall	10/13/2023	DAS	Primary

Das Date: 10/13/2023 **Audit Date** 10/13/2023
Das Time: 10:29:04 **Audit Time** 10:27:09
Das Day: 286 **Audit Day** 286

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0000	0.0000	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
4	0.0000	0.0000	0.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Alicat	301232	THR422	Tim Mendenhall	10/13/2023	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
50.33%	50.50%			**Cal Factor Full Scale**	5
				Rotometer Reading:	3

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.02	0.000	0.01	l/m	l/m	
primary	test pt 1	2.990	2.990	1.68	0.000	1.49	l/m	l/m	-50.17%
primary	test pt 2	3.002	3.000	1.68	0.000	1.49	l/m	l/m	-50.33%
primary	test pt 3	3.012	3.010	1.68	0.000	1.49	l/m	l/m	-50.50%

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**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	360 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
RM Young	29200	THR422	Tim Mendenhall	10/13/2023	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
0.27	0.39		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.34	0.26	0.000	0.65	C	0.39
primary	Temp Mid Range	27.71	27.31	0.000	27.65	C	0.34
primary	Temp High Rang	49.47	48.82	0.000	48.90	C	0.08

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	THR422	Tim Mendenhall	10/13/2023	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.59	0.80		

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	20.81	20.49	0.000	20.7	C	0.19
primary	Temp Mid Range	19.73	19.42	0.000	20.2	C	0.79
primary	Temp Mid Range	23.59	23.24	0.000	22.4	C	-0.8

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
THR422	Tim Mendenhall	10/13/2023

Shelter Make	Shelter Model	Shelter Size
Ekto	8814 (s/n 3028-1)	896 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	Fair	pass
Shelter Door	Good	pass
Shelter Roof	Good	pass
Shelter Floor	Fair	pass
Shelter walls	Fair	pass
Excessive mold present	Good	pass
Signal Cable	Good	pass
Tubing Type	3/8 teflon	pass
Sample Train	Good	pass
System Memo		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	200 m	Status	Fail
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	300 m	Status	Fail
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Gloves are not used to handle the filter pack. The filter bag is used as a glove.

2 **Parameter:** DasComments

The met tower is no longer in use.

3 **Parameter:** SiteOpsProcedures

The ozone sample train does not have a means to introduce test gas at the sample inlet. Results of routine zero, span, precision, and any multipoint calibration checks are maintained by the state personnel who perform the tests. The two inlet filters in the sample train are creating a large pressure drop.

4 **Parameter:** SitingCriteriaCom

The site is located 200 meters from an interstate rest area, and 300 meters from interstate 94. The rest area can have parked and idling vehicles for extended periods.

5 **Parameter:** ShelterCleanNotes

The shelter is in good condition, clean and well organized.

6 **Parameter:** PollAnalyzerCom

The ozone monitor is operated by the state of North Dakota. There is approximately 1.5 meters of tygon tubing attached to the 3/8 filter pack flow tubing. The data logger was recording the flow rate as 1.5 lpm while the rotometer and the audit standard device were measuring approximately 3 lpm.

7 **Parameter:** MetSensorComme

The 2-meter temperature sensor is mounted on south side of the sample tower, which is attached to the site shelter. The sensor is 4.1 meters above ground and close to the shelter.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	THR422	**Technician**	Tim Mendenhall	**Site Visit Date**	10/13/2023

Site Sponsor (agency)	NPS	**USGS Map**	Fryburg NW
Operating Group	NPS and state of ND	**Map Scale**	
AQS #	38-007-0002	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, SO2, IMPROVE, PM2.5	**QAPP Latitude**	46.8947
Deposition Measurement	dry, wet	**QAPP Longitude**	-103.3778
Land Use	prairie	**QAPP Elevation Meters**	850
Terrain	rolling - complex	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	46.894844
Site Address 1	Painted Canyon Visitor Center	**Audit Longitude**	-103.377719
Site Address 2	Exit 32 Interstate 94	**Audit Elevation**	840
County	Billings	**Audit Declination**	8.2
City, State	Medora, ND		
Zip Code	58645	**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** ☑	

Present

Shelter Working Room ☑	**Make**	Ekto	**Model**	8814 (s/n 3028-1)	**Shelter Size**	896 cuft
Shelter Clean ☑	**Notes**	The shelter is in good condition, clean and well organized.				
Site OK ☑	**Notes**					

Driving Directions From Interstate 94 take exit 32 to the Painted Canyon rest area and visitor center. The site is just east of the parking lot on a gravel road.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	THR422	Technician	Tim Mendenhall	Site Visit Date	10/13/2023

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:

The 2-meter temperature sensor is mounted on south side of the sample tower, which is attached to the site shelter. The sensor is 4.1 meters above ground and close to the shelter.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	THR422	Technician	Tim Mendenhall	Site Visit Date	10/13/2023

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?	☑	
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	THR422	Technician	Tim Mendenhall	Site Visit Date	10/13/2023

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 10 meters and glass manifold
4	Describe dry dep sample tube.		3/8 teflon by 12 meters and 1.5 meters of tygon
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet and analyzer
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:

The ozone monitor is operated by the state of North Dakota. There is approximately 1.5 meters of tygon tubing attached to the 3/8 filter pack flow tubing. The data logger was recording the flow rate as 1.5 lpm while the rotometer and the audit standard device were measuring approximately 3 lpm.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID	THR422	Technician	Tim Mendenhall	Site Visit Date	10/13/2023

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:

The met tower is no longer in use.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	THR422	Technician	Tim Mendenhall	Site Visit Date	10/13/2023

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	☐		☐
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?	☐	not used
2	Are the Site Status Report Forms being completed and current?	☑	Flow section only
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	THR422	Technician	Tim Mendenhall	Site Visit Date	10/13/2023

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Trained by previous site operator
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Trained by current 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?	☑	
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	☐	N/A	☑
Manual Zero/Span Tests	☑	Every 2 weeks	☑
Automatic Precision Level Tests	☐	N/A	☑
Manual Precision Level Test	☑	Every 2 weeks	☑
Analyzer Diagnostics Tests	☑	Semiannually	☑
In-line Filter Replacement (at inlet)	☑	every 2 months	☑
In-line Filter Replacement (at analyze	☑	every 2 months	☑
Sample Line Check for Dirt/Water	☐		☐
Zero Air Desiccant Check	☑	Every 2 weeks	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	not tested
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☐	Not tested
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 ozone sample train does not have a means to introduce test gas at the sample inlet. Results of routine zero, span, precision, and any multipoint calibration checks are maintained by the state personnel who perform the tests. The two inlet filters in the sample train are creating a large pressure drop.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID THR422 **Technician** Tim Mendenhall **Site Visit Date** 10/13/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings
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	☑	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	☐		☐

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:

Gloves are not used to handle the filter pack. The filter bag is used as a glove.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID THR422 **Technician** Tim Mendenhall **Site Visit Date** 10/13/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	65606	5CB1520H68	none
DAS	Environmental Sys Corp	8816	2600	90656
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	Illegible	none
Flow Rate	Alicat	MC-10SLPM-D-PCV	301232	none
Infrastructure	Infrastructure	none	none	none
Met tower	Rohn	unknown	none	none
Sample Tower	Aluma Tower	B	AT-81077-J5	none
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342VC	29200	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GLR468-Tim Mendenhall-10/18/2023						
1	10/18/2023	Computer	Hewlett Packard	ACAD	6730b	CNU9335F7W
2	10/18/2023	Elevation	Elevation	None	1	None
3	10/18/2023	Filter pack flow pump	Thomas	none	107CAB18	Illegible
4	10/18/2023	Flow Rate	Tylan	none	FC280	AW9710138
5	10/18/2023	Infrastructure	Infrastructure	none	none	none
6	10/18/2023	MFC power supply	Tylan	03944	RO-32	FP9605010
7	10/18/2023	Ozone	ThermoElectron Inc	none	49i A3NCA	1201477661
8	10/18/2023	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	0733726104
9	10/18/2023	Sample Tower	Aluma Tower	none	B	none
10	10/18/2023	Shelter Temperature	ARS	77	none	none
11	10/18/2023	Siting Criteria	Siting Criteria	None	1	None
12	10/18/2023	Temperature2meter	RM Young	none	41342	17625
13	10/18/2023	Zero air pump	Werther International	none	C 120/TC	001007354

DAS Data Form

DAS Time Max Error: 0.17

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	C2600	GLR468	Tim Mendenhall	10/18/2023	DAS	Primary

Das Date: 10/18/2023
Das Time: 09:55:05
Das Day: 291

Audit Date 10/18/2023
Audit Time 09:55:15
Audit Day 291

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0000	0.0000	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
4	0.0000	0.0000	0.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9710138	GLR468	Tim Mendenhall	10/18/2023	Flow Rate	none

Mfg	Tylan	
SN/Owner ID	FP9605010	03944
Parameter:	MFC power supply	

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**	
0.22%	0.33%			

Cal Factor Zero	0.094
Cal Factor Full Scale	5.441
Rotometer Reading:	3.1

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	-0.04	0.000	0.08	l/m	l/m	
primary	leak check	0.000	0.000	-0.01	0.000	0.12	l/m	l/m	
primary	test pt 1	3.009	3.010	2.72	0.000	3.00	l/m	l/m	-0.33%
primary	test pt 2	3.008	3.010	2.71	0.000	3.00	l/m	l/m	-0.33%
primary	test pt 3	3.008	3.010	2.72	0.000	3.01	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**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	360 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	1201477661	GLR468	Tim Mendenhall	10/18/2023	Ozone	none

Slope:	0.99776	**Slope:**	0.00000
Intercept	-0.82253	**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 % Dif**	**A Avg %Diff**	**A Max % Dif**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.45	0.15	-0.54	ppb		-0.69
primary	2	16.06	15.80	14.90	ppb		-0.9
primary	3	34.46	34.24	33.22	ppb	-3.02	
primary	4	63.59	63.45	62.45	ppb	-1.59	
primary	5	107.98	107.96	106.96	ppb	-0.93	

Sensor Component	Condition	Status
Audit Pressure	704 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	0.4	pass
Span	1.013	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	123.7 kHz	pass
Cell A Noise	2.3 ppb	pass
Cell A Flow	0.68 lpm	pass
Cell A Pressure	673.9 mmHg	pass
Cell A Tmp.	31.5 C	pass
Cell B Freq.	80.8 kHz	pass
Cell B Noise	1.1 ppb	pass
Cell B Flow	0.70 lpm	pass
Cell B Pressure	674.2 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	17625	GLR468	Tim Mendenhall	10/18/2023	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
0.21	0.24		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.31	0.23	0.000	0.06	C	-0.17
primary	Temp Mid Range	22.91	22.56	0.000	22.34	C	-0.22
primary	Temp High Rang	50.45	49.78	0.000	49.54	C	-0.24

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	GLR468	Tim Mendenhall	10/18/2023	Shelter Temperature	77

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.63	0.70		

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	23.11	22.76	0.000	23.3	C	0.5
primary	Temp Mid Range	21.37	21.04	0.000	21.7	C	0.7
primary	Temp Mid Range	21.80	21.47	0.000	22.2	C	0.69

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	GLR468	Technician	Tim Mendenhall	Site Visit Date	10/18/2023

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-20)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	Fair	Status	pass
Sensor Component	Met Tower	Condition	Poor	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Moisture Trap Type	Condition	Filter	Status	pass
Sensor Component	Power Cables	Condition	Fair	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	Fair	Status	pass
Sensor Component	Shelter Floor	Condition	Fair	Status	pass
Sensor Component	Shelter walls	Condition	Fair	Status	pass
Sensor Component	Excessive mold present	Condition	Fair	Status	pass
Sensor Component	Signal Cable	Condition	Poor	Status	Fail
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	20 km	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

The site operator uses the filter bad as a glove.

2 **Parameter:** SitingCriteriaCom

The site is located in a small clearing within 100 meters of a horse stable. There is a plywood and aluminum processing plant within 20 km of the site.

3 **Parameter:** ShelterCleanNotes

The shelter is in fair condition. Evidence of repairs to roof leaks attempted. The floor has been repaired since the previous audit visit.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	GLR468	**Technician**	Tim Mendenhall	**Site Visit Date**	10/18/2023

Site Sponsor (agency)	NPS	**USGS Map**	Lake McDonald West
Operating Group	NPS	**Map Scale**	
AQS #	30-029-8001	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**	48.5103
Deposition Measurement	dry, wet, Hg	**QAPP Longitude**	-113.9956
Land Use	woodland - mixed	**QAPP Elevation Meters**	976
Terrain	complex	**QAPP Declination**	18
Conforms to MLM	No	**QAPP Declination Date**	12/27/2004
Site Telephone	(406) 888-7983	**Audit Latitude**	48.510301
Site Address 1	Horse Stables	**Audit Longitude**	-113.996807
Site Address 2	Quarter Circle Bridge Rd	**Audit Elevation**	964
County	Flathead	**Audit Declination**	14.1
City, State	West Glacier, MT		
Zip Code	59936	**Fire Extinguisher** ☑	Inspected June 2011
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 2149-20)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in fair condition. Evidence of repairs to roof leaks attempted. The floor has been repaired since the previous audit visit.				
Site OK	☑	**Notes**					

Driving Directions

From Kalispell proceed north on route 2 to West Glacier. Turn left onto Going To The Sun Road into Glacier National Park. Proceed approximately 0.2 miles past the entrance and fee station, and turn left toward the horse stables. Bear right at the fork and continue through the gate past the stables. The site is visible in the clearing on the left.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	GLR468	Technician	Tim Mendenhall	Site Visit Date	10/18/2023

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)	☑	Temperature now at 2 meters
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	GLR468	Technician	Tim Mendenhall	Site Visit Date	10/18/2023

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:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	GLR468	Technician	Tim Mendenhall	Site Visit Date	10/18/2023

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 12 meters and 0.5 meters tygon
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 GLR468 **Technician** Tim Mendenhall **Site Visit Date** 10/18/2023

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	GLR468	Technician	Tim Mendenhall	Site Visit Date	10/18/2023

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	☑	Oct 2016	☑
HASP	☑	April 2004	☐
Field Ops Manual	☑	April 2004	☐
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	GLR468	Technician	Tim Mendenhall	Site Visit Date	10/18/2023

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Trained by previous site 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	☑	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:

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	GLR468	Technician	Tim Mendenhall	Site Visit Date	10/18/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed various times
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
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	☑	As needed	☑
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 uses the filter bad as a glove.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID GLR468 **Technician** Tim Mendenhall **Site Visit Date** 10/18/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6730b	CNU9335F7W	ACAD
DAS	Environmental Sys Corp	8864	C2600	None
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	Illegible	none
Flow Rate	Tylan	FC280	AW9710138	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP9605010	03944
Ozone	ThermoElectron Inc	49i A3NCA	1201477661	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	0733726104	none
Sample Tower	Aluma Tower	B	none	none
Shelter Temperature	ARS	none	none	77
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	17625	none
Zero air pump	Werther International	C 120/TC	001007354	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
UVL124-Eric Hebert-10/19/2023						
1	10/19/2023	DAS	Campbell	000347	CR3000	2126
2	10/19/2023	Ozone	ThermoElectron Inc	000680	49i A1NAA	1030244792
3	10/19/2023	Ozone Standard	ThermoElectron Inc	000438	49i A3NAA	CM08200014
4	10/19/2023	Zero air pump	Werther International	06936	C 70/4	000829169

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244792	UVL124	Eric Hebert	10/19/2023	Ozone	000680

Slope:	1.00788	**Slope:**	0.00000
Intercept	-0.41443	**Intercept**	0.00000
CorrCoff:	0.99998	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00450	**Intercept**	-0.25270
Cert Date	4/24/2023	**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	-0.41	-0.11	-0.13	ppb		-0.02
primary	2	16.44	16.60	16.07	ppb		-0.53
primary	3	32.45	32.48	32.09	ppb	-1.21	
primary	4	66.61	66.37	66.43	ppb	0.09	
primary	5	113.90	113.29	113.90	ppb	0.54	

Sensor Component	Audit Pressure	**Condition**	732 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 t	**Condition**	True	**Status**	pass
Sensor Component	ADT <1000 vehicles further than 5	**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**	0.40	**Status**	pass
Sensor Component	Span	**Condition**	1.030	**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**	115.1 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.6 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.68 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	713.5 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	33.5 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	100.7 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	1.1 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.68 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	714.4 mmHg	**Status**	pass
Sensor Component	Nafion dryer installed	**Condition**	False	**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*
HOX148-Eric Hebert-10/19/2023						
1	10/19/2023	DAS	Campbell	000426	CR3000	2533
2	10/19/2023	Ozone	ThermoElectron Inc	000734	49i A1NAA	1105347317
3	10/19/2023	Ozone Standard	ThermoElectron Inc	000544	49i A3NAA	0929938242
4	10/19/2023	Zero air pump	Werther International	06938	C 70/4	000829164

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347317	HOX148	Eric Hebert	10/19/2023	Ozone	000734

Slope:	1.01508	**Slope:**	0.00000
Intercept	0.46876	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00450	**Intercept**	-0.25270
Cert Date	4/24/2023	**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	-0.57	-0.27	0.19	ppb		0.46
primary	2	15.43	15.59	16.45	ppb		0.86
primary	3	35.17	35.18	36.04	ppb	2.42	
primary	4	64.95	64.72	66.09	ppb	2.09	
primary	5	117.25	116.61	118.90	ppb	1.94	

Sensor Component	Condition	Status
Audit Pressure	738 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	1.023	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	100.3 kHz	pass
Cell A Noise	1.6 ppb	pass
Cell A Flow	0.72 lpm	pass
Cell A Pressure	695.8 mmHg	pass
Cell A Tmp.	37.0 C	pass
Cell B Freq.	104.8 kHz	pass
Cell B Noise	1.3 ppb	pass
Cell B Flow	0.68 lpm	pass
Cell B Pressure	696.7 mmHg	pass
Nafion dryer installed	True	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ANA115-Eric Hebert-10/20/2023						
1	10/20/2023	DAS	Campbell	000339	CR3000	2118
2	10/20/2023	Ozone	ThermoElectron Inc	000699	49i A1NAA	1030244804
3	10/20/2023	Ozone Standard	ThermoElectron Inc	000513	49i A3NAA	0922236889
4	10/20/2023	Zero air pump	Werther International	06933	C 70/4	000836202

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244804	ANA115	Eric Hebert	10/20/2023	Ozone	000699

Slope:	0.99806	**Slope:**	0.00000
Intercept	-0.18415	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00450	**Intercept**	-0.25270
Cert Date	4/24/2023	**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	0.18	0.46	0.34	ppb		-0.12
primary	2	16.03	16.19	16.06	ppb		-0.13
primary	3	33.02	33.04	32.62	ppb	-1.28	
primary	4	69.12	68.86	68.50	ppb	-0.52	
primary	5	113.65	113.04	112.70	ppb	-0.3	

Sensor Component	Condition	Status
Audit Pressure	723 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	-0.20	pass
Span	1.014	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	99.5 kHz	pass
Cell A Noise	Not tested	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	690.1 mmHg	pass
Cell A Tmp.	34.3 C	pass
Cell B Freq.	102.8 kHz	pass
Cell B Noise	Not tested	pass
Cell B Flow	0.65 lpm	pass
Cell B Pressure	689.4 mmHg	pass
Nafion dryer installed	True	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CAV436-Martin Valvur-10/23/2023						
1	10/23/2023	Computer	Hewlett Packard	none	ProBook	5CD01715DB
2	10/23/2023	DAS	Environmental Sys Corp	None	8864	C2602
3	10/23/2023	Modem	Sierra wireless	none	GX450	Unknown
4	10/23/2023	Ozone	ThermoElectron Inc	none	49i A3NAA	0733726103
5	10/23/2023	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460009
6	10/23/2023	Shelter Temperature	ARS	none	none	none
7	10/23/2023	Temperature2meter	RM Young	none	41432VC	31823
8	10/23/2023	Zero air pump	Werther International	none	C 70/4	000915011

DAS Data Form

DAS Time Max Error: 1.57

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	C2602	CAV436	Martin Valvur	10/23/2023	DAS	Primary

Das Date: 10/23/2023 **Audit Date** 10/23/2023
Das Time: 07:57:26 **Audit Time** 07:59:00
Das Day: 296 **Audit Day** 296

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

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
4	0.0000	0.0000	0.0000	V	V	0.0000

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	0733726103	CAV436	Martin Valvur	10/23/2023	Ozone	none

Slope:	0.97980	**Slope:**	0.00000
Intercept	-0.77048	**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	-0.22	-1.00	ppb		-0.78
primary	2	14.45	14.13	12.91	ppb		-1.22
primary	3	33.86	33.40	32.09	ppb	-4	
primary	4	64.00	63.31	61.40	ppb	-3.06	
primary	5	115.04	113.97	110.80	ppb	-2.82	

Sensor Component	Condition	Status
Audit Pressure	648 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	-0.2	pass
Span	1.004	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	124.5 kHz	pass
Cell A Noise	1.1 ppb	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	633.4 mmHg	pass
Cell A Tmp.	37.9 C	pass
Cell B Freq.	71.8 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.69 lpm	pass
Cell B Pressure	632.8 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	31823	CAV436	Martin Valvur	10/23/2023	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
0.69	0.74		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.14	0.14	0.000	0.88	C	0.74
primary	Temp Mid Range	24.40	24.40	0.000	25.11	C	0.71
primary	Temp High Rang	48.09	48.09	0.000	48.71	C	0.62

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	CAV436	Martin Valvur	10/23/2023	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.32	0.69		

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	20.51	20.51	0.000	21.2	C	0.69
primary	Temp Mid Range	21.06	21.06	0.000	21.3	C	0.26
primary	Temp Mid Range	24.12	24.12	0.000	24.1	C	-0.02

Sensor Component	System Memo	Condition		Status	pass

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Dry deposition samples are not collected at this site.

2 **Parameter:** DocumentationCo

The site is visited every other Tuesday.

3 **Parameter:** MetSensorComme

The 2-meter temperature sensor is mounted one meter above the building roof and facing south. The building is likely to impact the accuracy of the measurements.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CAV436	**Technician**	Martin Valvur	**Site Visit Date**	10/23/2023

Site Sponsor (agency)	NPS	**USGS Map**	
Operating Group	NPS	**Map Scale**	
AQS #	35-151-0745	**Map Date**	
Meteorological Type			
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**	32.178141
Site Address 1		**Audit Longitude**	-104.443206
Site Address 2		**Audit Elevation**	1358
County		**Audit Declination**	7
City, State	Carlsbad, NM		
Zip Code	88220	**Fire Extinguisher** ☑	Inspected March 2023
Time Zone	Mountain	**First Aid Kit** ☐	in vehicle
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**	E8129-29034	**Shelter Size**	768 cutt
Shelter Clean	☑	**Notes**					
Site OK	☑	**Notes**					
Driving Directions							

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CAV436	Technician	Martin Valvur	Site Visit Date	10/23/2023

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?	☐	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)	☐	Attached to roof railing
6	Is the solar radiation sensor plumb?	☑	
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	
8	Is the rain gauge plumb?	☑	
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	
11	Is it inclined approximately 30 degrees?	☑	

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 is mounted one meter above the building roof and facing south. The building is likely to impact the accuracy of the measurements.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	CAV436	Technician	Martin Valvur	Site Visit Date	10/23/2023

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	CAV436	Technician	Martin Valvur	Site Visit Date	10/23/2023

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.		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?	☐	
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	CAV436	Technician	Martin Valvur	Site Visit Date	10/23/2023

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	CAV436	Technician	Martin Valvur	Site Visit Date	10/23/2023

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	☐		☐
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?	☐	

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 is visited every other Tuesday.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	CAV436	Technician	Martin Valvur	Site Visit Date	10/23/2023

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	N/A
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	N/A
3	Is the site visited regularly on the required Tuesday schedule?	☐	every other Tuesday
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	☑	Bi-monthly	☐
Translator Zero/Span Tests (climatronics)	☐		☐
Manual Rain Gauge Test	☑	Bi-monthly	☐
Confirm Reasonableness of Current Values	☑	Bi-monthly	☐
Test Surface Wetness Response	☐		☐

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	☑	Bi-monthly	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☑
Analyzer Diagnostics Tests	☑	Bi-monthly	☑
In-line Filter Replacement (at inlet)	☑	Bi-monthly	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Bi-monthly	☑
Zero Air Desiccant Check	☑	Bi-monthly	☑

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	CAV436	Technician	Martin Valvur	Site Visit Date	10/23/2023

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?	☑	N/A
4	Are general observations being made and recorded? How?	☑	N/A
5	Are site supplies on-hand and replenished in a timely fashion?	☑	N/A
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 site.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID CAV436 **Technician** Martin Valvur **Site Visit Date** 10/23/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	ProBook	5CD01715DB	none
DAS	Environmental Sys Corp	8864	C2602	None
Modem	Sierra wireless	GX450	Unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	0733726103	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	CM08460009	none
Shelter Temperature	ARS	none	none	none
Temperature2meter	RM Young	41432VC	31823	none
Zero air pump	Werther International	C 70/4	000915011	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CHA467-Martin Valvur-10/24/2023						
1	10/24/2023	DAS	Environmental Sys Corp	90611	8816	2613
2	10/24/2023	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460007
3	10/24/2023	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460051
4	10/24/2023	Zero air pump	Werther International	none	PC70/4	531392

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460007	CHA467	Martin Valvur	10/24/2023	Ozone	none

Slope:	0.98591	**Slope:**	0.00000
Intercept	0.08656	**Intercept**	0.00000
CorrCoff:	0.99990	**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	0.09	-0.11	0.84	ppb		0.95
primary	2	15.10	14.78	14.04	ppb		-0.74
primary	3	34.97	34.50	33.95	ppb	-1.61	
primary	4	64.57	63.88	62.57	ppb	-2.07	
primary	5	115.40	114.32	113.20	ppb	-0.98	

Sensor Component	Condition	Status
Audit Pressure	633 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	-0.4	pass
Span	1.025	pass
Zero Voltage	0.000	pass
Fullscale Voltage	1.000	pass
Cell A Freq.	110.3 kHz	pass
Cell A Noise	1.4 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	625.4 mmHg	pass
Cell A Tmp.	33.3 C	pass
Cell B Freq.	103.7 kHz	pass
Cell B Noise	1.8 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	624.5 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*
GRC474-Martin Valvur-10/25/2023						
1	10/25/2023	DAS	Environmental Sys Corp	90602	8816	2270
2	10/25/2023	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943902
3	10/25/2023	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450191
4	10/25/2023	Zero air pump	Werther International	none	PC70/4	531380

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1023943902	GRC474	Martin Valvur	10/25/2023	Ozone	none

Slope:	0.97456	**Slope:**	0.00000
Intercept	-0.76120	**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	0.07	-0.13	-1.01	ppb		-0.88
primary	2	14.33	14.01	13.02	ppb		-0.99
primary	3	35.51	35.04	33.49	ppb	-4.52	
primary	4	65.15	64.45	61.91	ppb	-4.02	
primary	5	116.24	115.16	111.50	ppb	-3.23	

Sensor Component		Condition		Status	
Sensor Component	Audit Pressure	Condition	597 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 t	Condition	True	Status	pass
Sensor Component	ADT <1000 vehicles further than 5	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	-0.1	Status	pass
Sensor Component	Span	Condition	1.021	Status	pass
Sensor Component	Zero Voltage	Condition	0.0002	Status	pass
Sensor Component	Fullscale Voltage	Condition	1.0001	Status	pass
Sensor Component	Cell A Freq.	Condition	87.3 kHz	Status	pass
Sensor Component	Cell A Noise	Condition	0.9 ppb	Status	pass
Sensor Component	Cell A Flow	Condition	0.68 lpm	Status	pass
Sensor Component	Cell A Pressure	Condition	592.7 mmHg	Status	pass
Sensor Component	Cell A Tmp.	Condition	34.1 C	Status	pass
Sensor Component	Cell B Freq.	Condition	80.5 kHz	Status	pass
Sensor Component	Cell B Noise	Condition	0.6 ppb	Status	pass
Sensor Component	Cell B Flow	Condition	0.69 lpm	Status	pass
Sensor Component	Cell B Pressure	Condition	592.1 mmHg	Status	pass
Sensor Component	Nafion dryer installed	Condition	False	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*
PET427-Martin Valvur-10/26/2023						
1	10/26/2023	DAS	Environmental Sys Corp	90641	8816	2526
2	10/26/2023	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943901
3	10/26/2023	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1211052489
4	10/26/2023	Zero air pump	Werther International	none	PC 70/4	531382

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1023943901	PET427	Martin Valvur	10/26/2023	Ozone	none

Slope:	0.95667	**Slope:**	0.00000
Intercept	0.46781	**Intercept**	0.00000
CorrCoff:	0.99977	**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	0.14	-0.06	1.77	ppb		1.83
primary	2	15.38	15.06	13.75	ppb		-1.31
primary	3	34.30	33.83	32.41	ppb	-4.29	
primary	4	58.46	57.81	55.60	ppb	-3.9	
primary	5	115.72	114.64	110.50	ppb	-3.68	

Sensor Component	Condition	Status
Audit Pressure	622 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	Not tested	pass
Offset	0.000	pass
Span	1.004	pass
Zero Voltage	0.0001	pass
Fullscale Voltage	1.0001	pass
Cell A Freq.	87.5 kHz	pass
Cell A Noise	0.4 ppb	pass
Cell A Flow	0.52 lpm	pass
Cell A Pressure	615.5 mmHg	pass
Cell A Tmp.	33.6 C	pass
Cell B Freq.	87.1 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.51 lpm	pass
Cell B Pressure	614.9 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*
STK138-Eric Hebert-10/29/2023						
1	10/29/2023	Computer	Dell	07065	Inspiron 15	1Y3MC12
2	10/29/2023	DAS	Campbell	000349	CR3000	2128
3	10/29/2023	Elevation	Elevation	None	1	None
4	10/29/2023	Filter pack flow pump	Thomas	04923	107CAB18	060300019959
5	10/29/2023	Flow Rate	Apex	000461	AXMC105LPMDPCV	illegible
6	10/29/2023	Infrastructure	Infrastructure	none	none	none
7	10/29/2023	Modem	Digi	07179	LR54	unknown
8	10/29/2023	Ozone	ThermoElectron Inc	000625	49i A1NAA	1009241797
9	10/29/2023	Ozone Standard	ThermoElectron Inc	000445	49i A3NAA	CM08200021
10	10/29/2023	Sample Tower	Aluma Tower	03554	A	none
11	10/29/2023	Shelter Temperature	Campbell	none	107-L	unknown
12	10/29/2023	Siting Criteria	Siting Criteria	None	1	None
13	10/29/2023	Temperature	RM Young	06407	41342VC	14040
14	10/29/2023	Zero air pump	Werther International	06897	C 70/4	000821893

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2128	STK138	Eric Hebert	10/29/2023	DAS	Primary

Das Date: 10/29/2023 **Audit Date** 10/29/2023
Das Time: 06:15:31 **Audit Time** 06:15:30
Das Day: 302 **Audit Day** 302

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

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2023	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
4	0.0000	0.0000	0.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	STK138	Eric Hebert	10/29/2023	Flow Rate	000461

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
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**	0.01
				Cal Factor Full Scale	1.02
0.90%	1.35%			**Rotometer Reading:**	1.45

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	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.02	l/m	l/m	
primary	test pt 1	1.483	1.480	1.47	0.000	1.50	l/m	l/m	1.35%
primary	test pt 2	1.483	1.480	1.47	0.000	1.50	l/m	l/m	1.35%
primary	test pt 3	1.500	1.500	1.47	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**	6.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.2 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 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	1009241797	STK138	Eric Hebert	10/29/2023	Ozone	000625

Slope:	1.01627	**Slope:**	0.00000
Intercept	0.16439	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00450	**Intercept**	-0.25270
Cert Date	4/24/2023	**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	-0.22	0.07	0.38	ppb		0.31
primary	2	16.50	16.65	17.03	ppb		0.38
primary	3	36.35	36.35	37.00	ppb	1.77	
primary	4	69.71	69.45	70.68	ppb	1.76	
primary	5	114.62	114.00	116.10	ppb	1.83	

Sensor Component	Condition	Status
Audit Pressure	Not tested	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	-0.20	pass
Span	1.032	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	100.4 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.63 lpm	pass
Cell A Pressure	699.3 mmHg	pass
Cell A Tmp.	34.1 C	pass
Cell B Freq.	101.7 kHz	pass
Cell B Noise	1.0 ppb	pass
Cell B Flow	0.57 lpm	pass
Cell B Pressure	698.7 mmHg	pass
Nafion dryer installed	True	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14040	STK138	Eric Hebert	10/29/2023	Temperature	06407

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**
0.08	0.11		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.19	0.02	0.000	0.1	C	0.11
primary	Temp Mid Range	28.50	28.07	0.000	28.0	C	-0.11
primary	Temp High Range	48.89	48.27	0.000	48.3	C	-0.02

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

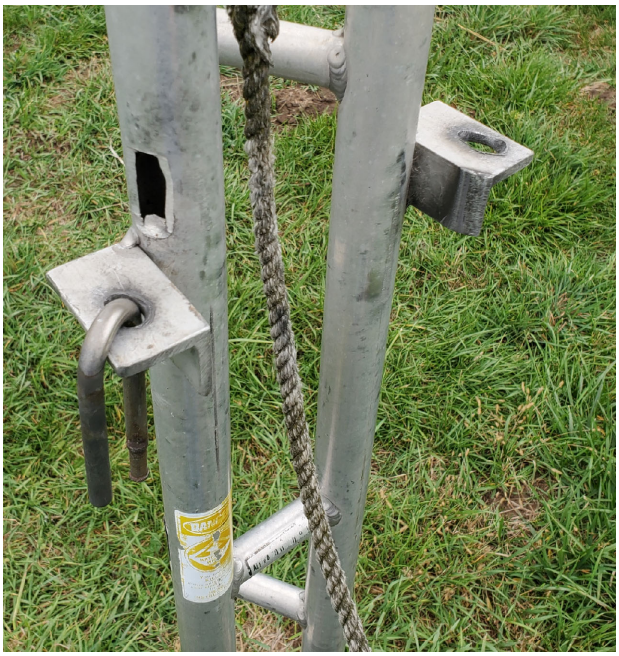
Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	unknown	STK138	Eric Hebert	10/29/2023	Shelter Temperature	none

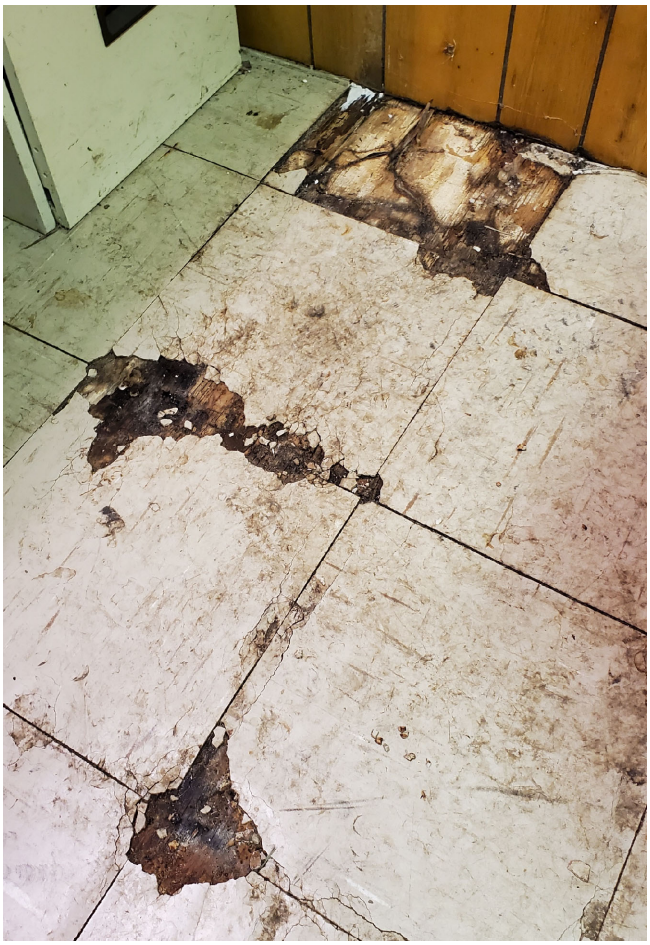
DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.65	1.54		

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	25.82	25.42	0.000	25.2	C	-0.21
primary	Temp Mid Range	23.14	22.76	0.000	24.3	C	1.54
primary	Temp Mid Range	28.48	28.05	0.000	27.9	C	-0.2

Sensor Component	System Memo	Condition		Status	pass





Infrastructure Data For

Site ID	Technician	Site Visit Date
STK138	Eric Hebert	10/29/2023

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-21)	640 cuft

Sensor Component	Condition	Status
Sample Tower Type	Type A	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	Poor	Fail
Shelter Condition	Poor	Fail
Shelter Door	Fair	pass
Shelter Roof	Good	pass
Shelter Floor	Poor	Fail
Shelter walls	Fair	pass
Excessive mold present	Fair	pass
Signal Cable	Good	pass
Tubing Type	3/8 teflon	pass
Sample Train	Good	pass
System Memo		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	Fail
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

The site operator is completing the SSRF information on the day the filter is removed rather than when installed. He is also indicating on the form that the ozone inlet filter is changed every week.

2 **Parameter:** DasComments

The sample tower is original and is in poor condition. The lower section has been cut to allow the upper section to fold down completely.

3 **Parameter:** SiteOpsProcedures

The ozone sample train is leak tested every 2 weeks.

4 **Parameter:** SitingCriteriaCom

The site is located in a corn field on a cattle farm. Corn is planted within 10 meters.

5 **Parameter:** ShelterCleanNotes

There are signs of leaks on the walls and floor rot. The shelter has continued to deteriorate since the previous audit visit.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	STK138	**Technician**	Eric Hebert	**Site Visit Date**	10/29/2023

Site Sponsor (agency)	EPA	**USGS Map**	Kent
Operating Group	Private	**Map Scale**	
AQS #	17-085-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	42.2872
Deposition Measurement	dry	**QAPP Longitude**	-89.9998
Land Use	agricultural	**QAPP Elevation Meters**	274
Terrain	rolling	**QAPP Declination**	1.3
Conforms to MLM	Yes	**QAPP Declination Date**	2/22/2006
Site Telephone		**Audit Latitude**	42.287216
Site Address 1	10939 E. Parker Road	**Audit Longitude**	-89.99995
Site Address 2		**Audit Elevation**	281
County	Jo Daviess	**Audit Declination**	-1.3
City, State	Stockton, IL		
Zip Code	61085	**Fire Extinguisher** ☑	new in 2015
Time Zone	Central	**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** ☑	

Present

Shelter Working Room ☑	**Make**	Ekto	**Model**	8810 (s/n 2149-21)	**Shelter Size**	640 cuft
Shelter Clean ☐	**Notes**	There are signs of leaks on the walls and floor rot. The shelter has continued to deteriorate since the previous audit visit.				
Site OK ☑	**Notes**					

Driving Directions

From Stockton go south on 78 (Main Street) for approximately 2.5 miles. As the road turns sharply to the right, continue straight onto a dirt road. There will be a stop sign at another dirt road intersection within 100 yards. Continue through that intersection, the site will be visible in the distance on a hill-side to the left. Continue another 1.5 miles bearing to the left on dirt roads to the Evans farm. The site is past both houses in the hay field.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	STK138	Technician	Eric Hebert	Site Visit Date	10/29/2023

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	STK138	Technician	Eric Hebert	Site Visit Date	10/29/2023

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	STK138	Technician	Eric Hebert	Site Visit Date	10/29/2023

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 18 meters
4	Describe dry dep sample tube.		3/8 teflon by 18 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:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID	STK138	Technician	Eric Hebert	Site Visit Date	10/29/2023

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:

The sample tower is original and is in poor condition. The lower section has been cut to allow the upper section to fold down completely.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	STK138	Technician	Eric Hebert	Site Visit Date	10/29/2023

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	STK138	Technician	Eric Hebert	Site Visit Date	10/29/2023

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	☑	As needed	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☑	As needed	☑
Analyzer Diagnostics Tests	☑	Weekly	☑
In-line Filter Replacement (at inlet)	☑	Weekly	☑
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?	☑	Call-in only

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 tested every 2 weeks.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	STK138	Technician	Eric Hebert	Site Visit Date	10/29/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings
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, 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 is completing the SSRF information on the day the filter is removed rather than when installed. He is also indicating on the form that the ozone inlet filter is changed every week.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID STK138 **Technician** Eric Hebert **Site Visit Date** 10/29/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	1Y3MC12	07065
DAS	Campbell	CR3000	2128	000349
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	060300019959	04923
Flow Rate	Apex	AXMC105LPMDPC	illegible	000461
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07179
Ozone	ThermoElectron Inc	49i A1NAA	1009241797	000625
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200021	000445
Sample Tower	Aluma Tower	A	none	03554
Shelter Temperature	Campbell	107-L	unknown	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	14040	06407
Zero air pump	Werther International	C 70/4	000821893	06897

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PND165-Martin Valvur-10/31/2023						
1	10/31/2023	DAS	Campbell	000403	CR3000	2516
2	10/31/2023	Elevation	Elevation	None	1	None
3	10/31/2023	Filter pack flow pump	Thomas	00534	107CA18	0000162757
4	10/31/2023	Flow Rate	Apex	000871	AXMC105LPMDPCV	illegible
5	10/31/2023	Infrastructure	Infrastructure	none	none	none
6	10/31/2023	Modem	Digi	07123	LR54	Illegible
7	10/31/2023	Noy	Teledyne	000807	T200U	112
8	10/31/2023	Ozone	ThermoElectron Inc	000676	49i A1NAA	1030244794
9	10/31/2023	Ozone Standard	ThermoElectron Inc	000694	49i A3NAA	1030244815
10	10/31/2023	Sample Tower	Aluma Tower	000055	B	AT-81213-J12
11	10/31/2023	Shelter Temperature	Campbell	none	107-L	none
12	10/31/2023	Siting Criteria	Siting Criteria	None	1	None
13	10/31/2023	Temperature	RM Young	06539	41342	14800
14	10/31/2023	Zero air pump	Werther International	06881	C 70/4	000815264

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2516	PND165	Martin Valvur	10/31/2023	DAS	Primary

Das Date: 10/31/2023
Das Time: 12:36:00
Das Day: 304

Audit Date 10/31/2023
Audit Time 12:36:00
Audit Day 304

Low Channel:

Avg Diff:	Max Diff:
0.0000	0.0000

High Channel:

Avg Diff:	Max Diff:
0.0000	0.0000

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
4	0.0000	0.0000	0.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	PND165	Martin Valvur	10/31/2023	Flow Rate	000871

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**	0.01
				Cal Factor Full Scale	1
0.29%	0.33%			**Rotometer Reading:**	3.6

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	0.000	0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.02	l/m	l/m	
primary	test pt 1	3.011	3.010	3.01	0.000	3.02	l/m	l/m	0.33%
primary	test pt 2	3.016	3.020	3.02	0.000	3.01	l/m	l/m	-0.33%
primary	test pt 3	3.004	3.000	3.02	0.000	3.01	l/m	l/m	0.20%

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**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 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	1030244794	PND165	Martin Valvur	10/31/2023	Ozone	000676

Slope:	1.00609	**Slope:**	0.00000
Intercept	-2.68838	**Intercept**	0.00000
CorrCoff:	0.99974	**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	0.14	-0.06	-4.20	ppb		-4.14
primary	2	16.32	15.99	14.65	ppb		-1.34
primary	3	36.12	35.64	33.92	ppb	-4.95	
primary	4	66.12	65.41	62.78	ppb	-4.1	
primary	5	117.68	116.59	114.40	ppb	-1.9	

Sensor Component	Condition	Status
Audit Pressure	578 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	1.9	pass
Span	1.068	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	76.0 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.65 lpm	pass
Cell A Pressure	561.0 mmHg	pass
Cell A Tmp.	29.3 C	pass
Cell B Freq.	84.7 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.62 lpm	pass
Cell B Pressure	560.7 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	14800	PND165	Martin Valvur	10/31/2023	Temperature	06539

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**
0.06	0.08		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.12	0.12	0.000	0.2	C	0.07
primary	Temp Mid Range	21.62	21.62	0.000	21.6	C	-0.03
primary	Temp High Range	47.14	47.14	0.000	47.1	C	-0.08

Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower	**Condition**	Functioning	**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	none	PND165	Martin Valvur	10/31/2023	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.43	0.82		

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	21.16	21.16	0.000	20.3	C	-0.82
primary	Temp Mid Range	21.29	21.29	0.000	21.6	C	0.33
primary	Temp Mid Range	21.16	21.16	0.000	21.3	C	0.15

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	PND165	Technician	Martin Valvur	Site Visit Date	10/31/2023

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-22)	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	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	Poor	Status	Fail
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:** SitingCriteriaCom

Construction at the bottom of the hill and entrance to the site access road has been completed.

2 **Parameter:** ShelterCleanNotes

The floor tiles are loose and breaking into pieces.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	PND165	**Technician**	Martin Valvur	**Site Visit Date**	10/31/2023

Site Sponsor (agency)	BLM-WSO	**USGS Map**	Fremont Lake South
Operating Group	Private / BLM	**Map Scale**	
AQS #	56-035-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	42.9214
Deposition Measurement	dry, wet	**QAPP Longitude**	-109.7900
Land Use	range	**QAPP Elevation Meters**	2388
Terrain	complex	**QAPP Declination**	12.75
Conforms to MLM	Marginally	**QAPP Declination Date**	2/22/2006
Site Telephone	(307) 367-6584	**Audit Latitude**	42.929031
Site Address 1	Skyline Drive	**Audit Longitude**	-109.787796
Site Address 2	Fremont Lake Rd.	**Audit Elevation**	2386
County	Sublette	**Audit Declination**	10.9
City, State	Pinedale, WY		
Zip Code	82941	**Fire Extinguisher** (Present) ☑	New in 2015
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 2149-22)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The floor tiles are loose and breaking into pieces.				
Site OK	☑	**Notes**					

Driving Directions From Rock Springs take route 191 north to Pinedale. At the south edge of town turn right onto Fremont Lake Rd. Continue approximately 6.5 miles on the main road, past Fremont Lake. The road changes to Skyline Drive. The site is visible on a ridge on the right. There is a dirt access road to the site in the summer.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	PND165	Technician	Martin Valvur	Site Visit Date	10/31/2023

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?	☑	Over shelter
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)	☑	Over shelter
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	PND165	Technician	Martin Valvur	Site Visit Date	10/31/2023

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?	☑	N/A
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	PND165	Technician	Martin Valvur	Site Visit Date	10/31/2023

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:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID PND165 **Technician** Martin Valvur **Site Visit Date** 10/31/2023

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	PND165	Technician	Martin Valvur	Site Visit Date	10/31/2023

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	☑	Feb 2014	☑
HASP	☑	Feb 2014	☑
Field Ops Manual	☑	Feb 2014	☑
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	PND165	Technician	Martin Valvur	Site Visit Date	10/31/2023

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 by current 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?	☑	
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	☑	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	☐	N/A	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐	N/A	☑
Analyzer Diagnostics Tests	☑	Every 2 weeks	☑
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, 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	PND165	Technician	Martin Valvur	Site Visit Date	10/31/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed afternoons approximately 80%
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, 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?	☑	
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 PND165 **Technician** Martin Valvur **Site Visit Date** 10/31/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR3000	2516	000403
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	0000162757	00534
Flow Rate	Apex	AXMC105LPMDPC	illegible	000871
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	Illegible	07123
Noy	Teledyne	T200U	112	000807
Ozone	ThermoElectron Inc	49i A1NAA	1030244794	000676
Ozone Standard	ThermoElectron Inc	49i A3NAA	1030244815	000694
Sample Tower	Aluma Tower	B	AT-81213-J12	000055
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14800	06539
Zero air pump	Werther International	C 70/4	000815264	06881

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GRB411-Martin Valvur-11/06/2023						
1	11/6/2023	DAS	Environmental Sys Corp	90635	8816	2507
2	11/6/2023	Ozone	ThermoElectron Inc	none	49i A3NAA	1200666539
3	11/6/2023	Ozone Standard	ThermoElectron Inc	none	49C	0330302753
4	11/6/2023	Zero air pump	Werther International	90722	TT70/4E	507782

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1200666539	GRB411	Martin Valvur	11/06/2023	Ozone	none

Slope:	1.01129	**Slope:**	0.00000
Intercept	-0.87381	**Intercept**	0.00000
CorrCoff:	0.99998	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	CM23147126	**Tfer Desc.**	Ozone primary stan
Tfer ID	01116		
Slope	1.00654	**Intercept**	-0.03885
Cert Date	9/19/2023	**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	0.19	0.22	-0.79	ppb		-1.01
primary	2	16.13	16.00	15.42	ppb		-0.58
primary	3	35.15	34.83	34.66	ppb	-0.49	
primary	4	64.95	64.32	63.77	ppb	-0.86	
primary	5	114.11	112.98	113.50	ppb	0.46	

Sensor Component	Condition	Status
Audit Pressure	588 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	1.005	pass
Zero Voltage	-0.0002	pass
Fullscale Voltage	1.0002	pass
Cell A Freq.	78.8 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.62 lpm	pass
Cell A Pressure	582.3 mmHg	pass
Cell A Tmp.	32.5 C	pass
Cell B Freq.	63.9 kHz	pass
Cell B Noise	0.7 ppb	pass
Cell B Flow	0.60 lpm	pass
Cell B Pressure	582.0 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*
SHE604-Tim Mendenhall-11/06/2023						
1	11/6/2023	DAS	Campbell	none	CR1000	49923
2	11/6/2023	elevation	Elevation	none	none	none
3	11/6/2023	Flow Rate	AALBORG	none	GFC-17	illegibile
4	11/6/2023	Infrastructure	Infrastructure	none	none	none
5	11/6/2023	Sample Tower	Unknown	none	Unknown	None
6	11/6/2023	siting criteria	Siting Criteria	none	none	None
7	11/6/2023	Temperature2meter	Campbell	none	10755	Illegible

DAS Data Form

DAS Time Max Error: 0.03

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	49923	SHE604	Tim Mendenhall	11/06/2023	DAS	Primary

Das Date: 11/6 /2023
Das Time: 8:02:57
Das Day: 310

Audit Date 11/6 /2023
Audit Time 8:02:59
Audit Day 310

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
4	0.0000	0.0000	0.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
AALBORG	illegibile	SHE604	Tim Mendenhall	11/06/2023	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 % Di**	**A Avg %Diff**	**A Max % Di**	**Cal Factor Zero**	0.26
0.89%	1.64%			**Cal Factor Full Scale**	0.987
				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	0.00	0.000	0.26	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.26	l/m	l/m	
primary	test pt 1	2.933	2.930	2.70	0.000	2.96	l/m	l/m	1.02%
primary	test pt 2	3.045	3.040	2.75	0.000	2.99	l/m	l/m	-1.64%
primary	test pt 3	2.975	2.980	2.75	0.000	2.98	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**	N/A	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	Illegible	SHE604	Tim Mendenhall	11/06/2023	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
0.11	0.17		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.17	0.09	0.000	0.14	C	0.05
primary	Temp Mid Rang	25.76	25.38	0.000	25.21	C	-0.17
primary	Temp High Rang	40.51	39.96	0.000	40.08	C	0.12

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

Infrastructure Data For

Site ID	SHE604	Technician	Tim Mendenhall	Site Visit Date	11/06/2023

Shelter Make	Shelter Model	Shelter Size

Sensor Component	Condition	Status
Sample Tower Type	Other	pass
Conduit	N/A	pass
Met Tower	Fair	pass
Moisture Trap	Installed	pass
Moisture Trap Type	Filter	pass
Power Cables	Good	pass
Shelter Temp Control	Functioning	pass
Rotometer	Not installed	pass
Sample Tower	Fair	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	Fair	pass
System Memo		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		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:** DasComments

The site power source is solar and wind with battery storage. The NEMA enclosure has a cooling fan and heat for the 2B ozone monitor.

2 **Parameter:** SiteOpsProcedures

observations of current meteorological measurements are recorded on a hardcopy checklist for ARS and not on the SSRF.

3 **Parameter:** DocumentationCo

The site operator is supplied with a disc containing the QAPP, operating procedures, and HASP which is kept at his office. A hard copy BLM check list developed by ARS is completed and sent to ARS each week. Standard CASTNET SSRF forms are being used now.

4 **Parameter:** SitingCriteriaCom

The site is located in range land. There is an active rail line with coal trains within one kilometer of the site.

5 **Parameter:** ShelterCleanNotes

NEMA enclosure, wind and solar power

6 **Parameter:** PollAnalyzerCom

The dry deposition filter pack enclosure is not the standard "pot" size as at the other CASTNET sites. The diameter is much smaller. It is not clear if this will impact particle collection efficiency. The filter is not plumb inside the enclosure and there is a section of tygon tubing between the pump and MFC.

7 **Parameter:** MetSensorComme

The site is a small footprint solar powered site that has been operating as part of the WARMS network for more than 10 years. Objects violate the 45 degree rule for the tipping bucket rain gage. The temperature and RH are being measured at 2.5 meters above the ground. The upper section of the tower is not plumb. The guy wires could be adjusted to correct.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	SHE604	**Technician**	Tim Mendenhall	**Site Visit Date**	11/06/2023

Site Sponsor (agency)	BLM-WSO	**USGS Map**	
Operating Group	BLM	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type	Met One		
Air Pollutant Analyzer		**QAPP Latitude**	
Deposition Measurement		**QAPP Longitude**	
Land Use		**QAPP Elevation Meters**	
Terrain		**QAPP Declination**	
Conforms to MLM		**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	44.933601
Site Address 1		**Audit Longitude**	-106.847161
Site Address 2		**Audit Elevation**	1141
County	Sheridan	**Audit Declination**	9.8
City, State	Sheridan, WY		
Zip Code	82801		
Time Zone	Mountain		
Primary Operator			
Primary Op. Phone #			
Primary Op. E-mail			
Backup Operator			
Backup Op. Phone #			
Backup Op. E-mail			

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

Shelter Working Room	☐	**Make**		**Model**		**Shelter Size**	
Shelter Clean	☑	**Notes**	NEMA enclosure, wind and solar power				
Site OK	☐	**Notes**					
Driving Directions							

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	SHE604	Technician	Tim Mendenhall	Site Visit Date	11/06/2023

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	
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)	☑	
3	Are the tower and sensors plumb?	☑	tower upper section not plumb
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?	☑	
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	
8	Is the rain gauge plumb?	☐	
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☐	45 degree rule violation
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:

The site is a small footprint solar powered site that has been operating as part of the WARMS network for more than 10 years. Objects violate the 45 degree rule for the tipping bucket rain gage. The temperature and RH are being measured at 2.5 meters above the ground. The upper section of the tower is not plumb. The guy wires could be adjusted to correct.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	SHE604	Technician	Tim Mendenhall	Site Visit Date	11/06/2023

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?	☑	N/A
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	
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	SHE604	Technician	Tim Mendenhall	Site Visit Date	11/06/2023

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.		N/A
4	Describe dry dep sample tube.		3/8 teflon by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	N/A
8	Are there moisture traps in the sample lines?	☑	in-line filter
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:

The dry deposition filter pack enclosure is not the standard "pot" size as at the other CASTNET sites. The diameter is much smaller. It is not clear if this will impact particle collection efficiency. The filter is not plumb inside the enclosure and there is a section of tygon tubing between the pump and MFC.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID	SHE604	Technician	Tim Mendenhall	Site Visit Date	11/06/2023

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?	☐	Marginally

		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 site power source is solar and wind with battery storage. The NEMA enclosure has a cooling fan and heat for the 2B ozone monitor.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	SHE604	Technician	Tim Mendenhall	Site Visit Date	11/06/2023

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	☑	2013	☑
HASP	☑	2013	☑
Field Ops Manual	☑	2013	☑
Calibration Reports	☐	Not present	☐
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?	☑	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:

The site operator is supplied with a disc containing the QAPP, operating procedures, and HASP which is kept at his office. A hard copy BLM check list developed by ARS is completed and sent to ARS each week. Standard CASTNET SSRF forms are being used now.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	SHE604	Technician	Tim Mendenhall	Site Visit Date	11/06/2023

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Training provided by ARS
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	☑	Monthly	☑
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	☐	N/A	☑
Automatic Zero/Span Tests	☐	N/A	☑
Manual Zero/Span Tests	☐	N/A	☑
Automatic Precision Level Tests	☐	N/A	☑
Manual Precision Level Test	☐	N/A	☑
Analyzer Diagnostics Tests	☐	N/A	☑
In-line Filter Replacement (at inlet)	☐	N/A	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☐	N/A	☑
Zero Air Desiccant Check	☐	N/A	☑

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

observations of current meteorological measurements are recorded on a hardcopy checklist for ARS and not on the SSRF.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	SHE604	Technician	Tim Mendenhall	Site Visit Date	11/06/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings
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?	☑	One set of gloves only
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	☐	Not present	☐
In-line Filter Inspection/Replacement	☑	Semiannually	☑
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:

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID SHE604 **Technician** Tim Mendenhall **Site Visit Date** 11/06/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR1000	49923	none
elevation	Elevation	none	none	none
Flow Rate	AALBORG	GFC-17	illegibile	none
Infrastructure	Infrastructure	none	none	none
Sample Tower	Unknown	Unknown	None	none
siting criteria	Siting Criteria	none	None	none
Temperature2meter	Campbell	10755	Illegible	none

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
BUF603-Tim Mendenhall-11/07/2023						
1	11/7/2023	DAS	Campbell	49917	CR1000	49917
2	11/7/2023	elevation	Elevation	none	none	none
3	11/7/2023	Filter pack flow pump	Thomas	02980	107CA18	608102A
4	11/7/2023	Flow Rate	Omega	none	FMA6518ST-RS232	315688-1
5	11/7/2023	Infrastructure	Infrastructure	none	none	none
6	11/7/2023	Sample Tower	Unknown	none	Unknown	None
7	11/7/2023	siting criteria	Siting Criteria	none	none	None
8	11/7/2023	Temperature2meter	Campbell	none	10755	Missing

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	49917	BUF603	Tim Mendenhall	11/07/2023	DAS	Primary

Das Date: 11/7 /2023
Das Time: 9:42:42
Das Day: 311

Audit Date 11/7 /2023
Audit Time 9:42:41
Audit Day 311

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0000	0.0000	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
4	0.0000	0.0000	0.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Omega	315688-1	BUF603	Tim Mendenhall	11/07/2023	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 % Di**	**A Avg %Diff**	**A Max % Di**	**Cal Factor Zero**	0.417
1.24%	1.35%			**Cal Factor Full Scale**	0.978
				Rotometer Reading:	0

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	0.42	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.42	l/m	l/m	
primary	test pt 1	2.956	2.960	0.00	0.000	3.00	l/m	l/m	1.35%
primary	test pt 2	2.957	2.960	0.00	0.000	3.00	l/m	l/m	1.35%
primary	test pt 3	2.980	2.980	0.00	0.000	3.01	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**	Not installed	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	3.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	9.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	Missing	BUF603	Tim Mendenhall	11/07/2023	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
0.28	0.42		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.24	0.16	0.000	0.58	C	0.42
primary	Temp Mid Rang	25.59	25.21	0.000	25.06	C	-0.15
primary	Temp High Rang	42.06	41.49	0.000	41.76	C	0.27

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

Infrastructure Data For

Site ID	BUF603	Technician	Tim Mendenhall	Site Visit Date	11/07/2023

Shelter Make	Shelter Model	Shelter Size

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Other	Status	pass
Sensor Component	Conduit	Condition	N/A	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	Not tested	Status	pass
Sensor Component	Shelter Temp Control	Condition	N/A	Status	pass
Sensor Component	Rotometer	Condition	Not 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		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		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

The site operator does not use gloves, however, he uses the filter bag when handling the filter.

2 **Parameter:** DasComments

The NEMA enclosure has a cooling fan.

3 **Parameter:** DocumentationCo

A disc with the current QAPP has been received and is kept at the site operator's office. The site operator completes and files a hardcopy checklist and logbook developed by ARS for BLM each week.

4 **Parameter:** ShelterCleanNotes

NEMA enclosure, 120 VAC power

5 **Parameter:** PollAnalyzerCom

The dry deposition filter pack enclosure is not the standard "pot" size that is used at the other CASTNET sites. The diameter of the enclosure is much smaller and the filter is mounted much deeper inside the opening. The geometry of the filter pack and enclosure is likely to impact particle collection efficiency.

6 **Parameter:** MetSensorComme

The temperature is measured at 2.5 meters above the ground. The top section of the tower is not perfectly plumb and guy wire tension could be applied to improve position.

7 **Parameter:** MetOpMaintCom

Some signal cables are showing signs of wear.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	BUF603	**Technician**	Tim Mendenhall	**Site Visit Date**	11/07/2023

Site Sponsor (agency)	BLM-WSO	**USGS Map**	
Operating Group	BLM	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type			
Air Pollutant Analyzer		**QAPP Latitude**	
Deposition Measurement		**QAPP Longitude**	
Land Use		**QAPP Elevation Meters**	
Terrain		**QAPP Declination**	
Conforms to MLM		**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	44.144135
Site Address 1		**Audit Longitude**	-106.108771
Site Address 2		**Audit Elevation**	1320
County	Johnson	**Audit Declination**	9.3
City, State	Buffalo, WY		
Zip Code	82834		**Present**
Time Zone	Mountain	**Fire Extinguisher**	☐
Primary Operator		**First Aid Kit**	☐
Primary Op. Phone #		**Safety Glasses**	☐
Primary Op. E-mail		**Safety Hard Hat**	☐
Backup Operator		**Climbing Belt**	☐
Backup Op. Phone #		**Security Fence**	☐
Backup Op. E-mail		**Secure Shelter**	☑
		Stable Entry Step	☑

Shelter Working Room	☐	**Make**		**Model**		**Shelter Size**	
Shelter Clean	☐	**Notes**	NEMA enclosure, 120 VAC power				
Site OK	☐	**Notes**					
Driving Directions							

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	BUF603	Technician	Tim Mendenhall	Site Visit Date	11/07/2023

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	
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)	☑	
3	Are the tower and sensors plumb?	☑	
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?	☑	
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	
8	Is the rain gauge plumb?	☑	
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☐	45 degree rule violation
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:

The temperature is measured at 2.5 meters above the ground. The top section of the tower is not perfectly plumb and guy wire tension could be applied to improve position.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	BUF603	Technician	Tim Mendenhall	Site Visit Date	11/07/2023

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?	☑	N/A
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	
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:

Some signal cables are showing signs of wear.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	BUF603	Technician	Tim Mendenhall	Site Visit Date	11/07/2023

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?	☑	N/A
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	N/A
3	Describe ozone sample tube.		N/A
4	Describe dry dep sample tube.		3/8 teflon by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	N/A
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	N/A
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:

The dry deposition filter pack enclosure is not the standard "pot" size that is used at the other CASTNET sites. The diameter of the enclosure is much smaller and the filter is mounted much deeper inside the opening. The geometry of the filter pack and enclosure is likely to impact particle collection efficiency.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID BUF603 **Technician** Tim Mendenhall **Site Visit Date** 11/07/2023

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?	☑	cooling fan only

		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 NEMA enclosure has a cooling fan.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	BUF603	Technician	Tim Mendenhall	Site Visit Date	11/07/2023

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	☑	2013	☑
HASP	☑	2013	☑
Field Ops Manual	☑	2013	☑
Calibration Reports	☐	Not present	☐
Ozone z/s/p Control Charts	☐	N/A	☑
Preventive maintenance schedule	☐	Not present	☐

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?	☑	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:

A disc with the current QAPP has been received and is kept at the site operator's office. The site operator completes and files a hardcopy checklist and logbook developed by ARS for BLM each week.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	BUF603	Technician	Tim Mendenhall	Site Visit Date	11/07/2023

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	☑	Semiannually	☑
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	☐	N/A	☑

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

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

1	Do multi-point calibration gases go through the complete sample train including all filters?	☑	N/A
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	N/A
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	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-S9-rev002

Site ID	BUF603	Technician	Tim Mendenhall	Site Visit Date	11/07/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings
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	☑	Weekly	☑
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	☐		☐

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, however, he uses the filter bag when handling the filter.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID BUF603 **Technician** Tim Mendenhall **Site Visit Date** 11/07/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR1000	49917	49917
elevation	Elevation	none	none	none
Filter pack flow pump	Thomas	107CA18	608102A	02980
Flow Rate	Omega	FMA6518ST-RS232	315688-1	none
Infrastructure	Infrastructure	none	none	none
Sample Tower	Unknown	Unknown	None	none
siting criteria	Siting Criteria	none	None	none
Temperature2meter	Campbell	10755	Missing	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CTH110-Eric Hebert-11/08/2023						
1	11/8/2023	DAS	Campbell	000415	CR3000	2510
2	11/8/2023	Ozone	ThermoElectron Inc	000735	49i A1NAA	1105347308
3	11/8/2023	Ozone Standard	ThermoElectron Inc	000447	49i A3NAA	CM08200023
4	11/8/2023	Zero air pump	Werther International	06864	PC70/4	000815261

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347308	CTH110	Eric Hebert	11/08/2023	Ozone	000735

Slope:	0.98097	**Slope:**	0.00000
Intercept	0.09209	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00450	**Intercept**	-0.25270
Cert Date	4/24/2023	**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	-0.42	-0.12	0.00	ppb		0.12
primary	2	17.41	17.56	17.17	ppb		-0.39
primary	3	33.36	33.38	32.91	ppb	-1.42	
primary	4	67.87	67.62	66.54	ppb	-1.61	
primary	5	116.00	115.37	113.20	ppb	-1.9	

Sensor Component	Audit Pressure	**Condition**	716.5 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 t	**Condition**	True	**Status**	pass
Sensor Component	ADT <1000 vehicles further than 5	**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**	-0.10	**Status**	pass
Sensor Component	Span	**Condition**	1.003	**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**	110.3 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	Not tested	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.69 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	685.1 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	34.3 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	89.4 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	Not tested	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.68 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	684.8 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*
BAS601-Tim Mendenhall-11/09/2023						
1	11/9/2023	DAS	Campbell	none	CR1000	47759
2	11/9/2023	Filter pack flow pump	Thomas	02980	107CA18	608102A
3	11/9/2023	Ozone	ThermoElectron Inc	L0534684	49i A1NAA	1214552973
4	11/9/2023	Ozone Standard	ThermoElectron Inc	none	49i E3CAA	1214552971

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1214552973	BAS601	Tim Mendenhall	11/09/2023	Ozone	L0534684

Slope:	0.97330	Slope:	0.00000
Intercept	-1.05805	Intercept	0.00000
CorrCoff	0.99991	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	-0.78	ppb		-0.91
primary	2	16.98	16.72	15.47	ppb		-1.25
primary	3	36.32	36.11	34.16	ppb	-5.55	
primary	4	67.51	67.38	63.52	ppb	-5.9	
primary	5	115.63	115.63	112.01	ppb	-3.18	

Sensor Component		Condition		Status	
Sensor Component	Audit Pressure	Condition	662 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	0.1	Status	pass
Sensor Component	Span	Condition	1.017	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	79.7 kHz	Status	pass
Sensor Component	Cell A Noise	Condition	0.9 ppb	Status	pass
Sensor Component	Cell A Flow	Condition	0.63 lpm	Status	pass
Sensor Component	Cell A Pressure	Condition	656.0 mmHg	Status	pass
Sensor Component	Cell A Tmp.	Condition	31.3 C	Status	pass
Sensor Component	Cell B Freq.	Condition	57.6 kHz	Status	pass
Sensor Component	Cell B Noise	Condition	0.6 ppb	Status	pass
Sensor Component	Cell B Flow	Condition	0.65 lpm	Status	pass
Sensor Component	Cell B Pressure	Condition	655.4 mmHg	Status	pass
Sensor Component	Nafion dryer installed	Condition	False	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*
WFM105-Eric Hebert-11/09/2023						
1	11/9/2023	DAS	Campbell	000803	CR850	23270
2	11/9/2023	elevation	Elevation	none	none	none
3	11/9/2023	Filter pack flow pump	Permotec	none	BL30EB	Illegible
4	11/9/2023	Flow Rate	Apex	000900	AXMC105LPMDPCV	illegible
5	11/9/2023	Infrastructure	Infrastructure	none	none	none
6	11/9/2023	Modem	Sierra wireless	06983	unknown	unknown
7	11/9/2023	siting criteria	Siting Criteria	none	none	None
8	11/9/2023	Temperature	RM Young	04683	41342VC	6697

DAS Data Form

DAS Time Max Error: 0.03

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	23270	WFM105	Eric Hebert	11/09/2023	DAS	Primary

Das Date: 11/10/2023
Das Time: 11:42:00
Das Day: 314

Audit Date 11/10/2023
Audit Time 11:41:58
Audit Day 314

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

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2023	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
4	0.0000	0.0000	0.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	WFM105	Eric Hebert	11/09/2023	Flow Rate	000900

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
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**	0.047
				Cal Factor Full Scale	1.049
1.12%	1.35%			**Rotometer Reading:**	2.95

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	0.000	0.05	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.06	l/m	l/m	
primary	test pt 1	2.965	2.960	2.95	0.000	3.00	l/m	l/m	1.35%
primary	test pt 2	2.963	2.960	2.95	0.000	3.00	l/m	l/m	1.35%
primary	test pt 3	2.980	2.980	2.95	0.000	3.00	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**	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**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	6697	WFM105	Eric Hebert	11/09/2023	Temperature	04683

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**
0.10	0.25		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.10	-0.06	0.000	0.0	C	0.04
primary	Temp Mid Range	26.56	26.15	0.000	25.9	C	-0.25
primary	Temp High Range	47.40	46.79	0.000	46.8	C	-0.01

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

Infrastructure Data For

Site ID	WFM105	Technician	Eric Hebert	Site Visit Date	11/09/2023

Shelter Make	Shelter Model	Shelter Size

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	Filter	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	N/A	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	N/A	Status	pass
Sensor Component	Shelter Door	Condition	N/A	Status	pass
Sensor Component	Shelter Roof	Condition	N/A	Status	pass
Sensor Component	Shelter Floor	Condition	N/A	Status	pass
Sensor Component	Shelter walls	Condition	N/A	Status	pass
Sensor Component	Excessive mold present	Condition	N/A	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

The observation section of the SSRF is completed the day the filer is removed and not the day of installation.

2 **Parameter:** DasComments

Single tower, with filter pack at 10 meters and temperature at 9 meters.

3 **Parameter:** DocumentationCo

The site operator takes notes in his own field notebook, there is no site logbook.

4 **Parameter:** SitingCriteriaCom

The site is located at the Atmospheric Science Research Center (ASRC) operated by the NY University (SUNY) system.

5 **Parameter:** ShelterCleanNotes

Small footprint site with no shelter. Equipment housed in enclosure on sample tower.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	WFM105	**Technician**	Eric Hebert	**Site Visit Date**	11/09/2023

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	SUNY	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type			
Air Pollutant Analyzer		**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	Woodland - mixed	**QAPP Elevation Meters**	
Terrain	Complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	44.39322
Site Address 1		**Audit Longitude**	-73.85874
Site Address 2		**Audit Elevation**	608
County		**Audit Declination**	
City, State	Wilmington, NY		
Zip Code	12997	**Fire Extinguisher** (Present) ☑	
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** **Model** **Shelter Size**

Shelter Clean ☐ **Notes** Small footprint site with no shelter. Equipment housed in enclosure on sample tower.

Site OK ☑ **Notes**

Driving Directions

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	WFM105	Technician	Eric Hebert	Site Visit Date	11/09/2023

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	WFM105	Technician	Eric Hebert	Site Visit Date	11/09/2023

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	WFM105	Technician	Eric Hebert	Site Visit Date	11/09/2023

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.		N/A
4	Describe dry dep sample tube.		3/8 Teflon by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	N/A
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	N/A
8	Are there moisture traps in the sample lines?	☑	inline filter
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	

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 WFM105 **Technician** Eric Hebert **Site Visit Date** 11/09/2023

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?	☐	N/A

		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:

Single tower, with filter pack at 10 meters and temperature at 9 meters.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	WFM105	Technician	Eric Hebert	Site Visit Date	11/09/2023

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	☐		☐
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?	☑	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:

The site operator takes notes in his own field notebook, there is no site logbook.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	WFM105	Technician	Eric Hebert	Site Visit Date	11/09/2023

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Trained onsite by AMEC personnel
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	☑		☑
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	☐	N/A	☑
Automatic Zero/Span Tests	☐	N/A	☑
Manual Zero/Span Tests	☐	N/A	☑
Automatic Precision Level Tests	☐	N/A	☑
Manual Precision Level Test	☐	N/A	☑
Analyzer Diagnostics Tests	☐	N/A	☑
In-line Filter Replacement (at inlet)	☐	N/A	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☐	N/A	☑
Zero Air Desiccant Check	☐	N/A	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☑	N/A
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	N/A
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	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-S9-rev002

Site ID	WFM105	Technician	Eric Hebert	Site Visit Date	11/09/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings
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
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?	☑	One set of gloves only
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	☑	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:

The observation section of the SSRF is completed the day the filer is removed and not the day of installation.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID WFM105 **Technician** Eric Hebert **Site Visit Date** 11/09/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR850	23270	000803
elevation	Elevation	none	none	none
Filter pack flow pump	Permotec	BL30EB	Illegible	none
Flow Rate	Apex	AXMC105LPMDPC	illegible	000900
Infrastructure	Infrastructure	none	none	none
Modem	Sierra wireless	unknown	unknown	06983
siting criteria	Siting Criteria	none	None	none
Temperature	RM Young	41342VC	6697	04683

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
NIC001-Eric Hebert-11/11/2023						
1	11/11/2023	DAS	Campbell	000801	CR850	23268
2	11/11/2023	elevation	Elevation	none	none	none
3	11/11/2023	Filter pack flow pump	Permotec	none	BL30EB	Illegible
4	11/11/2023	Flow Rate	Apex	000595	AXMC105LPMDPCV	illegible
5	11/11/2023	Infrastructure	Infrastructure	none	none	none
6	11/11/2023	Modem	Sierra wireless	06989	GX440	Unknown
7	11/11/2023	Sample Tower	Aluma Tower	000785	B	AT-212125X73
8	11/11/2023	siting criteria	Siting Criteria	none	none	None
9	11/11/2023	Temperature	RM Young	04943	41342	none

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	23268	NIC001	Eric Hebert	11/11/2023	DAS	Primary

Das Date: 11/11/2023
Das Time: 12:12:20
Das Day: 315

Audit Date 11/11/2023
Audit Time 12:12:20
Audit Day 315

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	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2023	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
4	0.0000	0.0000	0.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	NIC001	Eric Hebert	11/11/2023	Flow Rate	000595

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
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**	0.028
0.00%	0.00%			**Cal Factor Full Scale**	1.024
				Rotometer Reading:	2.75

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	0.000	0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.08	0.000	0.11	l/m	l/m	
primary	test pt 1	2.998	3.000	2.98	0.000	3.00	l/m	l/m	0.00%
primary	test pt 2	3.001	3.000	2.98	0.000	3.00	l/m	l/m	0.00%
primary	test pt 3	3.004	3.000	2.98	0.000	3.00	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**	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**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	360 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	none	NIC001	Eric Hebert	11/11/2023	Temperature	04943

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**
0.06	0.09		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.16	0.00	0.000	0.0	C	0.01
primary	Temp Mid Range	25.40	25.00	0.000	24.9	C	-0.09
primary	Temp High Range	46.14	45.54	0.000	45.5	C	-0.08

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

Infrastructure Data For

Site ID	NIC001	Technician	Eric Hebert	Site Visit Date	11/11/2023

Shelter Make	Shelter Model	Shelter Size

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	Filter	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	N/A	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	N/A	Status	pass
Sensor Component	Shelter Door	Condition	N/A	Status	pass
Sensor Component	Shelter Roof	Condition	N/A	Status	pass
Sensor Component	Shelter Floor	Condition	N/A	Status	pass
Sensor Component	Shelter walls	Condition	N/A	Status	pass
Sensor Component	Excessive mold present	Condition	N/A	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:** DasComments

Single tower with filter pack mounted at 10 meters and temperature mounted at 9 meters. The tower is difficult to lower due to the lower section contacting the chain-link fence. This could be a potential safety hazard. It is recommended that a solution be investigated.

2 **Parameter:** DocumentationCo

There is no logbook onsite to record information regarding site status or filter information.

3 **Parameter:** ShelterCleanNotes

Small footprint site with no shelter. Equipment housed in enclosure on sample tower.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	NIC001	**Technician**	Eric Hebert	**Site Visit Date**	11/11/2023

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	NY DEC	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type			
Air Pollutant Analyzer		**QAPP Latitude**	
Deposition Measurement	dry	**QAPP Longitude**	
Land Use	Woodland - mixed	**QAPP Elevation Meters**	
Terrain	Complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	43.68596
Site Address 1		**Audit Longitude**	-74.9857
Site Address 2		**Audit Elevation**	526
County	Herkimer	**Audit Declination**	
City, State	Old Forge, NY		
Zip Code	13420	**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 Steps**	☑

Present

Shelter Working Room	☐	**Make**		**Model**		**Shelter Size**	
Shelter Clean	☐	**Notes**	Small footprint site with no shelter. Equipment housed in enclosure on sample tower.				
Site OK	☐	**Notes**					

Driving Directions

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	NIC001	Technician	Eric Hebert	Site Visit Date	11/11/2023

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	NIC001	Technician	Eric Hebert	Site Visit Date	11/11/2023

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?	☑	
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	NIC001	Technician	Eric Hebert	Site Visit Date	11/11/2023

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.		N/A
4	Describe dry dep sample tube.		3/8 Teflon by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	N/A
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	N/A
8	Are there moisture traps in the sample lines?	☐	Flow line only (balston filter)
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	

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	NIC001	Technician	Eric Hebert	Site Visit Date	11/11/2023

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?	☑	
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?	☑	N/A

		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:

Single tower with filter pack mounted at 10 meters and temperature mounted at 9 meters. The tower is difficult to lower due to the lower section contacting the chain-link fence. This could be a potential safety hazard. It is recommended that a solution be investigated.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	NIC001	Technician	Eric Hebert	Site Visit Date	11/11/2023

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	☐	No logbook	☐
SSRF	☑		☑
Site Ops Manual	☐		☐
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?	☐	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?	☑	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:

There is no logbook onsite to record information regarding site status or filter information.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID NIC001 **Technician** Eric Hebert **Site Visit Date** 11/11/2023

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	☑	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	☐	N/A	☑
Automatic Zero/Span Tests	☐	N/A	☑
Manual Zero/Span Tests	☐	N/A	☑
Automatic Precision Level Tests	☐	N/A	☑
Manual Precision Level Test	☐	N/A	☑
Analyzer Diagnostics Tests	☐	N/A	☑
In-line Filter Replacement (at inlet)	☐	N/A	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☐	N/A	☑
Zero Air Desiccant Check	☐	N/A	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☑	N/A
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	N/A
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	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-S9-rev002

Site ID	NIC001	Technician	Eric Hebert	Site Visit Date	11/11/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings
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?	☑	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	☑	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 NIC001 **Technician** Eric Hebert **Site Visit Date** 11/11/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR850	23268	000801
elevation	Elevation	none	none	none
Filter pack flow pump	Permotec	BL30EB	Illegible	none
Flow Rate	Apex	AXMC105LPMDPC	illegible	000595
Infrastructure	Infrastructure	none	none	none
Modem	Sierra wireless	GX440	Unknown	06989
Sample Tower	Aluma Tower	B	AT-212125X73	000785
siting criteria	Siting Criteria	none	None	none
Temperature	RM Young	41342	none	04943

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
DUK008-Eric Hebert-11/14/2023						
1	11/14/2023	DAS	Campbell	000420	CR3000	2520
2	11/14/2023	Ozone	ThermoElectron Inc	000616	49i A1NAA	1009241781
3	11/14/2023	Ozone Standard	ThermoElectron Inc	000369	49i A3NAA	0726124690

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241781	DUK008	Eric Hebert	11/14/2023	Ozone	000616

Slope:	1.01197	Slope:	0.00000
Intercept	-0.03930	Intercept	0.00000
CorrCoff	1.00000	CorrCoff	0.00000

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	1180930075	Tfer Desc.	Ozone primary stan
Tfer ID	01115		
Slope	1.00450	Intercept	-0.25270
Cert Date	4/24/2023	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	-0.05	0.23	0.35	ppb		0.12
primary	2	17.66	17.81	17.94	ppb		0.13
primary	3	37.19	37.18	37.48	ppb	0.8	
primary	4	69.03	68.77	69.44	ppb	0.97	
primary	5	117.87	117.23	118.70	ppb	1.25	

Sensor Component		Condition		Status	
Sensor Component	Audit Pressure	Condition	752.8 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	1.020	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	84.8 kHz	Status	pass
Sensor Component	Cell A Noise	Condition	Not tested	Status	pass
Sensor Component	Cell A Flow	Condition	0.66 lpm	Status	pass
Sensor Component	Cell A Pressure	Condition	682.4 mmHg	Status	pass
Sensor Component	Cell A Tmp.	Condition	34.1 C	Status	pass
Sensor Component	Cell B Freq.	Condition	91.4 kHz	Status	pass
Sensor Component	Cell B Noise	Condition	Not tested	Status	pass
Sensor Component	Cell B Flow	Condition	0.61 lpm	Status	pass
Sensor Component	Cell B Pressure	Condition	682.7 mmHg	Status	pass
Sensor Component	Nafion dryer installed	Condition	False	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*
LAV410-Martin Valvur-11/14/2023						
1	11/14/2023	Computer	Hewlett Packard	none	EliteBook	CNU3389G02
2	11/14/2023	DAS	Environmental Sys Corp	90535	8816	2026
3	11/14/2023	Elevation	Elevation	None	1	None
4	11/14/2023	Filter pack flow pump	Thomas	none	107CAB18	Illegible
5	11/14/2023	flow rate	Tylan	none	FC280SAV	AW02213004
6	11/14/2023	Infrastructure	Infrastructure	none	none	none
7	11/14/2023	Met tower	Rohn	none	unknown	none
8	11/14/2023	MFC power supply	Tylan	00042	RO-32	FP902022
9	11/14/2023	Ozone	ThermoElectron Inc	none	49i A3NAA	1152780007
10	11/14/2023	Ozone Standard	ThermoElectron Inc	90567	49C	49C-59283-322
11	11/14/2023	Sample Tower	Aluma Tower	923314	B	AT-5324-F6-O
12	11/14/2023	Shelter Temperature	ARS	none	unknown	none
13	11/14/2023	Siting Criteria	Siting Criteria	None	1	None
14	11/14/2023	Temperature2meter	RM Young	none	41342VC	029458
15	11/14/2023	Zero air pump	Twin Tower Engineering	none	TT70/4E	526292

DAS Data Form

DAS Time Max Error: 0.67

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2026	LAV410	Martin Valvur	11/14/2023	DAS	Primary

Das Date: 11/14/2023
Das Time: 9:01:20
Das Day: 318

Audit Date 11/14/2023
Audit Time 9:02:00
Audit Day 318

Low Channel:

Avg Diff:	Max Diff:
0.0000	0.0000

High Channel:

Avg Diff:	Max Diff:
0.0000	0.0000

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
4	0.0000	0.0000	0.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW02213004	LAV410	Martin Valvur	11/14/2023	flow rate	none

Mfg	Tylan	
SN/Owner ID	FP902022	00042
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**	
1.28%	1.60%			

Cal Factor Zero	0.41
Cal Factor Full Scale	10.42
Rotometer Reading:	2

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	-0.30	0.0000	0.14	l/m	l/m	
primary	leak check	0.000	0.000	-0.29	0.0000	0.16	l/m	l/m	
primary	test pt 1	3.067	3.070	2.56	0.0000	3.02	l/m	l/m	-1.60%
primary	test pt 2	3.063	3.060	2.57	0.0000	3.02	l/m	l/m	-1.27%
primary	test pt 3	3.053	3.050	2.57	0.0000	3.02	l/m	l/m	-0.98%

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**	1.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	165 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	1152780007	LAV410	Martin Valvur	11/14/2023	Ozone	none

Slope:	0.97678	**Slope:**	0.00000
Intercept	0.41499	**Intercept**	0.00000
CorrCoff:	0.99998	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	CM23147126	**Tfer Desc.**	Ozone primary stan
Tfer ID	01116		
Slope	1.00654	**Intercept**	-0.03885
Cert Date	9/19/2023	**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	-0.24	-0.19	0.53	ppb		0.72
primary	2	14.36	14.25	14.42	ppb		0.17
primary	3	34.09	33.78	32.97	ppb	-2.43	
primary	4	63.60	62.99	61.79	ppb	-1.92	
primary	5	114.03	112.90	110.90	ppb	-1.79	

Sensor Component	Condition	Status
Audit Pressure	611.5 mmHg	pass
26.6 degree unobstructed rule	Not tested	pass
Tree dewline >10m or below inlet	6.8 m	Fail
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	1.008	pass
Zero Voltage	-0.0001	pass
Fullscale Voltage	1.0002	pass
Cell A Freq.	87.5 kHz	pass
Cell A Noise	1.0 ppb	pass
Cell A Flow	0.64 lpm	pass
Cell A Pressure	606.0 mmHg	pass
Cell A Tmp.	37.3 C	pass
Cell B Freq.	76.6 kHz	pass
Cell B Noise	1.0 ppb	pass
Cell B Flow	0.66 lpm	pass
Cell B Pressure	605.3 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	029458	LAV410	Martin Valvur	11/14/2023	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
0.22	0.33		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.25	0.25	0.0000	0.34	C	0.09
primary	Temp Mid Range	21.71	21.71	0.0000	21.96	C	0.25
primary	Temp High Rang	46.91	46.91	0.0000	47.24	C	0.33

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	LAV410	Martin Valvur	11/14/2023	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.59	0.62		

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	23.67	23.67	0.000	23.1	C	-0.55
primary	Temp Mid Range	24.39	24.39	0.000	23.8	C	-0.62
primary	Temp Mid Range	25.71	25.71	0.000	25.1	C	-0.59

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	LAV410	Technician	Martin Valvur	Site Visit Date	11/14/2023

Shelter Make	Shelter Model	Shelter Size
		1150 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

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	25 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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone inlet filter is changed and the sample line conditioned every two weeks or as needed.

2 **Parameter:** SitingCriteriaCom

The site is located at the end of a park service facility parking lot, in a fire station. The tree line is near the building, but the prevailing wind direction is from the clearing. Tree height above the sample inlet is not twice as far away as it is high above the inlet.

3 **Parameter:** ShelterCleanNotes

The inside equipment is located in room within the fire station, clean, neat, and organized.

4 **Parameter:** PollAnalyzerCom

Trees violate the ozone sample inlet siting criteria.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	LAV410	Technician	Martin Valvur	Site Visit Date	11/14/2023

Site Sponsor (agency)	NPS	USGS Map	Manzanita Lake
Operating Group	NPS	Map Scale	
AQS #	06-065-1004	Map Date	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMPROVE	QAPP Latitude	40.5403
Deposition Measurement	dry, wet	QAPP Longitude	-121.5764
Land Use	woodland - evergreen	QAPP Elevation Meters	1756
Terrain	complex	QAPP Declination	
Conforms to MLM	Marginally	QAPP Declination Date	
Site Telephone	(530) 335-7214	Audit Latitude	40.539991
Site Address 1	38050 Hwy 36E	Audit Longitude	-121.576462
Site Address 2		Audit Elevation	1755
County	Shasta	Audit Declination	14.5
City, State	Mineral, CA		
Zip Code	96063		
Time Zone	Pacific		
Primary Operator			
Primary Op. Phone #			
Primary Op. E-mail			
Backup Operator			
Backup Op. Phone #			
Backup Op. E-mail			

	Present		
Fire Extinguisher	☑	Inspected Oct 2023	
First Aid Kit	☑		
Safety Glasses	☐		
Safety Hard Hat	☑		
Climbing Belt	☐		
Security Fence	☐		
Secure Shelter	☑		
Stable Entry Steps	☑		

Shelter Working Room	☑	Make		Model		Shelter Size	1150 cuft
Shelter Clean	☑	Notes	The inside equipment is located in room within the fire station, clean, neat, and organized.				
Site OK	☑	Notes					

Driving Directions

From Redding take route 44 east for approximately 45 miles. At the park, and intersection of 44 and 89, turn right onto route 89. Turn right at the first road into the fire station and maintenance area. Take the first left, the site is behind the fire station at the end of the parking lot. One room in the fire station houses the climate controlled equipment.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	LAV410	Technician	Martin Valvur	Site Visit Date	11/14/2023

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	LAV410	Technician	Martin Valvur	Site Visit Date	11/14/2023

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	LAV410	Technician	Martin Valvur	Site Visit Date	11/14/2023

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 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 10 meters
4	Describe dry dep sample tube.		3/8 teflon 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?	☑	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:

Trees violate the ozone sample inlet siting criteria.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID LAV410 **Technician** Martin Valvur **Site Visit Date** 11/14/2023

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	LAV410	Technician	Martin Valvur	Site Visit Date	11/14/2023

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 2012	☑
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?	☑	
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	LAV410	Technician	Martin Valvur	Site Visit Date	11/14/2023

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Informal training provided by ARS during maintenance visits, and 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	☑	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	☑	Not performed	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☑	Not performed	☑
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?	☑	
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 changed and the sample line conditioned every two weeks or as needed.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	LAV410	Technician	Martin Valvur	Site Visit Date	11/14/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed between 11:00 and 13:00
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, dataview
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	☑	Weekly	☑
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 LAV410 **Technician** Martin Valvur **Site Visit Date** 11/14/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	EliteBook	CNU3389G02	none
DAS	Environmental Sys Corp	8816	2026	90535
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	Illegible	none
flow rate	Tylan	FC280SAV	AW02213004	none
Infrastructure	Infrastructure	none	none	none
Met tower	Rohn	unknown	none	none
MFC power supply	Tylan	RO-32	FP902022	00042
Ozone	ThermoElectron Inc	49i A3NAA	1152780007	none
Ozone Standard	ThermoElectron Inc	49C	49C-59283-322	90567
Sample Tower	Aluma Tower	B	AT-5324-F6-O	923314
Shelter Temperature	ARS	unknown	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342VC	029458	none
Zero air pump	Twin Tower Engineering	TT70/4E	526292	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
BFT142-Eric Hebert-11/15/2023						
1	11/15/2023	Computer	Dell	07212	Inspiron 15	Unknown
2	11/15/2023	DAS	Campbell	000498	CR3000	3815
3	11/15/2023	Elevation	Elevation	None	1	None
4	11/15/2023	Filter pack flow pump	Thomas	04279	107CA18	129800010158
5	11/15/2023	Flow Rate	Apex	000593	AXMC105LPMDPCV	illegible
6	11/15/2023	Infrastructure	Infrastructure	none	none	none
7	11/15/2023	Modem	Digi	07135	LR54	Illegible
8	11/15/2023	Ozone	ThermoElectron Inc	000746	49i A1NAA	1105347315
9	11/15/2023	Ozone Standard	ThermoElectron Inc	000330	49i A3NAA	0622717854
10	11/15/2023	Sample Tower	Aluma Tower	000863	B	unknown
11	11/15/2023	Shelter Temperature	Campbell	none	107-L	none
12	11/15/2023	Siting Criteria	Siting Criteria	None	1	None
13	11/15/2023	Temperature	RM Young	04444	41342VO	4542
14	11/15/2023	Zero air pump	Werther International	07291	C 120/TC	001071024

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	3815	BFT142	Eric Hebert	11/15/2023	DAS	Primary

Das Date: 11/15/2023 **Audit Date** 11/15/2023
Das Time: 9:22:15 **Audit Time** 9:22:14
Das Day: 319 **Audit Day** 319

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

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2023	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
4	0.0000	0.0000	0.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	BFT142	Eric Hebert	11/15/2023	Flow Rate	000593

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
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**	-0.01
0.00%	0.00%			**Cal Factor Full Scale**	0.99
				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	0.000	-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	1.502	1.500	1.51	0.000	1.50	l/m	l/m	0.00%
primary	test pt 2	1.502	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**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 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	1105347315	BFT142	Eric Hebert	11/15/2023	Ozone	000746

Slope:	0.97877	**Slope:**	0.00000
Intercept	-0.06249	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00450	**Intercept**	-0.25270
Cert Date	4/24/2023	**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	0.00	0.28	0.28	ppb		0
primary	2	16.54	16.69	16.25	ppb		-0.44
primary	3	36.27	36.27	35.40	ppb	-2.43	
primary	4	66.86	66.62	65.09	ppb	-2.32	
primary	5	117.54	116.90	114.40	ppb	-2.16	

Sensor Component	Condition	Status
Audit Pressure	755 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	Moderately clean	pass
Offset	-0.20	pass
Span	0.989	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	89.9 kHz	pass
Cell A Noise	Not tested	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	701.8 mmHg	pass
Cell A Tmp.	31.6 C	pass
Cell B Freq.	114.3 kHz	pass
Cell B Noise	Not tested	pass
Cell B Flow	0.69 lpm	pass
Cell B Pressure	702.1 mmHg	pass
Nafion dryer installed	True	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4542	BFT142	Eric Hebert	11/15/2023	Temperature	04444

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**
0.41	0.70		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.24	0.07	0.000	0.2	C	0.16
primary	Temp Mid Range	24.51	24.12	0.000	24.5	C	0.38
primary	Temp High Range	46.76	46.16	0.000	46.9	C	0.7

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	none	BFT142	Eric Hebert	11/15/2023	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.17	0.28		

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	21.00	20.64	0.000	20.9	C	0.28
primary	Temp Mid Range	20.95	20.59	0.000	20.7	C	0.13
primary	Temp Mid Range	21.27	20.91	0.000	21.0	C	0.11

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
BFT142	Eric Hebert	11/15/2023

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	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	Fair	pass
Shelter Door	Poor	Fail
Shelter Roof	Fair	pass
Shelter Floor	Fair	pass
Shelter walls	Poor	Fail
Excessive mold present	Poor	Fail
Signal Cable	Good	pass
Tubing Type	3/8 teflon	pass
Sample Train	Good	pass
System Memo		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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	BFT142	Eric Hebert	11/15/2023	Moisture Present	Apex	4169	☐	☐

The filter sample tubing has drops of moisture in low sections outside the shelter.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The SSRF forms are not competed on the day of filter installation. The logbook entries are not up to date.

2 **Parameter:** DasComments

The new sample tower is not attached to the shelter. The sample tower is not grounded.

3 **Parameter:** SitingCriteriaCom

The site is surrounded by a corn/soy bean field, within a large-scale commercial agriculture operation.

4 **Parameter:** ShelterCleanNotes

One shelter light is functioning properly. The shelter is in poor condition due to being flooded during hurricanes. The floor has been repaired.

5 **Parameter:** MetOpMaintCom

The meteorological tower has been removed and the temperature sensor is installed in a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	BFT142	**Technician**	Eric Hebert	**Site Visit Date**	11/15/2023

Site Sponsor (agency)	EPA	**USGS Map**	Williston
Operating Group	UNC-IMS	**Map Scale**	
AQS #	37-031-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	agriculture	**QAPP Elevation Meters**	
Terrain	flat	**QAPP Declination**	
Conforms to MLM	Yes	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	34.884668
Site Address 1	Open Grounds Farm	**Audit Longitude**	-76.620666
Site Address 2	100 Nelson Bay Rd.	**Audit Elevation**	5.3
County	Carteret	**Audit Declination**	-9.9
City, State	Beaufort, NC		
Zip Code	28516	**Fire Extinguisher** ☑ Present	New in 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 Steps** ☑	

Shelter Working Room ☑ **Make** Ekto **Model** 8810 **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** One shelter light is functioning properly. The shelter is in poor condition due to being flooded during hurricanes. The floor has been repaired.

Site OK ☑ **Notes**

Driving Directions From I-95 take highway 70 east through Morehead City and over the bridge. Continue through Beaufort staying on route 70 east. At East Carteret High School, route 70 turns to the right at a traffic light. Continue straight through the light on Merrimon Rd. (SR 1300), do not follow 70 to the right. Open Grounds Farm will be on the right approximately 6 miles on Merrimon Rd. Sign in at the guard house. Continue on the dirt road into the farm. Turn left at the first dirt road. The site will be visible in the corner of the field. Follow the dirt road around the field to the site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	BFT142	Technician	Eric Hebert	Site Visit Date	11/15/2023

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	BFT142	Technician	Eric Hebert	Site Visit Date	11/15/2023

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:

The meteorological tower has been removed and the temperature sensor is installed in a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	BFT142	Technician	Eric Hebert	Site Visit Date	11/15/2023

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.		3/8 teflon 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?	☑	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	BFT142	Technician	Eric Hebert	Site Visit Date	11/15/2023

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:

The new sample tower is not attached to the shelter. The sample tower is not grounded.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	BFT142	Technician	Eric Hebert	Site Visit Date	11/15/2023

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	☑	2019	☑
HASP	☑	2019	☑
Field Ops Manual	☑	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	BFT142	Technician	Eric Hebert	Site Visit Date	11/15/2023

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	☑	As needed	☑

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, 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	BFT142	Technician	Eric Hebert	Site Visit Date	11/15/2023

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
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 SSRF forms are not competed on the day of filter installation. The logbook entries are not up to date.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID BFT142 **Technician** Eric Hebert **Site Visit Date** 11/15/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07212
DAS	Campbell	CR3000	3815	000498
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	129800010158	04279
Flow Rate	Apex	AXMC105LPMDPC	illegible	000593
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	Illegible	07135
Ozone	ThermoElectron Inc	49i A1NAA	1105347315	000746
Ozone Standard	ThermoElectron Inc	49i A3NAA	0622717854	000330
Sample Tower	Aluma Tower	B	unknown	000863
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VO	4542	04444
Zero air pump	Werther International	C 120/TC	001071024	07291

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
DEV412-Martin Valvur-11/20/2023						
1	11/20/2023	Computer	panasonic	none	CF-53	2ULCUTM
2	11/20/2023	DAS	Environmental Sys Corp	None	8864	C2950
3	11/20/2023	Met tower	Glen Martin Engineering	none	unknown	none
4	11/20/2023	Modem	Hughesnet	none	HN9000	unknown
5	11/20/2023	Ozone	ThermoElectron Inc	none	49i A3NAA	1201557776
6	11/20/2023	Ozone Standard	ThermoElectron Inc	90716	49CPS	66830-354
7	11/20/2023	Sample Tower	Aluma Tower	none	FOT-10	218298EE3
8	11/20/2023	Shelter Temperature	ARS	none	unknown	none
9	11/20/2023	Temperature	Vaisala	none	HMP45AC	F0940121
10	11/20/2023	Zero air pump	Werther International	none	C 70/4	000915005

DAS Data Form

DAS Time Max Error: 3.97

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	C2950	DEV412	Martin Valvur	11/20/2023	DAS	Primary

Das Date: 11/20/2023
Das Time: 9:09:58
Das Day: 324

Audit Date 11/20/2023
Audit Time 9:06:00
Audit Day 324

Low Channel:

Avg Diff:	Max Diff:
0.0000	0.0000

High Channel:

Avg Diff:	Max Diff:
0.0000	0.0000

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
4	0.0000	0.0000	0.0000	V	V	0.0000

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1201557776	DEV412	Martin Valvur	11/20/2023	Ozone	none

Slope:	1.00126	**Slope:**	0.00000
Intercept	-1.02788	**Intercept**	0.00000
CorrCoff:	0.99999	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	CM23147126	**Tfer Desc.**	Ozone primary stan
Tfer ID	01116		
Slope	1.00654	**Intercept**	-0.03885
Cert Date	9/19/2023	**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	-0.08	-0.04	-0.90	ppb		-0.86
primary	2	14.01	13.90	12.86	ppb		-1.04
primary	3	33.21	32.91	31.88	ppb	-3.18	
primary	4	63.33	62.72	61.52	ppb	-1.93	
primary	5	113.75	112.63	111.90	ppb	-0.65	

Sensor Component	Condition	Status
Audit Pressure	752 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	Not tested	pass
Offset	-0.5	pass
Span	0.999	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	72.0 kHz	pass
Cell A Noise	0.4 ppb	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	746.2 mmHg	pass
Cell A Tmp.	30.8 C	pass
Cell B Freq.	125.6 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.71 lpm	Pass
Cell B Pressure	745.6 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
Vaisala	F0940121	DEV412	Martin Valvur	11/20/2023	Temperature	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**
0.58	0.83		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	19.43	19.43	0.0000	20.3	C	0.83
primary	Temp Mid Range	20.27	20.27	0.0000	19.9	C	-0.34

Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Not properly sited	**Status**	Fail
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	DEV412	Martin Valvur	11/20/2023	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
1.03	1.32		

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	21.98	21.98	0.000	21.1	C	-0.85
primary	Temp Mid Range	21.54	21.54	0.000	20.6	C	-0.93
primary	Temp Mid Range	22.75	22.75	0.000	21.4	C	-1.32

Sensor Component	System Memo	Condition		Status	pass

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Dry deposition samples are not collected at this site.

2 **Parameter:** MetSensorComme

The temperature and humidity combination sensor is mounted in a non-aspirated shield on the south side of the tower. The sensor cannot be submerged and therefore was only challenged in air side-by-side with the RTD standard. Audit results are not comparable with other submergible sensors.

3 **Parameter:** PollAnalyzerCom

The sample tubing is not secured to the sample tower.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	DEV412	**Technician**	Martin Valvur	**Site Visit Date**	11/20/2023

Site Sponsor (agency)	NPS	**USGS Map**	
Operating Group	NPS	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer		**QAPP Latitude**	
Deposition Measurement		**QAPP Longitude**	
Land Use		**QAPP Elevation Meters**	
Terrain		**QAPP Declination**	
Conforms to MLM		**QAPP Declination Date**	
Site Telephone	(760) 786-2497	**Audit Latitude**	36.508819
Site Address 1	PO Box 579	**Audit Longitude**	-116.847697
Site Address 2	Hwy 190	**Audit Elevation**	131
County	Inyo	**Audit Declination**	13.3
City, State	Death Valley, CA		
Zip Code	92328	**Fire Extinguisher** ☑	New July 2010
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** ☑	

Present

Shelter Working Room	☑	**Make**		**Model**		**Shelter Size**	
Shelter Clean	☑	**Notes**					
Site OK	☑	**Notes**					

Driving Directions

From Las Vegas take route 160 west to Pahrump. Turn onto 178 to Shoshone. At the stop sign in Shoshone turn right onto route 127 toward Death Valley. In Death Valley Junction, just past the Amargosa Theater, turn left onto Highway 190. Continue to the park. Approximately 3 miles past the Furnace Creek Ranch, turn right at the sign for Cow Creek and the park administratin offices. Take the first left and continue up the hill past the park housing, bearing left and continuing uphill. The site is past the locked gate on the service road to the water supply facilities.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	DEV412	Technician	Martin Valvur	Site Visit Date	11/20/2023

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?	☑	
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☐	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:

The temperature and humidity combination sensor is mounted in a non-aspirated shield on the south side of the tower. The sensor cannot be submerged and therefore was only challenged in air side-by-side with the RTD standard. Audit results are not comparable with other submergible sensors.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	DEV412	Technician	Martin Valvur	Site Visit Date	11/20/2023

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?	☑	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	DEV412	Technician	Martin Valvur	Site Visit Date	11/20/2023

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?	☑	

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?	☑	N/A
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:

The sample tubing is not secured to the sample tower.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID	DEV412	Technician	Martin Valvur	Site Visit Date	11/20/2023

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?	☐	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?	sample tower not grounded	

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	DEV412	Technician	Martin Valvur	Site Visit Date	11/20/2023

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	☑	Dataview	☑
SSRF	☐	N/A	☑
Site Ops Manual	☐		☐
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?	☑	
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	DEV412	Technician	Martin Valvur	Site Visit Date	11/20/2023

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	N/A
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	N/A
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	☑	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 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	DEV412	Technician	Martin Valvur	Site Visit Date	11/20/2023

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?	☑	N/A
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 site.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID DEV412 **Technician** Martin Valvur **Site Visit Date** 11/20/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	panasonic	CF-53	2ULCUTM	none
DAS	Environmental Sys Corp	8864	C2950	None
Met tower	Glen Martin Engineering	unknown	none	none
Modem	Hughesnet	HN9000	unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	1201557776	none
Ozone Standard	ThermoElectron Inc	49CPS	66830-354	90716
Sample Tower	Aluma Tower	FOT-10	218298EE3	none
Shelter Temperature	ARS	unknown	none	none
Temperature	Vaisala	HMP45AC	F0940121	none
Zero air pump	Werther International	C 70/4	000915005	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SAN189-Tim Mendenhall-11/27/2023						
1	11/27/2023	Computer	Dell	07019	Inspiron 15	GK2MC12
2	11/27/2023	DAS	Campbell	000360	CR3000	2138
3	11/27/2023	Elevation	Elevation	None	1	None
4	11/27/2023	Filter pack flow pump	Thomas	06019	107CAB18	050400022576
5	11/27/2023	Flow Rate	Apex	000861	AXMC105LPMDPCV	illegible
6	11/27/2023	Flow Rate	Apex	000527	AXMC105LPMDPCV	48100
7	11/27/2023	Infrastructure	Infrastructure	none	none	none
8	11/27/2023	Modem	Digi	07133	LR54	unknown
9	11/27/2023	Ozone	ThermoElectron Inc	000685	49i A1NAA	1030244789
10	11/27/2023	Ozone Standard	ThermoElectron Inc	000434	49i A3NAA	CM08200010
11	11/27/2023	Sample Tower	Aluma Tower	000207	B	none
12	11/27/2023	Shelter Temperature	Campbell	none	107-L	223461
13	11/27/2023	Temperature	RM Young	06537	41342VC	14798
14	11/27/2023	Zero air pump	Werther International	06875	C 70/4	000814272

DAS Data Form

DAS Time Max Error: 0.03

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2138	SAN189	Tim Mendenhall	11/27/2023	DAS	Primary

Das Date: 11/27/2023 **Audit Date** 11/27/2023
Das Time: 11:31:02 **Audit Time** 11:31:04
Das Day: 331 **Audit Day** 331

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0000	0.0000	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
4	0.0000	0.0000	0.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	48100	SAN189	Tim Mendenhall	11/27/2023	Flow Rate	000527

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
0.99%	1.32%			**Cal Factor Full Scale**	1
				Rotometer Reading:	3.1

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	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.02	0.000	0.03	l/m	l/m	
primary	test pt 1	3.011	3.010	2.99	0.000	3.00	l/m	l/m	-0.33%
primary	test pt 2	3.039	3.040	2.99	0.000	3.00	l/m	l/m	-1.32%
primary	test pt 3	3.040	3.040	2.99	0.000	3.00	l/m	l/m	-1.32%

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**	3.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Apex	illegible	SAN189	Tim Mendenhall	11/27/2023	Flow Rate	000861

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244789	SAN189	Tim Mendenhall	11/27/2023	Ozone	000685

Slope:	1.00318	**Slope:**	0.00000
Intercept	-0.01756	**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 % Dif**	**A Avg %Diff**	**A Max % Dif**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.49	0.19	0.36	ppb		0.17
primary	2	16.28	16.02	15.95	ppb		-0.07
primary	3	35.51	35.30	35.15	ppb	-0.43	
primary	4	65.82	65.69	66.05	ppb	0.55	
primary	5	111.48	111.47	111.80	ppb	0.3	

Sensor Component	Condition	Status
Audit Pressure	724.5 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	-0.5	pass
Span	1.052	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	78.4 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.72 lpm	pass
Cell A Pressure	698.6 mmHg	pass
Cell A Tmp.	34.3 C	pass
Cell B Freq.	107.8 kHz	pass
Cell B Noise	1.1 ppb	pass
Cell B Flow	0.72 lpm	pass
Cell B Pressure	698.0 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	14798	SAN189	Tim Mendenhall	11/27/2023	Temperature	06537

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**
0.28	0.50		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.16	0.08	0.000	0.2	C	0.12
primary	Temp Mid Range	25.64	25.26	0.000	25.1	C	-0.21
primary	Temp High Range	42.34	41.77	0.000	41.3	C	-0.5

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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	223461	SAN189	Tim Mendenhall	11/27/2023	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.64	0.80		

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	21.00	20.68	0.000	21.4	C	0.76
primary	Temp Mid Range	26.88	26.49	0.000	25.7	C	-0.8
primary	Temp Mid Range	26.09	25.71	0.000	25.3	C	-0.37

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
SAN189	Tim Mendenhall	11/27/2023

Shelter Make	Shelter Model	Shelter Size
Shelter One	E8109-26012	720 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	Fair	pass
Tubing Type	1/4 teflon	pass
Sample Train	Good	pass
System Memo		pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Temperature	SAN189	Tim Mendenhall	11/27/2023	System Memo	RM Young	2887	☐	☐

The sensor signal cables are showing signs of wear.

Field Systems Comments

1 **Parameter:** DasComments

The met tower is not currently in use and it is somewhat unstable.

2 **Parameter:** SiteOpsProcedures

The site operator was not available during the audit visit due to illness.

3 **Parameter:** DocumentationCo

The site operator reported that all instrument manuals are kept at the office.

4 **Parameter:** ShelterCleanNotes

The shelter is in very good condition.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	SAN189	**Technician**	Tim Mendenhall	**Site Visit Date**	11/27/2023

Site Sponsor (agency)	EPA	**USGS Map**	Santee
Operating Group	Santee Sioux Nation	**Map Scale**	
AQS #	31-107-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, SO2, NOx, CO	**QAPP Latitude**	
Deposition Measurement	dry	**QAPP Longitude**	
Land Use	range	**QAPP Elevation Meters**	429
Terrain	rolling	**QAPP Declination**	
Conforms to MLM	Yes	**QAPP Declination Date**	6/21/2018
Site Telephone	(402) 857-2546	**Audit Latitude**	42.829154
Site Address 1	SR S54D	**Audit Longitude**	-97.854128
Site Address 2	Santee Sioux Indian Reservation	**Audit Elevation**	434
County	Knox	**Audit Declination**	5.0
City, State	Niobrara, NE		**Present**
Zip Code	68760	**Fire Extinguisher**	☑ No inspection date
Time Zone	Central	**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** E8109-26012 **Shelter Size** 720 cuft

Shelter Clean ☑ **Notes** The shelter is in very good condition.

Site OK ☑ **Notes**

Driving Directions From Yankton, South Dakota go south on route 81. Turn right (south) at the intersection of route 12 and continue approximately 26 miles. Just past the casino and gas station, turn right (north) onto SR 54 toward Santee. Continue approximately 6.5 miles. The site will be visible through the farm gate on the left at the top of a hill just before reaching Santee.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	SAN189	Technician	Tim Mendenhall	Site Visit Date	11/27/2023

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?	☑	sensor mounted on south side of 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	SAN189	Technician	Tim Mendenhall	Site Visit Date	11/27/2023

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?	☑	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:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	SAN189	Technician	Tim Mendenhall	Site Visit Date	11/27/2023

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 16 meters
4	Describe dry dep sample tube.		1/4 teflon by 16 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?	☑	

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	SAN189	Technician	Tim Mendenhall	Site Visit Date	11/27/2023

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?	sample tower not grounded	

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 met tower is not currently in use and it is somewhat unstable.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	SAN189	Technician	Tim Mendenhall	Site Visit Date	11/27/2023

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	☑	2018	☐
HASP	☑	2018	☐
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:

The site operator reported that all instrument manuals are kept at the office.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	SAN189	Technician	Tim Mendenhall	Site Visit Date	11/27/2023

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Trained by the previous operator / and DEP staff
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Trained by the current 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?	☑	
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	☐		☐
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 site operator was not available during the audit visit due to illness.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	SAN189	Technician	Tim Mendenhall	Site Visit Date	11/27/2023

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, call-in
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?	☑	One set of gloves only
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 SAN189 **Technician** Tim Mendenhall **Site Visit Date** 11/27/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	GK2MC12	07019
DAS	Campbell	CR3000	2138	000360
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	050400022576	06019
Flow Rate	Apex	AXMC105LPMDPC	48100	000527
Flow Rate	Apex	AXMC105LPMDPC	illegible	000861
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07133
Ozone	ThermoElectron Inc	49i A1NAA	1030244789	000685
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200010	000434
Sample Tower	Aluma Tower	B	none	000207
Shelter Temperature	Campbell	107-L	223461	none
Temperature	RM Young	41342VC	14798	06537
Zero air pump	Werther International	C 70/4	000814272	06875

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
KIC003-Tim Mendenhall-11/29/2023						
1	11/29/2023	DAS	Campbell	000816	CR850	28382
2	11/29/2023	Flow Rate	Apex	000668	MC-5SLPM-D	54765
3	11/29/2023	Modem	Sierra wireless	06996	unknown	unknown
4	11/29/2023	Sample Tower	Aluma Tower	000814	B	none
5	11/29/2023	Temperature	RM Young	06112	41342	10176

DAS Data Form

DAS Time Max Error: 0.05

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	28382	KIC003	Tim Mendenhall	11/29/2023	DAS	Primary

Das Date: 11/29/2023 **Audit Date** 11/29/2023
Das Time: 7:52:25 **Audit Time** 7:52:28
Das Day: 333 **Audit Day** 333

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
4	0.0000	0.0000	0.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	54765	KIC003	Tim Mendenhall	11/29/2023	Flow Rate	000668

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**	-0.012
2.28%	2.74%			**Cal Factor Full Scale**	0.992
				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	0.00	0.000	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.32	0.000	0.31	l/m	l/m	
primary	test pt 1	2.925	2.920	3.00	0.000	2.99	l/m	l/m	2.40%
primary	test pt 2	2.922	2.920	3.00	0.000	3.00	l/m	l/m	2.74%
primary	test pt 3	2.948	2.950	3.00	0.000	3.00	l/m	l/m	1.69%

Sensor Component	Leak Test	**Condition**	0.30 lpm	**Status**	Fail
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Dirty	**Status**	Fail
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	10176	KIC003	Tim Mendenhall	11/29/2023	Temperature	06112

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**
0.08	0.21		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.05	-0.03	0.000	0.0	C	-0.01
primary	Temp Mid Range	24.41	24.05	0.000	24.0	C	-0.02
primary	Temp High Range	45.01	44.41	0.000	44.2	C	-0.21

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	KIC003	Tim Mendenhall	11/29/2023	Rotometer Condit	Apex	4793	☐	☐

The rotometer ball is stuck and not floating due to either dirt or moisture inside the rotometer.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operation is currently suspended until funding is available.

2 **Parameter:** DocumentationCo

Currently there is no logbook provided by WSP but that maybe due to suspension of site operation since July.

3 **Parameter:** SitingCriteriaCom

The site is located across the street from the community school in the town of Powhattan.

4 **Parameter:** ShelterCleanNotes

Small footprint site with no shelter.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	KIC003	**Technician**	Tim Mendenhall	**Site Visit Date**	11/29/2023

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	Kickapoo Tribe	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer		**QAPP Latitude**	
Deposition Measurement		**QAPP Longitude**	
Land Use		**QAPP Elevation Meters**	
Terrain		**QAPP Declination**	
Conforms to MLM		**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	39.76102
Site Address 1		**Audit Longitude**	-95.63599
Site Address 2		**Audit Elevation**	367
County	Brown	**Audit Declination**	
City, State	Powhattan, KS		
Zip Code	66527		
Time Zone	Central		
Primary Operator			
Primary Op. Phone #			
Primary Op. E-mail			
Backup Operator			
Backup Op. Phone #			
Backup Op. E-mail			

	Present		
Fire Extinguisher	☐		
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** Small footprint site with no shelter.

Site OK ☑ **Notes**

Driving Directions

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	KIC003	Technician	Tim Mendenhall	Site Visit Date	11/29/2023

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?	☑	sensor on south side of 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	KIC003	Technician	Tim Mendenhall	Site Visit Date	11/29/2023

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 KIC003 **Technician** Tim Mendenhall **Site Visit Date** 11/29/2023

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?	☑	N/A
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	N/A
3	Describe ozone sample tube.		N/A
4	Describe dry dep sample tube.		3/8 teflon by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	N/A
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	N/A
8	Are there moisture traps in the sample lines?	☑	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	rotometer is stuck at 0.0 lpm

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	KIC003	Technician	Tim Mendenhall	Site Visit Date	11/29/2023

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?	☑	GFI breaker tripped
8	Is the instrument shelter temperature controlled?	☑	N/A

		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	KIC003	Technician	Tim Mendenhall	Site Visit Date	11/29/2023

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	☑	Oct 2018	☑
HASP	☑	Oct 2018	☑
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?	☑	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:

Currently there is no logbook provided by WSP but that maybe due to suspension of site operation since July.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	KIC003	Technician	Tim Mendenhall	Site Visit Date	11/29/2023

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	no current site 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	☑	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	☐	N/A	☑
Automatic Zero/Span Tests	☐	N/A	☑
Manual Zero/Span Tests	☐	N/A	☑
Automatic Precision Level Tests	☐	N/A	☑
Manual Precision Level Test	☐	N/A	☑
Analyzer Diagnostics Tests	☐	N/A	☑
In-line Filter Replacement (at inlet)	☐	N/A	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☐	N/A	☑
Zero Air Desiccant Check	☐	N/A	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☑	N/A
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	N/A
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	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-S9-rev002

Site ID	KIC003	Technician	Tim Mendenhall	Site Visit Date	11/29/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☐	not operational
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, call-in
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	☑	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:

The site operation is currently suspended until funding is available.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID KIC003 **Technician** Tim Mendenhall **Site Visit Date** 11/29/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR850	28382	000816
Flow Rate	Apex	MC-5SLPM-D	54765	000668
Modem	Sierra wireless	unknown	unknown	06996
Sample Tower	Aluma Tower	B	none	000814
Temperature	RM Young	41342	10176	06112

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
SPD111-Martin Valvur-12/05/2023						
1	12/5/2023	DAS	Campbell	000405	CR3000	2622
2	12/5/2023	Ozone	ThermoElectron Inc	000615	49i A1NAA	1009241787
3	12/5/2023	Ozone Standard	ThermoElectron Inc	000435	49i A3NAA	CM08200011
4	12/5/2023	Zero air pump	Werther International	06912	C 70/4	000829177

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241787	SPD111	Martin Valvur	12/05/2023	Ozone	000615

Slope:	0.99728	**Slope:**	0.00000
Intercept	-0.63396	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	CM23147126	**Tfer Desc.**	Ozone primary stan
Tfer ID	01116		
Slope	1.00654	**Intercept**	-0.03885
Cert Date	9/19/2023	**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	0.25	0.34	-0.34	ppb		-0.68
primary	2	14.14	14.05	13.45	ppb		-0.6
primary	3	34.11	33.76	33.22	ppb	-1.61	
primary	4	62.01	61.29	60.16	ppb	-1.86	
primary	5	112.41	111.02	110.20	ppb	-0.74	

Sensor Component		Condition		Status	
Sensor Component	Audit Pressure	**Condition**	722 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**	-0.1	**Status**	pass
Sensor Component	Span	**Condition**	1.002	**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**	1.0 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.69 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	705.4 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	30.8 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	91.0 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.70 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	705.1 mmHg	**Status**	pass
Sensor Component	Nafion dryer installed	**Condition**	False	**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*
SND152-Martin Valvur-12/06/2023						
1	12/6/2023	DAS	Campbell	000357	CR3000	2135
2	12/6/2023	Ozone	ThermoElectron Inc	000743	49i A1NAA	1105347321
3	12/6/2023	Ozone Standard	ThermoElectron Inc	000704	49i A3NAA	1030244816
4	12/6/2023	Zero air pump	Werther International	06878	C 70/4	000815254

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347321	SND152	Martin Valvur	12/06/2023	Ozone	000743

Slope:	1.02085	**Slope:**	0.00000
Intercept	-0.74215	**Intercept**	0.00000
CorrCoff:	0.99996	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	CM23147126	**Tfer Desc.**	Ozone primary stan
Tfer ID	01116		
Slope	1.00654	**Intercept**	-0.03885
Cert Date	9/19/2023	**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	0.15	-0.25	ppb		-0.4
primary	2	14.87	14.77	13.69	ppb		-1.08
primary	3	32.83	32.49	32.56	ppb	0.22	
primary	4	61.74	61.02	61.83	ppb	1.32	
primary	5	112.62	111.23	112.70	ppb	1.31	

Sensor Component	Condition	Status
Audit Pressure	730 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	-0.5	pass
Span	1.034	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	96.2 kHz	pass
Cell A Noise	0.4 ppb	pass
Cell A Flow	0.65 lpm	pass
Cell A Pressure	708.8 mmHg	pass
Cell A Tmp.	35.2 C	pass
Cell B Freq.	91.8 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.66 lpm	pass
Cell B Pressure	708.5 mmHg	pass
Nafion dryer installed	True	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CND125-Eric Hebert-12/22/2023						
1	12/22/2023	Computer	Dell	07015	Inspiron 15	BQ3MC12
2	12/22/2023	DAS	Campbell	000499	CR3000	3816
3	12/22/2023	Elevation	Elevation	None	1	None
4	12/22/2023	Filter pack flow pump	Thomas	01235	107CA18	illegible
5	12/22/2023	Flow Rate	Apex	000859	AXMC105LPMDPCV	illegible
6	12/22/2023	Infrastructure	Infrastructure	none	none	none
7	12/22/2023	Modem	Digi	07122	LR54	Illegible
8	12/22/2023	Ozone	ThermoElectron Inc	000614	49i A1NAA	1009241794
9	12/22/2023	Ozone Standard	ThermoElectron Inc	000376	49i A3NAA	0726124693
10	12/22/2023	Sample Tower	Aluma Tower	03495	A	none
11	12/22/2023	Shelter Temperature	Campbell	none	107-L	none
12	12/22/2023	Siting Criteria	Siting Criteria	None	1	None
13	12/22/2023	Temperature	RM Young	06402	41342VC	14035
14	12/22/2023	Zero air pump	Werther International	06868	C 70/4	000814284

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	3816	CND125	Eric Hebert	12/22/2023	DAS	Primary

Das Date: 12/22/2023
Das Time: 10:07:00
Das Day: 356

Audit Date 12/22/2023
Audit Time 10:07:00
Audit Day 356

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0000	0.0000	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
4	0.0000	0.0000	0.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	CND125	Eric Hebert	12/22/2023	Flow Rate	000859

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
4.26%	4.46%			**Cal Factor Full Scale**	0.98
				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	-0.04	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	-0.02	0.000	-0.18	l/m	l/m	
primary	test pt 1	1.566	1.570	1.54	0.000	1.50	l/m	l/m	-4.46%
primary	test pt 2	1.565	1.560	1.54	0.000	1.50	l/m	l/m	-3.85%
primary	test pt 3	1.566	1.570	1.54	0.000	1.50	l/m	l/m	-4.46%

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**	1.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	100 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	1009241794	CND125	Eric Hebert	12/22/2023	Ozone	000614

Slope:	1.01683	**Slope:**	0.00000
Intercept	-0.04086	**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 % Dif**	**A Avg %Diff**	**A Max % Dif**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.46	0.16	0.23	ppb		0.07
primary	2	15.72	15.46	15.58	ppb		0.12
primary	3	37.15	36.94	37.39	ppb	1.21	
primary	4	68.87	68.74	70.03	ppb	1.86	
primary	5	108.29	108.27	110.00	ppb	1.59	

Sensor Component	Condition	Status
Audit Pressure	753.7 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	Dirty	Fail
Offset	-0.20	pass
Span	1.038	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	107.8 kHz	pass
Cell A Noise	1.0 ppb	pass
Cell A Flow	0.72 lpm	pass
Cell A Pressure	722.2 mmHg	pass
Cell A Tmp.	36.5 C	pass
Cell B Freq.	94.6 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	721.6 mmHg	pass
Nafion dryer installed	True	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14035	CND125	Eric Hebert	12/22/2023	Temperature	06402

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**
0.04	0.05		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.23	0.15	0.000	0.2	C	0.05
primary	Temp Mid Range	21.97	21.63	0.000	21.7	C	0.03
primary	Temp High Range	46.85	46.23	0.000	46.2	C	-0.03

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 Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CND125	Eric Hebert	12/22/2023	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.12	0.23		

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	27.51	27.11	0.000	27.0	C	-0.07
primary	Temp Mid Range	29.18	28.76	0.000	28.5	C	-0.23
primary	Temp Mid Range	28.51	28.10	0.000	28.1	C	-0.05

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
CND125	Eric Hebert	12/22/2023

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type A	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	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	Fair	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		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		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:** SitingCriteriaCom

The land owner maintains a pine tree forest on the property within 50 meters of the site. The trees were planted just before the site was installed in 1990 and may or may not be harvested in the future.

2 **Parameter:** ShelterCleanNotes

The shelter is well clean and well organized. There are signs of insect infestation on floor.

3 **Parameter:** PollAnalyzerCom

Ozone sample train has inline dryer.

4 **Parameter:** MetOpMaintCom

The temperature sensor is mounted on the sample tower in a naturally aspirated shield.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CND125	**Technician**	Eric Hebert	**Site Visit Date**	12/22/2023

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	private	**Map Scale**	
AQS #	37-123-9991	**Map Date**	
Meteorological Type	Claytronic		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, Hg, PM2.5, PM10	**QAPP Longitude**	
Land Use	woodland	**QAPP Elevation Meters**	
Terrain	rolling	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	35.26333
Site Address 1	136 Perry Drive	**Audit Longitude**	-79.83754
Site Address 2		**Audit Elevation**	172
County	Montgomery	**Audit Declination**	-8
City, State	Candor, NC		
Zip Code	27229	**Fire Extinguisher** ☑	New in 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 well clean and well organized. There are signs of insect infestation on floor.				
Site OK	☑	**Notes**					

Driving Directions

From Greensboro take Hwy 220 (future I-73) south to Candor. Exit at 211 west to Candor. At the traffic light turn left (south) onto 220 south and 731 west. Continue approximately 1.3 miles which will take you out of town. Bear right onto 731 west at the split. Take an immediate right onto McCallum Rd. (there is a sign for E-KU-SUMEE at the intersection). Continue approximately 5.4 miles to Perry Drive which is on the left. Turn left onto the gravel road and follow it to the end. The site is behind the house, drive around the grapevines on the left.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CND125	Technician	Eric Hebert	Site Visit Date	12/22/2023

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	CND125	Technician	Eric Hebert	Site Visit Date	12/22/2023

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?	☑	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?	☑	N/A
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	☑	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:

The temperature sensor is mounted on the sample tower in a naturally aspirated shield.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	CND125	Technician	Eric Hebert	Site Visit Date	12/22/2023

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	CND125	Technician	Eric Hebert	Site Visit Date	12/22/2023

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?		

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	CND125	Technician	Eric Hebert	Site Visit Date	12/22/2023

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	CND125	Technician	Eric Hebert	Site Visit Date	12/22/2023

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?	☑	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	CND125	Technician	Eric Hebert	Site Visit Date	12/22/2023

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings
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 CND125 **Technician** Eric Hebert **Site Visit Date** 12/22/2023

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	BQ3MC12	07015
DAS	Campbell	CR3000	3816	000499
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	illegible	01235
Flow Rate	Apex	AXMC105LPMDPC	illegible	000859
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	Illegible	07122
Ozone	ThermoElectron Inc	49i A1NAA	1009241794	000614
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124693	000376
Sample Tower	Aluma Tower	A	none	03495
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	14035	06402
Zero air pump	Werther International	C 70/4	000814284	06868

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
COW137-Eric Hebert-12/26/2023						
1	12/26/2023	DAS	Campbell	000401	CR3000	2529
2	12/26/2023	Ozone	ThermoElectron Inc	000684	49i A1NAA	103244795
3	12/26/2023	Ozone Standard	ThermoElectron Inc	000441	49i A3NAA	CM08200017
4	12/26/2023	Zero air pump	Werther International	06940	C 70/4	000821897

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	103244795	COW137	Eric Hebert	12/26/2023	Ozone	000684

Slope:	0.97363	**Slope:**	0.00000
Intercept	-0.54646	**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 % Dif**	**A Avg %Diff**	**A Max % Dif**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.36	0.06	-0.54	ppb		-0.6
primary	2	14.96	14.69	13.74	ppb		-0.95
primary	3	35.95	35.74	34.44	ppb	-3.7	
primary	4	70.08	69.96	67.40	ppb	-3.73	
primary	5	110.43	110.41	107.00	ppb	-3.14	

Sensor Component	Condition	Status
Audit Pressure	678.4 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	-0.30	pass
Span	1.015	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	101.6 kHz	pass
Cell A Noise	Not tested	pass
Cell A Flow	0.68 lpm	pass
Cell A Pressure	637.4 mmHg	pass
Cell A Tmp.	33.4 C	pass
Cell B Freq.	95.2 kHz	pass
Cell B Noise	Not tested	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	638.0 mmHg	pass
Nafion dryer installed	True	pass
System Memo		pass

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: 11/5/2023 19:04:30

SiteVisitDate	Site	Technician
10/20/2023	ANA115	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	0.99806	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.18415	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.7	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.12	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.13	ppb	**P**

EEMS Spot Report

Data Compiled: 1/16/2024 11:28:00 AM

SiteVisitDate	Site	Technician
11/09/2023	BAS601	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	0.97330	unitless	**P**
2	Ozone Intercept	P	0	5	4	-1.05805	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99991	unitless	**P**
4	Ozone % difference avg	P	7	10	4	5.4	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.91	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-1.25	ppb	**P**

EEMS Spot Report

Data Compiled: 1/15/2024 6:12:10 PM

SiteVisitDate	Site	Technician
11/15/2023	BFT142	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	0.41	c	**P**
2	Temperature max error	P	4	0.5	18	0.70	c	**Fail**
3	Ozone Slope	P	0	1.1	4	0.97877	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.06249	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.4	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.00	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.44	ppb	**P**
9	Flow Rate average % difference	P	10	5	5	0.00	%	**P**
10	Flow Rate max % difference	P	10	5	5	0.00	%	**P**
11	DAS Voltage average error	P	4	0.003	13	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	24	0.17	c	**P**
13	Shelter Temperature max error	P	5	2	24	0.28	c	**P**

SiteVisitDate	Site	Technician
11/15/2023	BFT142	Eric Hebert

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** Moisture Present **CommentCode:** 72

The filter sample tubing has drops of moisture in low sections outside the shelter.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The SSRF forms are not competed on the day of filter installation. The logbook entries are not up to date.

2 **Parameter:** DasComments

The new sample tower is not attached to the shelter. The sample tower is not grounded.

3 **Parameter:** SitingCriteriaCom

The site is surrounded by a corn/soy bean field, within a large-scale commercial agriculture operation.

4 **Parameter:** ShelterCleanNotes

One shelter light is functioning properly. The shelter is in poor condition due to being flooded during hurricanes. The floor has been repaired.

5 **Parameter:** MetOpMaintCom

The meteorological tower has been removed and the temperature sensor is installed in a naturally aspirated shield on the sample tower.

EEMS Spot Report

Data Compiled: 1/12/2024 12:03:32 PM

SiteVisitDate	Site	Technician
11/07/2023	BUF603	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	0.28	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.42	c	**P**
3	Flow Rate average % difference	P	10	5	9	1.24	%	**P**
4	Flow Rate max % difference	P	10	5	9	1.35	%	**P**
5	DAS Voltage average error	P	4	0.003	1	0.0000	V	**P**

SiteVisitDate	Site	Technician
11/07/2023	BUF603	Tim Mendenhall

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator does not use gloves, however, he uses the filter bag when handling the filter.

2 **Parameter:** DasComments

The NEMA enclosure has a cooling fan.

3 **Parameter:** DocumentationCo

A disc with the current QAPP has been received and is kept at the site operator's office. The site operator completes and files a hardcopy checklist and logbook developed by ARS for BLM each week.

4 **Parameter:** ShelterCleanNotes

NEMA enclosure, 120 VAC power

5 **Parameter:** PollAnalyzerCom

The dry deposition filter pack enclosure is not the standard "pot" size that is used at the other CASTNET sites. The diameter of the enclosure is much smaller and the filter is mounted much deeper inside the opening. The geometry of the filter pack and enclosure is likely to impact particle collection efficiency.

6 **Parameter:** MetSensorComme

The temperature is measured at 2.5 meters above the ground. The top section of the tower is not perfectly plumb and guy wire tension could be applied to improve position.

7 **Parameter:** MetOpMaintCom

Some signal cables are showing signs of wear.

EEMS Spot Report

Data Compiled: 11/5/2023 20:03:18

SiteVisitDate	Site	Technician
10/23/2023	CAV436	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	0.69	c	**Fail**
2	Temperature2meter max error	P	5	0.5	3	0.74	c	**Fail**
3	Ozone Slope	P	0	1.1	4	0.97980	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.77048	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	4.6	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.78	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-1.22	ppb	**P**
9	DAS Voltage average error	P	4	0.003	3	0.0000	V	**P**
10	Shelter Temperature average error	P	5	2	9	0.32	c	**P**
11	Shelter Temperature max error	P	5	2	9	0.69	c	**P**

SiteVisitDate	Site	Technician
10/23/2023	CAV436	Martin Valvur

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Dry deposition samples are not collected at this site.

2 **Parameter:** DocumentationCo

The site is visited every other Tuesday.

3 **Parameter:** MetSensorComme

The 2-meter temperature sensor is mounted one meter above the building roof and facing south. The building is likely to impact the accuracy of the measurements.

EEMS Spot Report

Data Compiled: 11/5/2023 20:13:22

SiteVisitDate	Site	Technician
10/24/2023	CHA467	Martin Valvur

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	0.98591	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.08656	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99990	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.4	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.95	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.74	ppb	**P**

EEMS Spot Report

Data Compiled: 1/16/2024 11:20:34 AM

SiteVisitDate	Site	Technician
12/22/2023	CND125	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	0.04	c	**P**
2	Temperature max error	P	4	0.5	18	0.05	c	**P**
3	Ozone Slope	P	0	1.1	4	1.01683	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.04086	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.4	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.07	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	4.25	%	**P**
10	Flow Rate max % difference	P	10	5	3	4.46	%	**P**
11	DAS Voltage average error	P	4	0.003	14	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	24	0.12	c	**P**
13	Shelter Temperature max error	P	5	2	24	0.23	c	**P**

SiteVisitDate	Site	Technician
12/22/2023	CND125	Eric Hebert

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The land owner maintains a pine tree forest on the property within 50 meters of the site. The trees were planted just before the site was installed in 1990 and may or may not be harvested in the future.

2 **Parameter:** ShelterCleanNotes

The shelter is well clean and well organized. There are signs of insect infestation on floor.

3 **Parameter:** PollAnalyzerCom

Ozone sample train has inline dryer.

4 **Parameter:** MetOpMaintCom

The temperature sensor is mounted on the sample tower in a naturally aspirated shield.

EEMS Spot Report

Data Compiled: 1/16/2024 11:29:17 AM

SiteVisitDate	Site	Technician
12/26/2023	COW137	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	0.97363	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.54646	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.2	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.6	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.95	ppb	**P**

EEMS Spot Report

Data Compiled: 1/16/2024 11:30:22 AM

SiteVisitDate	Site	Technician
11/08/2023	CTH110	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	0.98097	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.09209	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.8	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.12	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.39	ppb	**P**

EEMS Spot Report

Data Compiled: 11/5/2023 15:47:42

SiteVisitDate	Site	Technician
10/11/2023	DEN417	Martin Valvur

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	1.0253	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.11634	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.6	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.34	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.49	ppb	**P**

EEMS Spot Report

Data Compiled: 1/16/2024 8:13:43 AM

SiteVisitDate	Site	Technician
11/20/2023	DEV412	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	2	0.59	c	**Fail**
2	Temperature max error	P	4	0.5	2	0.83	c	**Fail**
3	Ozone Slope	P	0	1.1	4	1.00126	unitless	**P**
4	Ozone Intercept	P	0	5	4	-1.02788	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.3	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.86	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-1.04	ppb	**P**
9	DAS Voltage average error	P	4	0.003	1	0.0000	V	**P**
10	Shelter Temperature average error	P	5	2	6	1.03	c	**P**
11	Shelter Temperature max error	P	5	2	6	1.32	c	**P**

SiteVisitDate	Site	Technician
11/20/2023	DEV412	Martin Valvur

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Dry deposition samples are not collected at this site.

2 **Parameter:** PollAnalyzerCom

The sample tubing is not secured to the sample tower.

3 **Parameter:** MetSensorComme

The temperature and humidity combination sensor is mounted in a non-aspirated shield on the south side of the tower. The sensor cannot be submerged and therefore was only challenged in air side-by-side with the RTD standard. Audit results are not comparable with other submergible sensors.

EEMS Spot Report

Data Compiled: 1/16/2024 11:31:48 AM

SiteVisitDate	Site	Technician
11/14/2023	DUK008	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	1.01197	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.0393	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.9	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.12	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.13	ppb	**P**

EEMS Spot Report

Data Compiled: 11/5/2023 17:22:52

SiteVisitDate	Site	Technician
10/18/2023	GLR468	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	0.21	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.24	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99776	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.82253	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.8	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.69	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.9	ppb	**P**
9	Flow Rate average % difference	P	10	5	8	0.22	%	**P**
10	Flow Rate max % difference	P	10	5	8	0.33	%	**P**
11	DAS Voltage average error	P	4	0.003	4	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	24	0.63	c	**P**
13	Shelter Temperature max error	P	5	2	24	0.70	c	**P**

SiteVisitDate	Site	Technician
10/18/2023	GLR468	Tim Mendenhall

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator uses the filter bad as a glove.

2 **Parameter:** SitingCriteriaCom

The site is located in a small clearing within 100 meters of a horse stable. There is a plywood and aluminum processing plant within 20 km of the site.

3 **Parameter:** ShelterCleanNotes

The shelter is in fair condition. Evidence of repairs to roof leaks attempted. The floor has been repaired since the previous audit visit.

EEMS Spot Report

Data Compiled: 1/16/2024 11:32:52 AM

SiteVisitDate	Site	Technician
11/06/2023	GRB411	Martin Valvur

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	1.01129	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.87381	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.4	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-1.01	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.58	ppb	**P**

EEMS Spot Report

Data Compiled: 11/5/2023 20:21:26

SiteVisitDate	Site	Technician
10/25/2023	GRC474	Martin Valvur

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	0.97456	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.7612	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.7	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.88	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.99	ppb	**P**

EEMS Spot Report

Data Compiled: 11/5/2023 18:51:44

SiteVisitDate	Site	Technician
10/19/2023	HOX148	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	1.01508	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.46876	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.0	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.46	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.86	ppb	**P**

EEMS Spot Report

Data Compiled: 1/16/2024 9:07:23 AM

SiteVisitDate	Site	Technician
11/29/2023	KIC003	Tim Mendenhall

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	15	0.08	c	**P**
2	Temperature max error	P	4	0.5	15	0.21	c	**P**
3	Flow Rate average % difference	P	10	5	2	2.28	%	**P**
4	Flow Rate max % difference	P	10	5	2	2.74	%	**P**
5	DAS Voltage average error	P	4	0.003	5	0.0000	V	**P**

SiteVisitDate	Site	Technician
11/29/2023	KIC003	Tim Mendenhall

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** Rotometer Conditi **CommentCode:** 203

The rotometer ball is stuck and not floating due to either dirt or moisture inside the rotometer.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operation is currently suspended until funding is available.

2 **Parameter:** DocumentationCo

Currently there is no logbook provided by WSP but that maybe due to suspension of site operation since July.

3 **Parameter:** SitingCriteriaCom

The site is located across the street from the community school in the town of Powhattan.

4 **Parameter:** ShelterCleanNotes

Small footprint site with no shelter.

EEMS Spot Report

Data Compiled: 11/5/2023 12:25:01

SiteVisitDate	Site	Technician
10/10/2023	KNZ184	Tim Mendenhall

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	9	0.05	c	**P**
2	Temperature max error	P	4	0.5	9	0.14	c	**P**
3	Flow Rate average % difference	P	10	5	2	0.78	%	**P**
4	Flow Rate max % difference	P	10	5	2	1.35	%	**P**
5	DAS Voltage average error	P	4	0.003	9	0.0000	V	**P**
6	Shelter Temperature average error	P	5	2	24	0.13	c	**P**
7	Shelter Temperature max error	P	5	2	24	0.38	c	**P**

SiteVisitDate	Site	Technician
10/10/2023	KNZ184	Tim Mendenhall

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** Moisture Present **CommentCode:** 72

The filter sample tubing has drops of moisture in low sections outside the shelter.

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is located at a Long Term Ecological Research site operated by KSU.

2 **Parameter:** ShelterCleanNotes

The shelter is very clean, neat an well organized. Although patched, he shelter floor is deteriorated and in poor condition.

3 **Parameter:** MetSensorComme

The temperature sensor is mounted on the north side of the sample tower.

EEMS Spot Report

Data Compiled: 1/15/2024 5:43:43 PM

SiteVisitDate	Site	Technician
11/14/2023	LAV410	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	0.22	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.33	c	**P**
3	Ozone Slope	P	0	1.1	4	0.97678	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.41499	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.8	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.72	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.17	ppb	**P**
9	Flow Rate average % difference	P	10	5	12	1.28	%	**P**
10	Flow Rate max % difference	P	10	5	12	1.6	%	**P**
11	DAS Voltage average error	P	4	0.003	10	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	6	0.59	c	**P**
13	Shelter Temperature max error	P	5	2	6	0.62	c	**P**

SiteVisitDate	Site	Technician
11/14/2023	LAV410	Martin Valvur

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone inlet filter is changed and the sample line conditioned every two weeks or as needed.

2 **Parameter:** SitingCriteriaCom

The site is located at the end of a park service facility parking lot, in a fire station. The tree line is near the building, but the prevailing wind direction is from the clearing. Tree height above the sample inlet is not twice as far away as it is high above the inlet.

3 **Parameter:** ShelterCleanNotes

The inside equipment is located in room within the fire station, clean, neat, and organized.

4 **Parameter:** PollAnalyzerCom

Trees violate the ozone sample inlet siting criteria.

EEMS Spot Report

Data Compiled: 1/15/2024 5:19:11 PM

SiteVisitDate	Site	Technician
11/11/2023	NIC001	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	0.06	c	**P**
2	Temperature max error	P	4	0.5	18	0.09	c	**P**
3	Flow Rate average % difference	P	10	5	8	0.00	%	**P**
4	Flow Rate max % difference	P	10	5	8	0.00	%	**P**
5	DAS Voltage average error	P	4	0.003	6	0.0000	V	**P**

SiteVisitDate	Site	Technician
11/11/2023	NIC001	Eric Hebert

Field Systems Comments

1 **Parameter:** DasComments

Single tower with filter pack mounted at 10 meters and temperature mounted at 9 meters. The tower is difficult to lower due to the lower section contacting the chain-link fence. This could be a potential safety hazard. It is recommended that a solution be investigated.

2 **Parameter:** DocumentationCo

There is no logbook onsite to record information regarding site status or filter information.

3 **Parameter:** ShelterCleanNotes

Small footprint site with no shelter. Equipment housed in enclosure on sample tower.

EEMS Spot Report

Data Compiled: 11/5/2023 20:29:07

SiteVisitDate	Site	Technician
10/26/2023	PET427	Martin Valvur

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	0.95667	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.46781	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99977	unitless	**P**
4	Ozone % difference avg	P	7	10	4	5.1	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	1.83	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-1.31	ppb	**P**

EEMS Spot Report

Data Compiled: 11/5/2023 21:40:57

SiteVisitDate	Site	Technician
10/31/2023	PND165	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	0.06	c	**P**
2	Temperature max error	P	4	0.5	21	0.08	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00609	unitless	**P**
4	Ozone Intercept	P	0	5	4	-2.68838	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99974	unitless	**P**
6	Ozone % difference avg	P	7	10	4	4.8	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-4.14	ppb	**Fail**
8	Ozone Absolute Difference g2	P	7	1.5	1	-1.34	ppb	**P**
9	Flow Rate average % difference	P	10	5	3	0.29	%	**P**
10	Flow Rate max % difference	P	10	5	3	0.33	%	**P**
11	DAS Voltage average error	P	4	0.003	14	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	24	0.43	c	**P**
13	Shelter Temperature max error	P	5	2	24	0.82	c	**P**

SiteVisitDate	Site	Technician
10/31/2023	PND165	Martin Valvur

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

Construction at the bottom of the hill and entrance to the site access road has been completed.

2 **Parameter:** ShelterCleanNotes

The floor tiles are loose and breaking into pieces.

EEMS Spot Report

Data Compiled: 1/16/2024 8:40:18 AM

SiteVisitDate	Site	Technician
11/27/2023	SAN189	Tim Mendenhall

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	0.28	c	**P**
2	Temperature max error	P	4	0.5	21	0.50	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00318	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.01756	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.4	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.17	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.07	ppb	**P**
9	Flow Rate average % difference	P	10	5	6	0.99	%	**P**
10	Flow Rate max % difference	P	10	5	6	1.32	%	**P**
11	DAS Voltage average error	P	4	0.003	13	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	24	0.64	c	**P**
13	Shelter Temperature max error	P	5	2	24	0.80	c	**P**

SiteVisitDate	Site	Technician
11/27/2023	SAN189	Tim Mendenhall

Field Performance Comments

1 **Parameter:** Temperature **SensorComponent:** System Memo **CommentCode:** 4

The sensor signal cables are showing signs of wear.

Field Systems Comments

1 **Parameter:** DasComments

The met tower is not currently in use and it is somewhat unstable.

2 **Parameter:** SiteOpsProcedures

The site operator was not available during the audit visit due to illness.

3 **Parameter:** DocumentationCo

The site operator reported that all instrument manuals are kept at the office.

4 **Parameter:** ShelterCleanNotes

The shelter is in very good condition.

EEMS Spot Report

Data Compiled: 1/15/2024 2:02:24 PM

SiteVisitDate	Site	Technician
11/06/2023	SHE604	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	0.17	c	**P**
3	Flow Rate average % difference	P	10	5	2	0.89	%	**P**
4	Flow Rate max % difference	P	10	5	2	1.64	%	**P**
5	DAS Voltage average error	P	4	0.003	1	0.0000	V	**P**

SiteVisitDate	Site	Technician
11/06/2023	SHE604	Tim Mendenhall

Field Systems Comments

1 **Parameter:** DasComments

The site power source is solar and wind with battery storage. The NEMA enclosure has a cooling fan and heat for the 2B ozone monitor.

2 **Parameter:** SiteOpsProcedures

observations of current meteorological measurements are recorded on a hardcopy checklist for ARS and not on the SSRF.

3 **Parameter:** DocumentationCo

The site operator is supplied with a disc containing the QAPP, operating procedures, and HASP which is kept at his office. A hard copy BLM check list developed by ARS is completed and sent to ARS each week. Standard CASTNET SSRF forms are being used now.

4 **Parameter:** SitingCriteriaCom

The site is located in range land. There is an active rail line with coal trains within one kilometer of the site.

5 **Parameter:** ShelterCleanNotes

NEMA enclosure, wind and solar power

6 **Parameter:** PollAnalyzerCom

The dry deposition filter pack enclosure is not the standard "pot" size as at the other CASTNET sites. The diameter is much smaller. It is not clear if this will impact particle collection efficiency. The filter is not plumb inside the enclosure and there is a section of tygon tubing between the pump and MFC.

7 **Parameter:** MetSensorComme

The site is a small footprint solar powered site that has been operating as part of the WARMS network for more than 10 years. Objects violate the 45 degree rule for the tipping bucket rain gage. The temperature and RH are being measured at 2.5 meters above the ground. The upper section of the tower is not plumb. The guy wires could be adjusted to correct.

EEMS Spot Report

Data Compiled: 1/16/2024 11:34:04 AM

SiteVisitDate	Site	Technician
12/06/2023	SND152	Martin Valvur

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	1.02085	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.74215	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.5	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.4	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-1.08	ppb	**P**

EEMS Spot Report

Data Compiled: 1/16/2024 11:35:10 AM

SiteVisitDate	Site	Technician
12/05/2023	SPD111	Martin Valvur

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	0.99728	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.63396	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.1	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.68	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.6	ppb	**P**

EEMS Spot Report

Data Compiled: 11/5/2023 21:12:10

SiteVisitDate	Site	Technician
10/29/2023	STK138	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	21	0.08	c	**P**
2	Temperature max error	P	4	0.5	21	0.11	c	**P**
3	Ozone Slope	P	0	1.1	4	1.01627	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.16439	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.9	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.31	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.38	ppb	**P**
9	Flow Rate average % difference	P	10	5	6	0.90	%	**P**
10	Flow Rate max % difference	P	10	5	6	1.35	%	**P**
11	DAS Voltage average error	P	4	0.003	14	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	24	0.65	c	**P**
13	Shelter Temperature max error	P	5	2	24	1.54	c	**P**

SiteVisitDate	Site	Technician
10/29/2023	STK138	Eric Hebert

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator is completing the SSRF information on the day the filter is removed rather than when installed. He is also indicating on the form that the ozone inlet filter is changed every week.

2 **Parameter:** DasComments

The sample tower is original and is in poor condition. The lower section has been cut to allow the upper section to fold down completely.

3 **Parameter:** SiteOpsProcedures

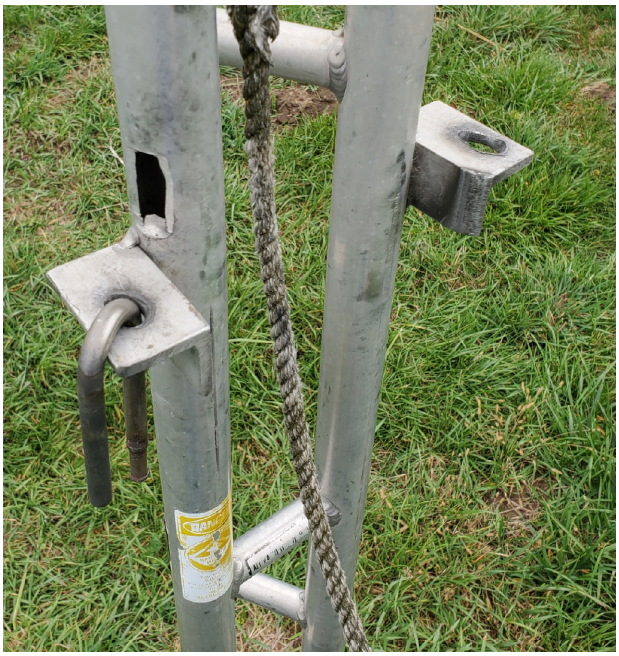
The ozone sample train is leak tested every 2 weeks.

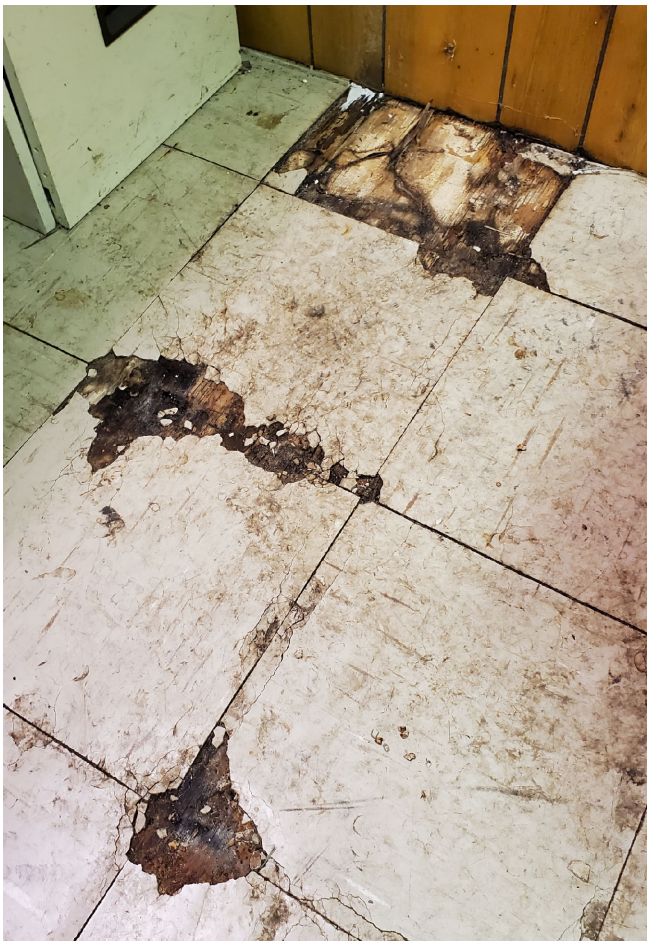
4 **Parameter:** SitingCriteriaCom

The site is located in a corn field on a cattle farm. Corn is planted within 10 meters.

5 **Parameter:** ShelterCleanNotes

There are signs of leaks on the walls and floor rot. The shelter has continued to deteriorate since the previous audit visit.





EEMS Spot Report

Data Compiled: 11/5/2023 22:26:11

SiteVisitDate	Site	Technician
10/13/2023	THR422	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	0.27	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.39	c	**P**
3	Flow Rate average % difference	P	10	5	2	50.33	%	**Fail**
4	Flow Rate max % difference	P	10	5	2	50.5	%	**Fail**
5	DAS Voltage average error	P	4	0.003	11	0.0000	V	**P**
6	Shelter Temperature average error	P	5	2	27	0.59	c	**P**
7	Shelter Temperature max error	P	5	2	27	0.80	c	**P**

SiteVisitDate	Site	Technician
10/13/2023	THR422	Tim Mendenhall

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Gloves are not used to handle the filter pack. The filter bag is used as a glove.

2 **Parameter:** DasComments

The met tower is no longer in use.

3 **Parameter:** SiteOpsProcedures

The ozone sample train does not have a means to introduce test gas at the sample inlet. Results of routine zero, span, precision, and any multipoint calibration checks are maintained by the state personnel who perform the tests. The two inlet filters in the sample train are creating a large pressure drop.

4 **Parameter:** SitingCriteriaCom

The site is located 200 meters from an interstate rest area, and 300 meters from interstate 94. The rest area can have parked and idling vehicles for extended periods.

5 **Parameter:** ShelterCleanNotes

The shelter is in good condition, clean and well organized.

6 **Parameter:** PollAnalyzerCom

The ozone monitor is operated by the state of North Dakota. There is approximately 1.5 meters of tygon tubing attached to the 3/8 filter pack flow tubing. The data logger was recording the flow rate as 1.5 lpm while the rotometer and the audit standard device were measuring approximately 3 lpm.

7 **Parameter:** MetSensorComme

The 2-meter temperature sensor is mounted on south side of the sample tower, which is attached to the site shelter. The sensor is 4.1 meters above ground and close to the shelter.

EEMS Spot Report

Data Compiled: 11/5/2023 18:37:20

SiteVisitDate	Site	Technician
10/19/2023	UVL124	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	1.00788	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.41443	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.3	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.02	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.53	ppb	**P**

EEMS Spot Report

Data Compiled: 11/5/2023 13:07:28

SiteVisitDate	Site	Technician
10/10/2023	VOY413	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	0.41	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.58	c	**Fail**
3	Ozone Slope	P	0	1.1	4	1.01225	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.10569	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.2	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.37	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.22	ppb	**P**
9	Flow Rate average % difference	P	10	5	4	1.93	%	**P**
10	Flow Rate max % difference	P	10	5	4	2.05	%	**P**
11	DAS Voltage average error	P	4	0.003	13	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	18	0.97	c	**P**
13	Shelter Temperature max error	P	5	2	18	1.92	c	**P**

SiteVisitDate	Site	Technician
10/10/2023	VOY413	Eric Hebert

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator handles the filter barehanded.

2 **Parameter:** DasComments

The sample tower itself is not grounded, however it is bolted to the shelter which is grounded. The roof leak above the instrument rack may have been repaired, it is dry at this time.

3 **Parameter:** SitingCriteriaCom

The site is located at the top of a hill in a forest. There are trees surrounding the site which are below the tower height, but within 10 m of the inlet.

4 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, and is neat and well organized.

5 **Parameter:** PollAnalyzerCom

There are no trees violating the 22.5 degree cone above the ozone sample inlet. However, there is a communication tower which is above the 22.5 degree threshold.

EEMS Spot Report

Data Compiled: 1/15/2024 4:50:43 PM

SiteVisitDate	Site	Technician
11/09/2023	WFM105	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	21	0.10	c	**P**
2	Temperature max error	P	4	0.5	21	0.25	c	**P**
3	Flow Rate average % difference	P	10	5	2	1.12	%	**P**
4	Flow Rate max % difference	P	10	5	2	1.35	%	**P**
5	DAS Voltage average error	P	4	0.003	6	0.0000	V	**P**

SiteVisitDate	Site	Technician
11/09/2023	WFM105	Eric Hebert

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The observation section of the SSRF is completed the day the filer is removed and not the day of installation.

2 **Parameter:** DasComments

Single tower, with filter pack at 10 meters and temperature at 9 meters.

3 **Parameter:** DocumentationCo

The site operator takes notes in his own field notebook, there is no site logbook.

4 **Parameter:** SitingCriteriaCom

The site is located at the Atmospheric Science Research Center (ASRC) operated by the NY University (SUNY) system.

5 **Parameter:** ShelterCleanNotes

Small footprint site with no shelter. Equipment housed in enclosure on sample tower.