2019 – 3rd Quarter Report

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

EPA Contract No. EP-W-18-005

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Report Submitted
January 2020

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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-WSO	Bureau of Land Management – Wyoming State Office
CASTNET	Clean Air Status and Trends Network
CMAQ	Community Multiscale Air Quality
DAS	data acquisition system
DC	direct current
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
lpm	liters per minute
MLM	Multilayer Model
m/s	meters per second
mv	millivolt
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
PE	Performance Evaluation
QAPP	Quality Assurance Project Plan
SOP	standard operating procedure
TDEP	Total Deposition
TEI	Thermo Environmental Instruments
USNO	United States Naval Observatory
V	volts
WRR	World Radiation Reference

1.0 CASTNET Quarterly Report

1.1 Introduction

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

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

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

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

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

Currently 84 sites at 82 distinct locations measure ground-level ozone concentrations. Annual performance evaluation (PE), ozone audit data are submitted to the Air Quality System (AQS) database.

As of September 2019, the network is comprised of 97 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. Wood Environment and Infrastructure Solutions (Wood) 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 ≤ ± 0.003 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.

Site systems audits 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 Third Quarter 2019

This report consists of the systems and performance, and other audit results from the CASTNET sites visited during the third quarter (July through September) of 2019. The site locations, visit dates, and parameters audited are included in Table 2.

Table 2. Site Audit Visits

Side ID	Audit Type	Sponsor	Site Visit Date	Station Name
PND165	FSA	EPA/WSO	7/1/2019	Pinedale
PND165	O_3 PE	EPA/WSO	7/1/2019	Pinedale
PND165	Flow	EPA/WSO	7/1/2019	Pinedale
WFM105	FSA	EPA	7/2/2019	Whiteface Mountain
WFM105	Flow	EPA	7/2/2019	Whiteface Mountain
YEL408	FSA	NPS	7/2/2019	Yellowstone NP
YEL408	O_3 PE	NPS	7/2/2019	Yellowstone NP
YEL408	Flow	NPS	7/2/2019	Yellowstone NP
GLR468	FSA	NPS	7/3/2019	Glacier NP
GLR468	O_3 PE	NPS	7/3/2019	Glacier NP
GLR468	Flow	NPS	7/3/2019	Glacier NP

Side ID	Audit Type	Sponsor	Site Visit Date	Station Name
UND002	FSA	EPA	7/9/2019	Underhill
UND002	Flow	EPA	7/9/2019	Underhill
NIC001	FSA	EPA	7/10/2019	Nick's Lake
NIC001	Flow	EPA	7/10/2019	Nick's Lake
CNT169	FSA	EPA	7/16/2019	Centennial
CNT169	O_3 PE	EPA	7/16/2019	Centennial
CNT169	Flow	EPA	7/16/2019	Centennial
THR422	FSA	NPS	7/22/2019	Theodore Roosevelt NP
THR422	O_3 PE	NPS	7/22/2019	Theodore Roosevelt NP
THR422	Flow	NPS	7/22/2019	Theodore Roosevelt NP
NEC602	FSA	WSO	7/23/2019	Newcastle
NEC602	O_3 PE	WSO	7/23/2019	Newcastle
NEC602	Flow	WSO	7/23/2019	Newcastle
WNC429	FSA	NPS	7/24/2019	Wind Cave NP
WNC429	O_3 PE	NPS	7/24/2019	Wind Cave NP
WNC429	Flow	NPS	7/24/2019	Wind Cave NP
PED108	FSA	EPA	7/26/2019	Prince Edward
PED108	O_3 PE	EPA	7/26/2019	Prince Edward
PED108	Flow	EPA	7/26/2019	Prince Edward
ZIO433	Met	NPS	8/3/2019	Zion NP
ZIO433	O_3 PE	NPS	8/3/2019	Zion NP
CHC432	Met	NPS	8/5/2019	Chiricahua NM

Side ID	Audit Type	Sponsor	Site Visit Date	Station Name
CHC432	FSA	NPS	8/5/2019	Chiricahua NM
CHC432	O_3 PE	NPS	8/5/2019	Chiricahua NM
GTH161	FSA	EPA	8/6/2019	Gothic
GTH161	O_3 PE	EPA	8/6/2019	Gothic
GTH161	Flow	EPA	8/6/2019	Gothic
BAS601	FSA	WSO	8/19/2019	Basin
BAS601	O_3 PE	WSO	8/19/2019	Basin
BAS601	Flow	WSO	8/19/2019	Basin
BUF603	FSA	WSO	8/20/2019	Buffalo
BUF603	Flow	WSO	8/20/2019	Buffalo
SHE604	FSA	WSO	8/20/2019	Sheridan
SHE604	Flow	WSO	8/20/2019	Sheridan
PRK134	FSA	EPA	8/27/2019	Perkinstown
PRK134	O_3 PE	EPA	8/27/2019	Perkinstown
PRK134	Flow	EPA	8/27/2019	Perkinstown
VOY413	FSA	NPS	8/29/2019	Voyageurs NP
VOY413	O_3 PE	NPS	8/29/2019	Voyageurs NP
VOY413	Flow	NPS	8/29/2019	Voyageurs NP
ACA416	Met	NPS	9/18/2019	Acadia NP
ACA416	FSA	NPS	9/18/2019	Acadia NP
ACA416	O_3 PE	NPS	9/18/2019	Acadia NP
ACA416	Flow	NPS	9/18/2019	Acadia NP

Side ID	Audit Type	Sponsor	Site Visit Date	Station Name
VPI120	FSA	EPA	9/24/2019	Horton Station
VPI120	O_3 PE	EPA	9/24/2019	Horton Station
VPI120	Flow	EPA	9/24/2019	Horton Station
PAR107	FSA	EPA	9/25/2019	Parsons
PAR107	O_3 PE	EPA	9/25/2019	Parsons
PAR107	Flow	EPA	9/25/2019	Parsons
LRL117	FSA	EPA	9/26/2019	Laurel Hill St. Park
LRL117	O_3 PE	EPA	9/26/2019	Laurel Hill St. Park
LRL117	Flow	EPA	9/26/2019	Laurel Hill St. Park

In addition to the sites listed in Table 2 that were visited for complete audits, the sites listed in Table 3 were visited to conduct Through-The-Probe (TTP) Performance Evaluations of gaseous pollutant monitors as indicated in the table.

Table 3. TTP Pollutant PE Visits

Side ID	PE Audit Type	Sponsor	Site Visit Date	Station Name
HWF187	O_3 and NOy	EPA	7/5/2019	Huntington Wildlife Forest
NPT006	O_3	EPA	7/8/2019	Nez Perce Tribe
CRM435	O_3	NPS	7/9/2019	Craters of the Moon (NP)
CTH110	O_3	EPA	7/15/2019	Connecticut Hill
ARE128	O_3	EPA	7/24/2019	Arendtsville
KEF112	O_3	EPA	7/24/2019	Kane Experimental Forest
MKG113	O_3	EPA	7/25/2019	M. K. Goddard St. Park
PSU106	O_3	EPA	7/25/2019	Penn State

Side ID	PE Audit Type	Sponsor	Site Visit Date	Station Name
CND125	O_3	EPA	7/31/2019	Candor
CAN407	O_3	NPS	8/7/2019	Canyonlands NP
DIN431	O_3	NPS	8/8/2019	Dinosaur NM
WST109	O_3	EPA	8/19/2019	Woodstock
ANA115	O_3	EPA	8/22/2019	Ann Arbor
UVL124	O_3	EPA	8/22/2019	Unionville
HOX148	O_3	EPA	8/23/2019	Hoxeyville
DEN417	O_3	NPS	9/5/2019	Denali NP
ROM206	NOy	EPA	9/10/2019	Rocky Mountain NP
GRB411	O_3	NPS	9/16/2019	Great Basin NP
ASH135	O_3	EPA	9/19/2019	Ashland
ABT147	O_3	EPA	9/25/2019	Abington

1.4 Audit Results

The observations and results of the systems and performance 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.* The Ozone PE results and observations are included in Appendix C, *CASTNET Ozone Performance Evaluation 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.

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 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 located at the Wisconsin State Lab of Hygiene (WSLH) at the University of Wisconsin in Madison. The Mercury Analytical Laboratory (HAL) and the network equipment depot (NED) have been relocated to the WSLH.

2.2 Project Objectives

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

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

2.3 NADP Sites Visited Third Quarter 2019

This report presents the NADP sites surveyed during the Third quarter (July through September) of 2019. The station names and dates of the surveys are presented in Table 4.

Table 4. Sites Surveyed – Third Quarter 2019

Side ID	Network	Visit Date	Station Name
WY95	AMoN	7/16/2019	Brooklyn Lake
PA72	NTN	7/17/2019	Milford
MD08	NTN/MDN/AMoN	7/23/2019	Piney Reservoir
PA00	AMoN	7/24/2019	Arendtsville
PA29	AMoN	7/24/2019	Kane Experimental Forest
PA56	AMoN	7/25/2019	M. K. Goddard
PA96	AMoN	7/25/2019	Penn State - Fairbrook Park
VA24	AMoN	7/26/2019	Prince Edward
CO10	AMoN	8/6/2019	Gothic
NY59	NTN	8/6/2019	Wanakena
UT09	AMoN	8/7/2019	Canyonlands National Park-Island In The Sky
NY93	NTN	8/13/2019	Paul Smith's
NY22	NTN	8/14/2019	Akwesasne Mohawk-Fort Covington
NH02	AMoN	8/19/2019	Hubbard Brook
WY93	AMoN	8/19/2019	Basin - Big Horn
AB14	MDN	8/20/2019	Genesee
ME08	NTN	8/21/2019	Gilead
MI51	AMoN	8/22/2019	Unionville
MI52	AMoN	8/22/2019	Ann Arbor
MI95	AMoN	8/23/2019	Hoxeyville
MA01	MDN/NTN	8/27/2019	North Atlantic Coastal Lab
ME02	MDN/NTN	8/27/2019	Bridgton
WI35	AMoN	8/27/2019	Perkinstown

Side ID	Network	Visit Date	Station Name
MD15	NTN	9/4/2019	Smith Island
MD18	NTN	9/5/2019	Assateague Island National Seashore-Woodcock
NJ00	NTN	9/9/2019	Edwin B. Forsythe National Wildlife Refuge
NJ39	NTN	9/10/2019	Cattus Island
NJ99	NTN	9/10/2019	Washington Crossing
ME93	AMoN	9/19/2019	Ashland
ME09	MDN/NTN	9/23/2019	Greenville Station
ME96	MDN/NTN	9/24/2019	Casco Bay-Wolfe's Neck Farm
VA13	AMoN	9/24/2019	Horton's Station
CT15	AMoN	9/25/2019	Abington
WV18	NTN/AMoN	9/25/2019	Parsons
PA97	AMoN	9/26/2019	Laurel Hill

2.4 Survey Results

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

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

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

APPENDIX A

CASTNET Audit Report Forms

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PND165-Martin Valvur-07/01/2019						
1	7/1/2019	DAS	Campbell	000403	CR3000	2516
2	7/1/2019	Elevation	Elevation	None	1	None
3	7/1/2019	Filter pack flow pump	Thomas	00534	107CA18	0000162757
4	7/1/2019	Flow Rate	Apex	000549	AXMC105LPMDPCV	illegible
5	7/1/2019	Infrastructure	Infrastructure	none	none	none
6	7/1/2019	Modem	Raven	06608	V4221-V	0844349088
7	7/1/2019	Noy	Teledyne	000795	T200U	101
8	7/1/2019	Ozone	ThermoElectron Inc	000621	49i A1NAA	1009241798
9	7/1/2019	Ozone Standard	ThermoElectron Inc	000435	49i A3NAA	CM08200011
10	7/1/2019	Sample Tower	Aluma Tower	000055	B	AT-81213-J12
11	7/1/2019	Shelter Temperature	Campbell	none	107-L	none
12	7/1/2019	Siting Criteria	Siting Criteria	None	1	None
13	7/1/2019	Temperature	RM Young	06539	41342	14800
14	7/1/2019	Zero air pump	Werther International	06881	C 70/4	000815264

DAS Data Form

DAS Time Max Error: 0.05

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2516	PND165	Martin Valvur	07/01/2019	DAS	Primary

Das Date: 6 /30/2019
Das Time: 07:59:00
Das Day: 181

Audit Date 6 /30/2019
Audit Time 07:59:03
Audit Day 181

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

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2019	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	-0.0002	V	V	-0.0001
7	0.1000	0.0999	0.1001	V	V	0.0002
7	0.3000	0.2998	0.2999	V	V	0.0001
7	0.5000	0.4998	0.4998	V	V	0.0000
7	0.7000	0.7001	0.6997	V	V	-0.0004
7	0.9000	0.8994	0.8996	V	V	0.0002
7	1.0000	1.0000	0.9996	V	V	-0.0004

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	PND165	Martin Valvur	07/01/2019	Flow Rate	000549

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00178	**Intercept**	0.00161
Cert Date	7/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.04
1.21%	1.64%			**Cal Factor Full Scale**	0.96
				Rotometer Reading:	3.7

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	-0.03	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	3.040	3.030	3.03	0.000	3.00	l/m	l/m	-0.99%
primary	test pt 2	3.050	3.040	3.03	0.000	3.01	l/m	l/m	-0.99%
primary	test pt 3	3.060	3.050	3.03	0.000	3.00	l/m	l/m	-1.64%

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**	350 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	1009241798	PND165	Martin Valvur	07/01/2019	Ozone	000621

Slope:	0.95438	**Slope:**	0.00000
Intercept	-2.08948	**Intercept**	0.00000
CorrCoff:	0.99964	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00151	**Intercept**	0.00666
Cert Date	10/30/2018	**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	0.07	-1.24	ppb		-1.31
primary	2	16.79	16.75	14.50	ppb		-2.25
primary	3	37.46	37.39	32.36	ppb	-14.42	
primary	4	66.41	66.30	60.00	ppb	-9.98	
primary	5	110.99	110.81	104.70	ppb	-5.67	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.5	pass
Span	0.999	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	97.0 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.63 lpm	pass
Cell A Pressure	565.7 mmHg	pass
Cell A Tmp.	33.3 C	pass
Cell B Freq.	96.7 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.63 lpm	pass
Cell B Pressure	565.4 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	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	07/01/2019	Temperature	06539

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.04	0.07		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.02	0.03	0.000	0.0	C	-0.02
primary	Temp Mid Range	24.58	24.59	0.000	24.5	C	-0.07
primary	Temp High Range	47.69	47.70	0.000	47.7	C	-0.04

Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	Blower Status Switch	Condition	N/A	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
PND165	Martin Valvur	07/01/2019

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-22)	640 cuft

Sensor Component	Condition	Status
Sample Tower Type	Type B	pass
Conduit	Good	pass
Met Tower	Good	pass
Moisture Trap	Installed	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	Poor	pass
Shelter Floor	Fair	pass
Signal Cable	Good	pass
Tubing Type	3/8 teflon	pass
Sample Train	Good	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 shelter is well maintained.

3 **Parameter:** MetOpMaintCom

Only the temperature sensor is included in the site assessment.

4 **Parameter:** MetSensorComme

Met sensors audits are no longer included under the contract.

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	PND165	Martin Valvur	07/01/2019	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.73	1.14		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.57	26.58	0.000	25.7	C	-0.86
primary	Temp Mid Range	25.70	25.71	0.000	25.9	C	0.19
primary	Temp Mid Range	26.14	26.15	0.000	25.0	C	-1.14

Sensor Component	System Memo	Condition		Status	pass

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	PND165	**Technician**	Martin Valvur	**Site Visit Date**	07/01/2019

Site Sponsor (agency)	EPA	**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 shelter is well maintained.

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-S2-rev002

Site ID PND165 **Technician** Martin Valvur **Site Visit Date** 07/01/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

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

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	PND165	Technician	Martin Valvur	Site Visit Date	07/01/2019

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:

Met sensors audits are no longer included under the contract.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	PND165	Technician	Martin Valvur	Site Visit Date	07/01/2019

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:

Only the temperature sensor is included in the site assessment.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	PND165	Technician	Martin Valvur	Site Visit Date	07/01/2019

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** 07/01/2019

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	07/01/2019

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	07/01/2019

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	☑	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	07/01/2019

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** 07/01/2019

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	000549
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0844349088	06608
Noy	Teledyne	T200U	101	000795
Ozone	ThermoElectron Inc	49i A1NAA	1009241798	000621
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200011	000435
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*
WFM105-Korey Devins-07/02/2019						
1	7/2/2019	DAS	Campbell	none	CR850	23270
2	7/2/2019	elevation	Elevation	none	none	none
3	7/2/2019	Filter pack flow pump	Permotec	none	BL30EB	Illegible
4	7/2/2019	Flow Rate	Apex	000651	AXMC105LPMDPCV	illegible
5	7/2/2019	Infrastructure	Infrastructure	none	none	none
6	7/2/2019	Modem	Sierra wireless	06983	unknown	unknown
7	7/2/2019	siting criteria	Siting Criteria	none	none	None
8	7/2/2019	Temperature	RM Young	04683	41342VC	6697

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	WFM105	Korey Devins	07/02/2019	Flow Rate	000651

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00000	**Intercept**	0.00000
Cert Date	3/4/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0
1.46%	1.69%			**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	-0.06	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.00	l/m	l/m	
primary	test pt 1	2.950	2.950	2.75	0.000	3.00	l/m	l/m	1.69%
primary	test pt 2	2.955	2.960	2.76	0.000	3.00	l/m	l/m	1.35%
primary	test pt 3	2.957	2.960	2.75	0.000	3.00	l/m	l/m	1.35%

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**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	150 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	Korey Devins	07/02/2019	Temperature	04683

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00733	**Intercept**	0.14497
Cert Date	2/12/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.12	0.18		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.16	0.01	0.000	0.2	C	0.14
primary	Temp Mid Range	26.45	26.11	0.000	26.2	C	0.05
primary	Temp High Range	47.71	47.22	0.000	47.4	C	0.18

Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	WFM105	Technician	Korey Devins	Site Visit Date	07/02/2019

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	Not installed	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	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Comments

1 **Parameter:** DasComments

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

2 **Parameter:** SitingCriteriaCom

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

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	WFM105	**Technician**	Korey Devins	**Site Visit Date**	07/02/2019

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		**Present**
Zip Code	12997	**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**	☐

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-S2-rev002

Site ID WFM105 **Technician** Korey Devins **Site Visit Date** 07/02/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m	75 m	☐
Tree line	50 m	25 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

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

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	WFM105	Technician	Korey Devins	Site Visit Date	07/02/2019

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	Korey Devins	Site Visit Date	07/02/2019

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	Korey Devins	Site Visit Date	07/02/2019

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?	☐	Not present
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** Korey Devins **Site Visit Date** 07/02/2019

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** Korey Devins **Site Visit Date** 07/02/2019

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:

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	WFM105	Technician	Korey Devins	Site Visit Date	07/02/2019

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	Korey Devins	Site Visit Date	07/02/2019

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?	☑	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 WFM105 **Technician** Korey Devins **Site Visit Date** 07/02/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR850	23270	none
elevation	Elevation	none	none	none
Filter pack flow pump	Permotec	BL30EB	Illegible	none
Flow Rate	Apex	AXMC105LPMDPC	illegible	000651
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*
YEL408-Martin Valvur-07/02/2019						
1	7/2/2019	DAS	Environmental Sys Corp	None	8832	A4888K
2	7/2/2019	Elevation	Elevation	None	1	None
3	7/2/2019	Filter pack flow pump	Thomas	none	107CA18B	120000014912
4	7/2/2019	Flow Rate	Alicat	none	MC-10SLPM-D-PCV	Illgeible
5	7/2/2019	Infrastructure	Infrastructure	none	none	none
6	7/2/2019	Met tower	Climatronics	01362	14 inch taper	illegible
7	7/2/2019	Ozone	ThermoElectron Inc	none	49i A3NAA	1172090002
8	7/2/2019	Ozone Standard	ThermoElectron Inc	none	49i A1NAB	0926938297
9	7/2/2019	Printer	Hewlett Packard	none	840C	unknown
10	7/2/2019	Sample Tower	Aluma Tower	illegible	B	none
11	7/2/2019	Shelter Temperature	ARS	none	none	none
12	7/2/2019	Siting Criteria	Siting Criteria	None	1	None
13	7/2/2019	Temperature2meter	RM Young	none	41342VC	029239
14	7/2/2019	Zero air pump	Werther International	none	PC 70/4	000836215

DAS Data Form

DAS Time Max Error: 0.08

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	A4888K	YEL408	Martin Valvur	07/02/2019	DAS	Primary

Das Date: 7 /2 /2019
Das Time: 07:00:00
Das Day: 183

Audit Date 7 /2 /2019
Audit Time 07:00:05
Audit Day 183

Low Channel: Avg Diff:	Low Channel: Max Diff:	High Channel: Avg Diff:	High Channel: Max Diff:
0.0003	0.0004	0.0003	0.0004

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2019	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
8	0.0000	-0.0004	-0.0003	V	V	0.0001
8	0.1000	0.0998	0.1000	V	V	0.0002
8	0.3000	0.2996	0.2999	V	V	0.0003
8	0.5000	0.4999	0.4997	V	V	-0.0002
8	0.7000	0.6998	0.7002	V	V	0.0004
8	0.9000	0.8999	0.8995	V	V	-0.0004
8	1.0000	1.0000	0.9996	V	V	-0.0004

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Alicat	Illgeible	YEL408	Martin Valvur	07/02/2019	Flow Rate	none

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00178	**Intercept**	0.00161
Cert Date	7/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.02
0.54%	0.64%			**Cal Factor Full Scale**	5.03
				Rotometer Reading:	3.65

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.02	0.000	0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.06	0.000	0.07	l/m	l/m	
primary	test pt 1	2.984	2.980	2.99	0.000	3.00	l/m	l/m	0.50%
primary	test pt 2	2.984	2.980	2.99	0.000	2.99	l/m	l/m	0.47%
primary	test pt 3	2.991	2.980	2.99	0.000	3.00	l/m	l/m	0.64%

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**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	45 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1172090002	YEL408	Martin Valvur	07/02/2019	Ozone	none

Slope:	1.00478	**Slope:**	0.00000
Intercept	-0.10150	**Intercept**	0.00000
CorrCoff:	0.99999	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00151	**Intercept**	0.00666
Cert Date	10/30/2018	**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	0.10	0.09	0.19	ppb		0.1
primary	2	15.84	15.80	15.49	ppb		-0.31
primary	3	35.48	35.41	35.41	ppb	0	
primary	4	66.78	66.67	67.10	ppb	0.64	
primary	5	118.09	117.90	118.30	ppb	0.34	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		Fail
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.30	pass
Span	0.986	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	120.3 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.63 lpm	pass
Cell A Pressure	557.0 mmHg	pass
Cell A Tmp.	35.5 C	pass
Cell B Freq.	80.1 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.66 lpm	pass
Cell B Pressure	556.4 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	029239	YEL408	Martin Valvur	07/02/2019	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.29	0.41		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.06	0.07	0.000	-0.17	C	-0.24
primary	Temp Mid Range	24.18	24.19	0.000	23.98	C	-0.21
primary	Temp High Rang	48.11	48.12	0.000	47.71	C	-0.41

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	YEL408	Martin Valvur	07/02/2019	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.86	1.17		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.88	22.89	0.000	24.1	C	1.17
primary	Temp Mid Range	29.96	29.97	0.000	28.9	C	-1.09
primary	Temp Mid Range	23.18	23.19	0.000	22.9	C	-0.32

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	YEL408	Technician	Martin Valvur	Site Visit Date	07/02/2019

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

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	Good	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	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	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Gloves are not used to handle the filter pack.

2 **Parameter:** DasComments

The shelter heat and air conditioner run simultaneously.

3 **Parameter:** SiteOpsProcedures

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

4 **Parameter:** SitingCriteriaCom

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

5 **Parameter:** ShelterCleanNotes

The shelter is organized and well maintained.

6 **Parameter:** MetOpMaintCom

The recorded temperature is now being measured at approximately 2 meters above the ground.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	YEL408	**Technician**	Martin Valvur	**Site Visit Date**	07/02/2019

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

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

Driving Directions

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

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID YEL408 **Technician** Martin Valvur **Site Visit Date** 07/02/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m	15 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

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

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	YEL408	Technician	Martin Valvur	Site Visit Date	07/02/2019

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	YEL408	Technician	Martin Valvur	Site Visit Date	07/02/2019

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

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

The recorded temperature is now being measured at approximately 2 meters above the ground.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	YEL408	Technician	Martin Valvur	Site Visit Date	07/02/2019

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID YEL408 **Technician** Martin Valvur **Site Visit Date** 07/02/2019

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 shelter heat and air conditioner run simultaneously.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	YEL408	Technician	Martin Valvur	Site Visit Date	07/02/2019

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	DataView2	☑
SSRF	☑		☑
Site Ops Manual	☑	July 2016	☑
HASP	☑	July 2016	☑
Field Ops Manual	☑	July 2016	☑
Calibration Reports	☑	Not current	☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	YEL408	Technician	Martin Valvur	Site Visit Date	07/02/2019

Site operation procedures

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

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID YEL408 **Technician** Martin Valvur **Site Visit Date** 07/02/2019

Site operation procedures

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

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

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

Gloves are not used to handle the filter pack.

Field Systems Data Form F-02058-1500-S10-rev002

Site ID YEL408 **Technician** Martin Valvur **Site Visit Date** 07/02/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Environmental Sys Corp	8832	A4888K	None
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18B	120000014912	none
Flow Rate	Alicat	MC-10SLPM-D-PCV	Illgeible	none
Infrastructure	Infrastructure	none	none	none
Met tower	Climatronics	14 inch taper	illegible	01362
Ozone	ThermoElectron Inc	49i A3NAA	1172090002	none
Ozone Standard	ThermoElectron Inc	49i A1NAB	0926938297	none
Printer	Hewlett Packard	840C	unknown	none
Sample Tower	Aluma Tower	B	none	illegible
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342VC	029239	none
Zero air pump	Werther International	PC 70/4	000836215	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GLR468-Martin Valvur-07/03/2019						
1	7/3/2019	Computer	Hewlett Packard	none	6560 b	5CB1520H65
2	7/3/2019	DAS	Environmental Sys Corp	90647	8816	2560
3	7/3/2019	Elevation	Elevation	None	1	None
4	7/3/2019	Filter pack flow pump	Thomas	none	107CAB11A	109500000039
5	7/3/2019	Flow Rate	Tylan	none	FC280	AW9710138
6	7/3/2019	Infrastructure	Infrastructure	none	none	none
7	7/3/2019	MFC power supply	Tylan	03687	RO-32	FP9403014
8	7/3/2019	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943901
9	7/3/2019	Ozone Standard	ThermoElectron Inc	none	49i A3NAA	0733726104
10	7/3/2019	Sample Tower	Aluma Tower	none	B	none
11	7/3/2019	Shelter Temperature	ARS	77	none	none
12	7/3/2019	Siting Criteria	Siting Criteria	None	1	None
13	7/3/2019	Temperature2meter	RM Young	none	41342	17625
14	7/3/2019	Zero air pump	Werther International	none	PC70/4	000756725

DAS Data Form

DAS Time Max Error: 0.67

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2560	GLR468	Martin Valvur	07/03/2019	DAS	Primary

Das Date: 7 /3 /2019
Das Time: 08:52:45
Das Day: 184

Audit Date 7 /3 /2019
Audit Time 08:53:25
Audit Day 184

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0005	0.0002	0.0005

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	1/25/2019	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
15	0.0000	-0.0005	-0.0003	V	V	0.0002
15	0.1000	0.1002	0.1002	V	V	0.0000
15	0.3000	0.3000	0.2998	V	V	-0.0002
15	0.5000	0.4998	0.4997	V	V	-0.0001
15	0.7000	0.6999	0.6998	V	V	-0.0001
15	0.9000	0.9000	0.8999	V	V	-0.0001
15	1.0000	1.0002	0.9997	V	V	-0.0005

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9710138	GLR468	Martin Valvur	07/03/2019	Flow Rate	none

Mfg	Tylan		
SN/Owner ID	FP9403014	03687	
Parameter:	MFC power supply		

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00178	**Intercept**	0.00161
Cert Date	7/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.393
0.33%	0.33%			**Cal Factor Full Scale**	5.874
				Rotometer Reading:	3.3

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	-0.37	0.0000	0.02	l/m	l/m	
primary	leak check	0.000	0.000	-0.37	0.0000	0.03	l/m	l/m	
primary	test pt 1	3.020	3.010	2.37	0.0000	3.00	l/m	l/m	-0.33%
primary	test pt 2	3.020	3.010	2.38	0.0000	3.00	l/m	l/m	-0.33%
primary	test pt 3	3.020	3.010	2.37	0.0000	3.00	l/m	l/m	-0.33%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 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	1023943901	GLR468	Martin Valvur	07/03/2019	Ozone	none

Slope:	1.03800	**Slope:**	0.00000
Intercept	-0.52100	**Intercept**	0.00000
CorrCoff:	0.99997	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00151	**Intercept**	0.00666
Cert Date	10/30/2018	**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	0.40	0.39	0.31	ppb		-0.08
primary	2	15.07	15.04	15.00	ppb		-0.04
primary	3	35.04	34.98	35.41	ppb	1.22	
primary	4	65.02	64.91	66.65	ppb	2.65	
primary	5	112.10	111.92	115.90	ppb	3.49	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.1	pass
Span	1.012	pass
Zero Voltage	0.0004	pass
Fullscale Voltage	1.0004	pass
Cell A Freq.	100.7 kHz	pass
Cell A Noise	0.4 ppb	pass
Cell A Flow	0.55 lpm	pass
Cell A Pressure	669.6 mmHg	pass
Cell A Tmp.	30.3 C	pass
Cell B Freq.	92.7 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.55 lpm	pass
Cell B Pressure	669.3 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	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	Martin Valvur	07/03/2019	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.23	0.31		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.11	0.12	0.0000	0.38	C	0.26
primary	Temp Mid Range	24.81	24.82	0.0000	25.13	C	0.31
primary	Temp High Rang	46.97	46.98	0.0000	47.11	C	0.13

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	GLR468	Martin Valvur	07/03/2019	Shelter Temperature	77

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.99	1.09		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.30	22.31	0.000	21.4	C	-0.9
primary	Temp Mid Range	22.70	22.71	0.000	21.6	C	-1.09
primary	Temp Mid Range	21.32	21.33	0.000	20.3	C	-0.99

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	GLR468	Technician	Martin Valvur	Site Visit Date	07/03/2019

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	Good	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Fair	Status	pass
Sensor Component	Shelter Floor	Condition	Fair	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

Field Systems Comments

1 **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.

2 **Parameter:** ShelterCleanNotes

The shelter is in fair condition. Evidence of repairs to roof leaks attempted. Some floor tiles are loose.

3 **Parameter:** MetSensorComme

The recorded temperature data at this site is measured at approximately 2 meters above the ground.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	GLR468	**Technician**	Martin Valvur	**Site Visit Date**	07/03/2019

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** ☑	

Present

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. Some floor tiles are loose.				
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-S2-rev002

Site ID GLR468 **Technician** Martin Valvur **Site Visit Date** 07/03/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km	20 km	☐
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m	30 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☐

Siting Criteria Comment

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.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	GLR468	Technician	Martin Valvur	Site Visit Date	07/03/2019

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:

The recorded temperature data at this site is measured at approximately 2 meters above the ground.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	GLR468	Technician	Martin Valvur	Site Visit Date	07/03/2019

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	
2	Are all the meteorological sensors operational online, and reporting data?	☑	
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☑	
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	
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	GLR468	Technician	Martin Valvur	Site Visit Date	07/03/2019

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
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 GLR468 **Technician** Martin Valvur **Site Visit Date** 07/03/2019

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	Martin Valvur	Site Visit Date	07/03/2019

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	Martin Valvur	Site Visit Date	07/03/2019

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	Martin Valvur	Site Visit Date	07/03/2019

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?	☑	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	☑	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:

Field Systems Data Form F-02058-1500-S10-rev002

Site ID GLR468 **Technician** Martin Valvur **Site Visit Date** 07/03/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB1520H65	none
DAS	Environmental Sys Corp	8816	2560	90647
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB11A	109500000039	none
Flow Rate	Tylan	FC280	AW9710138	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP9403014	03687
Ozone	ThermoElectron Inc	49i A3NAA	1023943901	none
Ozone Standard	ThermoElectron Inc	49i A3NAA	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	PC70/4	000756725	none

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
UND002-Korey Devins-07/09/2019						
1	7/9/2019	DAS	Campbell	000802	CR850	23269
2	7/9/2019	elevation	Elevation	none	none	none
3	7/9/2019	Filter pack flow pump	Permotec	none	BL30EB	Illegible
4	7/9/2019	Flow Rate	Apex	000658	AXMC105LPMDPCV	unknown
5	7/9/2019	Infrastructure	Infrastructure	none	none	none
6	7/9/2019	Modem	Sierra wireless	06982	unknown	unknown
7	7/9/2019	Sample Tower	Aluma Tower	000778	B	AT-212125X77
8	7/9/2019	siting criteria	Siting Criteria	none	none	None
9	7/9/2019	Temperature	RM Young	04688	41342	6702

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	unknown	UND002	Korey Devins	07/09/2019	Flow Rate	000658

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00000	**Intercept**	0.00000
Cert Date	3/4/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0
1.21%	1.32%			**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	0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.00	l/m	l/m	
primary	test pt 1	3.034	3.030	2.98	0.000	3.00	l/m	l/m	-0.99%
primary	test pt 2	3.044	3.040	2.98	0.000	3.00	l/m	l/m	-1.32%
primary	test pt 3	3.037	3.040	2.98	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**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	150 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	6702	UND002	Korey Devins	07/09/2019	Temperature	04688

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00733	**Intercept**	0.14497
Cert Date	2/12/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.19	0.38		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.21	0.06	0.000	0.4	C	0.38
primary	Temp Mid Range	26.40	26.06	0.000	26.0	C	-0.06
primary	Temp High Range	48.76	48.26	0.000	48.1	C	-0.14

Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	UND002	Technician	Korey Devins	Site Visit Date	07/09/2019

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	Not installed	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	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	UND002	Korey Devins	07/09/2019	Moisture Present	Apex	3972	☐	☐

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

Field Systems Comments

1 **Parameter:** DasComments

Single tower with filer pack mounted at 10 meters and temperature mounted at 9 meters.

2 **Parameter:** DocumentationCo

Although there is no CASTNET logbook present onsite, the site operator records CASTNET information in the VT Monitoring Coop logbook.

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	UND002	**Technician**	Korey Devins	**Site Visit Date**	07/09/2019

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	VT Monitoring Coop	**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**	44.52843
Site Address 1		**Audit Longitude**	-72.86804
Site Address 2		**Audit Elevation**	402
County	Chittenden	**Audit Declination**	
City, State	Underhill Center, VT		
Zip Code	05489	**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** ☐	

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-S2-rev002

Site ID UND002 **Technician** Korey Devins **Site Visit Date** 07/09/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m	30 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	UND002	Technician	Korey Devins	Site Visit Date	07/09/2019

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	UND002	Technician	Korey Devins	Site Visit Date	07/09/2019

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	UND002	Technician	Korey Devins	Site Visit Date	07/09/2019

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?	☐	Not present
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 UND002 **Technician** Korey Devins **Site Visit Date** 07/09/2019

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 circuit breaker trips frequently
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 filer pack mounted at 10 meters and temperature mounted at 9 meters.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	UND002	Technician	Korey Devins	Site Visit Date	07/09/2019

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:

Although there is no CASTNET logbook present onsite, the site operator records CASTNET information in the VT Monitoring Coop logbook.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	UND002	Technician	Korey Devins	Site Visit Date	07/09/2019

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	☑	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	UND002	Technician	Korey Devins	Site Visit Date	07/09/2019

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?	☑	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 UND002 **Technician** Korey Devins **Site Visit Date** 07/09/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR850	23269	000802
elevation	Elevation	none	none	none
Filter pack flow pump	Permotec	BL30EB	Illegible	none
Flow Rate	Apex	AXMC105LPMDPC	unknown	000658
Infrastructure	Infrastructure	none	none	none
Modem	Sierra wireless	unknown	unknown	06982
Sample Tower	Aluma Tower	B	AT-212125X77	000778
siting criteria	Siting Criteria	none	None	none
Temperature	RM Young	41342	6702	04688

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
NIC001-Korey Devins-07/10/2019						
1	7/10/2019	DAS	Campbell	000801	CR850	23268
2	7/10/2019	elevation	Elevation	none	none	none
3	7/10/2019	Filter pack flow pump	Permotec	none	BL30EB	Illegible
4	7/10/2019	Flow Rate	Apex	000594	AXMC105LPMDPCV	unknown
5	7/10/2019	Infrastructure	Infrastructure	none	none	none
6	7/10/2019	Modem	Sierra wireless	06989	GX440	Unknown
7	7/10/2019	Sample Tower	Aluma Tower	000785	B	AT-212125X73
8	7/10/2019	siting criteria	Siting Criteria	none	none	None
9	7/10/2019	Temperature	RM Young	04943	41342	none

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	unknown	NIC001	Korey Devins	07/10/2019	Flow Rate	000594

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00000	**Intercept**	0.00000
Cert Date	3/4/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0
0.11%	0.33%			**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	-0.06	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	-0.05	l/m	l/m	
primary	test pt 1	2.997	3.000	3.00	0.000	3.00	l/m	l/m	0.00%
primary	test pt 2	2.997	3.000	3.00	0.000	3.00	l/m	l/m	0.00%
primary	test pt 3	3.007	3.010	3.00	0.000	3.00	l/m	l/m	-0.33%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	340 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	Korey Devins	07/10/2019	Temperature	04943

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00733	**Intercept**	0.14497
Cert Date	2/12/2019	**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	0.26	0.11	0.000	0.1	C	-0.01
primary	Temp Mid Range	25.13	24.80	0.000	24.7	C	-0.07
primary	Temp High Range	47.18	46.69	0.000	46.8	C	0.09

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	NIC001	Technician	Korey Devins	Site Visit Date	07/10/2019

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	Not installed	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	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	NIC001	Korey Devins	07/10/2019	Moisture Present	Apex	3963	☐	☐

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

Field Systems Comments

1 **Parameter:** DasComments

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

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. The NY DEC operators a full monitoring shelter at the same location.

4 **Parameter:** PollAnalyzerCom

There is water accumulating in a low section of the filter pack tubing below the enclosure.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	NIC001	**Technician**	Korey Devins	**Site Visit Date**	07/10/2019

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. The NY DEC operators a full monitoring shelter at the same location.				
Site OK	☐	**Notes**					

Driving Directions

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID NIC001 **Technician** Korey Devins **Site Visit Date** 07/10/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m	20 m	☐
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	NIC001	Technician	Korey Devins	Site Visit Date	07/10/2019

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	Korey Devins	Site Visit Date	07/10/2019

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?	☑	
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	Korey Devins	Site Visit Date	07/10/2019

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?	☑	Water in low section of tubing
7	Is the zero air supply desiccant unsaturated?	☑	N/A
8	Are there moisture traps in the sample lines?	☐	Not present
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:

There is water accumulating in a low section of the filter pack tubing below the enclosure.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID NIC001 **Technician** Korey Devins **Site Visit Date** 07/10/2019

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.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	NIC001	Technician	Korey Devins	Site Visit Date	07/10/2019

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	Korey Devins	Site Visit Date	07/10/2019

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	Korey Devins	Site Visit Date	07/10/2019

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** Korey Devins **Site Visit Date** 07/10/2019

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	unknown	000594
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*
CNT169-Martin Valvur-07/16/2019						
1	7/16/2019	Computer	Dell	07038	Inspiron 15	Unknown
2	7/16/2019	DAS	Campbell	000427	CR3000	2526
3	7/16/2019	Elevation	Elevation	None	1	None
4	7/16/2019	Filter pack flow pump	Thomas	02753	107CAB18	1192001900
5	7/16/2019	Flow Rate	Apex	000559	AXMC105LPMDPCV	illegible
6	7/16/2019	Infrastructure	Infrastructure	none	none	none
7	7/16/2019	Ozone	ThermoElectron Inc	000620	49i A1NAA	1009241793
8	7/16/2019	Ozone Standard	ThermoElectron Inc	000687	49i A3NAA	1030244809
9	7/16/2019	Sample Tower	Aluma Tower	000179	B	unknown
10	7/16/2019	Shelter Temperature	Campbell	none	107-L	none
11	7/16/2019	Siting Criteria	Siting Criteria	None	1	None
12	7/16/2019	Temperature	RM Young	06501	41342	14606
13	7/16/2019	Zero air pump	Werther International	06925	C 70/4	000836220

DAS Data Form

DAS Time Max Error: 0.08

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2526	CNT169	Martin Valvur	07/16/2019	DAS	Primary

Das Date: 7 /16/2019
Das Time: 09:33:35
Das Day: 197

Audit Date 7 /16/2019
Audit Time 09:33:30
Audit Day 197

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0001	0.0003	0.0001	0.0003

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	1/25/2019	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0004	-0.0003	V	V	0.0001
7	0.1000	0.0998	0.0997	V	V	-0.0001
7	0.3000	0.2993	0.2992	V	V	-0.0001
7	0.5000	0.4998	0.4997	V	V	-0.0001
7	0.7000	0.6997	0.6994	V	V	-0.0003
7	0.9000	0.8992	0.8990	V	V	-0.0002
7	1.0000	1.0001	1.0000	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	CNT169	Martin Valvur	07/16/2019	Flow Rate	000559

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00178	**Intercept**	0.00161
Cert Date	7/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.01
0.77%	0.99%			**Cal Factor Full Scale**	1.011
				Rotometer Reading:	3.85

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	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.01	l/m	l/m	
primary	test pt 1	3.030	3.020	2.95	0.000	2.99	l/m	l/m	-0.99%
primary	test pt 2	3.020	3.010	2.95	0.000	2.99	l/m	l/m	-0.66%
primary	test pt 3	3.030	3.020	2.95	0.000	3.00	l/m	l/m	-0.66%

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**	0.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	350 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	1009241793	CNT169	Martin Valvur	07/16/2019	Ozone	000620

Slope:	1.03170	**Slope:**	0.00000
Intercept	0.05684	**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	1.00151	**Intercept**	0.00666
Cert Date	10/30/2018	**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	0.19	0.22	ppb		0.03
primary	2	15.04	15.01	15.40	ppb		0.39
primary	3	35.33	35.26	36.67	ppb	3.92	
primary	4	65.53	65.42	67.54	ppb	3.19	
primary	5	110.38	110.20	113.70	ppb	3.13	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.3	pass
Span	1.011	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	90.7 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.59 lpm	pass
Cell A Pressure	506.4 mmHg	pass
Cell A Tmp.	36.4 C	pass
Cell B Freq.	102.1 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.58 lpm	pass
Cell B Pressure	506.1 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14606	CNT169	Martin Valvur	07/16/2019	Temperature	06501

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99989	**Intercept**	-0.00649
Cert Date	1/23/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.07	0.12		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.05	0.06	0.000	0.2	C	0.12
primary	Temp Mid Range	24.18	24.19	0.000	24.2	C	-0.02
primary	Temp High Range	46.94	46.95	0.000	47.0	C	0.06

Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CNT169	Martin Valvur	07/16/2019	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.16	0.41		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.00	25.01	0.000	25.0	C	-0.03
primary	Temp Mid Range	26.36	26.37	0.000	26.0	C	-0.41
primary	Temp Mid Range	26.69	26.70	0.000	26.8	C	0.05

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	CNT169	Technician	Martin Valvur	Site Visit Date	07/16/2019

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-19)	640 cuft

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone inlet filter is changed once each month.

2 **Parameter:** ShelterCleanNotes

The shelter is dirty. Many floor tiles are old and broken, the floor is deteriorating.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CNT169	**Technician**	Martin Valvur	**Site Visit Date**	07/16/2019

Site Sponsor (agency)	EPA	**USGS Map**	Centennial
Operating Group	Forest Service	**Map Scale**	
AQS #	56-001-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	41.3722
Deposition Measurement	dry, wet	**QAPP Longitude**	-106.2422
Land Use	woodland - evergreen	**QAPP Elevation Meters**	3178
Terrain	complex	**QAPP Declination**	10.9
Conforms to MLM	Marginally	**QAPP Declination Date**	12/28/2004
Site Telephone	(307) 742-7229	**Audit Latitude**	41.364531
Site Address 1	Brooklyn Lake Guard Station	**Audit Longitude**	-106.24002
Site Address 2	Medicine Bow National Forest	**Audit Elevation**	3175
County	Albany	**Audit Declination**	9.5
City, State	Centennial, WY		
Zip Code	82055	**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 2149-19)	**Shelter Size**	640 cuft
Shelter Clean	☐	**Notes**	The shelter is dirty. Many floor tiles are old and broken, the floor is deteriorating.				
Site OK	☑	**Notes**					

Driving Directions

From Laramie take route 130 west to Centennial. Continue through town and into the Medicine Bow National Forest. Turn right near the summit onto a dirt road at the sign for Brooklyn Lake Campground. Continue approximately 1.5 miles to Little Brooklyn Lake. There will be a small chapel on the right. Park at the chapel and walk approximately 200 meters up the hill past the chapel to the site.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID CNT169 **Technician** Martin Valvur **Site Visit Date** 07/16/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CNT169	Technician	Martin Valvur	Site Visit Date	07/16/2019

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	CNT169	Technician	Martin Valvur	Site Visit Date	07/16/2019

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?	☑	
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	CNT169	Technician	Martin Valvur	Site Visit Date	07/16/2019

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CNT169 **Technician** Martin Valvur **Site Visit Date** 07/16/2019

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	CNT169	Technician	Martin Valvur	Site Visit Date	07/16/2019

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	☑	March 2015	☑
HASP	☑	March 2015	☑
Field Ops Manual	☑	March 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	CNT169	Technician	Martin Valvur	Site Visit Date	07/16/2019

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)	☑	Monthly	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

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

The ozone inlet filter is changed once each month.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	CNT169	Technician	Martin Valvur	Site Visit Date	07/16/2019

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	filter changed afternoons, 80% of the time
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:

Field Systems Data Form F-02058-1500-S10-rev002

Site ID CNT169 **Technician** Martin Valvur **Site Visit Date** 07/16/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07038
DAS	Campbell	CR3000	2526	000427
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	1192001900	02753
Flow Rate	Apex	AXMC105LPMDPC	illegible	000559
Infrastructure	Infrastructure	none	none	none
Ozone	ThermoElectron Inc	49i A1NAA	1009241793	000620
Ozone Standard	ThermoElectron Inc	49i A3NAA	1030244809	000687
Sample Tower	Aluma Tower	B	unknown	000179
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14606	06501
Zero air pump	Werther International	C 70/4	000836220	06925

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
THR422-Martin Valvur-07/22/2019						
1	7/22/2019	Computer	Hewlett Packard	none	65606	5CB1520H68
2	7/22/2019	DAS	Environmental Sys Corp	90656	8816	2600
3	7/22/2019	Elevation	Elevation	None	1	None
4	7/22/2019	Filter pack flow pump	Thomas	03634	107CAB18	049400004441
5	7/22/2019	flow rate	Tylan	02170	FC280SAV	AW901295
6	7/22/2019	Infrastructure	Infrastructure	none	none	none
7	7/22/2019	Mainframe	Climatronics	none	100081	1911
8	7/22/2019	Mainframe power supply	Climatronics	none	101074	unknown
9	7/22/2019	Met tower	Rohn	none	unknown	none
10	7/22/2019	MFC power supply	Tylan	03870	RO-32	FP9508008
11	7/22/2019	Ozone	ThermoElectron Inc	E00051	49i A1NAA	1153170017
12	7/22/2019	Sample Tower	Aluma Tower	none	B	AT-81077-J5
13	7/22/2019	Shelter Temperature	ARS	none	none	none
14	7/22/2019	Siting Criteria	Siting Criteria	None	1	None
15	7/22/2019	Temperature Translator	Climatronics	01545	100088-2	217
16	7/22/2019	Temperature2meter	Climatronics	none	100093	7974
17	7/22/2019	Zero air pump	Thomas	none	607CA22C	039500000348

DAS Data Form

DAS Time Max Error: 1.1

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2600	THR422	Martin Valvur	07/22/2019	DAS	Primary

Das Date: 7 /22/2019
Das Time: 07:39:36
Das Day: 203

Audit Date 7 /22/2019
Audit Time 07:38:30
Audit Day 203

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

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2019	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
15	0.0000	-0.0003	-0.0002	V	V	0.0001
15	0.1000	0.0995	0.0997	V	V	0.0002
15	0.3000	0.2994	0.2996	V	V	0.0002
15	0.5000	0.4994	0.4995	V	V	0.0001
15	0.7000	0.6998	0.7002	V	V	0.0004
15	0.9000	0.9000	0.9002	V	V	0.0002
15	1.0000	1.0002	1.0005	V	V	0.0003

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW901295	THR422	Martin Valvur	07/22/2019	flow rate	02170

Mfg	Tylan
SN/Owner ID	FP9508008 03870
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	3/4/2019	**CorrCoff**	1.00000
Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00178	**Intercept**	0.00161
Cert Date	7/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	
0.76%	1.31%			

Cal Factor Zero	-0.094
Cal Factor Full Scale	5.33
Rotometer Reading:	3.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	-0.07	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	3.050	3.050	2.92	0.000	3.09	l/m	l/m	1.31%
primary	test pt 2	3.053	3.050	2.91	0.000	3.05	l/m	l/m	0.00%
primary	test pt 3	3.049	3.050	2.91	0.000	3.08	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**	0.2 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	1153170017	THR422	Martin Valvur	07/22/2019	Ozone	E00051

Slope:	0.96757	**Slope:**	0.00000
Intercept	-1.34024	**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	1.00151	**Intercept**	0.00666
Cert Date	10/30/2018	**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	0.18	-1.00	ppb		-1.18
primary	2	17.34	17.30	15.60	ppb		-1.7
primary	3	34.66	34.60	31.80	ppb	-8.43	
primary	4	67.90	67.79	64.00	ppb	-5.75	
primary	5	113.99	113.81	109.00	ppb	-4.32	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	1.1	pass
Span	0.960	pass
Zero Voltage	0.02	pass
Fullscale Voltage	1.02	pass
Cell A Freq.	47.9 kHz	Fail
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.54 lpm	pass
Cell A Pressure	545.3 mmHg	Fail
Cell A Tmp.	31.6 C	pass
Cell B Freq.	73.6 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.53 lpm	pass
Cell B Pressure	545.0 mmHg	Fail
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo	See comments	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	7974	THR422	Martin Valvur	07/22/2019	Temperature2meter	none

Mfg	Climatronics
SN/Owner ID	217 01545
Parameter:	Temperature Translator

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.06	0.14		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.19	0.20	0.000	0.34	C	0.14
primary	Temp Mid Range	23.83	23.84	0.000	23.80	C	-0.04
primary	Temp High Rang	46.98	46.99	0.000	47.00	C	0.01

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	THR422	Martin Valvur	07/22/2019	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
1.70	2.14		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.82	23.83	0.000	25.9	C	2.09
primary	Temp Mid Range	25.35	25.36	0.000	26.2	C	0.88
primary	Temp Mid Range	23.99	24.00	0.000	26.1	C	2.14

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	THR422	Technician	Martin Valvur	Site Visit Date	07/22/2019

Shelter Make	Shelter Model	Shelter Size
Ekto	8814 (s/n 3028-1)	896 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	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	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	THR422	Martin Valvur	07/22/2019	Cell B Pressure	ThermoElectron	4382	☐	☐
This analyzer diagnostic check is outside the manufacturer's recommended value.								
Ozone	THR422	Martin Valvur	07/22/2019	Cell A Pressure	ThermoElectron	4382	☐	☐
This analyzer diagnostic check is outside the manufacturer's recommended value.								
Ozone	THR422	Martin Valvur	07/22/2019	Cell A Freq.	ThermoElectron	4382	☐	☐
This analyzer diagnostic check is outside the manufacturer's recommended value.								

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:** 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.

3 **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.

4 **Parameter:** PollAnalyzerCom

The ozone analyzer is operated by the state of North Dakota. The sample train contains a glass manifold. There is no means to introduce on-site generated test gas at the sample inlet. A through-the-probe audit was conducted using the EEMS system.

5 **Parameter:** ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	THR422	**Technician**	Martin Valvur	**Site Visit Date**	07/22/2019

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-S2-rev002

Site ID THR422 **Technician** Martin Valvur **Site Visit Date** 07/22/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km	300 m	☐
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m	200 m	☐
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☐

Siting Criteria Comment

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.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	THR422	Technician	Martin Valvur	Site Visit Date	07/22/2019

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	THR422	Technician	Martin Valvur	Site Visit Date	07/22/2019

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	
2	Are all the meteorological sensors operational online, and reporting data?	☑	
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☑	
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	N/A
6	Is the surface wetness sensor grid clean and undamaged?	☑	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	☑	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	THR422	Technician	Martin Valvur	Site Visit Date	07/22/2019

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
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 analyzer is operated by the state of North Dakota. The sample train contains a glass manifold. There is no means to introduce on-site generated test gas at the sample inlet. A through-the-probe audit was conducted using the EEMS system.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID THR422 **Technician** Martin Valvur **Site Visit Date** 07/22/2019

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 THR422 **Technician** Martin Valvur **Site Visit Date** 07/22/2019

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	☐		☐
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	THR422	Technician	Martin Valvur	Site Visit Date	07/22/2019

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	☑	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 performed
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☐	Not performed
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:

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	Martin Valvur	Site Visit Date	07/22/2019

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?	☑	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** Martin Valvur **Site Visit Date** 07/22/2019

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	049400004441	03634
flow rate	Tylan	FC280SAV	AW901295	02170
Infrastructure	Infrastructure	none	none	none
Mainframe	Climatronics	100081	1911	none
Mainframe power supply	Climatronics	101074	unknown	none
Met tower	Rohn	unknown	none	none
MFC power supply	Tylan	RO-32	FP9508008	03870
Ozone	ThermoElectron Inc	49i A1NAA	1153170017	E00051
Sample Tower	Aluma Tower	B	AT-81077-J5	none
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature Translator	Climatronics	100088-2	217	01545
Temperature2meter	Climatronics	100093	7974	none
Zero air pump	Thomas	607CA22C	039500000348	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
NEC602-Martin Valvur-07/23/2019						
1	7/23/2019	DAS	Campbell	none	CR1000	41007
2	7/23/2019	elevation	Elevation	none	none	none
3	7/23/2019	Filter pack flow pump	Thomas	none	107CAB18	061200041880
4	7/23/2019	Flow Rate	Omega	none	FMA6518ST-RS232	324333-1
5	7/23/2019	Infrastructure	Infrastructure	none	none	none
6	7/23/2019	MFC power supply	Sceptre	none	FMA65PWC	295106-8
7	7/23/2019	Ozone	ThermoElectron Inc	none	49i A1NAA	1214552974
8	7/23/2019	Ozone Standard	ThermoElectron Inc	L0534683	49i E3CAA	1214552972
9	7/23/2019	Sample Tower	Unknown	none	Unknown	None
10	7/23/2019	Shelter Temperature	ARS	none	Thermocouple	none
11	7/23/2019	siting criteria	Siting Criteria	none	none	None
12	7/23/2019	Temperature2meter	Vaisala	none	HMP45AC	E3720077
13	7/23/2019	Zero air pump	Thomas	none	107CAB18	079600005244

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Omega	324333-1	NEC602	Martin Valvur	07/23/2019	Flow Rate	none

Mfg	Sceptre	
SN/Owner ID	295106-8	none
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	3/4/2019	**CorrCoff**	1.00000

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00178	**Intercept**	0.00161
Cert Date	7/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	
3.64%	3.85%			

Cal Factor Zero	0.324
Cal Factor Full Scale	1.259
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	0.32	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.32	l/m	l/m	
primary	test pt 1	3.120	3.120	0.00	0.000	3.00	l/m	l/m	-3.85%
primary	test pt 2	3.120	3.120	0.00	0.000	3.00	l/m	l/m	-3.85%
primary	test pt 3	3.110	3.110	0.00	0.000	3.01	l/m	l/m	-3.22%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Poor	**Status**	fail
Sensor Component	Rotometer Condition	**Condition**	N/A	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	-0.3 cm	**Status**	fail
Sensor Component	Filter Azimuth	**Condition**	70 deg	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1214552974	NEC602	Martin Valvur	07/23/2019	Ozone	none

Slope:	0.97785	**Slope:**	0.00000
Intercept	-1.07778	**Intercept**	0.00000
CorrCoff:	0.99981	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00151	**Intercept**	0.00666
Cert Date	10/30/2018	**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	0.31	0.30	0.31	ppb		0.01
primary	2	14.74	14.71	12.90	ppb		-1.81
primary	3	36.32	36.25	33.79	ppb	-7.02	
primary	4	64.54	64.43	61.10	ppb	-5.31	
primary	5	111.61	111.43	108.60	ppb	-2.57	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.1	pass
Span	1.029	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	102.6 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.64 lpm	pass
Cell A Pressure	598.4 mmHg	pass
Cell A Tmp.	33.8 C	pass
Cell B Freq.	88.8 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.66 lpm	pass
Cell B Pressure	597.9 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	E3720077	NEC602	Martin Valvur	07/23/2019	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.09	0.16		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.21	0.22	0.000	0.38	C	0.16
primary	Temp Mid Range	24.73	24.74	0.000	24.80	C	0.06
primary	Temp High Rang	46.72	46.73	0.000	46.79	C	0.06

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	NEC602	Martin Valvur	07/23/2019	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.88	1.06		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.89	26.90	0.000	27.5	C	0.64
primary	Temp Mid Range	27.05	27.06	0.000	28.1	C	1.06
primary	Temp Mid Range	26.60	26.61	0.000	27.5	C	0.93

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	NEC602	Technician	Martin Valvur	Site Visit Date	07/23/2019

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

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	other	Status	pass
Sensor Component	Conduit	Condition	Good	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Not installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Not installed	Status	Fail
Sensor Component	Sample Tower	Condition	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	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	NEC602	Martin Valvur	07/23/2019	Filter Depth	Omega	3842	☐	☐

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator does not use gloves to handle the filter pack. The bag is used as a glove to install and remove the filter.

2 **Parameter:** SiteOpsProcedures

The site operator is aware that the desiccant is in need of replacement. Some of the items on the SSRF were discussed and the site operator's questions were answered regarding the correct procedures.

3 **Parameter:** DocumentationCo

The site operator received a disc with the current QAPP which is kept at his office.

4 **Parameter:** SitingCriteriaCom

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

5 **Parameter:** ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	NEC602	**Technician**	Martin Valvur	**Site Visit Date**	07/23/2019

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	BLM	**Map Scale**	
AQS #	560450003	**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**	43.8731
Site Address 1		**Audit Longitude**	-104.192009
Site Address 2		**Audit Elevation**	1469
County	Weston	**Audit Declination**	8.2
City, State	Newcastle, WY		**Present**
Zip Code	82701	**Fire Extinguisher**	☐
Time Zone	Mountain	**First Aid Kit**	☐
Primary Operator		**Safety Glasses**	☐
Primary Op. Phone #		**Safety Hard Hat**	☐
Primary Op. E-mail		**Climbing Belt**	☐
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Steps**	☑

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

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID NEC602 **Technician** Martin Valvur **Site Visit Date** 07/23/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km	< 10 km	☐
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km	2 km	☐
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m	100 m	☐
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☐

Siting Criteria Comment

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

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	NEC602	Technician	Martin Valvur	Site Visit Date	07/23/2019

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	NEC602	Technician	Martin Valvur	Site Visit Date	07/23/2019

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	NEC602	Technician	Martin Valvur	Site Visit Date	07/23/2019

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 Nylon by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☐	Saturated with moisture
8	Are there moisture traps in the sample lines?	☐	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☐	Not present

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID NEC602 **Technician** Martin Valvur **Site Visit Date** 07/23/2019

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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	NEC602	Technician	Martin Valvur	Site Visit Date	07/23/2019

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	☐	Not present	☐
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?	☐	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 received a disc with the current QAPP which is kept at his office.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	NEC602	Technician	Martin Valvur	Site Visit Date	07/23/2019

Site operation procedures

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

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

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

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

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

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

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

The site operator is aware that the desiccant is in need of replacement. Some of the items on the SSRF were discussed and the site operator's questions were answered regarding the correct procedures.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID NEC602 **Technician** Martin Valvur **Site Visit Date** 07/23/2019

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?	☑	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	☑	Weekly	☑

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

The site operator does not use gloves to handle the filter pack. The bag is used as a glove to install and remove the filter.

Field Systems Data Form F-02058-1500-S10-rev002

Site ID NEC602 **Technician** Martin Valvur **Site Visit Date** 07/23/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR1000	41007	none
elevation	Elevation	none	none	none
Filter pack flow pump	Thomas	107CAB18	061200041880	none
Flow Rate	Omega	FMA6518ST-RS232	324333-1	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Sceptre	FMA65PWC	295106-8	none
Ozone	ThermoElectron Inc	49i A1NAA	1214552974	none
Ozone Standard	ThermoElectron Inc	49i E3CAA	1214552972	L0534683
Sample Tower	Unknown	Unknown	None	none
Shelter Temperature	ARS	Thermocouple	none	none
siting criteria	Siting Criteria	none	None	none
Temperature2meter	Vaisala	HMP45AC	E3720077	none
Zero air pump	Thomas	107CAB18	079600005244	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
WNC429-Martin Valvur-07/24/2019						
1	7/24/2019	Computer	Hewlett Packard	none	6560 b	5CB1520H5J
2	7/24/2019	DAS	Environmental Sys Corp	None	8832	A4868
3	7/24/2019	Elevation	Elevation	None	1	None
4	7/24/2019	Filter pack flow pump	Thomas	none	107CAB18	0688001767
5	7/24/2019	flow rate	Tylan	03379	FC280AV	AW9403023
6	7/24/2019	Infrastructure	Infrastructure	none	none	none
7	7/24/2019	Met tower	unknown	none	unknown	none
8	7/24/2019	MFC power supply	Tylan	03684	RO-32	FP9404003
9	7/24/2019	Ozone	ThermoElectron Inc	0352631	49i A3NAA	1313057856
10	7/24/2019	Ozone Standard	ThermoElectron Inc	none	49i PSA2AB	0807328333
11	7/24/2019	Sample Tower	Aluma Tower	none	B	none
12	7/24/2019	Shelter Temperature	ARS	none	none	none
13	7/24/2019	Shield (2 meter)	RM Young	none	43532	none
14	7/24/2019	Siting Criteria	Siting Criteria	None	1	None
15	7/24/2019	Temperature2meter	RM Young	none	41342	14264
16	7/24/2019	Zero air pump	Teledyne	none	701	1304

DAS Data Form

DAS Time Max Error: 1.67

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	A4868	WNC429	Martin Valvur	07/24/2019	DAS	Primary

Das Date: 7 /24/2019
Das Time: 08:11:20
Das Day: 205

Audit Date 7 /24/2019
Audit Time 08:13:00
Audit Day 205

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0003	0.0002	0.0003

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2019	**CorrCoff**	1.00000

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
1	0.0000	-0.0005	-0.0004	V	V	0.0001
1	0.1000	0.0994	0.0994	V	V	0.0000
1	0.3000	0.2993	0.2996	V	V	0.0003
1	0.5000	0.4999	0.4996	V	V	-0.0003
1	0.7000	0.6995	0.6993	V	V	-0.0002
1	0.9000	0.8996	0.8995	V	V	-0.0001
1	1.0000	1.0002	1.0000	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9403023	WNC429	Martin Valvur	07/24/2019	flow rate	03379

Mfg	Tylan	
SN/Owner ID	FP9404003	03684
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	3/4/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.205
3.12%	3.34%			**Cal Factor Full Scale**	6.008
				Rotometer Reading:	3.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalE	PctDifference
primary	pump off	0.000	0.000	-0.39	0.000	-0.17	l/m	l/m	
primary	leak check	0.000	0.000	-0.40	0.000	-0.17	l/m	l/m	
primary	test pt 1	2.990	2.990	2.65	0.000	3.08	l/m	l/m	3.01%
primary	test pt 2	2.990	2.990	2.65	0.000	3.08	l/m	l/m	3.01%
primary	test pt 3	2.990	2.990	2.65	0.000	3.09	l/m	l/m	3.34%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Poor	**Status**	Fail
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	-1.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	100 deg	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1313057856	WNC429	Martin Valvur	07/24/2019	Ozone	0352631

Slope:	0.97856	**Slope:**	0.00000
Intercept	1.03205	**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	1.00151	**Intercept**	0.00666
Cert Date	10/30/2018	**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	0.19	1.34	ppb		1.15
primary	2	14.80	14.77	15.50	ppb		0.73
primary	3	36.90	36.83	36.93	ppb	0.27	
primary	4	65.51	65.40	64.94	ppb	-0.71	
primary	5	114.30	114.12	112.80	ppb	-1.16	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.0021	pass
Span	1.003	pass
Zero Voltage	0.00036	pass
Fullscale Voltage	10.0059	pass
Cell A Freq.	65.1 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.63 lpm	pass
Cell A Pressure	639.0 mmHg	pass
Cell A Tmp.	34.7 C	pass
Cell B Freq.	53.2 kHz	Fail
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.66 lpm	pass
Cell B Pressure	638.7 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo	See comments	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14264	WNC429	Martin Valvur	07/24/2019	Temperature2meter	none

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99989	**Intercept**	-0.00649
Cert Date	1/23/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.11	0.19		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.21	0.22	0.0000	0.41	C	0.19
primary	Temp Mid Rang	24.64	24.65	0.0000	24.77	C	0.12
primary	Temp High Rang	48.06	48.07	0.0000	48.09	C	0.02

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	WNC429	Martin Valvur	07/24/2019	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.82	1.13		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.48	25.49	0.000	26.6	C	1.13
primary	Temp Mid Range	25.32	25.33	0.000	26.3	C	0.99
primary	Temp Mid Range	26.68	26.69	0.000	27.0	C	0.35

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	WNC429	Technician	Martin Valvur	Site Visit Date	07/24/2019

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 3034-1)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	Good	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	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	Signal Cable	Condition	Fair	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	WNC429	Martin Valvur	07/24/2019	Filter Position	Tylan	1345	☐	☐
The filter attachment plate is mounted too low in the enclosure resulting in the filter being exposed to wind-driven rain and in the standard geometric orientation.								
Ozone	WNC429	Martin Valvur	07/24/2019	Cell B Freq.	ThermoElectron	4486	☐	☐
This analyzer diagnostic check is outside the manufacturer's recommended value.								

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The general observations section of the SSRF is still not completed. Gloves are not used when handling the filter pack, however the filter bag is used as a glove.

2 **Parameter:** DocumentationCo

Records of the routine checks performed by the state personnel are kept onsite in a logbook.

3 **Parameter:** SiteOpsProcedures

The ozone analyzer is operated by the state of South Dakota and the sample train is now 1/4 Teflon with a filter at the inlet 4 meters above the ground.

4 **Parameter:** ShelterCleanNotes

One shelter houses the ozone monitor and is in good condition and clean. The second shelter houses the flow system and IMPROVE. It is older and not climate controlled.

5 **Parameter:** PollAnalyzerCom

The dry deposition filter is mounted low in the enclosure which changes the particle collection characteristics, and can allow precipitation to enter.

6 **Parameter:** MetOpMaintCom

The temperature sensor signal cable insulation is cracked and showing signs of extreme wear.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	WNC429	**Technician**	Martin Valvur	**Site Visit Date**	07/24/2019

Site Sponsor (agency)	NPS	**USGS Map**	Wind Cave
Operating Group	NPS and state of SD	**Map Scale**	
AQS #	46-033-0132	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, NOx, PM2.5, PM10, IMPROVE	**QAPP Latitude**	43.5578
Deposition Measurement	dry, wet	**QAPP Longitude**	-103.4839
Land Use	prairie - woodland - evergreen	**QAPP Elevation Meters**	1292
Terrain	rolling	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	43.557639
Site Address 1	Visitor Center	**Audit Longitude**	-103.483856
Site Address 2	Route 385 Wind Cave National Park	**Audit Elevation**	1288
County	Custer	**Audit Declination**	8.1
City, State	Hot Springs, SD		
Zip Code	57747	**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**	8810 (s/n 3034-1)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	One shelter houses the ozone monitor and is in good condition and clean. The second shelter houses the flow system and IMPROVE. It is older and not climate controlled.				
Site OK	☑	**Notes**					

Driving Directions

From Hot Springs proceed north on 385 into Wind Cave National Park. Turn left onto the visitor center loop road. The site operator's office is in the visitors center. The site is up the gravel access road to the park water supply on the opposite side of the parking lot from the visitor center.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID WNC429 **Technician** Martin Valvur **Site Visit Date** 07/24/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	WNC429	Technician	Martin Valvur	Site Visit Date	07/24/2019

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	WNC429	Technician	Martin Valvur	Site Visit Date	07/24/2019

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

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

The temperature sensor signal cable insulation is cracked and showing signs of extreme wear.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	WNC429	Technician	Martin Valvur	Site Visit Date	07/24/2019

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 inch teflon, 4 meters above ground
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:

The dry deposition filter is mounted low in the enclosure which changes the particle collection characteristics, and can allow precipitation to enter.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID WNC429 **Technician** Martin Valvur **Site Visit Date** 07/24/2019

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?	☑	Signs of wear
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?	☑	Both on

		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	WNC429	Technician	Martin Valvur	Site Visit Date	07/24/2019

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?	☑	
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:

Records of the routine checks performed by the state personnel are kept onsite in a logbook.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	WNC429	Technician	Martin Valvur	Site Visit Date	07/24/2019

Site operation procedures

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

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?	☑	Logbook

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 analyzer is operated by the state of South Dakota and the sample train is now 1/4 Teflon with a filter at the inlet 4 meters above the ground.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID WNC429 **Technician** Martin Valvur **Site Visit Date** 07/24/2019

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?	☐	
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	☐		☐

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 general observations section of the SSRF is still not completed. Gloves are not used when handling the filter pack, however the filter bag is used as a glove.

Field Systems Data Form F-02058-1500-S10-rev002

Site ID WNC429 **Technician** Martin Valvur **Site Visit Date** 07/24/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB1520H5J	none
DAS	Environmental Sys Corp	8832	A4868	None
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	0688001767	none
flow rate	Tylan	FC280AV	AW9403023	03379
Infrastructure	Infrastructure	none	none	none
Met tower	unknown	unknown	none	none
MFC power supply	Tylan	RO-32	FP9404003	03684
Ozone	ThermoElectron Inc	49i A3NAA	1313057856	0352631
Ozone Standard	ThermoElectron Inc	49i PSA2AB	0807328333	none
Sample Tower	Aluma Tower	B	none	none
Shelter Temperature	ARS	none	none	none
Shield (2 meter)	RM Young	43532	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	14264	none
Zero air pump	Teledyne	701	1304	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PED108-Sandy Grenville-07/26/2019						
1	7/26/2019	Computer	Dell	07051	Inspiron 15	Unknown
2	7/26/2019	DAS	Campbell	000406	CR3000	2511
3	7/26/2019	Elevation	Elevation	None	1	None
4	7/26/2019	Filter pack flow pump	Thomas	00564	107CA18	1088003022
5	7/26/2019	Flow Rate	Apex	000835	AXMC105LPMDPCV	108252
6	7/26/2019	Infrastructure	Infrastructure	none	none	none
7	7/26/2019	Modem	Raven	06587	V4221-V	0844353122
8	7/26/2019	Ozone	ThermoElectron Inc	000732	49i A1NAA	1105347319
9	7/26/2019	Ozone Standard	ThermoElectron Inc	000214	49i A3NAA	0622717855
10	7/26/2019	Sample Tower	Aluma Tower	000788	B	unknown
11	7/26/2019	Shelter Temperature	Campbell	none	107-L	none
12	7/26/2019	Siting Criteria	Siting Criteria	None	1	None
13	7/26/2019	Temperature	RM Young	06408	41342	14041
14	7/26/2019	Zero air pump	Werther International	06883	C 70/4	000815257

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2511	PED108	Sandy Grenville	07/26/2019	DAS	Primary

Das Date: 7 /26/2019
Das Time: 14:54:15
Das Day: 207

Audit Date 7 /26/2019
Audit Time 14:54:15
Audit Day 207

Low Channel:

Avg Diff:	Max Diff:
0.0001	0.0003

High Channel:

Avg Diff:	Max Diff:
0.0001	0.0003

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2019	**CorrCoff**	1.00000

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2997	0.2997	V	V	0.0000
7	0.5000	0.4996	0.4995	V	V	-0.0001
7	0.7000	0.6995	0.6994	V	V	-0.0001
7	0.9000	0.8994	0.8992	V	V	-0.0002
7	1.0000	0.9993	0.9990	V	V	-0.0003

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	108252	PED108	Sandy Grenville	07/26/2019	Flow Rate	000835

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00000	**Intercept**	0.00000
Cert Date	3/4/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.01
2.04%	2.04%			**Cal Factor Full Scale**	1.02
				Rotometer Reading:	1.35

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalE	PctDifference
primary	pump off	0.000	0.000	0.03	0.000	0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.00	l/m	l/m	
primary	test pt 1	1.470	1.470	1.47	0.000	1.50	l/m	l/m	2.04%
primary	test pt 2	1.472	1.470	1.47	0.000	1.50	l/m	l/m	2.04%
primary	test pt 3	1.473	1.470	1.47	0.000	1.50	l/m	l/m	2.04%

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**	1.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347319	PED108	Sandy Grenville	07/26/2019	Ozone	000732

Slope:	0.99796	**Slope:**	0.00000
Intercept	-0.29137	**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	0.99840	**Intercept**	0.27090
Cert Date	6/11/2019	**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	0.31	0.03	-0.41	ppb		-0.44
primary	2	15.10	14.85	14.87	ppb		0.02
primary	3	34.74	34.52	33.94	ppb	-1.69	
primary	4	67.20	67.03	66.61	ppb	-0.63	
primary	5	111.20	111.10	110.60	ppb	-0.45	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.10	pass
Span	0.996	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	83.5 kHz	pass
Cell A Noise	1.3 ppb	pass
Cell A Flow	0.62 lpm	pass
Cell A Pressure	713.2 mmHg	pass
Cell A Tmp.	35.5 C	pass
Cell B Freq.	99.1 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.56 lpm	pass
Cell B Pressure	713.9 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14041	PED108	Sandy Grenville	07/26/2019	Temperature	06408

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00733	**Intercept**	0.14497
Cert Date	2/12/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.13	0.17		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.24	0.09	0.000	0.0	C	-0.09
primary	Temp Mid Range	25.39	25.06	0.000	24.9	C	-0.12
primary	Temp High Range	49.33	48.83	0.000	48.7	C	-0.17

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	PED108	Sandy Grenville	07/26/2019	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.93	1.47		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00733	Intercept	0.14497
Cert Date	2/12/2019	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	30.30	29.94	0.000	29.4	C	-0.57
primary	Temp Mid Range	25.27	24.94	0.000	26.4	C	1.47
primary	Temp Mid Range	27.05	26.71	0.000	27.5	C	0.75

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	PED108	Technician	Sandy Grenville	Site Visit Date	07/26/2019

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2116-13)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Fair	Status	pass
Sensor Component	Shelter Roof	Condition	Fair	Status	pass
Sensor Component	Shelter Floor	Condition	Fair	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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	PED108	Sandy Grenville	07/26/2019	Moisture Present	Apex	4280	☐	☐

There is moisture present in the dry deposition sample train inside the shelter.

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is in a clearing in an evergreen plantation in the Prince Edward-Gallion State Forest. Trees were cut within the last 11 years to increase the size of the clearing. The tree line is encroaching again and is between 25 and 35 meters from the site.

2 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, clean, neat, and well organized. The floor is rotting beneath the heater.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	PED108	**Technician**	Sandy Grenville	**Site Visit Date**	07/26/2019

Site Sponsor (agency)	EPA	**USGS Map**	Green Bay
Operating Group	Private	**Map Scale**	
AQS #	51-147-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	37.1653
Deposition Measurement	dry, wet	**QAPP Longitude**	-78.3070
Land Use	woodland - mixed	**QAPP Elevation Meters**	150
Terrain	rolling	**QAPP Declination**	-9.1
Conforms to MLM	Yes	**QAPP Declination Date**	2/22/2006
Site Telephone		**Audit Latitude**	37.165222
Site Address 1	SR 629	**Audit Longitude**	-78.307067
Site Address 2	Prince Edward-Gallion State Forest	**Audit Elevation**	149
County	Prince Edward	**Audit Declination**	-9.4
City, State	Burkesville, VA		
Zip Code	23922	**Fire Extinguisher** (Present) ☑	No inspection date
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 (s/n 2116-13)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in fair condition, clean, neat, and well organized. The floor is rotting beneath the heater.				
Site OK	☑	**Notes**					

Driving Directions

From Farmville travel east on 460 approximately 1 mile. Turn right (south) onto route 696 toward Twin Lakes State Park. Continue approximately 8.5 miles on 696 (do not turn at the next sign for Twin Lakes State Park near the church) into the state forest. Turn left onto route 629 and continue approximately 1.3 miles. The site is not visible from the road, and is through a gate on a gravel road to the right.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID PED108 **Technician** Sandy Grenville **Site Visit Date** 07/26/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m	25 - 35 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

The site is in a clearing in an evergreen plantation in the Prince Edward-Gallion State Forest. Trees were cut within the last 11 years to increase the size of the clearing. The tree line is encroaching again and is between 25 and 35 meters from the site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	PED108	Technician	Sandy Grenville	Site Visit Date	07/26/2019

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	PED108	Technician	Sandy Grenville	Site Visit Date	07/26/2019

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?	☑	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	PED108	Technician	Sandy Grenville	Site Visit Date	07/26/2019

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?	☑	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 PED108 **Technician** Sandy Grenville **Site Visit Date** 07/26/2019

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?	Met tower removed	

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	PED108	Technician	Sandy Grenville	Site Visit Date	07/26/2019

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 2001	☐
HASP	☑	Feb 2014	☑
Field Ops Manual	☑	July 1999	☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☑	Minimal information
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	PED108	Technician	Sandy Grenville	Site Visit Date	07/26/2019

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained in FL in 1987 and refresher course in July 2006
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	☐		☐
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	PED108	Technician	Sandy Grenville	Site Visit Date	07/26/2019

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Flter 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, 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	☐	Unknown	☐
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 PED108 **Technician** Sandy Grenville **Site Visit Date** 07/26/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07051
DAS	Campbell	CR3000	2511	000406
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	1088003022	00564
Flow Rate	Apex	AXMC105LPMDPC	108252	000835
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0844353122	06587
Ozone	ThermoElectron Inc	49i A1NAA	1105347319	000732
Ozone Standard	ThermoElectron Inc	49i A3NAA	0622717855	000214
Sample Tower	Aluma Tower	B	unknown	000788
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14041	06408
Zero air pump	Werther International	C 70/4	000815257	06883

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ZIO433-Martin Valvur-08/03/2019						
1	8/3/2019	DAS	Environmental Sys Corp	none	8816	4296
2	8/3/2019	Ozone	ThermoElectron Inc	90568	49C	49C-59348-322
3	8/3/2019	Ozone Standard	ThermoElectron Inc	90728	49C	49C-70528-366
4	8/3/2019	Precipitation	Climatronics	91002	100508-2	illegible
5	8/3/2019	Shelter Temperature	ARS	none	unknown	none
6	8/3/2019	Solar Radiation	Licor	none	LI-200	64345
7	8/3/2019	Temperature2meter	RM Young	none	41432VC	15103
8	8/3/2019	Wind Direction	RM Young	90859	AQ05305	59339wdr
9	8/3/2019	Wind Speed	RM Young	90859	AQ05305	59339wsp
10	8/3/2019	Zero air pump	Werther International	none	PC70/4	531392

DAS Data Form

DAS Time Max Error: 0.75

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	4296	ZIO433	Martin Valvur	08/03/2019	DAS	Primary

Das Date: 8 /13/2019 **Audit Date** 8 /13/2019
Das Time: 08:39:00 **Audit Time** 08:39:45
Das Day: 215 **Audit Day** 215

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0003	0.0002	0.0003

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2019	**CorrCoff**	1.00000

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
4	0.0000	-0.0001	-0.0003	V	V	-0.0002
4	0.1000	0.0998	0.0997	V	V	-0.0001
4	0.3000	0.2997	0.2997	V	V	0.0000
4	0.5000	0.5004	0.5003	V	V	-0.0001
4	0.7000	0.6999	0.6997	V	V	-0.0002
4	0.9000	0.8999	0.8996	V	V	-0.0003
4	1.0000	1.0005	1.0002	V	V	-0.0003

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-59348-322	ZIO433	Martin Valvur	08/03/2019	Ozone	90568

Slope:	0.98129	**Slope:**	0.00000
Intercept	-0.02606	**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	1.00151	**Intercept**	0.00666
Cert Date	10/30/2018	**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	0.23	0.22	0.33	ppb		0.11
primary	2	16.23	16.19	15.68	ppb		-0.51
primary	3	38.79	38.72	37.95	ppb	-2.01	
primary	4	68.19	68.08	66.85	ppb	-1.82	
primary	5	112.06	111.88	109.75	ppb	-1.92	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.20	pass
Span	1.003	pass
Zero Voltage	0.000	pass
Fullscale Voltage	1.0002	pass
Cell A Freq.	86.2 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.73 lpm	pass
Cell A Pressure	650.2 mmHg	pass
Cell A Tmp.	37.0 C	pass
Cell B Freq.	95.7 kHz	pass
Cell B Noise	0.5 ppb	pass
Cell B Flow	0.73 lpm	pass
Cell B Pressure	650.2 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Wind Direction Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	59339wdr	ZIO433	Martin Valvur	08/03/2019	Wind Direction	90859

Mfg	RM Young	**Parameter**	wind direction
Serial Number		**Tfer Desc.**	wind direction wheel
Tfer ID	01266		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/1/2006	**CorrCoff**	1.00000

Mfg	Ushikata	**Parameter**	wind direction
Serial Number	190037	**Tfer Desc.**	transit
Tfer ID	01265		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/23/2019	**CorrCoff**	1.00000

Vane SN: N/A **C. A. Align. deg. true:**

VaneTorque 15 **to** 15 2

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	9.5	1.4		
Abs Max Err	12	4		

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01266	0	☑	0.000	350	10	45.3	##########
primary	01266	45	☑	0.000	38	7	47.9	##########
primary	01266	90	☑	0.000	84	6	46.2	1.2
primary	01266	135	☑	0.000	130	5	46	1
primary	01266	180	☑	0.000	175	5	45	0
primary	01266	225	☑	0.000	216	9	41	-4
primary	01266	270	☑	0.000	260	10	43.9	##########
primary	01266	315	☑	0.000	305	10	44.7	##########
primary	01265	2	☐	0.000	350	12		12
primary	01265	92	☐	0.000	83	9		9
primary	01265	182	☐	0.000	175	7		7
primary	01265	272	☐	0.000	262	10		10

Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Mast	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Vane Condition	**Condition**		**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Wind Speed Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	59339wsp	ZIO433	Martin Valvur	08/03/2019	Wind Speed	90859

Mfg	RM Young	**Parameter**	wind speed
Serial Number	CA4353	**Tfer Desc.**	wind speed motor (h
Tfer ID	01457		
Slope	1.00000	**Intercept**	0.00000
Cert Date	4/19/2018	**CorrCoff**	1.00000

Prop or Cups SN	59835			
Prop or Cups Torque	0.3	**to**	0.3	
Prop Correction Facto	0.0512			

	DAS 1:		**DAS 2:**	
	Low Range	**High Range:**	**Low Range**	**High Range:**
Abs Avg Err	0.05	0.00%		
Abs Max Err	0.20	0.00%		

UseDescription:	Input Device	Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.20	0.0	0.0		-0.20	
primary	01457	200	1.02	0.0	1.0		0.00	
primary	01457	400	2.05	0.0	2.1		0.00	
primary	01457	800	4.10	0.0	4.1		0.00	
primary	01457	1200	6.14	0.0	6.1	0.00%		
primary	01457	2400	12.29	0.0	12.3	0.00%		
primary	01457	4000	20.48	0.0	20.5	0.00%		
primary	01457	9400	48.13	0.0	48.1	0.00%		

Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Prop or Cups Condition	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**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	15103	ZIO433	Martin Valvur	08/03/2019	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.3	0.4		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.22	0.23	0.000	0.41	C	0.18
primary	Temp Mid Range	23.75	23.76	0.000	24.16	C	0.4
primary	Temp High Rang	47.95	47.96	0.000	48.29	C	0.33

Sensor Component	Properly Sited	Condition	Partially shaded	Status	pass
Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	Blower Status Switch	Condition	N/A	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Solar Radiation Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	64345	ZIO433	Martin Valvur	08/03/2019	Solar Radiation	none

Mfg	Eppley	**Parameter**	solar radiation
Serial Number	23824	**Tfer Desc.**	SR transfer sensor
Tfer ID	01247		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg:**	**%Diff of Max**
0.7%	0.3%	0.0%	0.0%

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	8/3/2019	08:00	430	430	429	-0.3%
primary	8/3/2019	09:00	583	583	570	-2.3%
primary	8/3/2019	10:00	791	791	794	0.3%

Sensor Component	Sensor Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Sensor Level	**Condition**	Level	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Precipitation Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	ZIO433	Martin Valvur	08/03/2019	Precipitation	91002

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Dif	A Avg %Diff	A Max % Dif
1.7%	1.7%		

Mfg	PMP	Parameter	Precipitation
Serial Number	None	Tfer Desc.	250ml graduate
Tfer ID	01249		
Slope	1.00000	Intercept	0.00000
Cert Date	4/26/2013	CorrCoff	1.00000

UseDesc.	Test type	TferVolume	Iteration	TimePerTip	Eq.Ht	DAS eng	Eq.HtUnit	OSE Unit	TferUnits	PctDifference
primary	test 1	250	1	10 sec	7.50	7.37	mm	mm	ml	-1.7%
primary	test 2	250	2	10 sec	7.50	7.62	mm	mm	ml	1.6%

Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Gauge Drain Screen	Condition	Installed	Status	pass
Sensor Component	Funnel Clean	Condition	Clean	Status	pass
Sensor Component	Condition	Condition	Good	Status	pass
Sensor Component	Gauge Screen	Condition	Installed	Status	pass
Sensor Component	Gauge Clean	Condition	Clean	Status	pass
Sensor Component	Level	Condition	Level	Status	pass
Sensor Component	Sensor Heater	Condition	N/A	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	ZIO433	Martin Valvur	08/03/2019	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
2.42	3.44		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.91	24.92	0.000	27.4	C	2.52
primary	Temp Mid Range	26.39	26.40	0.000	27.7	C	1.31
primary	Temp Mid Range	24.08	24.09	0.000	27.5	C	3.44

Sensor Component	System Memo	Condition		Status	pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CHC432-Martin Valvur-08/05/2019						
1	8/5/2019	Computer	Hewlett Packard	none	ProBook	5CG5340VRK
2	8/5/2019	DAS	Environmental Sys Corp	none	8832	A4871K
3	8/5/2019	elevation	Elevation	none	none	none
4	8/5/2019	Infrastructure	Infrastructure	none	none	none
5	8/5/2019	Modem	CradlePoint	none	unknown	unknown
6	8/5/2019	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460049
7	8/5/2019	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1152780006
8	8/5/2019	Precipitation	Texas Electronics	none	TR-525i-HT	64172-315
9	8/5/2019	Relative Humidity	Vaisala	none	HMP45A	Z1730058
10	8/5/2019	Sample Tower	Aluma Tower	none	FOT-10	Unknown
11	8/5/2019	Shelter Temperature	ARS	none	unknown	none
12	8/5/2019	siting criteria	Siting Criteria	none	none	None
13	8/5/2019	Solar Radiation	Licor	none	Pyranometer	PY16747
14	8/5/2019	Wind Direction	RM Young	90856	AQ05103-5	43941wdr
15	8/5/2019	Wind Speed	RM Young	90856	AQ05103-5	43941wsp
16	8/5/2019	Zero air pump	Werther International	none	P 70/4	000756726

DAS Data Form

DAS Time Max Error: 0.95

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	A4871K	CHC432	Martin Valvur	08/05/2019	DAS	Primary

Das Date: 8 /5 /2019
Das Time: 08:43:57
Das Day: 217

Audit Date 8 /5 /2019
Audit Time 08:43:00
Audit Day 217

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0003	0.0007	0.0003	0.0007

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2019	**CorrCoff**	1.00000

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
8	0.0000	-0.0006	-0.0008	V	V	-0.0002
8	0.1000	0.0996	0.1000	V	V	0.0004
8	0.3000	0.2992	0.2993	V	V	0.0001
8	0.5000	0.4998	0.5005	V	V	0.0007
8	0.7000	0.6997	0.6999	V	V	0.0002
8	0.9000	0.8997	0.9001	V	V	0.0004
8	1.0000	1.0006	1.0008	V	V	0.0002

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460049	CHC432	Martin Valvur	08/05/2019	Ozone	none

Slope:	0.99233	**Slope:**	0.00000
Intercept	0.12613	**Intercept**	0.00000
CorrCoff:	0.99999	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00151	**Intercept**	0.00666
Cert Date	10/30/2018	**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	0.00	0.38	ppb		0.38
primary	2	14.07	14.04	13.74	ppb		-0.3
primary	3	36.66	36.59	36.57	ppb	-0.05	
primary	4	64.09	63.98	63.46	ppb	-0.82	
primary	5	111.22	111.04	110.40	ppb	-0.58	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.30	pass
Span	0.995	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	89.2 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.64 lpm	pass
Cell A Pressure	598.1 mmHg	pass
Cell A Tmp.	32.3 C	pass
Cell B Freq.	122.6 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.64 lpm	pass
Cell B Pressure	597.8 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Wind Direction Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	43941wdr	CHC432	Martin Valvur	08/05/2019	Wind Direction	90856

Mfg	RM Young	**Parameter**	wind direction
Serial Number		**Tfer Desc.**	wind direction wheel
Tfer ID	01266		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/1/2006	**CorrCoff**	1.00000

Mfg	Ushikata	**Parameter**	wind direction
Serial Number	190037	**Tfer Desc.**	transit
Tfer ID	01265		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/23/2019	**CorrCoff**	1.00000

Vane SN: N/A **C. A. Align. deg. true:**

VaneTorque 10 **to** 10 0

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	1.3	1.7		
Abs Max Err	3	4		

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01266	0	☑	0.000	0	0	46.4	##########
primary	01266	45	☑	0.000	41	4	40.6	-4.4
primary	01266	90	☑	0.000	88	2	46.9	1.9
primary	01266	135	☑	0.000	132	3	44.6	##########
primary	01266	180	☑	0.000	181	1	48.6	##########
primary	01266	225	☑	0.000	226	0	44.8	##########
primary	01266	270	☑	0.000	269	1	43.7	##########
primary	01266	315	☑	0.000	314	1	44.4	##########
primary	01265	0	☐	0.000	0	0		0
primary	01265	90	☐	0.000	87	3		3
primary	01265	180	☐	0.000	180	0		0
primary	01265	270	☐	0.000	268	2		2

Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Mast	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Vane Condition	**Condition**	Good	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Wind Speed Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	43941wsp	CHC432	Martin Valvur	08/05/2019	Wind Speed	90856

Mfg	RM Young	**Parameter**	wind speed
Serial Number	CA4353	**Tfer Desc.**	wind speed motor (h
Tfer ID	01457		
Slope	1.00000	**Intercept**	0.00000
Cert Date	4/19/2018	**CorrCoff**	1.00000

Prop or Cups SN 76717
Prop or Cups Torque 0.3 **to** 0.3
Prop Correction Facto 0.0512

	DAS 1:		DAS 2:	
	Low Range	**High Range:**	**Low Range**	**High Range:**
Abs Avg Err	0.05	0.09%		
Abs Max Err	0.20	0.16%		

UseDescription:	Input Device	Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.20	0.0	0.0		-0.20	
primary	01457	200	1.02	0.0	1.0		0.01	
primary	01457	400	2.05	0.0	2.1		0.00	
primary	01457	800	4.10	0.0	4.1		0.00	
primary	01457	1200	6.14	0.0	6.2	0.16%		
primary	01457	2400	12.29	0.0	12.3	0.08%		
primary	01457	4000	20.48	0.0	20.5	0.05%		
primary	01457	9400	48.13	0.0	48.2	0.06%		

Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Prop or Cups Condition	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Humidity Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	Z1730058	CHC432	Martin Valvur	08/05/2019	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	124432	**Tfer Desc.**	Hygroclip
Tfer ID	01225		
Slope	1.00000	**Intercept**	0.00000
Cert Date	8/5/2019	**CorrCoff**	1.00000

	DAS 1:		DAS 2:	
	Low Range:	**High Range:**	**Low Range:**	**High Range:**
Abs Avg Err	1.8			
Abs Max Err	2.7			

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	Hygroclip	32.8	33.9	33.9	0.000	31.2	-2.7
primary	RH Low Range	Hygroclip	52.9	46.7	46.7	0.000	46.5	-0.2
primary	RH High Range	Hygroclip	90.0	81.2	81.2	0.000	78.6	-2.6

Sensor Component	RH Filter	**Condition**	Clean	**Status**	pass
Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower	**Condition**	Functioning	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Solar Radiation Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY16747	CHC432	Martin Valvur	08/05/2019	Solar Radiation	none

Mfg	Eppley	**Parameter**	solar radiation
Serial Number	23824	**Tfer Desc.**	SR transfer sensor
Tfer ID	01247		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg:**	**%Diff of Max**
1.8%	3.4%	0.0%	0.0%

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	8/5/2019	10:00	747	747	755	1.0%
primary	8/5/2019	11:00	904	904	886	-2.0%
primary	8/5/2019	12:00	983	983	963	-2.0%
primary	8/5/2019	13:00	991	991	957	-3.4%

Sensor Component	Sensor Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Sensor Level	**Condition**	Level	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Precipitation Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Texas Electronics	64172-315	CHC432	Martin Valvur	08/05/2019	Precipitation	none

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Dif	A Avg %Diff	A Max % Dif
2.8%	3.7%		

Mfg	PMP	Parameter	Precipitation
Serial Number	None	Tfer Desc.	250ml graduate
Tfer ID	01249		
Slope	1.00000	Intercept	0.00000
Cert Date	4/26/2013	CorrCoff	1.00000

UseDesc.	Test type	TferVolume	Iteration	TimePerTip	Eq.Ht	DAS eng	Eq.HtUnit	OSE Unit	TferUnits	PctDifference
primary	test 1	250	1	10 sec	5.40	5.50	mm	mm	ml	1.9%
primary	test 2	250	2	10 sec	5.40	5.20	mm	mm	ml	-3.7%

Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Gauge Drain Screen	Condition	Installed	Status	pass
Sensor Component	Funnel Clean	Condition	Clean	Status	pass
Sensor Component	Condition	Condition	Good	Status	pass
Sensor Component	Gauge Screen	Condition	Installed	Status	pass
Sensor Component	Gauge Clean	Condition	Clean	Status	pass
Sensor Component	Level	Condition	Level	Status	pass
Sensor Component	Sensor Heater	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	CHC432	Martin Valvur	08/05/2019	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
2.32	2.88		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.28	23.29	0.000	26.2	C	2.88
primary	Temp Mid Range	24.17	24.18	0.000	27.0	C	2.79
primary	Temp Mid Range	26.64	26.65	0.000	27.9	C	1.29

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	CHC432	Technician	Martin Valvur	Site Visit Date	08/05/2019

Shelter Make	Shelter Model	Shelter Size
Ekto	8812	768 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	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	N/A	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	N/A	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	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	N/A	Status	pass
Sensor Component	Sample Train	Condition	N/A	Status	pass

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Dry deposition samples are not collected at this CASTNET site.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CHC432	**Technician**	Martin Valvur	**Site Visit Date**	08/05/2019

Site Sponsor (agency)	NPS	**USGS Map**	
Operating Group	NPS	**Map Scale**	
AQS #	35-045-0020	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement		**QAPP Longitude**	
Land Use		**QAPP Elevation Meters**	
Terrain		**QAPP Declination**	
Conforms to MLM		**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	36.034484
Site Address 1		**Audit Longitude**	-107.904275
Site Address 2		**Audit Elevation**	1964
County	San Juan	**Audit Declination**	9.13
City, State	Nageezi, NM		**Present**
Zip Code	87037	**Fire Extinguisher** ☐	Not present
Time Zone	Mountain	**First Aid Kit** ☐	Not present
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☐	Not present
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**	8812	**Shelter Size**	768 cuft
Shelter Clean	☑	**Notes**					
Site OK	☑	**Notes**					

Driving Directions From highway 550 take county road 7950 (dirt road) for 21 miles to the park entrance. Less than one mile from the park entrance look for a gate on the north side of the road. Proceed through the gate for approximately 3 miles on rough dirt road to the top of the mesa.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID CHC432 **Technician** Martin Valvur **Site Visit Date** 08/05/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CHC432	Technician	Martin Valvur	Site Visit Date	08/05/2019

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?	☑	
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	CHC432	Technician	Martin Valvur	Site Visit Date	08/05/2019

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	
2	Are all the meteorological sensors operational online, and reporting data?	☑	
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☑	
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	
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	CHC432	Technician	Martin Valvur	Site Visit Date	08/05/2019

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?	☐	Not present
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 CHC432 **Technician** Martin Valvur **Site Visit Date** 08/05/2019

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

11 Tower comments?

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	CHC432	Technician	Martin Valvur	Site Visit Date	08/05/2019

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	☑	Electronic copy	☑
HASP	☑	Electronic copy	☑
Field Ops Manual	☑	Electronic copy	☑
Calibration Reports	☑	Electronic copy	☐
Ozone z/s/p Control Charts	☑	Electronic copy	☑
Preventive maintenance schedule	☑	Electronic copy	☑

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?	☑	Electronic copy

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	CHC432	Technician	Martin Valvur	Site Visit Date	08/05/2019

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	☑	Every 2 weeks	☑
Translator Zero/Span Tests (climatronics)	☑	N/A	☑
Manual Rain Gauge Test	☑	Monthly	☑
Confirm Reasonableness of Current Values	☑	Every 2 weeks	☑
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	☐	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	☑	Every 2 weeks	☑
Zero Air Desiccant Check	☑	Every 2 weeks	☑

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?	☑	Electronic copy

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	CHC432	Technician	Martin Valvur	Site Visit Date	08/05/2019

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?	☑	
6	Are sample flow rates recorded? How?	☑	N/A
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	N/A
8	Are filters protected from contamination during handling and shipping? How?	☑	N/A
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

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

Dry deposition samples are not collected at this CASTNET site.

Field Systems Data Form F-02058-1500-S10-rev002

Site ID CHC432 **Technician** Martin Valvur **Site Visit Date** 08/05/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	ProBook	5CG5340VRK	none
DAS	Environmental Sys Corp	8832	A4871K	none
elevation	Elevation	none	none	none
Infrastructure	Infrastructure	none	none	none
Modem	CradlePoint	unknown	unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	CM08460049	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1152780006	none
Precipitation	Texas Electronics	TR-525i-HT	64172-315	none
Relative Humidity	Vaisala	HMP45A	Z1730058	none
Sample Tower	Aluma Tower	FOT-10	Unknown	none
Shelter Temperature	ARS	unknown	none	none
siting criteria	Siting Criteria	none	None	none
Solar Radiation	Licor	Pyranometer	PY16747	none
Wind Direction	RM Young	AQ05103-5	43941wdr	90856
Wind Speed	RM Young	AQ05103-5	43941wsp	90856
Zero air pump	Werther International	P 70/4	000756726	none

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GTH161-Martin Valvur-08/06/2019						
1	8/6/2019	Computer	Dell	07055	Inspiron 15	834MC12
2	8/6/2019	DAS	Campbell	000416	CR3000	2513
3	8/6/2019	Elevation	Elevation	None	1	None
4	8/6/2019	Filter pack flow pump	Thomas	00517	107CAB18	100300020817
5	8/6/2019	Flow Rate	Apex	000558	AXMC105LPMDPCV	50735
6	8/6/2019	Infrastructure	Infrastructure	none	none	none
7	8/6/2019	Modem	Raven	06604	H4222-C	0844355767
8	8/6/2019	Ozone	ThermoElectron Inc	000617	49i A1NAA	1009241780
9	8/6/2019	Ozone Standard	ThermoElectron Inc	000208	49i A3NAA	0611416461
10	8/6/2019	Sample Tower	Aluma Tower	03564	A	none
11	8/6/2019	Shelter Temperature	Campbell	none	107-L	none
12	8/6/2019	Siting Criteria	Siting Criteria	None	1	None
13	8/6/2019	Temperature	RM Young	06120	41342VC	11742
14	8/6/2019	Zero air pump	Werther International	06927	P 70/4	000836211

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2513	GTH161	Martin Valvur	08/06/2019	DAS	Primary

Das Date: 8 /6 /2019
Das Time: 08:26:00
Das Day: 218

Audit Date 8 /6 /2019
Audit Time 08:26:00
Audit Day 218

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0010	0.0002	0.0010

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2019	**CorrCoff**	1.00000

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0004	-0.0005	V	V	-0.0001
7	0.1000	0.0996	0.0996	V	V	0.0000
7	0.3000	0.2998	0.2998	V	V	0.0000
7	0.5000	0.5001	0.5002	V	V	0.0001
7	0.7000	0.6995	0.6994	V	V	-0.0001
7	0.9000	0.9020	0.9018	V	V	-0.0002
7	1.0000	1.0001	0.9991	V	V	-0.0010

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	50735	GTH161	Martin Valvur	08/06/2019	Flow Rate	000558

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00000	**Intercept**	0.00000
Cert Date	3/4/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.04
				Cal Factor Full Scale	0.96
1.10%	1.32%			**Rotometer Reading:**	3.8

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	-0.04	l/m	l/m	
primary	leak check	0.000	0.000	0.02	0.000	-0.02	l/m	l/m	
primary	test pt 1	3.040	3.040	3.04	0.000	3.01	l/m	l/m	-0.99%
primary	test pt 2	3.040	3.040	3.04	0.000	3.01	l/m	l/m	-0.99%
primary	test pt 3	3.040	3.040	3.04	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**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 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	1009241780	GTH161	Martin Valvur	08/06/2019	Ozone	000617

Slope:	1.01969	**Slope:**	0.00000
Intercept	-0.35367	**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	1.00151	**Intercept**	0.00666
Cert Date	10/30/2018	**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	0.30	0.29	0.24	ppb		-0.05
primary	2	15.05	15.02	14.97	ppb		-0.05
primary	3	35.06	35.00	35.08	ppb	0.23	
primary	4	65.16	65.05	65.66	ppb	0.93	
primary	5	110.20	110.02	112.10	ppb	1.87	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.000	pass
Span	1.013	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	86.5 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.32 lpm	pass
Cell A Pressure	525.9 mmHg	pass
Cell A Tmp.	35.0 C	pass
Cell B Freq.	101.4 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.46 lpm	pass
Cell B Pressure	525.3 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	11742	GTH161	Martin Valvur	08/06/2019	Temperature	06120

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99989	**Intercept**	-0.00649
Cert Date	1/23/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.09	0.20		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.02	0.03	0.000	0.2	C	0.2
primary	Temp Mid Range	23.61	23.62	0.000	23.7	C	0.06
primary	Temp High Range	45.73	45.74	0.000	45.8	C	0.02

Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	GTH161	Martin Valvur	08/06/2019	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.07	0.13		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.07	23.08	0.000	23.2	C	0.13
primary	Temp Mid Range	26.42	26.43	0.000	26.4	C	-0.05
primary	Temp Mid Range	28.12	28.13	0.000	28.2	C	0.04

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	GTH161	Technician	Martin Valvur	Site Visit Date	08/06/2019

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-12)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	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	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

Some floor tiles are damaged.

2 **Parameter:** MetSensorComme

The temperature sensor has been moved to the sample tower and mounted in a naturally aspirated shield facing south and over the shelter roof. The met tower has been removed.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	GTH161	**Technician**	Martin Valvur	**Site Visit Date**	08/06/2019

Site Sponsor (agency)	EPA	**USGS Map**	Gothic
Operating Group	RMBL	**Map Scale**	
AQS #	08-051-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	38.9573
Deposition Measurement	dry, wet	**QAPP Longitude**	-106.9854
Land Use	mountain meadow, woodland - mixed	**QAPP Elevation Meters**	2926
Terrain	complex	**QAPP Declination**	10.75
Conforms to MLM	No	**QAPP Declination Date**	2/23/2006
Site Telephone	(970) 349-5691	**Audit Latitude**	38.95627
Site Address 1	RMBL	**Audit Longitude**	-106.98587
Site Address 2	Gothic	**Audit Elevation**	2915
County	Gunnison	**Audit Declination**	9.6
City, State	Crested Butte, CO		
Zip Code	81224	**Fire Extinguisher** ☑	Inspected July 2016
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 2149-12)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	Some floor tiles are damaged.				
Site OK	☑	**Notes**					

Driving Directions

From Gunnison take route 135 north to Crested Butte. Continue through town to Mount Crested Butte. Continue through town past the fire station and the road maintenance facility onto the dirt road to Gothic. Continue approximately three miles and park at the visitor area at the bottom of the hill below the site. The site is approximately 200 meters on the path up the hill.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID GTH161 **Technician** Martin Valvur **Site Visit Date** 08/06/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	GTH161	Technician	Martin Valvur	Site Visit Date	08/06/2019

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)	☐	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:

The temperature sensor has been moved to the sample tower and mounted in a naturally aspirated shield facing south and over the shelter roof. The met tower has been removed.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	GTH161	Technician	Martin Valvur	Site Visit Date	08/06/2019

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	GTH161	Technician	Martin Valvur	Site Visit Date	08/06/2019

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 15 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	
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 GTH161 **Technician** Martin Valvur **Site Visit Date** 08/06/2019

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?	Tower does not have ground rod but is bolted to shelter.	

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	GTH161	Technician	Martin Valvur	Site Visit Date	08/06/2019

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 2001	☐
HASP	☐		☐
Field Ops Manual	☑	July 1990	☐
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 GTH161 **Technician** Martin Valvur **Site Visit Date** 08/06/2019

Site operation procedures

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

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

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

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

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

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	GTH161	Technician	Martin Valvur	Site Visit Date	08/06/2019

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	☑	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 GTH161 **Technician** Martin Valvur **Site Visit Date** 08/06/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	834MC12	07055
DAS	Campbell	CR3000	2513	000416
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	100300020817	00517
Flow Rate	Apex	AXMC105LPMDPC	50735	000558
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4222-C	0844355767	06604
Ozone	ThermoElectron Inc	49i A1NAA	1009241780	000617
Ozone Standard	ThermoElectron Inc	49i A3NAA	0611416461	000208
Sample Tower	Aluma Tower	A	none	03564
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	11742	06120
Zero air pump	Werther International	P 70/4	000836211	06927

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
BAS601-Martin Valvur-08/19/2019						
1	8/19/2019	DAS	Campbell	none	CR1000	41006
2	8/19/2019	elevation	Elevation	none	none	none
3	8/19/2019	Filter pack flow pump	Thomas	none	107CAB18	Illegible
4	8/19/2019	Flow Rate	Omega	none	FMA6518ST-RS232	318559-1
5	8/19/2019	Infrastructure	Infrastructure	none	none	none
6	8/19/2019	Met tower	unknown	none	unknown	none
7	8/19/2019	Ozone	ThermoElectron Inc	L0534684	49i A1NAA	1214552973
8	8/19/2019	Ozone Standard	ThermoElectron Inc	none	49i E3CAA	1214552971
9	8/19/2019	Shelter Temperature	unknown	none	unknown	none
10	8/19/2019	siting criteria	Siting Criteria	none	none	None
11	8/19/2019	Temperature2meter	Campbell	none	10755	124
12	8/19/2019	Zero air pump	Thomas	none	107CAB18	100800033636

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Omega	318559-1	BAS601	Martin Valvur	08/19/2019	Flow Rate	none

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00178	**Intercept**	0.00161
Cert Date	7/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.249
1.43%	1.64%			**Cal Factor Full Scale**	0.988
				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	0.25	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.25	l/m	l/m	
primary	test pt 1	3.050	3.040	0.00	0.000	3.00	l/m	l/m	-1.32%
primary	test pt 2	3.060	3.050	0.00	0.000	3.00	l/m	l/m	-1.64%
primary	test pt 3	3.050	3.040	0.00	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**	Poor	**Status**	Fail
Sensor Component	Rotometer Condition	**Condition**	N/A	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	6.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	- 3.0 cm	**Status**	Fail
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	1214552973	BAS601	Martin Valvur	08/19/2019	Ozone	L0534684

Slope:	0.99416	**Slope:**	0.00000
Intercept	-0.21771	**Intercept**	0.00000
CorrCoff:	0.99981	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00151	**Intercept**	0.00666
Cert Date	10/30/2018	**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	0.11	0.10	0.05	ppb		-0.05
primary	2	16.27	16.23	15.69	ppb		-0.54
primary	3	36.77	36.70	35.41	ppb	-3.58	
primary	4	65.16	65.05	65.86	ppb	1.24	
primary	5	115.17	114.98	113.60	ppb	-1.21	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.1	pass
Span	1.009	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	117.8 kHz	pass
Cell A Noise	1.0 ppb	pass
Cell A Flow	0.66 lpm	pass
Cell A Pressure	645.9 mmHg	pass
Cell A Tmp.	32.6 C	pass
Cell B Freq.	79.0 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.68 lpm	pass
Cell B Pressure	645.7 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	124	BAS601	Martin Valvur	08/19/2019	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.12	0.21		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.04	0.05	0.000	0.06	C	0.01
primary	Temp Mid Range	22.68	22.69	0.000	22.90	C	0.21
primary	Temp High Rang	48.19	48.20	0.000	48.33	C	0.13

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
unknown	none	BAS601	Martin Valvur	08/19/2019	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.43	0.45		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.79	22.80	0.000	23.3	C	0.45
primary	Temp Mid Range	24.25	24.26	0.000	24.7	C	0.45
primary	Temp Mid Range	27.11	27.12	0.000	27.5	C	0.38

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	BAS601	Technician	Martin Valvur	Site Visit Date	08/19/2019

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

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	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Not installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Not installed	Status	Fail
Sensor Component	Sample Tower	Condition	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	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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	BAS601	Martin Valvur	08/19/2019	Filter Position	Omega	3806	☐	☐

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced each month.

2 **Parameter:** DocumentationCo

The filter pack chain-of-custody labels are not being used.

3 **Parameter:** ShelterCleanNotes

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

4 **Parameter:** MetSensorComme

Some objects violate the 45 degree rule for the tipping bucket rain gage. The Temperature shield is mounted on the south side of the tower tripod at 2 meters.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	BAS601	**Technician**	Martin Valvur	**Site Visit Date**	08/19/2019

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	BLM	**Map Scale**	
AQS #	56-003-0002	**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**	44.279947
Site Address 1		**Audit Longitude**	-108.04082
Site Address 2		**Audit Elevation**	1241
County	Big Horn	**Audit Declination**	10.3
City, State	Basin, WY		
Zip Code	82410		
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 Steps	☑		

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

Site ID	BAS601	**Technician**	Martin Valvur	**Site Visit Date**	08/19/2019

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	BLM	**Map Scale**	

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID BAS601 **Technician** Martin Valvur **Site Visit Date** 08/19/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m	100 m	☐
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Site ID BAS601 **Technician** Martin Valvur **Site Visit Date** 08/19/2019

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	BAS601	Technician	Martin Valvur	Site Visit Date	08/19/2019

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?	☐	Pointing south
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	
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:

Some objects violate the 45 degree rule for the tipping bucket rain gage. The Temperature shield is mounted on the south side of the tower tripod at 2 meters.

Site ID	BAS601	Technician	Martin Valvur	Site Visit Date	08/19/2019

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)	☐	

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	BAS601	Technician	Martin Valvur	Site Visit Date	08/19/2019

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:

Site ID	BAS601	Technician	Martin Valvur	Site Visit Date	08/19/2019

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	BAS601	Technician	Martin Valvur	Site Visit Date	08/19/2019

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 nylon by 15 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☐	Not present
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:

Site ID	BAS601	Technician	Martin Valvur	Site Visit Date	08/19/2019

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?	☐	

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID BAS601 **Technician** Martin Valvur **Site Visit Date** 08/19/2019

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

11 **Tower comments?**

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:

Site ID BAS601 **Technician** Martin Valvur **Site Visit Date** 08/19/2019

DAS, sensor translators, and peripheral equipment operations and maintenance

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	BAS601	Technician	Martin Valvur	Site Visit Date	08/19/2019

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	☐	in BLM office	☑
HASP	☐	in BLM office	☑
Field Ops Manual	☐	in BLM office	☑
Calibration Reports	☐	Not present	☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☐	Not present
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 filter pack chain-of-custody labels are not being used.

Site ID	BAS601	Technician	Martin Valvur	Site Visit Date	08/19/2019

Documentation

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	BAS601	Technician	Martin Valvur	Site Visit Date	08/19/2019

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	☑	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)	☑	Monthly	☑
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?	☐	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 inlet filter is replaced each month.

Site ID	BAS601	Technician	Martin Valvur	Site Visit Date	08/19/2019

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	BAS601	Technician	Martin Valvur	Site Visit Date	08/19/2019

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings 90% of the time
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?	☑	
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:

Site ID	BAS601	Technician	Martin Valvur	Site Visit Date	08/19/2019

Site operation procedures

Field Systems Data Form F-02058-1500-S10-rev002

Site ID BAS601 **Technician** Martin Valvur **Site Visit Date** 08/19/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR1000	41006	none
elevation	Elevation	none	none	none
Filter pack flow pump	Thomas	107CAB18	Illegible	none
Flow Rate	Omega	FMA6518ST-RS232	318559-1	none
Infrastructure	Infrastructure	none	none	none
Met tower	unknown	unknown	none	none
Ozone	ThermoElectron Inc	49i A1NAA	1214552973	L0534684
Ozone Standard	ThermoElectron Inc	49i E3CAA	1214552971	none
Shelter Temperature	unknown	unknown	none	none
siting criteria	Siting Criteria	none	None	none
Temperature2meter	Campbell	10755	124	none
Zero air pump	Thomas	107CAB18	100800033636	none

Site ID BAS601 **Technician** Martin Valvur **Site Visit Date** 08/19/2019

Site Visit Sensors

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
BUF603-Martin Valvur-08/20/2019						
1	8/20/2019	DAS	Campbell	49917	CR1000	43073
2	8/20/2019	elevation	Elevation	none	none	none
3	8/20/2019	Filter pack flow pump	Thomas	none	107CAB18A	119900011286
4	8/20/2019	Flow Rate	Omega	none	FMA6518ST-RS232	315688-1
5	8/20/2019	Infrastructure	Infrastructure	none	none	none
6	8/20/2019	MFC power supply	Sceptre	none	FMA65PWC	295106-12
7	8/20/2019	Sample Tower	Unknown	none	Unknown	None
8	8/20/2019	siting criteria	Siting Criteria	none	none	None
9	8/20/2019	Temperature2meter	Campbell	none	10755	Missing

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Omega	315688-1	BUF603	Martin Valvur	08/20/2019	Flow Rate	none

Mfg	Sceptre	
SN/Owner ID	295106-12	none
Parameter:	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00178	**Intercept**	0.00161
Cert Date	7/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.401
2.86%	3.09%			**Cal Factor Full Scale**	0.985
				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	0.40	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.40	l/m	l/m	
primary	test pt 1	2.920	2.910	0.00	0.000	3.00	l/m	l/m	3.09%
primary	test pt 2	2.930	2.920	0.00	0.000	3.00	l/m	l/m	2.74%
primary	test pt 3	2.930	2.920	0.00	0.000	3.00	l/m	l/m	2.74%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	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**	2.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	10 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 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
Campbell	Missing	BUF603	Martin Valvur	08/20/2019	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.06	0.14		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary		0.17	0.18	0.000	0.20	C	0.02
primary		25.00	25.01	0.000	25.15	C	0.14
primary		47.27	47.28	0.000	47.26	C	-0.02

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

Infrastructure Data For

Site ID	BUF603	Technician	Martin Valvur	Site Visit Date	08/20/2019

Shelter Make	Shelter Model	Shelter Size

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Other	Status	pass
Sensor Component	Conduit	Condition	Good	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	N/A	Status	pass
Sensor Component	Rotometer	Condition	Not installed	Status	Fail
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	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Comments

1 **Parameter:** DasComments

The NEMA enclosure has a cooling fan.

2 **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 developed by ARS for BLM each week.

3 **Parameter:** ShelterCleanNotes

NEMA enclosure, 120 VAC power

4 **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.

5 **Parameter:** MetSensorComme

The temperature is measured at 2.5 meters above the ground.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	BUF603	**Technician**	Martin Valvur	**Site Visit Date**	08/20/2019

Site Sponsor (agency)	EPA	**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		**Present**
Zip Code	82834	**Fire Extinguisher**	☐
Time Zone	Mountain	**First Aid Kit**	☐
Primary Operator		**Safety Glasses**	☐
Primary Op. Phone #		**Safety Hard Hat**	☐
Primary Op. E-mail		**Climbing Belt**	☐
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Steps**	☑

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

Driving Directions

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID BUF603 **Technician** Martin Valvur **Site Visit Date** 08/20/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	BUF603	Technician	Martin Valvur	Site Visit Date	08/20/2019

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.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	BUF603	Technician	Martin Valvur	Site Visit Date	08/20/2019

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	BUF603	Technician	Martin Valvur	Site Visit Date	08/20/2019

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?	☐	Not present
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** Martin Valvur **Site Visit Date** 08/20/2019

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 NEMA enclosure has a cooling fan.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	BUF603	Technician	Martin Valvur	Site Visit Date	08/20/2019

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?	☐	Not present
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 developed by ARS for BLM each week.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	BUF603	Technician	Martin Valvur	Site Visit Date	08/20/2019

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	Martin Valvur	Site Visit Date	08/20/2019

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 BUF603 **Technician** Martin Valvur **Site Visit Date** 08/20/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR1000	43073	49917
elevation	Elevation	none	none	none
Filter pack flow pump	Thomas	107CAB18A	119900011286	none
Flow Rate	Omega	FMA6518ST-RS232	315688-1	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Sceptre	FMA65PWC	295106-12	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*
SHE604-Martin Valvur-08/20/2019						
1	8/20/2019	DAS	Campbell	49923	CR1000	unknown2
2	8/20/2019	elevation	Elevation	none	none	none
3	8/20/2019	Flow Rate	Omega	none	FMA6518ST-RS232	318559-1
4	8/20/2019	Infrastructure	Infrastructure	none	none	none
5	8/20/2019	Sample Tower	Unknown	none	Unknown	None
6	8/20/2019	siting criteria	Siting Criteria	none	none	None
7	8/20/2019	Temperature2meter	Campbell	none	10755	Illegible

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Omega	318559-1	SHE604	Martin Valvur	08/20/2019	Flow Rate	none

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00178	**Intercept**	0.00161
Cert Date	7/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.393
2.88%	4.01%			**Cal Factor Full Scale**	0.933
				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	0.37	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.37	l/m	l/m	
primary	test pt 1	3.000	2.990	0.00	0.000	3.11	l/m	l/m	4.01%
primary	test pt 2	3.020	3.010	0.00	0.000	3.12	l/m	l/m	3.65%
primary	test pt 3	3.090	3.080	0.00	0.000	3.11	l/m	l/m	0.97%

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**	3.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	315 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
Campbell	Illegible	SHE604	Martin Valvur	08/20/2019	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99989	Intercept	-0.00649
Cert Date	1/23/2019	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.07	0.09		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.16	0.17	0.000	0.22	C	0.05
primary	Temp Mid Range	24.23	24.24	0.000	24.33	C	0.09
primary	Temp High Rang	47.49	47.50	0.000	47.56	C	0.06

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

Infrastructure Data For

Site ID	SHE604	Technician	Martin Valvur	Site Visit Date	08/20/2019

Shelter Make	Shelter Model	Shelter Size

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Other	Status	pass
Sensor Component	Conduit	Condition	Good	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	N/A	Status	pass
Sensor Component	Rotometer	Condition	Not installed	Status	Fail
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	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	SHE604	**Technician**	Martin Valvur	**Site Visit Date**	08/20/2019

Site Sponsor (agency)	EPA	**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 Steps	☑		

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

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID SHE604 **Technician** Martin Valvur **Site Visit Date** 08/20/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

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

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	SHE604	Technician	Martin Valvur	Site Visit Date	08/20/2019

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 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.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	SHE604	Technician	Martin Valvur	Site Visit Date	08/20/2019

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:

The accuracy of the DAS was not tested with a voltage source since there were no available test channels.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	SHE604	Technician	Martin Valvur	Site Visit Date	08/20/2019

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?	☐	Not present
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.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID SHE604 **Technician** Martin Valvur **Site Visit Date** 08/20/2019

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.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	SHE604	Technician	Martin Valvur	Site Visit Date	08/20/2019

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	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☐	Not performed
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 received a disc with the 2013 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.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	SHE604	Technician	Martin Valvur	Site Visit Date	08/20/2019

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:

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	Martin Valvur	Site Visit Date	08/20/2019

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** Martin Valvur **Site Visit Date** 08/20/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR1000	unknown2	49923
elevation	Elevation	none	none	none
Flow Rate	Omega	FMA6518ST-RS232	318559-1	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*
PRK134-Eric Hebert-08/27/2019						
1	8/27/2019	Computer	Dell	07021	Inspiron 15	2884848822
2	8/27/2019	DAS	Campbell	000411	CR3000	2509
3	8/27/2019	Elevation	Elevation	None	1	None
4	8/27/2019	Filter pack flow pump	Thomas	04918	107CAB18	060300019989
5	8/27/2019	Flow Rate	Apex	000656	AXMC105LPMDPCV	illegible
6	8/27/2019	Infrastructure	Infrastructure	none	none	none
7	8/27/2019	Modem	Digi	07198	LR54	unknown
8	8/27/2019	Ozone	ThermoElectron Inc	000693	49i A1NAA	1030244806
9	8/27/2019	Ozone Standard	ThermoElectron Inc	000440	49i A3NAA	CM08200016
10	8/27/2019	Sample Tower	Aluma Tower	000930	B	AT214072-Z-7-2
11	8/27/2019	Shelter Temperature	Campbell	none	107-L	unknown
12	8/27/2019	Siting Criteria	Siting Criteria	None	1	None
13	8/27/2019	Temperature	RM Young	06306	41342VC	12545
14	8/27/2019	Zero air pump	Werther International	06905	C 70/4	000821907

DAS Data Form

DAS Time Max Error: 0.03

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2509	PRK134	Eric Hebert	08/27/2019	DAS	Primary

Das Date: 8 /27/2019 **Audit Date** 8 /27/2019
Das Time: 14:29:00 **Audit Time** 14:28:58
Das Day: 239 **Audit Day** 239

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2019	**CorrCoff**	1.00000

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2997	0.2997	V	V	0.0000
7	0.5000	0.4996	0.4996	V	V	0.0000
7	0.7000	0.6995	0.6995	V	V	0.0000
7	0.9000	0.8994	0.8993	V	V	-0.0001
7	1.0000	0.9993	0.9992	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	PRK134	Eric Hebert	08/27/2019	Flow Rate	000656

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00000	**Intercept**	0.00000
Cert Date	3/4/2019	**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	0.99
0.90%	1.35%			**Rotometer Reading:**	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalE	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.05	0.000	0.06	l/m	l/m	
primary	test pt 1	1.484	1.480	1.51	0.000	1.50	l/m	l/m	1.35%
primary	test pt 2	1.486	1.490	1.51	0.000	1.50	l/m	l/m	0.67%
primary	test pt 3	1.492	1.490	1.51	0.000	1.50	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**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	30 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244806	PRK134	Eric Hebert	08/27/2019	Ozone	000693

Slope:	0.96640	**Slope:**	0.00000
Intercept	-1.33743	**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	0.99840	**Intercept**	0.27090
Cert Date	6/11/2019	**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	0.47	0.19	-1.18	ppb		-1.37
primary	2	15.99	15.74	13.66	ppb		-2.08
primary	3	33.23	33.01	30.72	ppb	-7.19	
primary	4	68.63	68.46	65.06	ppb	-5.09	
primary	5	117.32	117.23	111.80	ppb	-4.74	

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	0.000	**Status**	pass
Sensor Component	Span	**Condition**	1.008	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	94.6 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	Not tested	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.71 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	695.7 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	35.7 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	95.8 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	Not tested	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.62 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	696.3 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**	N/A	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**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	12545	PRK134	Eric Hebert	08/27/2019	Temperature	06306

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00733	**Intercept**	0.14497
Cert Date	2/12/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.07	0.11		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.23	0.08	0.000	0.0	C	-0.11
primary	Temp Mid Range	24.01	23.69	0.000	23.6	C	-0.09
primary	Temp High Range	45.90	45.42	0.000	45.4	C	-0.01

Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	unknown	PRK134	Eric Hebert	08/27/2019	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.26	0.40		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00733	Intercept	0.14497
Cert Date	2/12/2019	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.81	26.47	0.000	26.2	C	-0.28
primary	Temp Mid Range	26.67	26.33	0.000	26.2	C	-0.11
primary	Temp Mid Range	27.29	26.95	0.000	26.6	C	-0.4

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	PRK134	Technician	Eric Hebert	Site Visit Date	08/27/2019

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

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	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	Fair	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	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

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

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

2 **Parameter:** ShelterCleanNotes

The shelter is clean, neat, and well organized.

3 **Parameter:** PollAnalyzerCom

The ozone inlet filter housing is dirty, however the ozone accuracy was within acceptance limits.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	PRK134	**Technician**	Eric Hebert	**Site Visit Date**	08/27/2019

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

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

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

Driving Directions

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

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID PRK134 **Technician** Eric Hebert **Site Visit Date** 08/27/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m	20 m	☐
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

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

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	PRK134	Technician	Eric Hebert	Site Visit Date	08/27/2019

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	PRK134	Technician	Eric Hebert	Site Visit Date	08/27/2019

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:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	PRK134	Technician	Eric Hebert	Site Visit Date	08/27/2019

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

The ozone inlet filter housing is dirty, however the ozone accuracy was within acceptance limits.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID PRK134 **Technician** Eric Hebert **Site Visit Date** 08/27/2019

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	PRK134	Technician	Eric Hebert	Site Visit Date	08/27/2019

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 2001	☐
HASP	☑	Fe b 2014	☑
Field Ops Manual	☑	July 1990	☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	PRK134	Technician	Eric Hebert	Site Visit Date	08/27/2019

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?	☑	Channels up during ozone diagnostics
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?	☑	
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	Logbook, call-in

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	PRK134	Technician	Eric Hebert	Site Visit Date	08/27/2019

Site operation procedures

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

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

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

Field Systems Data Form F-02058-1500-S10-rev002

Site ID PRK134 **Technician** Eric Hebert **Site Visit Date** 08/27/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	2884848822	07021
DAS	Campbell	CR3000	2509	000411
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	060300019989	04918
Flow Rate	Apex	AXMC105LPMDPC	illegible	000656
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07198
Ozone	ThermoElectron Inc	49i A1NAA	1030244806	000693
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200016	000440
Sample Tower	Aluma Tower	B	AT214072-Z-7-2	000930
Shelter Temperature	Campbell	107-L	unknown	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	12545	06306
Zero air pump	Werther International	C 70/4	000821907	06905

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
VOY413-Eric Hebert-08/29/2019						
1	8/29/2019	DAS	Environmental Sys Corp	90632	8816	2505
2	8/29/2019	Elevation	Elevation	None	1	None
3	8/29/2019	Filter pack flow pump	Thomas	none	107CAB18	111500052144
4	8/29/2019	Flow Rate	Alicat	none	MC-10SLPM-D-PCV	Unknown
5	8/29/2019	Infrastructure	Infrastructure	none	none	none
6	8/29/2019	Ozone	ThermoElectron Inc	90714	49C	49C-66828-354
7	8/29/2019	Ozone Standard	ThermoElectron Inc	90569	49C	49C-59260-322
8	8/29/2019	Sample Tower	Aluma Tower	none	B	AT-51159-11-G
9	8/29/2019	Shelter Temperature	ARS	none	none	none
10	8/29/2019	Siting Criteria	Siting Criteria	None	1	None
11	8/29/2019	Temperature2meter	RM Young	none	41342VC	029199
12	8/29/2019	Zero air pump	Twin Tower Engineering	90719	TT70/E4	526294

DAS Data Form

DAS Time Max Error: 1.83

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2505	VOY413	Eric Hebert	08/29/2019	DAS	Primary

Das Date: 8 /29/2019 **Audit Date** 8 /29/2019
Das Time: 11:28:00 **Audit Time** 11:26:10
Das Day: 241 **Audit Day** 241

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2019	**CorrCoff**	1.00000

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
3	0.0000	0.0000	0.0000	V	V	0.0000
3	0.1000	0.0999	0.1000	V	V	0.0001
3	0.3000	0.2997	0.2997	V	V	0.0000
3	0.5000	0.4996	0.4996	V	V	0.0000
3	0.7000	0.6995	0.6995	V	V	0.0000
3	0.9000	0.8993	0.8993	V	V	0.0000
3	1.0000	0.9992	0.9993	V	V	0.0001

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Alicat	Unknown	VOY413	Eric Hebert	08/29/2019	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	3/4/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.021
0.22%	0.33%			**Cal Factor Full Scale**	5.098
				Rotometer Reading:	3.15

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	-0.01	0.000	0.03	l/m	l/m	
primary	test pt 1	2.988	2.990	2.96	0.000	3.00	l/m	l/m	0.33%
primary	test pt 2	2.993	2.990	2.96	0.000	3.00	l/m	l/m	0.33%
primary	test pt 3	3.000	3.000	2.96	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**	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**	0.5 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	08/29/2019	Ozone	90714

Slope:	1.00464	**Slope:**	0.00000
Intercept	-0.49771	**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	0.99840	**Intercept**	0.27090
Cert Date	6/11/2019	**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	0.18	-0.45	ppb		-0.63
primary	2	16.11	15.86	15.39	ppb		-0.47
primary	3	33.58	33.36	33.19	ppb	-0.51	
primary	4	68.68	68.51	68.46	ppb	-0.07	
primary	5	112.50	112.40	112.30	ppb	-0.09	

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	0.20	**Status**	pass
Sensor Component	Span	**Condition**	1.021	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	-0.0005	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	1.0005	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	78.1 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.71 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	706.8 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	33.3 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	71.4 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.73 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	706.1 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**	N/A	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**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	029199	VOY413	Eric Hebert	08/29/2019	Temperature2meter	none

Mfg	Extech	Parameter	Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00733	Intercept	0.14497
Cert Date	2/12/2019	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.37	0.46		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.33	0.18	0.000	-0.07	C	-0.25
primary	Temp Mid Range	23.51	23.20	0.000	22.81	C	-0.39
primary	Temp High Rang	44.56	44.09	0.000	43.63	C	-0.46

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	VOY413	Eric Hebert	08/29/2019	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.18	0.28		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00733	Intercept	0.14497
Cert Date	2/12/2019	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	21.86	21.56	0.000	21.6	C	0.07
primary	Temp Mid Range	21.64	21.34	0.000	21.6	C	0.28

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	VOY413	Technician	Eric Hebert	Site Visit Date	08/29/2019

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2880-2)	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	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Not installed	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	Poor	Status	Fail
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Poor	Status	Fail
Sensor Component	Shelter Floor	Condition	Fair	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

Field Systems Comments

1 **Parameter:** DasComments

The sample tower itself is not grounded, however it is bolted to the shelter which is grounded. The shelter has a leak above the instrument rack. The site operator has placed a gallon milk jug to catch the water which he reports can sometimes be full in one week.

2 **Parameter:** DocumentationCo

Correctly completing the general observations section of the SSRF on the day of filter installation was discussed with the operator.

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 neat and well organized. The shelter is in poor condition with a severe roof leak.

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	VOY413	**Technician**	Eric Hebert	**Site Visit Date**	08/29/2019

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		
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 neat and well organized. The shelter is in poor condition with a severe roof leak.				
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-S2-rev002

Site ID VOY413 **Technician** Eric Hebert **Site Visit Date** 08/29/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m	5 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

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.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	VOY413	Technician	Eric Hebert	Site Visit Date	08/29/2019

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	08/29/2019

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** 08/29/2019

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 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** 08/29/2019

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 shelter has a leak above the instrument rack. The site operator has placed a gallon milk jug to catch the water which he reports can sometimes be full in one week.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	VOY413	Technician	Eric Hebert	Site Visit Date	08/29/2019

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:

Correctly completing the general observations section of the SSRF on the day of filter installation was discussed with the operator.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	VOY413	Technician	Eric Hebert	Site Visit Date	08/29/2019

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Trained 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	☑	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	08/29/2019

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?	☑	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	☑	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 VOY413 **Technician** Eric Hebert **Site Visit Date** 08/29/2019

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	107CAB18	111500052144	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*
ACA416-Korey Devins-09/18/2019						
1	9/18/2019	Computer	Hewlett Packard	none	8460p	CNU20941M6
2	9/18/2019	DAS	Environmental Sys Corp	none	8832	A3506K
3	9/18/2019	Elevation	Elevation	None	1	None
4	9/18/2019	F460 translator	Climatronics	none	100163	683
5	9/18/2019	Flow Rate	Alicat	none	MC-10SLPM-D-PCV	Illgeible
6	9/18/2019	Infrastructure	Infrastructure	none	none	none
7	9/18/2019	Mainframe	Climatronics	01342	100081	1288
8	9/18/2019	Met tower	Climatronics	none	unknown	illegible
9	9/18/2019	Ozone	ThermoElectron Inc	90744	49C	49C-74536-376
10	9/18/2019	Ozone Standard	T-API	none	T-703V	71
11	9/18/2019	Precipitation	Climatronics	01322	100508-2	illegible
12	9/18/2019	Relative Humidity	Rotronic	none	MP 601A	67857
13	9/18/2019	Sample Tower	Aluma Tower	none	B	AT-71103-7I-3
14	9/18/2019	Shelter Temperature	Agilaire	none	Unknown	None
15	9/18/2019	Shield (2 meter)	Climatronics	none	100325	illegible
16	9/18/2019	Siting Criteria	Siting Criteria	None	1	None
17	9/18/2019	Solar Radiation	Licor	none	LI-200	PY16746
18	9/18/2019	Temperature Translator	Climatronics	03630	100088-2	401
19	9/18/2019	Temperature2meter	Climatronics	none	100093	missing
20	9/18/2019	Wind Direction	Climatronics	none	100076	illegible
21	9/18/2019	Wind Speed	Climatronics	none	100075	illegible
22	9/18/2019	Zero air pump	ThermoElectron Inc	none	111	111-30215-237

DAS Data Form

DAS Time Max Error: 0.17

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	A3506K	ACA416	Korey Devins	09/18/2019	DAS	Primary

Das Date: 9 /18/2019
Das Time: 14:36:10
Das Day: 261

Audit Date 9 /18/2019
Audit Time 14:36:20
Audit Day 261

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0006	0.0019	0.0006	0.0019

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2019	**CorrCoff**	1.00000

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
9	0.0000	0.0000	0.0000	V	V	0.0000
9	0.1000	0.1001	0.0997	V	V	-0.0004
9	0.3000	0.3004	0.2997	V	V	-0.0007
9	0.5000	0.5008	0.5004	V	V	-0.0004
9	0.7000	0.7011	0.7002	V	V	-0.0009
9	0.9000	0.9020	0.9019	V	V	-0.0001
9	1.0000	1.0049	1.0030	V	V	-0.0019

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Alicat	Illgeible	ACA416	Korey Devins	09/18/2019	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	3/4/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0
0.43%	0.65%			**Cal Factor Full Scale**	0
				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	0.01	0.0000	0.04	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.0000	0.03	l/m	l/m	
primary	test pt 1	1.529	1.530	1.50	0.0000	1.52	l/m	l/m	-0.65%
primary	test pt 2	1.525	1.520	1.50	0.0000	1.52	l/m	l/m	0.00%
primary	test pt 3	1.531	1.530	1.50	0.0000	1.52	l/m	l/m	-0.65%

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**	1.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	140 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-74536-376	ACA416	Korey Devins	09/18/2019	Ozone	90744

Slope:	1.06837	**Slope:**	0.00000
Intercept	-1.25419	**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	1.00800	**Intercept**	-0.40210
Cert Date	3/26/2019	**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	0.37	-0.71	ppb		-1.08
primary	2	14.74	15.02	14.79	ppb		-0.23
primary	3	34.95	35.07	36.23	ppb	3.25	
primary	4	68.14	67.99	70.99	ppb	4.32	
primary	5	113.60	113.09	119.80	ppb	5.76	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	1.20	pass
Span	1.105	pass
Zero Voltage	-0.0004	pass
Fullscale Voltage	10.0000	pass
Cell A Freq.	88.5 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.72 lpm	pass
Cell A Pressure	734.1 mmHg	pass
Cell A Tmp.	33.2 C	pass
Cell B Freq.	81.8 kHz	pass
Cell B Noise	0.3 ppb	pass
Cell B Flow	0.65 lpm	pass
Cell B Pressure	734.6 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Wind Direction Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	ACA416	Korey Devins	09/18/2019	Wind Direction	none

Mfg	Climatronics	
SN/Owner ID	683	none
Parameter:	F460 translator	

Vane SN: 1491 **C. A. Align. deg. true:**

VaneTorque 5 **to** 18 360

Mfg	Ushikata	**Parameter**	wind direction	
Serial Number	191832	**Tfer Desc.**	transit	
Tfer ID	01272			
Slope	1.00000	**Intercept**	0.00000	
Cert Date	1/23/2019	**CorrCoff**	1.00000	
Mfg	RM Young	**Parameter**	wind direction	
Serial Number	None	**Tfer Desc.**	wind direction wheel	
Tfer ID	01252			
Slope	1.00000	**Intercept**	0.00000	
Cert Date	4/26/2013	**CorrCoff**	1.00000	

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	3.8	1.8		
Abs Max Err	5	3		

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01252	0	☑	0.0000	358	2	47.5	2.5
primary	01252	45	☑	0.0000	41	4	42.54	-2.4
primary	01252	90	☑	0.0000	86	4	45.51	0.5
primary	01252	135	☑	0.0000	128	7	41.85	-3.1
primary	01252	180	☑	0.0000	176	4	47.3	2.2
primary	01252	225	☑	0.0000	221	4	45.7	0.7
primary	01252	270	☑	0.0000	265	5	43.5	-1.5
primary	01252	315	☑	0.0000	311	4	46.1	1
primary	01272	90	☐	0.0000	86	4		4
primary	01272	180	☐	0.0000	176	4		4
primary	01272	270	☐	0.0000	265	5		5
primary	01272	360	☐	0.0000	358	2		2

Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Mast	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	Functioning	**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Vane Condition	**Condition**	Good	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Wind Speed Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	ACA416	Korey Devins	09/18/2019	Wind Speed	none

Mfg	Climatronics		
SN/Owner ID	683	none	
Parameter:	F460 translator		
Prop or Cups SN	2033		
Prop or Cups Torque	0.4	**to**	0.5
Prop Correction Facto	N/A		

Mfg	RM Young	**Parameter**	wind speed	
Serial Number	CA04013	**Tfer Desc.**	wind speed motor (l	
Tfer ID	01254			
Slope	1.00000	**Intercept**	0.00000	
Cert Date	4/16/2019	**CorrCoff**	1.00000	
Mfg	RM Young	**Parameter**	wind speed	
Serial Number	CA4353	**Tfer Desc.**	wind speed motor (h	
Tfer ID	01457			
Slope	1.00000	**Intercept**	0.00000	
Cert Date	4/16/2019	**CorrCoff**	1.00000	

	DAS 1:		DAS 2:	
	Low Range	**High Range:**	**Low Range**	**High Range:**
Abs Avg Err	0.13	7.27%		
Abs Max Err	0.21	25.69%		

UseDescription:	Input Device	Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.20	0.0	0.3		0.10	
primary	01254	50	1.40	0.0	1.2		-0.19	
primary	01254	100	2.57	0.0	2.6		-0.01	
primary	01254	170	4.22	0.0	4.0		-0.21	
primary	01254	250	6.10	0.0	5.9	-2.79%		
primary	01457	500	11.97	0.0	12.0	0.50%		
primary	01457	800	19.02	0.0	19.0	0.11%		
primary	01457	2000	47.22	0.0	35.1	-25.69%		

Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Prop or Cups Condition	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	Functioning	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	missing	ACA416	Korey Devins	09/18/2019	Temperature2meter	none

Mfg	Climatronics
SN/Owner ID	401 03630
Parameter:	Temperature Translator

Mfg	Extech	Parameter	Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00733	Intercept	0.14497
Cert Date	2/12/2019	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.12	0.28		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.52	0.37	0.0000	0.65	C	0.28
primary	Temp Mid Range	28.28	27.93	0.0000	27.91	C	-0.02
primary	Temp High Rang	47.22	46.73	0.0000	46.78	C	0.05

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

Solar Radiation Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY16746	ACA416	Korey Devins	09/18/2019	Solar Radiation	none

Mfg	Eppley	**Parameter**	solar radiation
Serial Number	10765	**Tfer Desc.**	SR transfer translato
Tfer ID	01246		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2019	**CorrCoff**	1.00000

Mfg	Eppley	**Parameter**	solar radiation
Serial Number	34341F3	**Tfer Desc.**	SR transfer sensor
Tfer ID	01245		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
% Diff of Avg	%Diff of Max	%Diff of Avg:	%Diff of Max
0.0%	0.0%	0.0%	0.0%

Sensor Component	Sensor Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Sensor Level	**Condition**	Level	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

Humidity Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Rotronic	67857	ACA416	Korey Devins	09/18/2019	Relative Humidity	none

Mfg	AZ Instruments	**Parameter**	Relative Humidity
Serial Number	10325189	**Tfer Desc.**	Psychrometer
Tfer ID	01223		
Slope	1.01540	**Intercept**	-1.34560
Cert Date	2/6/2019	**CorrCoff**	0.99994

	DAS 1:		DAS 2:	
	Low Range:	**High Range:**	**Low Range:**	**High Range:**
Abs Avg Err	1.4			
Abs Max Err	2.2			

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	Psychrometer	52.9	42.1	42.8	0.0000	43.4	0.6
primary	RH Low Range	Psychrometer	75.3	78.5	78.6	0.0000	76.4	-2.2

Sensor Component	RH Filter	**Condition**	Clean	**Status**	pass
Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower	**Condition**	Functioning	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Precipitation Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	ACA416	Korey Devins	09/18/2019	Precipitation	01322

DAS 1:

A Avg % Diff:	A Max % Dif
2.0%	2.0%

DAS 2:

A Avg %Diff	A Max % Dif

Mfg	PMP	**Parameter**	Precipitation
Serial Number	EW-06134-50	**Tfer Desc.**	250ml graduate
Tfer ID	01250		
Slope	1.00000	**Intercept**	0.00000
Cert Date	9/5/2005	**CorrCoff**	1.00000

UseDesc.	Test type	TferVolume	Iteration	TimePerTip	Eq.Ht	DAS eng	Eq.HtUnit	OSE Unit	TferUnits	PctDifference
primary	test 1	231.5	1	10 sec	5.00	4.90	mm	mm	ml	-2.0%
primary	test 2	231.5	2	10 sec	5.00	4.90	mm	mm	ml	-2.0%

Sensor Component		Condition		Status	
Sensor Component	Properly Sited	Condition	45 degree rule	Status	pass
Sensor Component	Gauge Drain Screen	Condition	Not installed	Status	pass
Sensor Component	Funnel Clean	Condition	Moderately clean	Status	pass
Sensor Component	Condition	Condition	Fair	Status	pass
Sensor Component	Gauge Screen	Condition	Installed	Status	pass
Sensor Component	Gauge Clean	Condition	Moderately clean	Status	pass
Sensor Component	Level	Condition	Level	Status	pass
Sensor Component	Sensor Heater	Condition	Not functioning	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
Agilaire	None	ACA416	Korey Devins	09/18/2019	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
1.83	2.09		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00733	Intercept	0.14497
Cert Date	2/12/2019	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.80	24.48	0.000	25.9	C	1.42
primary	Temp Mid Range	24.20	23.88	0.000	25.9	C	1.99
primary	Temp Mid Range	24.02	23.70	0.000	25.8	C	2.09

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	ACA416	Technician	Korey Devins	Site Visit Date	09/18/2019

Shelter Make	Shelter Model	Shelter Size
Custom	Unknown	Unknown

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	Good	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	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	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Solar Radiation	ACA416	Korey Devins	09/18/2019	System Memo	Licor	4019	☐	☐
Additional details can be found in the hardcopy of the site audit report.								
Wind Speed	ACA416	Korey Devins	09/18/2019	Accuracy High R	Climatronics	4393	☐	☐
Additional details can be found in the hardcopy of the site audit report.								

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

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

2 **Parameter:** SiteOpsProcedures

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

3 **Parameter:** ShelterCleanNotes

The shelter is new, clean and well organized. Equipment is still being moved from the old shelter.

4 **Parameter:** MetSensorComme

The wind speed sensor response at the high speed test was much lower than expected. This condition has been observed and reported during previous audits.

5 **Parameter:** MetOpMaintCom

The surface wetness sensor is no longer operated. Although the solar radiation system was audited with the EEMS standard, the data were not recorded due to the flag set incorrectly on the DAS. Visual comparisons of the data were observed to be approximately 8% different throughout the day.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	ACA416	**Technician**	Korey Devins	**Site Visit Date**	09/18/2019

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

Shelter Working Room ☑ **Make** Custom **Model** Unknown **Shelter Size** Unknown

Shelter Clean ☑ **Notes** The shelter is new, clean and well organized. Equipment is still being moved from the old shelter.

Site OK ☑ **Notes**

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

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID ACA416 **Technician** Korey Devins **Site Visit Date** 09/18/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m	25 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	ACA416	Technician	Korey Devins	Site Visit Date	09/18/2019

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?	☑	
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 wind speed sensor response at the high speed test was much lower than expected. This condition has been observed and reported during previous audits.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	ACA416	Technician	Korey Devins	Site Visit Date	09/18/2019

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	
2	Are all the meteorological sensors operational online, and reporting data?	☑	
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☑	
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	
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 surface wetness sensor is no longer operated. Although the solar radiation system was audited with the EEMS standard, the data were not recorded due to the flag set incorrectly on the DAS. Visual comparisons of the data were observed to be approximately 8% different throughout the day.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	ACA416	Technician	Korey Devins	Site Visit Date	09/18/2019

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID	ACA416	Technician	Korey Devins	Site Visit Date	09/18/2019

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	ACA416	Technician	Korey Devins	Site Visit Date	09/18/2019

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	ACA416	Technician	Korey Devins	Site Visit Date	09/18/2019

Site operation procedures

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

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	ACA416	Technician	Korey Devins	Site Visit Date	09/18/2019

Site operation procedures

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

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

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

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

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID ACA416 **Technician** Korey Devins **Site Visit Date** 09/18/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	8460p	CNU20941M6	none
DAS	Environmental Sys Corp	8832	A3506K	none
Elevation	Elevation	1	None	None
F460 translator	Climatronics	100163	683	none
Flow Rate	Alicat	MC-10SLPM-D-PCV	Illgeible	none
Infrastructure	Infrastructure	none	none	none
Mainframe	Climatronics	100081	1288	01342
Met tower	Climatronics	unknown	illegible	none
Ozone	ThermoElectron Inc	49C	49C-74536-376	90744
Ozone Standard	T-API	T-703V	71	none
Precipitation	Climatronics	100508-2	illegible	01322
Relative Humidity	Rotronic	MP 601A	67857	none
Sample Tower	Aluma Tower	B	AT-71103-7I-3	none
Shelter Temperature	Agilaire	Unknown	None	none
Shield (2 meter)	Climatronics	100325	illegible	none
Siting Criteria	Siting Criteria	1	None	None
Solar Radiation	Licor	LI-200	PY16746	none
Temperature Translator	Climatronics	100088-2	401	03630
Temperature2meter	Climatronics	100093	missing	none
Wind Direction	Climatronics	100076	illegible	none
Wind Speed	Climatronics	100075	illegible	none
Zero air pump	ThermoElectron Inc	111	111-30215-237	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
VPI120-Sandy Grenville-09/24/2019						
1	9/24/2019	Computer	Dell	07032	Inspiron 15	Unknown
2	9/24/2019	DAS	Campbell	000402	CR3000	2514
3	9/24/2019	Elevation	Elevation	None	1	None
4	9/24/2019	Filter pack flow pump	Thomas	02751	107CAB18	1192001884
5	9/24/2019	Flow Rate	Apex	000591	AXMC105LPMDPCV	illegible
6	9/24/2019	Infrastructure	Infrastructure	none	none	none
7	9/24/2019	Modem	Digi	07203	LR54	unknown
8	9/24/2019	Ozone	ThermoElectron Inc	000690	49i A1NAA	1030244800
9	9/24/2019	Ozone Standard	ThermoElectron Inc	000328	49i A3NAA	0622717850
10	9/24/2019	Sample Tower	Aluma Tower	none	B	unknown
11	9/24/2019	Shelter Temperature	Campbell	none	107-L	none
12	9/24/2019	Siting Criteria	Siting Criteria	None	1	None
13	9/24/2019	Temperature	RM Young	04318	41342	4037
14	9/24/2019	Zero air pump	Werther International	06910	C 70/4	000829160

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2514	VPI120	Sandy Grenville	09/24/2019	DAS	Primary

Das Date: 9 /24/2019
Das Time: 12:53:00
Das Day: 267

Audit Date 9 /24/2019
Audit Time 12:53:00
Audit Day 267

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2019	**CorrCoff**	1.00000

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0998	0.0999	V	V	0.0001
7	0.3000	0.2997	0.2997	V	V	0.0000
7	0.5000	0.4996	0.4996	V	V	0.0000
7	0.7000	0.6995	0.6995	V	V	0.0000
7	0.9000	0.8994	0.8993	V	V	-0.0001
7	1.0000	0.9992	0.9992	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	VPI120	Sandy Grenville	09/24/2019	Flow Rate	000591

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00000	**Intercept**	0.00000
Cert Date	3/4/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0
0.00%	0.00%			**Cal Factor Full Scale**	0.99
				Rotometer Reading:	1.65

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	0.00	0.000	0.01	l/m	l/m	
primary	test pt 1	1.505	1.500	1.51	0.000	1.50	l/m	l/m	0.00%
primary	test pt 2	1.504	1.500	1.51	0.000	1.50	l/m	l/m	0.00%
primary	test pt 3	1.505	1.500	1.51	0.000	1.50	l/m	l/m	0.00%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	Not tested	**Status**	pass
Sensor Component	Filter Depth	**Condition**	Not tested	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	200 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	1030244800	VPI120	Sandy Grenville	09/24/2019	Ozone	000690

Slope:	0.96526	**Slope:**	0.00000
Intercept	-0.04806	**Intercept**	0.00000
CorrCoff:	0.99996	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	0.99840	**Intercept**	0.27090
Cert Date	6/11/2019	**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	0.28	0.00	0.41	ppb		0.41
primary	2	14.74	14.49	13.89	ppb		-0.6
primary	3	35.40	35.18	33.47	ppb	-4.98	
primary	4	67.52	67.35	64.69	ppb	-4.03	
primary	5	114.20	114.11	110.40	ppb	-3.3	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.000	pass
Span	0.998	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	104.5 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.66 lpm	pass
Cell A Pressure	655.4 mmHg	pass
Cell A Tmp.	37.3 C	pass
Cell B Freq.	89.9 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.66 lpm	pass
Cell B Pressure	655.1 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4037	VPI120	Sandy Grenville	09/24/2019	Temperature	04318

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00733	**Intercept**	0.14497
Cert Date	2/12/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.03	0.05		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.25	0.10	0.000	0.1	C	0.03
primary	Temp Mid Range	25.76	25.43	0.000	25.4	C	0
primary	Temp High Range	47.87	47.38	0.000	47.3	C	-0.05

Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	VPI120	Sandy Grenville	09/24/2019	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.72	0.87		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00733	Intercept	0.14497
Cert Date	2/12/2019	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.10	24.77	0.000	25.3	C	0.55
primary	Temp Mid Range	24.24	23.92	0.000	24.8	C	0.87
primary	Temp Mid Range	26.04	25.71	0.000	26.5	C	0.75

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	VPI120	Technician	Sandy Grenville	Site Visit Date	09/24/2019

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2107-3)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Fair	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Fair	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

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is on a wooded hillside. The temperature sensor and sample inlet are at the tree tops of the downhill trees. The uphill tree line is 20 meters away.

2 **Parameter:** ShelterCleanNotes

The shelter is clean, neat, and well organized. Floor tiles are loose and the paneling is deteriorating.

3 **Parameter:** MetSensorComme

The temperature sensor is 10 meters from small pond.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	VPI120	**Technician**	Sandy Grenville	**Site Visit Date**	09/24/2019

Site Sponsor (agency)	EPA	**USGS Map**	Eggleston
Operating Group	VA Tech	**Map Scale**	
AQS #	51-071-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	37.3300
Deposition Measurement	dry, wet	**QAPP Longitude**	-80.5573
Land Use	woodland - mixed	**QAPP Elevation Meters**	920
Terrain	complex	**QAPP Declination**	7.9
Conforms to MLM	No	**QAPP Declination Date**	1/31/2007
Site Telephone		**Audit Latitude**	37.329832
Site Address 1	Mountain Lake Rd.	**Audit Longitude**	-80.55751
Site Address 2	Jefferson National Forest	**Audit Elevation**	920
County	Giles	**Audit Declination**	-7.8
City, State	Newport, VA		
Zip Code	24128	**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 Steps** ☑	

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2107-3)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is clean, neat, and well organized. Floor tiles are loose and the paneling is deteriorating.				
Site OK	☑	**Notes**					

Driving Directions

From Blacksburg go west on route 460 approximately 10 miles. Turn right (north) onto route 700, Mountain Lake Rd., toward Mountain Lake Resort. There is a sign for Virginia Tech and Horton Station. Continue on 700 up the mountain. Turn right at the sign for Horton Station on the gravel drive into the research center.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID VPI120 **Technician** Sandy Grenville **Site Visit Date** 09/24/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m	20 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

The site is on a wooded hillside. The temperature sensor and sample inlet are at the tree tops of the downhill trees. The uphill tree line is 20 meters away.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	VPI120	Technician	Sandy Grenville	Site Visit Date	09/24/2019

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)	☐	10 meters from pond
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 10 meters from small pond.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	VPI120	Technician	Sandy Grenville	Site Visit Date	09/24/2019

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?	☑	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	VPI120	Technician	Sandy Grenville	Site Visit Date	09/24/2019

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?	☑	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 VPI120 **Technician** Sandy Grenville **Site Visit Date** 09/24/2019

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?	Met tower removed	

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	VPI120	Technician	Sandy Grenville	Site Visit Date	09/24/2019

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 2001	☐
HASP	☑	Feb 2014	☑
Field Ops Manual	☑	July 1990	☐
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	VPI120	Technician	Sandy Grenville	Site Visit Date	09/24/2019

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	☑	N/A	☑
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	☑	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	☐		☐
Zero Air Desiccant Check	☑	Weekly	☑

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	VPI120	Technician	Sandy Grenville	Site Visit Date	09/24/2019

Site operation procedures

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

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

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 VPI120 **Technician** Sandy Grenville **Site Visit Date** 09/24/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07032
DAS	Campbell	CR3000	2514	000402
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	1192001884	02751
Flow Rate	Apex	AXMC105LPMDPC	illegible	000591
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07203
Ozone	ThermoElectron Inc	49i A1NAA	1030244800	000690
Ozone Standard	ThermoElectron Inc	49i A3NAA	0622717850	000328
Sample Tower	Aluma Tower	B	unknown	none
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	4037	04318
Zero air pump	Werther International	C 70/4	000829160	06910

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PAR107-Sandy Grenville-09/25/2019					
1 9/25/2019	Computer	Dell	07072	Inspiron 15	Unknown
2 9/25/2019	DAS	Campbell	000333	CR3000	2112
3 9/25/2019	Elevation	Elevation	None	1	None
4 9/25/2019	Filter pack flow pump	Thomas	00859	107CA18	missing
5 9/25/2019	Flow Rate	Apex	000803	AXMC105LPMDPCV	50752
6 9/25/2019	Infrastructure	Infrastructure	none	none	none
7 9/25/2019	Modem	Digi	07160	LR54	unknown
8 9/25/2019	Ozone	ThermoElectron Inc	000689	49i A1NAA	1030244802
9 9/25/2019	Ozone Standard	ThermoElectron Inc	000436	49i A3NAA	CM08200012
10 9/25/2019	Sample Tower	Aluma Tower	000838	B	unknown
11 9/25/2019	Shelter Temperature	Campbell	none	107-L	none
12 9/25/2019	Siting Criteria	Siting Criteria	None	1	None
13 9/25/2019	Temperature	RM Young	04316	41342VO	4013
14 9/25/2019	Zero air pump	Werther International	06907	C 70/4	000829179

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2112	PAR107	Sandy Grenville	09/25/2019	DAS	Primary

Das Date: 9 /25/2019
Das Time: 13:30:00
Das Day: 268

Audit Date 9 /25/2019
Audit Time 13:30:00
Audit Day 268

Low Channel:

Avg Diff:	Max Diff:
0.0000	0.0001

High Channel:

Avg Diff:	Max Diff:
0.0000	0.0001

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/25/2019	**CorrCoff**	1.00000

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2997	0.2997	V	V	0.0000
7	0.5000	0.4995	0.4995	V	V	0.0000
7	0.7000	0.6995	0.6994	V	V	-0.0001
7	0.9000	0.8993	0.8993	V	V	0.0000
7	1.0000	0.9992	0.9992	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	50752	PAR107	Sandy Grenville	09/25/2019	Flow Rate	000803

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00000	**Intercept**	0.00000
Cert Date	3/4/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.02
2.17%	2.60%			**Cal Factor Full Scale**	0.97
				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	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.02	l/m	l/m	
primary	test pt 1	1.537	1.540	1.54	0.000	1.50	l/m	l/m	-2.60%
primary	test pt 2	1.538	1.540	1.54	0.000	1.51	l/m	l/m	-1.95%
primary	test pt 3	1.540	1.540	1.54	0.000	1.51	l/m	l/m	-1.95%

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**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244802	PAR107	Sandy Grenville	09/25/2019	Ozone	000689

Slope:	0.98162	**Slope:**	0.00000
Intercept	-0.62791	**Intercept**	0.00000
CorrCoff	0.99985	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	0.99840	**Intercept**	0.27090
Cert Date	6/11/2019	**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	0.36	0.08	-1.11	ppb		-1.19
primary	2	15.20	14.95	13.78	ppb		-1.17
primary	3	33.83	33.61	33.70	ppb	0.27	
primary	4	68.18	68.01	65.77	ppb	-3.35	
primary	5	111.42	111.32	108.50	ppb	-2.57	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.10	pass
Span	1.009	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	85.4 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.43 lpm	pass
Cell A Pressure	680.1 mmHg	pass
Cell A Tmp.	35.8 C	pass
Cell B Freq.	86.6 kHz	pass
Cell B Noise	0.4 ppb	pass
Cell B Flow	0.51 lpm	pass
Cell B Pressure	680.7 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4013	PAR107	Sandy Grenville	09/25/2019	Temperature	04316

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00733	**Intercept**	0.14497
Cert Date	2/12/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.22	0.50		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.23	0.08	0.000	0.1	C	0.05
primary	Temp Mid Range	26.17	25.84	0.000	25.7	C	-0.12
primary	Temp High Range	48.70	48.20	0.000	47.7	C	-0.5

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	PAR107	Technician	Sandy Grenville	Site Visit Date	09/25/2019

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	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	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The city of Parsons, estimated population 1500, is within 5 km of the site.

2 **Parameter:** ShelterCleanNotes

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	PAR107	Sandy Grenville	09/25/2019	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.44	0.61		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00733	Intercept	0.14497
Cert Date	2/12/2019	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	27.01	26.67	0.000	27.3	C	0.61
primary	Temp Mid Range	29.57	29.21	0.000	28.8	C	-0.41
primary	Temp Mid Range	25.66	25.33	0.000	25.6	C	0.31

Sensor Component	System Memo	Condition		Status	pass

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	PAR107	**Technician**	Sandy Grenville	**Site Visit Date**	09/25/2019

Site Sponsor (agency)	EPA/USFS	**USGS Map**	Parsons
Operating Group	USFS	**Map Scale**	
AQS #	54-093-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**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**	39.090434
Site Address 1	USFS Timber & Watershed Lab	**Audit Longitude**	-79.661742
Site Address 2	Rt. 219, Nursery Bottom	**Audit Elevation**	510
County	Parsons	**Audit Declination**	-9
City, State	Parsons, WV		
Zip Code	26287	**Fire Extinguisher** ☑	Inspected Nov 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**	The shelter is in good condition, clean, neat, and well organized.				
Site OK	☑	**Notes**					

Driving Directions Take highway 33W to Elkins WV. Turn onto 19N to Parsons. Continue through town to the Nursery Bottom Reservoir. The site entrance is on the right next to the visitors center.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID PAR107 **Technician** Sandy Grenville **Site Visit Date** 09/25/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km	2.5 km	☐
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

The city of Parsons, estimated population 1500, is within 5 km of the site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	PAR107	Technician	Sandy Grenville	Site Visit Date	09/25/2019

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	PAR107	Technician	Sandy Grenville	Site Visit Date	09/25/2019

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?	☑	
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	PAR107	Technician	Sandy Grenville	Site Visit Date	09/25/2019

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID PAR107 **Technician** Sandy Grenville **Site Visit Date** 09/25/2019

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?	Met tower removed	

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID PAR107 **Technician** Sandy Grenville **Site Visit Date** 09/25/2019

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	☑	July 1990	☐
HASP	☑	Feb 2014	☑
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?	☑	Minimal information
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	PAR107	Technician	Sandy Grenville	Site Visit Date	09/25/2019

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?	☑	
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:

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID PAR107 **Technician** Sandy Grenville **Site Visit Date** 09/25/2019

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?	☑	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?	☑	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	☐		☐

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 PAR107 **Technician** Sandy Grenville **Site Visit Date** 09/25/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07072
DAS	Campbell	CR3000	2112	000333
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	missing	00859
Flow Rate	Apex	AXMC105LPMDPC	50752	000803
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07160
Ozone	ThermoElectron Inc	49i A1NAA	1030244802	000689
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200012	000436
Sample Tower	Aluma Tower	B	unknown	000838
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VO	4013	04316
Zero air pump	Werther International	C 70/4	000829179	06907

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
LRL117-Sandy Grenville-09/26/2019						
1	9/26/2019	Computer	Dell	07010	D520	unknown
2	9/26/2019	DAS	Campbell	000344	CR300	2123
3	9/26/2019	Elevation	Elevation	None	1	None
4	9/26/2019	Filter pack flow pump	Thomas	01133	107CA18	1088003123
5	9/26/2019	Flow Rate	Apex	000460	AXMC105LPMDPCV	42229
6	9/26/2019	Infrastructure	Infrastructure	none	none	none
7	9/26/2019	Ozone	ThermoElectron Inc	000701	49i A1NAA	1030244808
8	9/26/2019	Ozone Standard	ThermoElectron Inc	000444	49i A3NAA	CM08200020
9	9/26/2019	Sample Tower	Aluma Tower	000783	B	none
10	9/26/2019	Shelter Temperature	Campbell	none	107-L	none
11	9/26/2019	Siting Criteria	Siting Criteria	None	1	None
12	9/26/2019	Temperature	RM Young	06245	41342VC	12792
13	9/26/2019	Zero air pump	Werther International	06904	C 70/4	000821901

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2123	LRL117	Sandy Grenville	09/26/2019	DAS	Primary

Das Date: 9 /26/2019
Das Time: 13:44:00
Das Day: 269

Audit Date 9 /26/2019
Audit Time 13:44:00
Audit Day 269

Low Channel:
Avg Diff: 0.0000
Max Diff: 0.0001

High Channel:
Avg Diff: 0.0000
Max Diff: 0.0001

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

Mfg Fluke
Parameter DAS
Serial Number 95740135
Tfer Desc. DVM
Tfer ID 01311
Slope 1.00000
Intercept 0.00000
Cert Date 1/25/2019
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0001	V	V	0.0001
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2997	0.2997	V	V	0.0000
7	0.5000	0.4996	0.4996	V	V	0.0000
7	0.7000	0.6995	0.6995	V	V	0.0000
7	0.9000	0.8993	0.8993	V	V	0.0000
7	1.0000	0.9992	0.9992	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	42229	LRL117	Sandy Grenville	09/26/2019	Flow Rate	000460

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00000	**Intercept**	0.00000
Cert Date	3/4/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.03
0.45%	0.67%			**Cal Factor Full Scale**	0.97
				Rotometer Reading:	1.7

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	-0.02	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	1.494	1.490	1.53	0.000	1.49	l/m	l/m	0.00%
primary	test pt 2	1.496	1.500	1.53	0.000	1.49	l/m	l/m	-0.67%
primary	test pt 3	1.497	1.500	1.53	0.000	1.49	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**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	160 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	1030244808	LRL117	Sandy Grenville	09/26/2019	Ozone	000701

Slope:	0.98045	**Slope:**	0.00000
Intercept	-0.50137	**Intercept**	0.00000
CorrCoff:	0.99994	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	0.99840	**Intercept**	0.27090
Cert Date	6/11/2019	**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	0.43	0.15	-0.44	ppb		-0.59
primary	2	15.11	14.86	13.87	ppb		-0.99
primary	3	37.40	37.18	35.85	ppb	-3.64	
primary	4	68.12	67.95	66.94	ppb	-1.5	
primary	5	112.84	112.74	109.60	ppb	-2.82	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.10	pass
Span	1.011	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	129.0 kHz	pass
Cell A Noise	0.90 ppb	pass
Cell A Flow	0.65 lpm	pass
Cell A Pressure	691.3 mmHg	pass
Cell A Tmp.	35.5 C	pass
Cell B Freq.	90.8 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	690.7 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	12792	LRL117	Sandy Grenville	09/26/2019	Temperature	06245

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00733	**Intercept**	0.14497
Cert Date	2/12/2019	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.22	0.34		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.21	0.06	0.000	0.3	C	0.26
primary	Temp Mid Range	24.83	24.51	0.000	24.5	C	-0.05
primary	Temp High Range	48.92	48.42	0.000	48.1	C	-0.34

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	LRL117	Sandy Grenville	09/26/2019	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.56	0.94		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00733	Intercept	0.14497
Cert Date	2/12/2019	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	29.80	29.44	0.000	28.5	C	-0.94
primary	Temp Mid Range	28.20	27.85	0.000	27.8	C	-0.01
primary	Temp Mid Range	25.50	25.17	0.000	25.9	C	0.72

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	LRL117	Technician	Sandy Grenville	Site Visit Date	09/26/2019

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	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	Fair	Status	pass
Sensor Component	Shelter Floor	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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

Ozone sample line leak checks conducted every other week following the inlet filter replacements.

2 **Parameter:** ShelterCleanNotes

The shelter is in good condition. A new peaked roof has been installed.

3 **Parameter:** MetOpMaintCom

The temperature sensor shield has moss growing on it and should be cleaned.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	LRL117	**Technician**	Sandy Grenville	**Site Visit Date**	09/26/2019

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	private/PADNR	**Map Scale**	
AQS #	42-111-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**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**	39.988309
Site Address 1	Laurel Hill State Park	**Audit Longitude**	-79.251573
Site Address 2	1447 Laurel Hill State Park Rd.	**Audit Elevation**	609
County		**Audit Declination**	-9
City, State	Somerset, PA		
Zip Code	15501	**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** ☐	Locked gate
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**	The shelter is in good condition. A new peaked roof has been installed.				
Site OK	☑	**Notes**					
Driving Directions	From Somerset take 30 west						

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID LRL117 **Technician** Sandy Grenville **Site Visit Date** 09/26/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m	30 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	LRL117	Technician	Sandy Grenville	Site Visit Date	09/26/2019

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	LRL117	Technician	Sandy Grenville	Site Visit Date	09/26/2019

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?	☑	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:

The temperature sensor shield has moss growing on it and should be cleaned.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	LRL117	Technician	Sandy Grenville	Site Visit Date	09/26/2019

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID LRL117 **Technician** Sandy Grenville **Site Visit Date** 09/26/2019

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	LRL117	Technician	Sandy Grenville	Site Visit Date	09/26/2019

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

1	Is the station log properly completed during every site visit?	☑	Minimal information
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	LRL117	Technician	Sandy Grenville	Site Visit Date	09/26/2019

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	☑	N/A	☑
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?	☑	
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	Logbook, call-in

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

Ozone sample line leak checks conducted every other week following the inlet filter replacements.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID LRL117 **Technician** Sandy Grenville **Site Visit Date** 09/26/2019

Site operation procedures

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

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

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

Field Systems Data Form F-02058-1500-S10-rev002

Site ID LRL117 **Technician** Sandy Grenville **Site Visit Date** 09/26/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	07010
DAS	Campbell	CR300	2123	000344
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	1088003123	01133
Flow Rate	Apex	AXMC105LPMDPC	42229	000460
Infrastructure	Infrastructure	none	none	none
Ozone	ThermoElectron Inc	49i A1NAA	1030244808	000701
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200020	000444
Sample Tower	Aluma Tower	B	none	000783
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	12792	06245
Zero air pump	Werther International	C 70/4	000821901	06904

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: 1/28/2020 19:44:32

SiteVisitDate	Site	Technician
09/25/2019	ABT147	Korey Devins

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	0.99630	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.32338	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.3	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.32	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.39	ppb	**P**

EEMS Spot Report

Data Compiled: 1/28/2020 19:21:17

SiteVisitDate	Site	Technician
09/18/2019	ACA416	Korey Devins

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	0.12	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.28	c	**P**
3	Wind Speed average error below 5m/s in m/s	P	3	0.5	12	0.13	m/s	**P**
4	Wind Speed max error below 5m/s in m/s	P	3	0.5	12	0.21	m/s	**P**
5	Wind Speed average % difference above 5 m/s	P	3	5	12	7.3	%	**Fail**
6	Wind Speed max % difference above 5 m/s	P	3	5	12	25.7	%	**Fail**
7	Wind Speed Torque average error	P	3	0.5	1	0.45	g-cm	**P**
8	Wind Speed Torque max error	P	3	0.5	1	0.5	g-cm	**Fail**
9	Wind Direction Input Deg True average error (de	P	2	5	12	3.8	degrees	**P**
10	Wind Direction Input Deg True max error (deg)	P	2	5	12	5	degrees	**P**
11	Wind Direction Linearity average error (deg)	P	2	5	24	1.7	degrees	**P**
12	Wind Direction Linearity max error (deg)	P	2	5	24	3	degrees	**P**
13	Wind Direction Torque average error	P	2	30	1	12	g-cm	**P**
14	Wind Direction Torque max error	P	2	30	1	18	g-cm	**P**
15	Relative Humidity average below 85%	P	6	10	6	1.4	%	**P**
16	Relative Humidity max below 85%	P	6	10	6	2.2	%	**P**
17	Precipitation average % difference	P	1	10	2	2.0	%	**P**
18	Precipitation max % difference	P	1	10	2	2.0	%	**P**
19	Ozone Slope	P	0	1.1	4	1.06837	unitless	**P**
20	Ozone Intercept	P	0	5	4	-1.25419	ppb	**P**
21	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
22	Ozone % difference avg	P	7	10	4	3.8	%	**P**
23	Ozone Absolute Difference g1	P	7	3	1	-1.08	ppb	**P**
24	Ozone Absolute Difference g2	P	7	1.5	1	-0.23	ppb	**P**
25	Flow Rate average % difference	P	10	5	2	0.44	%	**P**
26	Flow Rate max % difference	P	10	5	2	0.65	%	**P**
27	DAS Voltage average error	P	9	0.003	14	0.0006	V	**P**
28	Shelter Temperature average error	P	5	2	9	1.83	c	**P**
29	Shelter Temperature max error	P	5	2	9	2.09	c	**Fail**

SiteVisitDate	Site	Technician
09/18/2019	ACA416	Korey Devins

Field Performance Comments

1 **Parameter:** Solar Radiation **SensorComponent:** System Memo **CommentCode:** 174

Additional details can be found in the hardcopy of the site audit report.

2 **Parameter:** Wind Speed **SensorComponent:** Accuracy High Ran **CommentCode:** 174

Additional details can be found in the hardcopy of the site audit report.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

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

2 **Parameter:** SiteOpsProcedures

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

3 **Parameter:** ShelterCleanNotes

The shelter is new, clean and well organized. Equipment is still being moved from the old shelter.

4 **Parameter:** MetSensorComme

The wind speed sensor response at the high speed test was much lower than expected. This condition has been observed and reported during previous audits.

5 **Parameter:** MetOpMaintCom

The surface wetness sensor is no longer operated. Although the solar radiation system was audited with the EEMS standard, the data were not recorded due to the flag set incorrectly on the DAS. Visual comparisons of the data were observed to be approximately 8% different throughout the day.

EEMS Spot Report

Data Compiled: 1/26/2020 20:47:52

SiteVisitDate	Site	Technician
08/22/2019	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	1.00901	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.33313	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.8	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.42	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.26	ppb	**P**

EEMS Spot Report

Data Compiled: 1/26/2020 14:53:43

SiteVisitDate	Site	Technician
07/24/2019	ARE128	Sandy Grenville

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	0.97944	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.31014	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.1	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.37	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.78	ppb	**P**

EEMS Spot Report

Data Compiled: 1/28/2020 19:34:14

SiteVisitDate	Site	Technician
09/19/2019	ASH135	Korey Devins

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	0.99454	unitless	**P**
2	Ozone Intercept	P	0	5	4	-2.50547	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99993	unitless	**P**
4	Ozone % difference avg	P	7	10	4	7.4	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-3.14	ppb	**Fail**
6	Ozone Absolute Difference g2	P	7	1.5	1	-2.51	ppb	**Fail**

EEMS Spot Report

Data Compiled: 10/27/2019 17:32:04

SiteVisitDate	Site	Technician
08/19/2019	BAS601	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	0.12	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.21	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99416	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.21771	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99981	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.3	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.05	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.54	ppb	**P**
9	Flow Rate average % difference	P	10	5	6	1.42	%	**P**
10	Flow Rate max % difference	P	10	5	6	1.64	%	**P**
11	Shelter Temperature average error	P	5	2	12	0.43	c	**P**
12	Shelter Temperature max error	P	5	2	12	0.45	c	**P**

SiteVisitDate	Site	Technician
08/19/2019	BAS601	Martin Valvur

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced each month.

2 **Parameter:** DocumentationCo

The filter pack chain-of-custody labels are not being used.

3 **Parameter:** ShelterCleanNotes

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

4 **Parameter:** MetSensorComme

Some objects violate the 45 degree rule for the tipping bucket rain gage. The Temperature shield is mounted on the south side of the tower tripod at 2 meters.

EEMS Spot Report

Data Compiled: 10/27/2019 19:21:54

SiteVisitDate	Site	Technician
08/20/2019	BUF603	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	0.06	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.14	c	**P**
3	Flow Rate average % difference	P	10	5	6	2.86	%	**P**
4	Flow Rate max % difference	P	10	5	6	3.09	%	**P**

SiteVisitDate	Site	Technician
08/20/2019	BUF603	Martin Valvur

Field Systems Comments

1 **Parameter:** DasComments

The NEMA enclosure has a cooling fan.

2 **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 developed by ARS for BLM each week.

3 **Parameter:** ShelterCleanNotes

NEMA enclosure, 120 VAC power

4 **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.

5 **Parameter:** MetSensorComme

The temperature is measured at 2.5 meters above the ground.

EEMS Spot Report

Data Compiled: 1/26/2020 20:20:31

SiteVisitDate	Site	Technician
08/07/2019	CAN407	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	0.97119	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.339	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.5	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.27	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-1.00	ppb	**P**

EEMS Spot Report

Data Compiled: 1/26/2020 19:36:33

SiteVisitDate	Site	Technician
08/05/2019	CHC432	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	P	3	0.5	8	0.05	m/s	**P**
2	Wind Speed max error below 5m/s in m/s	P	3	0.5	8	0.20	m/s	**P**
3	Wind Speed average % difference above 5 m/s	P	3	5	8	0.1	%	**P**
4	Wind Speed max % difference above 5 m/s	P	3	5	8	0.2	%	**P**
5	Wind Speed Torque average error	P	3	0.5	1	0.30	g-cm	**P**
6	Wind Speed Torque max error	P	3	0.5	1	0.3	g-cm	**P**
7	Wind Direction Input Deg True average error (de	P	2	5	8	1.2	degrees	**P**
8	Wind Direction Input Deg True max error (deg)	P	2	5	8	3	degrees	**P**
9	Wind Direction Linearity average error (deg)	P	2	5	16	1.7	degrees	**P**
10	Wind Direction Linearity max error (deg)	P	2	5	16	4	degrees	**P**
11	Wind Direction Torque average error	P	2	30	1	10	g-cm	**P**
12	Wind Direction Torque max error	P	2	30	1	10	g-cm	**P**
13	Relative Humidity average below 85%	P	6	10	3	1.8	%	**P**
14	Relative Humidity max below 85%	P	6	10	3	2.7	%	**P**
15	Solar Radiation % diff of avg	P	9	10	8	1.76	%	**P**
16	Solar Radiation % diff of max STD value	P	9	10	8	3.4	%	**P**
17	Precipitation average % difference	P	1	10	2	2.8	%	**P**
18	Precipitation max % difference	P	1	10	2	3.7	%	**P**
19	Ozone Slope	P	0	1.1	4	0.99233	unitless	**P**
20	Ozone Intercept	P	0	5	4	0.12613	ppb	**P**
21	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
22	Ozone % difference avg	P	7	10	4	0.9	%	**P**
23	Ozone Absolute Difference g2	P	7	1.5	1	-0.3	ppb	**P**
24	DAS Voltage average error	P	8	0.003	21	0.0003	V	**P**
25	Shelter Temperature average error	P	5	2	9	2.32	c	**Fail**
26	Shelter Temperature max error	P	5	2	9	2.88	c	**Fail**

SiteVisitDate	Site	Technician
08/05/2019	CHC432	Martin Valvur

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Dry deposition samples are not collected at this CASTNET site.

EEMS Spot Report

Data Compiled: 1/26/2020 17:04:34

SiteVisitDate	Site	Technician
07/31/2019	CND125	Sandy Grenville

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	0.97601	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.12496	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.9	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.12	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.1	ppb	**P**

EEMS Spot Report

Data Compiled: 1/26/2020 12:02:38

SiteVisitDate	Site	Technician
07/16/2019	CNT169	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	9	0.07	c	**P**
2	Temperature max error	P	4	0.5	9	0.12	c	**P**
3	Ozone Slope	P	0	1.1	4	1.0317	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.05684	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.3	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.03	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.39	ppb	**P**
9	Flow Rate average % difference	P	10	5	8	0.77	%	**P**
10	Flow Rate max % difference	P	10	5	8	0.99	%	**P**
11	DAS Voltage average error	P	7	0.003	63	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	18	0.16	c	**P**
13	Shelter Temperature max error	P	5	2	18	0.41	c	**P**

SiteVisitDate	Site	Technician
07/16/2019	CNT169	Martin Valvur

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone inlet filter is changed once each month.

2 **Parameter:** ShelterCleanNotes

The shelter is dirty. Many floor tiles are old and broken, the floor is deteriorating.

EEMS Spot Report

Data Compiled: 1/26/2020 10:59:50

SiteVisitDate	Site	Technician
07/15/2019	CTH110	Korey Devins

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	0.96273	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.36734	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	-0.42	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.83	ppb	**P**

EEMS Spot Report

Data Compiled: 1/27/2020 14:37:56

SiteVisitDate	Site	Technician
09/05/2019	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	1.03417	unitless	**P**
2	Ozone Intercept	P	0	5	4	1.35257	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
4	Ozone % difference avg	P	7	10	4	6.9	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	1.93	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	1.62	ppb	**Fail**

EEMS Spot Report

Data Compiled: 1/26/2020 20:28:47

SiteVisitDate	Site	Technician
08/08/2019	DIN431	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	0.99070	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.52028	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	-0.22	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.75	ppb	**P**

EEMS Spot Report

Data Compiled: 1/25/2020 19:46:08

SiteVisitDate	Site	Technician
07/03/2019	GLR468	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	0.23	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.31	c	**P**
3	Ozone Slope	P	0	1.1	4	1.038	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.521	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.9	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.08	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.04	ppb	**P**
9	Flow Rate average % difference	P	10	5	4	0.33	%	**P**
10	Flow Rate max % difference	P	10	5	4	0.33	%	**P**
11	DAS Voltage average error	P	15	0.003	63	0.0002	V	**P**
12	Shelter Temperature average error	P	5	2	18	0.99	c	**P**
13	Shelter Temperature max error	P	5	2	18	1.09	c	**P**

SiteVisitDate	Site	Technician
07/03/2019	GLR468	Martin Valvur

Field Systems Comments

1 **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.

2 **Parameter:** ShelterCleanNotes

The shelter is in fair condition. Evidence of repairs to roof leaks attempted. Some floor tiles are loose.

3 **Parameter:** MetSensorComme

The recorded temperature data at this site is measured at approximately 2 meters above the ground.

EEMS Spot Report

Data Compiled: 1/27/2020 15:21:31

SiteVisitDate	Site	Technician
09/16/2019	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	0.97911	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.40853	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.9	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.11	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.99	ppb	**P**

EEMS Spot Report

Data Compiled: 1/26/2020 20:11:55

SiteVisitDate	Site	Technician
08/06/2019	GTH161	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	18	0.09	c	**P**
2	Temperature max error	P	4	0.5	18	0.20	c	**P**
3	Ozone Slope	P	0	1.1	4	1.01969	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.35367	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.8	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.05	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.05	ppb	**P**
9	Flow Rate average % difference	P	10	5	4	1.1	%	**P**
10	Flow Rate max % difference	P	10	5	4	1.32	%	**P**
11	DAS Voltage average error	P	7	0.003	56	0.0002	V	**P**
12	Shelter Temperature average error	P	5	2	18	0.07	c	**P**
13	Shelter Temperature max error	P	5	2	18	0.13	c	**P**

SiteVisitDate	Site	Technician
08/06/2019	GTH161	Martin Valvur

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

Some floor tiles are damaged.

2 **Parameter:** MetSensorComme

The temperature sensor has been moved to the sample tower and mounted in a naturally aspirated shield facing south and over the shelter roof. The met tower has been removed.

EEMS Spot Report

Data Compiled: 1/26/2020 21:04:33

SiteVisitDate	Site	Technician
08/23/2019	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	0.99012	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.37417	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.2	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.26	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.55	ppb	**P**

EEMS Spot Report

Data Compiled: 1/25/2020 19:56:31

SiteVisitDate	Site	Technician
07/05/2019	HWF187	Korey Devins

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	0.97682	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.2718	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.1	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.35	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.66	ppb	**P**

EEMS Spot Report

Data Compiled: 1/26/2020 15:01:46

SiteVisitDate	Site	Technician
07/24/2019	KEF112	Korey Devins

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	1.00429	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.46454	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	-0.44	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.28	ppb	**P**

EEMS Spot Report

Data Compiled: 10/27/2019 16:47:22

SiteVisitDate	Site	Technician
09/26/2019	LRL117	Sandy Grenville

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	0.22	c	**P**
2	Temperature max error	P	4	0.5	15	0.34	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98045	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.50137	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99994	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.6	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.59	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.99	ppb	**P**
9	Flow Rate average % difference	P	10	5	6	0.44	%	**P**
10	Flow Rate max % difference	P	10	5	6	0.67	%	**P**
11	DAS Voltage average error	P	7	0.003	63	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	18	0.56	c	**P**
13	Shelter Temperature max error	P	5	2	18	0.94	c	**P**

SiteVisitDate	Site	Technician
09/26/2019	LRL117	Sandy Grenville

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

Ozone sample line leak checks conducted every other week following the inlet filter replacements.

2 **Parameter:** ShelterCleanNotes

The shelter is in good condition. A new peaked roof has been installed.

3 **Parameter:** MetOpMaintCom

The temperature sensor shield has moss growing on it and should be cleaned.

EEMS Spot Report

Data Compiled: 1/26/2020 15:55:48

SiteVisitDate	Site	Technician
07/25/2019	MKG113	korey Devins

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	0.97286	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.68795	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.7	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.71	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-1.02	ppb	**P**

EEMS Spot Report

Data Compiled: 1/26/2020 14:42:00

SiteVisitDate	Site	Technician
07/23/2019	NEC602	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	0.09	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.16	c	**P**
3	Ozone Slope	P	0	1.1	4	0.97785	unitless	**P**
4	Ozone Intercept	P	0	5	4	-1.07778	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99981	unitless	**P**
6	Ozone % difference avg	P	7	10	4	6.7	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.01	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-1.81	ppb	**Fail**
9	Flow Rate average % difference	P	10	5	6	3.64	%	**P**
10	Flow Rate max % difference	P	10	5	6	3.85	%	**P**
11	Shelter Temperature average error	P	5	2	12	0.88	c	**P**
12	Shelter Temperature max error	P	5	2	12	1.06	c	**P**

SiteVisitDate	Site	Technician
07/23/2019	NEC602	Martin Valvur

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator does not use gloves to handle the filter pack. The bag is used as a glove to install and remove the filter.

2 **Parameter:** SiteOpsProcedures

The site operator is aware that the desiccant is in need of replacement. Some of the items on the SSRF were discussed and the site operator's questions were answered regarding the correct procedures.

3 **Parameter:** DocumentationCo

The site operator received a disc with the current QAPP which is kept at his office.

4 **Parameter:** SitingCriteriaCom

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

5 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 1/25/2020 22:30:59

SiteVisitDate	Site	Technician
07/10/2019	NIC001	Korey Devins

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	12	0.06	c	**P**
2	Temperature max error	P	4	0.5	12	0.09	c	**P**
3	Flow Rate average % difference	P	10	5	6	0.11	%	**P**
4	Flow Rate max % difference	P	10	5	6	0.33	%	**P**

SiteVisitDate	Site	Technician
07/10/2019	NIC001	Korey Devins

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:** DasComments

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

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. The NY DEC operators a full monitoring shelter at the same location.

4 **Parameter:** PollAnalyzerCom

There is water accumulating in a low section of the filter pack tubing below the enclosure.

EEMS Spot Report

Data Compiled: 1/25/2020 20:05:26

SiteVisitDate	Site	Technician
07/08/2019	NPT006	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	1.00136	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.45783	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.2	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.47	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.42	ppb	**P**

EEMS Spot Report

Data Compiled: 1/27/2020 21:47:22

SiteVisitDate	Site	Technician
09/25/2019	PAR107	Sandy Grenville

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	0.22	c	**P**
2	Temperature max error	P	4	0.5	18	0.50	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98162	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.62791	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99985	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.5	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-1.19	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-1.17	ppb	**P**
9	Flow Rate average % difference	P	10	5	6	2.16	%	**P**
10	Flow Rate max % difference	P	10	5	6	2.6	%	**P**
11	DAS Voltage average error	P	7	0.003	70	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	18	0.44	c	**P**
13	Shelter Temperature max error	P	5	2	18	0.61	c	**P**

SiteVisitDate	Site	Technician
09/25/2019	PAR107	Sandy Grenville

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The city of Parsons, estimated population 1500, is within 5 km of the site.

2 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 1/27/2020 19:35:20

SiteVisitDate	Site	Technician
07/26/2019	PED108	Sandy Grenville

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	0.13	c	**P**
2	Temperature max error	P	4	0.5	9	0.17	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99796	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.29137	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.7	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.44	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.02	ppb	**P**
9	Flow Rate average % difference	P	10	5	3	2.04	%	**P**
10	Flow Rate max % difference	P	10	5	3	2.04	%	**P**
11	DAS Voltage average error	P	7	0.003	70	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	18	0.93	c	**P**
13	Shelter Temperature max error	P	5	2	18	1.47	c	**P**

SiteVisitDate	Site	Technician
07/26/2019	PED108	Sandy Grenville

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** Moisture Present **CommentCode:** 204

There is moisture present in the dry deposition sample train inside the shelter.

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is in a clearing in an evergreen plantation in the Prince Edward-Gallion State Forest. Trees were cut within the last 11 years to increase the size of the clearing. The tree line is encroaching again and is between 25 and 35 meters from the site.

2 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, clean, neat, and well organized. The floor is rotting beneath the heater.

EEMS Spot Report

Data Compiled: 9/27/2019 11:08:32

SiteVisitDate	Site	Technician
07/01/2019	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	15	0.04	c	**P**
2	Temperature max error	P	4	0.5	15	0.07	c	**P**
3	Ozone Slope	P	0	1.1	4	0.95438	unitless	**P**
4	Ozone Intercept	P	0	5	4	-2.08948	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99964	unitless	**P**
6	Ozone % difference avg	P	7	10	4	10.5	%	**Fail**
7	Ozone Absolute Difference g1	P	7	3	1	-1.31	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-2.25	ppb	**Fail**
9	Flow Rate average % difference	P	10	5	6	1.21	%	**P**
10	Flow Rate max % difference	P	10	5	6	1.64	%	**P**
11	DAS Voltage average error	P	7	0.003	70	0.0002	V	**P**
12	Shelter Temperature average error	P	5	2	18	0.73	c	**P**
13	Shelter Temperature max error	P	5	2	18	1.14	c	**P**

SiteVisitDate	Site	Technician
07/01/2019	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 shelter is well maintained.

3 **Parameter:** MetSensorComme

Met sensors audits are no longer included under the contract.

4 **Parameter:** MetOpMaintCom

Only the temperature sensor is included in the site assessment.

EEMS Spot Report

Data Compiled: 1/27/2020 19:42:49

SiteVisitDate	Site	Technician
08/27/2019	PRK134	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	12	0.07	c	**P**
2	Temperature max error	P	4	0.5	12	0.11	c	**P**
3	Ozone Slope	P	0	1.1	4	0.96640	unitless	**P**
4	Ozone Intercept	P	0	5	4	-1.33743	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	7.4	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-1.37	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-2.08	ppb	**Fail**
9	Flow Rate average % difference	P	10	5	4	0.90	%	**P**
10	Flow Rate max % difference	P	10	5	4	1.35	%	**P**
11	DAS Voltage average error	P	7	0.003	70	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	18	0.26	c	**P**
13	Shelter Temperature max error	P	5	2	18	0.40	c	**P**

SiteVisitDate	Site	Technician
08/27/2019	PRK134	Eric Hebert

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

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

2 **Parameter:** ShelterCleanNotes

The shelter is clean, neat, and well organized.

3 **Parameter:** PollAnalyzerCom

The ozone inlet filter housing is dirty, however the ozone accuracy was within acceptance limits.

EEMS Spot Report

Data Compiled: 1/26/2020 16:04:42

SiteVisitDate	Site	Technician
07/25/2019	PSU106	Sandy Grenville

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	0.95555	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.12622	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	0.17	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.74	ppb	**P**

EEMS Spot Report

Data Compiled: 10/27/2019 18:45:57

SiteVisitDate	Site	Technician
08/20/2019	SHE604	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.07	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.09	c	**P**
3	Flow Rate average % difference	P	10	5	8	2.88	%	**P**
4	Flow Rate max % difference	P	10	5	8	4.01	%	**P**

SiteVisitDate	Site	Technician
08/20/2019	SHE604	Martin Valvur

Field Systems Comments

1 **Parameter:** DasComments

The site power source is solar and wind with battery storage. The NEMA enclosure has a cooling fan.

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 received a disc with the 2013 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.

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, 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.

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.

8 **Parameter:** MetOpMaintCom

The accuracy of the DAS was not tested with a voltage source since there were no available test channels.

EEMS Spot Report

Data Compiled: 1/26/2020 13:30:57

SiteVisitDate	Site	Technician
07/22/2019	THR422	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	0.06	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.14	c	**P**
3	Ozone Slope	P	0	1.1	4	0.96757	unitless	**P**
4	Ozone Intercept	P	0	5	4	-1.34024	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	6.9	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-1.18	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-1.7	ppb	**Fail**
9	Flow Rate average % difference	P	10	5	4	0.77	%	**P**
10	Flow Rate max % difference	P	10	5	4	1.31	%	**P**
11	DAS Voltage average error	P	15	0.003	63	0.0002	V	**P**
12	Shelter Temperature average error	P	5	2	21	1.7	c	**P**
13	Shelter Temperature max error	P	5	2	21	2.14	c	**Fail**

SiteVisitDate	Site	Technician
07/22/2019	THR422	Martin Valvur

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** Cell B Pressure **CommentCode:** 99

This analyzer diagnostic check is outside the manufacturer's recommended value.

2 **Parameter:** Ozone **SensorComponent:** Cell A Pressure **CommentCode:** 99

This analyzer diagnostic check is outside the manufacturer's recommended value.

3 **Parameter:** Ozone **SensorComponent:** Cell A Freq. **CommentCode:** 99

This analyzer diagnostic check is outside the manufacturer's recommended value.

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:** 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.

3 **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.

4 **Parameter:** ShelterCleanNotes

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

5 **Parameter:** PollAnalyzerCom

The ozone analyzer is operated by the state of North Dakota. The sample train contains a glass manifold. There is no means to introduce on-site generated test gas at the sample inlet. A through-the-probe audit was conducted using the EEMS system.

EEMS Spot Report

Data Compiled: 1/25/2020 22:12:24

SiteVisitDate	Site	Technician
07/09/2019	UND002	Korey Devins

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	6	0.19	c	**P**
2	Temperature max error	P	4	0.5	6	0.38	c	**P**
3	Flow Rate average % difference	P	10	5	6	1.21	%	**P**
4	Flow Rate max % difference	P	10	5	6	1.32	%	**P**

SiteVisitDate	Site	Technician
07/09/2019	UND002	Korey Devins

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:** DasComments

Single tower with filer pack mounted at 10 meters and temperature mounted at 9 meters.

2 **Parameter:** DocumentationCo

Although there is no CASTNET logbook present onsite, the site operator records CASTNET information in the VT Monitoring Coop logbook.

3 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 1/26/2020 20:55:46

SiteVisitDate	Site	Technician
08/22/2019	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	0.96589	unitless	**P**
2	Ozone Intercept	P	0	5	4	-3.15365	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99993	unitless	**P**
4	Ozone % difference avg	P	7	10	4	12.6	%	**Fail**
5	Ozone Absolute Difference g1	P	7	3	1	-2.83	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-3.54	ppb	**Fail**

EEMS Spot Report

Data Compiled: 1/27/2020 19:48:56

SiteVisitDate	Site	Technician
08/29/2019	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	0.37	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.46	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00464	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.49771	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.9	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.63	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.47	ppb	**P**
9	Flow Rate average % difference	P	10	5	2	0.22	%	**P**
10	Flow Rate max % difference	P	10	5	2	0.33	%	**P**
11	DAS Voltage average error	P	3	0.003	63	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	14	0.18	c	**P**
13	Shelter Temperature max error	P	5	2	14	0.28	c	**P**

SiteVisitDate	Site	Technician
08/29/2019	VOY413	Eric Hebert

Field Systems Comments

1 **Parameter:** DasComments

The sample tower itself is not grounded, however it is bolted to the shelter which is grounded. The shelter has a leak above the instrument rack. The site operator has placed a gallon milk jug to catch the water which he reports can sometimes be full in one week.

2 **Parameter:** DocumentationCo

Correctly completing the general observations section of the SSRF on the day of filter installation was discussed with the operator.

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 neat and well organized. The shelter is in poor condition with a severe roof leak.

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: 1/27/2020 22:08:47

SiteVisitDate	Site	Technician
09/24/2019	VPI120	Sandy Grenville

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	12	0.03	c	**P**
2	Temperature max error	P	4	0.5	12	0.05	c	**P**
3	Ozone Slope	P	0	1.1	4	0.96526	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.04806	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
6	Ozone % difference avg	P	7	10	4	4.1	%	**P**
7	Ozone Absolute Difference g2	P	7	1.5	1	-0.6	ppb	**P**
8	Flow Rate average % difference	P	10	5	6	0.00	%	**P**
9	Flow Rate max % difference	P	10	5	6	0.00	%	**P**
10	DAS Voltage average error	P	7	0.003	77	0.0000	V	**P**
11	Shelter Temperature average error	P	5	2	18	0.72	c	**P**
12	Shelter Temperature max error	P	5	2	18	0.87	c	**P**

SiteVisitDate	Site	Technician
09/24/2019	VPI120	Sandy Grenville

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is on a wooded hillside. The temperature sensor and sample inlet are at the tree tops of the downhill trees. The uphill tree line is 20 meters away.

2 **Parameter:** ShelterCleanNotes

The shelter is clean, neat, and well organized. Floor tiles are loose and the paneling is deteriorating.

3 **Parameter:** MetSensorComme

The temperature sensor is 10 meters from small pond.

EEMS Spot Report

Data Compiled: 1/25/2020 19:11:40

SiteVisitDate	Site	Technician
07/02/2019	WFM105	Korey Devins

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	0.12	c	**P**
2	Temperature max error	P	4	0.5	15	0.18	c	**P**
3	Flow Rate average % difference	P	10	5	4	1.47	%	**P**
4	Flow Rate max % difference	P	10	5	4	1.69	%	**P**

SiteVisitDate	Site	Technician
07/02/2019	WFM105	Korey Devins

Field Systems Comments

1 **Parameter:** DasComments

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

2 **Parameter:** SitingCriteriaCom

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

3 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 1/26/2020 15:46:13

SiteVisitDate	Site	Technician
07/24/2019	WNC429	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	0.00	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.00	c	**P**
3	Ozone Slope	P	0	1.1	4	0.97856	unitless	**P**
4	Ozone Intercept	P	0	5	4	1.03205	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.8	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	1.15	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.73	ppb	**P**
9	Flow Rate average % difference	P	10	5	10	3.12	%	**P**
10	Flow Rate max % difference	P	10	5	10	3.34	%	**P**
11	DAS Voltage average error	P	1	0.003	14	0.0002	V	**P**
12	Shelter Temperature average error	P	5	2	3	0.82	c	**P**
13	Shelter Temperature max error	P	5	2	3	1.13	c	**P**

SiteVisitDate	Site	Technician
07/24/2019	WNC429	Martin Valvur

Field Performance Comments

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

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

2 **Parameter:** Ozone **SensorComponent:** Cell B Freq. **CommentCode:** 99

This analyzer diagnostic check is outside the manufacturer's recommended value.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The general observations section of the SSRF is still not completed. Gloves are not used when handling the filter pack, however the filter bag is used as a glove.

2 **Parameter:** DocumentationCo

Records of the routine checks performed by the state personnel are kept onsite in a logbook.

3 **Parameter:** SiteOpsProcedures

The ozone analyzer is operated by the state of South Dakota and the sample train is now 1/4 Teflon with a filter at the inlet 4 meters above the ground.

4 **Parameter:** ShelterCleanNotes

One shelter houses the ozone monitor and is in good condition and clean. The second shelter houses the flow system and IMPROVE. It is older and not climate controlled.

5 **Parameter:** PollAnalyzerCom

The dry deposition filter is mounted low in the enclosure which changes the particle collection characteristics, and can allow precipitation to enter.

6 **Parameter:** MetOpMaintCom

The temperature sensor signal cable insulation is cracked and showing signs of extreme wear.

EEMS Spot Report

Data Compiled: 1/26/2020 20:39:56

SiteVisitDate	Site	Technician
08/19/2019	WST109	Korey Devins

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	0.96271	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.07811	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.1	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.05	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.81	ppb	**P**

EEMS Spot Report

Data Compiled: 10/27/2019 20:17:45

SiteVisitDate	Site	Technician
07/02/2019	YEL408	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	0.29	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.41	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00478	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.1015	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.7	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.10	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.31	ppb	**P**
9	Flow Rate average % difference	P	10	5	2	0.54	%	**P**
10	Flow Rate max % difference	P	10	5	2	0.64	%	**P**
11	DAS Voltage average error	P	8	0.003	14	0.0003	V	**P**
12	Shelter Temperature average error	P	5	2	21	0.86	c	**P**
13	Shelter Temperature max error	P	5	2	21	1.17	c	**P**

SiteVisitDate	Site	Technician
07/02/2019	YEL408	Martin Valvur

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Gloves are not used to handle the filter pack.

2 **Parameter:** DasComments

The shelter heat and air conditioner run simultaneously.

3 **Parameter:** SiteOpsProcedures

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

4 **Parameter:** SitingCriteriaCom

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

5 **Parameter:** ShelterCleanNotes

The shelter is organized and well maintained.

6 **Parameter:** MetOpMaintCom

The recorded temperature is now being measured at approximately 2 meters above the ground.

EEMS Spot Report

Data Compiled: 1/26/2020 18:39:33

SiteVisitDate	Site	Technician
08/03/2019	ZIO433	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.30	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.40	c	**P**
3	Wind Speed average error below 5m/s in m/s	P	3	0.5	8	0.05	m/s	**P**
4	Wind Speed max error below 5m/s in m/s	P	3	0.5	8	0.20	m/s	**P**
5	Wind Speed average % difference above 5 m/s	P	3	5	8	0.0	%	**P**
6	Wind Speed max % difference above 5 m/s	P	3	5	8	0.0	%	**P**
7	Wind Speed Torque average error	P	3	0.5	1	0.30	g-cm	**P**
8	Wind Speed Torque max error	P	3	0.5	1	0.3	g-cm	**P**
9	Wind Direction Input Deg True average error (de	P	2	5	8	9.5	degrees	**Fail**
10	Wind Direction Input Deg True max error (deg)	P	2	5	8	12	degrees	**Fail**
11	Wind Direction Linearity average error (deg)	P	2	5	16	1.4	degrees	**P**
12	Wind Direction Linearity max error (deg)	P	2	5	16	4	degrees	**P**
13	Wind Direction Torque average error	P	2	30	1	15	g-cm	**P**
14	Wind Direction Torque max error	P	2	30	1	15	g-cm	**P**
15	Solar Radiation % diff of avg	P	9	10	3	0.69	%	**P**
16	Solar Radiation % diff of max STD value	P	9	10	3	0.30	%	**P**
17	Precipitation average % difference	P	1	10	2	1.7	%	**P**
18	Precipitation max % difference	P	1	10	2	1.7	%	**P**
19	Ozone Slope	P	0	1.1	4	0.98129	unitless	**P**
20	Ozone Intercept	P	0	5	4	-0.02606	ppb	**P**
21	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
22	Ozone % difference avg	P	7	10	4	2.2	%	**P**
23	Ozone Absolute Difference g1	P	7	3	1	0.11	ppb	**P**
24	Ozone Absolute Difference g2	P	7	1.5	1	-0.51	ppb	**P**
25	DAS Voltage average error	P	4	0.003	7	0.0002	V	**P**
26	Shelter Temperature average error	P	5	2	3	2.42	c	**Fail**
27	Shelter Temperature max error	P	5	2	3	3.44	c	**Fail**

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
HWF187-Korey Devins-07/05/2019						
1	7/5/2019	DAS	Campbell	000356	CR3000	2134
2	7/5/2019	Ozone	ThermoElectron Inc	000700	49i A1NAA	1030244793
3	7/5/2019	Ozone Standard	ThermoElectron Inc	000445	49i A3NAA	CM08200021
4	7/5/2019	Zero air pump	Teledyne	000772	701H	608

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244793	HWF187	Korey Devins	07/05/2019	Ozone	000700

Slope:	0.97682	**Slope:**	0.00000
Intercept	-0.27180	**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	0.99840	**Intercept**	0.27090
Cert Date	6/11/2019	**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	0.51	0.23	-0.12	ppb		-0.35
primary	2	15.10	14.85	14.19	ppb		-0.66
primary	3	35.59	35.37	34.39	ppb	-2.81	
primary	4	68.00	67.83	66.07	ppb	-2.63	
primary	5	113.47	113.38	110.40	ppb	-2.66	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.000	pass
Span	0.993	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	94.4 kHz	pass
Cell A Noise	0.3 ppb	pass
Cell A Flow	0.61 lpm	pass
Cell A Pressure	704.5 mmHg	pass
Cell A Tmp.	37.0 C	pass
Cell B Freq.	94.1 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.65 lpm	pass
Cell B Pressure	705.0 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
NPT006-Martin Valvur-07/08/2019						
1	7/8/2019	DAS	Campbell	000353	CR3000	2131
2	7/8/2019	Ozone	ThermoElectron Inc	000612	49i A1NAA	1009241779
3	7/8/2019	Ozone Standard	ThermoElectron Inc	000448	49i A3NAA	CM08200024
4	7/8/2019	Zero air pump	Werther International	000626	PC 70/4	000815300

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241779	NPT006	Martin Valvur	07/08/2019	Ozone	000612

Slope:	1.00136	**Slope:**	0.00000
Intercept	-0.45783	**Intercept**	0.00000
CorrCoff:	0.99999	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00151	**Intercept**	0.00666
Cert Date	10/30/2018	**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	0.17	-0.30	ppb		-0.47
primary	2	15.78	15.74	15.32	ppb		-0.42
primary	3	35.87	35.80	35.20	ppb	-1.69	
primary	4	65.98	65.87	65.82	ppb	-0.08	
primary	5	109.72	109.54	109.10	ppb	-0.4	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.1	pass
Span	1.019	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	104.6 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.63 lpm	pass
Cell A Pressure	651.8 mmHg	pass
Cell A Tmp.	36.1 C	pass
Cell B Freq.	89.3 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.63 lpm	pass
Cell B Pressure	651.2 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CTH110-Korey Devins-07/15/2019						
1	7/15/2019	DAS	Campbell	000415	CR3000	2510
2	7/15/2019	Ozone	ThermoElectron Inc	000735	49i A1NAA	1105347308
3	7/15/2019	Ozone Standard	ThermoElectron Inc	000447	49i A3NAA	CM08200023
4	7/15/2019	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	Korey Devins	07/15/2019	Ozone	000735

Slope:	0.96273	**Slope:**	0.00000
Intercept	-0.36734	**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	0.99840	**Intercept**	0.27090
Cert Date	6/11/2019	**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	0.38	0.10	-0.32	ppb		-0.42
primary	2	14.42	14.17	13.34	ppb		-0.83
primary	3	36.83	36.61	34.93	ppb	-4.7	
primary	4	68.15	67.98	64.97	ppb	-4.53	
primary	5	113.65	113.56	109.00	ppb	-4.1	

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	0.2	**Status**	pass
Sensor Component	Span	**Condition**	1.000	**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**	96.2 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	1.1 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.58 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	684.8 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	35.9 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	95.7 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	1.0 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.71 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	685.7 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**	N/A	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**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*
KEF112-Korey Devins-07/24/2019						
1	7/24/2019	DAS	Campbell	000414	CR3000	2537
2	7/24/2019	Ozone	ThermoElectron Inc	000728	49i A1NAA	1105347306
3	7/24/2019	Ozone Standard	ThermoElectron Inc	000432	49i A3NAA	CM08200008
4	7/24/2019	Zero air pump	Werther International	06932	C 70/4	000829174

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347306	KEF112	Korey Devins	07/24/2019	Ozone	000728

Slope:	1.00429	**Slope:**	0.00000
Intercept	-0.46454	**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	0.99840	**Intercept**	0.27090
Cert Date	6/11/2019	**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	0.44	0.16	-0.28	ppb		-0.44
primary	2	14.60	14.35	14.07	ppb		-0.28
primary	3	35.46	35.24	34.81	ppb	-1.23	
primary	4	69.11	68.94	68.64	ppb	-0.44	
primary	5	112.78	112.68	112.80	ppb	0.11	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.000	pass
Span	1.011	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	94.1 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	669.4 mmHg	pass
Cell A Tmp.	38.1 C	pass
Cell B Freq.	87.6 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.55 lpm	pass
Cell B Pressure	670.3 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ARE128-Sandy Grenville-07/24/2019						
1	7/24/2019	DAS	Campbell	000400	CR3000	2524
2	7/24/2019	Ozone	ThermoElectron Inc	000725	49i A1NAA	1105347326
3	7/24/2019	Ozone Standard	ThermoElectron Inc	000199	49i A3NAA	0607315737
4	7/24/2019	Zero air pump	Werther International	06866	PC70/4	000815262

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347326	ARE128	Sandy Grenville	07/24/2019	Ozone	000725

Slope:	0.97944	**Slope:**	0.00000
Intercept	-0.31014	**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	1.00800	**Intercept**	-0.40210
Cert Date	3/26/2019	**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	-0.01	0.38	0.01	ppb		-0.37
primary	2	15.36	15.63	14.85	ppb		-0.78
primary	3	36.12	36.23	35.19	ppb	-2.91	
primary	4	67.90	67.76	66.50	ppb	-1.88	
primary	5	110.00	109.52	106.70	ppb	-2.61	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.000	pass
Span	1.006	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	90.2 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	709.3 mmHg	pass
Cell A Tmp.	30.7 C	pass
Cell B Freq.	103.2 kHz	pass
Cell B Noise	1.1 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	709.7 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PSU106-Sandy Grenville-07/25/2019						
1	7/25/2019	DAS	Campbell	000407	CR3000	2512
2	7/25/2019	Ozone	ThermoElectron Inc	000678	49i A1NAA	1030244791
3	7/25/2019	Ozone Standard	ThermoElectron Inc	000434	49i A3NAA	CM08200010
4	7/25/2019	Zero air pump	Werther International	06921	C 70/4	000836216

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244791	PSU106	Sandy Grenville	07/25/2019	Ozone	000678

Slope:	0.95555	**Slope:**	0.00000
Intercept	0.12622	**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	1.00800	**Intercept**	-0.40210
Cert Date	3/26/2019	**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	-0.04	0.35	0.52	ppb		0.17
primary	2	16.01	16.28	15.54	ppb		-0.74
primary	3	35.72	35.83	34.48	ppb	-3.84	
primary	4	67.29	67.15	64.25	ppb	-4.41	
primary	5	109.70	109.22	104.50	ppb	-4.42	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.20	pass
Span	1.010	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	94.8 kHz	pass
Cell A Noise	1.0 ppb	pass
Cell A Flow	0.68 lpm	pass
Cell A Pressure	709.5 mmHg	pass
Cell A Tmp.	34.1 C	pass
Cell B Freq.	97.9 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.66 lpm	pass
Cell B Pressure	709.9 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MKG113-korey Devins-07/25/2019						
1	7/25/2019	DAS	Campbell	000404	CR3000	2521
2	7/25/2019	Ozone	ThermoElectron Inc	000703	49i A1NAA	1030244805
3	7/25/2019	Ozone Standard	ThermoElectron Inc	000374	49i A3NAA	0726124694
4	7/25/2019	Zero air pump	Werther International	06937	C 70/4	000821896

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244805	MKG113	korey Devins	07/25/2019	Ozone	000703

Slope:	0.97286	**Slope:**	0.00000
Intercept	-0.68795	**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	0.99840	**Intercept**	0.27090
Cert Date	6/11/2019	**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	0.43	0.15	-0.56	ppb		-0.71
primary	2	14.41	14.16	13.14	ppb		-1.02
primary	3	36.98	36.76	35.21	ppb	-4.31	
primary	4	67.59	67.42	64.61	ppb	-4.26	
primary	5	114.46	114.37	110.70	ppb	-3.26	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.1	pass
Span	1.015	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	101.1 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.67 lpm	pass
Cell A Pressure	695.5 mmHg	pass
Cell A Tmp.	34.2 C	pass
Cell B Freq.	89.1 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.61 lpm	pass
Cell B Pressure	694.9 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CND125-Sandy Grenville-07/31/2019						
1	7/31/2019	DAS	Campbell	000499	CR3000	3816
2	7/31/2019	Ozone	ThermoElectron Inc	000692	49i A1NAA	1030244803
3	7/31/2019	Ozone Standard	ThermoElectron Inc	000376	49i A3NAA	0726124693
4	7/31/2019	Zero air pump	Werther International	06868	C 70/4	000814284

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244803	CND125	Sandy Grenville	07/31/2019	Ozone	000692

Slope:	0.97601	**Slope:**	0.00000
Intercept	0.12496	**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	0.99840	**Intercept**	0.27090
Cert Date	6/11/2019	**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	0.63	0.35	0.47	ppb		0.12
primary	2	15.25	15.00	14.90	ppb		-0.1
primary	3	35.01	34.79	34.01	ppb	-2.27	
primary	4	67.33	67.16	65.49	ppb	-2.52	
primary	5	110.20	110.10	107.70	ppb	-2.2	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.20	pass
Span	1.003	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	100.7 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.72 lpm	pass
Cell A Pressure	710.7 mmHg	pass
Cell A Tmp.	38.4 C	pass
Cell B Freq.	108.6 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	711.6 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CAN407-Martin Valvur-08/07/2019					
1 8/7/2019	DAS	Environmental Sys Corp	90665	8816	2689
2 8/7/2019	Ozone	ThermoElectron Inc	none	49i A3NAA	1030745086
3 8/7/2019	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1030745084
4 8/7/2019	Zero air pump	Twin Tower Engineering	90721	TT70/E4	526297

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030745086	CAN407	Martin Valvur	08/07/2019	Ozone	none

Slope:	0.97119	**Slope:**	0.00000
Intercept	-0.33900	**Intercept**	0.00000
CorrCoff:	0.99995	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00151	**Intercept**	0.00666
Cert Date	10/30/2018	**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	0.06	0.33	ppb		0.27
primary	2	16.55	16.51	15.51	ppb		-1
primary	3	35.85	35.78	33.91	ppb	-5.37	
primary	4	66.51	66.40	63.89	ppb	-3.85	
primary	5	114.51	114.33	111.03	ppb	-2.93	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.20	pass
Span	1.001	pass
Zero Voltage	0.0004	pass
Fullscale Voltage	1.0003	pass
Cell A Freq.	84.5 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	603.8 mmHg	pass
Cell A Tmp.	38.3 C	pass
Cell B Freq.	90.8 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.70 lpm	pass
Cell B Pressure	603.5 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
DIN431-Martin Valvur-08/08/2019						
1	8/8/2019	DAS	Environmental Sys Corp	90652	8816	2565
2	8/8/2019	Ozone	ThermoElectron Inc	none	49i A3NAA	1211052490
3	8/8/2019	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460050
4	8/8/2019	Zero air pump	Werther International	none	PC70/4	531395

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1211052490	DIN431	Martin Valvur	08/08/2019	Ozone	none

Slope:	0.99070	**Slope:**	0.00000
Intercept	-0.52028	**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	1.00151	**Intercept**	0.00666
Cert Date	10/30/2018	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.13	0.12	-0.10	ppb		-0.22
primary	2	16.69	16.65	15.90	ppb		-0.75
primary	3	37.80	37.73	36.74	ppb	-2.66	
primary	4	66.20	66.09	64.59	ppb	-2.3	
primary	5	116.03	115.84	114.50	ppb	-1.16	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.000	pass
Span	1.004	pass
Zero Voltage	0.0001	pass
Fullscale Voltage	1.0001	pass
Cell A Freq.	79.0 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.67 lpm	pass
Cell A Pressure	623.0 mmHg	pass
Cell A Tmp.	36.3 C	pass
Cell B Freq.	74.9 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.64 lpm	pass
Cell B Pressure	622.4 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
WST109-Korey Devins-08/19/2019						
1	8/19/2019	DAS	Campbell	000354	CR3000	2132
2	8/19/2019	Ozone	ThermoElectron Inc	000611	49i A1NAA	1009241795
3	8/19/2019	Ozone Standard	ThermoElectron Inc	000443	49i A3NAA	CM08200019
4	8/19/2019	Zero air pump	Werther International	06934	P 70/4	000821881

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241795	WST109	Korey Devins	08/19/2019	Ozone	000611

Slope:	0.96271	**Slope:**	0.00000
Intercept	-0.07811	**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	1.00800	**Intercept**	-0.40210
Cert Date	3/26/2019	**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	0.30	0.25	ppb		-0.05
primary	2	15.33	15.60	14.79	ppb		-0.81
primary	3	36.74	36.84	35.35	ppb	-4.13	
primary	4	67.78	67.64	65.34	ppb	-3.46	
primary	5	109.89	109.41	105.10	ppb	-4.02	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.20	pass
Span	0.992	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	98.0 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.67 lpm	pass
Cell A Pressure	708.1 mmHg	pass
Cell A Tmp.	37.6 C	pass
Cell B Freq.	99.6 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.69 lpm	pass
Cell B Pressure	708.7 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ANA115-Eric Hebert-08/22/2019						
1	8/22/2019	DAS	Campbell	000339	CR3000	2118
2	8/22/2019	Ozone	ThermoElectron Inc	000699	49i A1NAA	1030244804
3	8/22/2019	Ozone Standard	ThermoElectron Inc	000686	49i A3NAA	1030244818
4	8/22/2019	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	08/22/2019	Ozone	000699

Slope:	1.00901	**Slope:**	0.00000
Intercept	-0.33313	**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	0.99840	**Intercept**	0.27090
Cert Date	6/11/2019	**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	0.48	0.20	-0.22	ppb		-0.42
primary	2	14.67	14.42	14.16	ppb		-0.26
primary	3	35.82	35.60	35.61	ppb	0.03	
primary	4	68.47	68.30	68.88	ppb	0.85	
primary	5	116.35	116.26	116.80	ppb	0.46	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.000	pass
Span	1.043	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	99.8 kHz	pass
Cell A Noise	1.3 ppb	pass
Cell A Flow	0.73 lpm	pass
Cell A Pressure	699.9 mmHg	pass
Cell A Tmp.	36.9 C	pass
Cell B Freq.	99.6 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.70 lpm	pass
Cell B Pressure	700.5 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
UVL124-Eric Hebert-08/22/2019						
1	8/22/2019	DAS	Campbell	000347	CR3000	2126
2	8/22/2019	Ozone	ThermoElectron Inc	000680	49i A1NAA	1030244792
3	8/22/2019	Ozone Standard	ThermoElectron Inc	000362	49i A3NAA	0726124686
4	8/22/2019	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	08/22/2019	Ozone	000680

Slope:	0.96589	**Slope:**	0.00000
Intercept	-3.15365	**Intercept**	0.00000
CorrCoff:	0.99993	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	0.99840	**Intercept**	0.27090
Cert Date	6/11/2019	**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	0.08	-2.75	ppb		-2.83
primary	2	15.37	15.12	11.58	ppb		-3.54
primary	3	38.10	37.88	33.21	ppb	-13.14	
primary	4	69.35	69.18	62.91	ppb	-9.49	
primary	5	112.15	112.05	105.60	ppb	-5.93	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.20	pass
Span	1.009	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	91.9 kHz	pass
Cell A Noise	Not tested	pass
Cell A Flow	0.50 lpm	pass
Cell A Pressure	723.0 mmHg	pass
Cell A Tmp.	37.1 C	pass
Cell B Freq.	85.9 kHz	pass
Cell B Noise	Not tested	pass
Cell B Flow	0.73 lpm	pass
Cell B Pressure	723.6 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	< 1 %	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
HOX148-Eric Hebert-08/23/2019						
1	8/23/2019	DAS	Campbell	000426	CR3000	2533
2	8/23/2019	Ozone	ThermoElectron Inc	000614	49i A1NAA	1009241794
3	8/23/2019	Ozone Standard	ThermoElectron Inc	000438	49i A3NAA	CM08200014
4	8/23/2019	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	1009241794	HOX148	Eric Hebert	08/23/2019	Ozone	000614

Slope:	0.99012	**Slope:**	0.00000
Intercept	-0.37417	**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	0.99840	**Intercept**	0.27090
Cert Date	6/11/2019	**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	0.08	-0.18	ppb		-0.26
primary	2	15.79	15.54	14.99	ppb		-0.55
primary	3	33.16	32.94	32.07	ppb	-2.68	
primary	4	67.88	67.71	66.73	ppb	-1.46	
primary	5	115.49	115.40	113.90	ppb	-1.31	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.50	pass
Span	1.028	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	100.6 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.74 lpm	pass
Cell A Pressure	706.4 mmHg	pass
Cell A Tmp.	37.5 C	pass
Cell B Freq.	95.3 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.74 lpm	pass
Cell B Pressure	705.8 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
DEN417-Martin Valvur-09/05/2019						
1	9/5/2019	DAS	Environmental Sys Corp	90600	8816	2274
2	9/5/2019	Ozone	ThermoElectron Inc	none	49iQ-ABBN	1183030010
3	9/5/2019	Ozone Standard	ThermoElectron Inc	none	49C	49C-71310-368
4	9/5/2019	Zero air pump	Werther International	none	PC70/4	526281

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1183030010	DEN417	Martin Valvur	09/05/2019	Ozone	none

Slope:	1.03417	**Slope:**	0.00000
Intercept	1.35257	**Intercept**	0.00000
CorrCoff	0.99995	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00151	**Intercept**	0.00666
Cert Date	10/30/2018	**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	-0.87	-0.87	1.06	ppb		1.93
primary	2	14.77	14.74	16.36	ppb		1.62
primary	3	31.89	31.83	33.92	ppb	6.36	
primary	4	63.29	63.18	66.29	ppb	4.8	
primary	5	106.60	106.43	111.80	ppb	4.92	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.000	pass
Span	1.018	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	73.6 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	1.45 lpm	pass
Cell A Pressure	699.13 mmHg	pass
Cell A Tmp.	30.28 C	pass
Cell B Freq.	70.6 kHz	pass
Cell B Noise	0.60 ppb	pass
Cell B Flow	N/A	pass
Cell B Pressure	699.17 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GRB411-Martin Valvur-09/16/2019					
1 9/16/2019	DAS	Environmental Sys Corp	90635	8816	2507
2 9/16/2019	Ozone	ThermoElectron Inc	none	49iQ-ABBN	1183030014
3 9/16/2019	Ozone Standard	ThermoElectron Inc	none	49C	0330302753
4 9/16/2019	Zero air pump	Werther International	90722	TT70/4E	507782

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1183030014	GRB411	Martin Valvur	09/16/2019	Ozone	none

Slope:	0.97911	**Slope:**	0.00000
Intercept	-0.40853	**Intercept**	0.00000
CorrCoff	0.99996	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00151	**Intercept**	0.00666
Cert Date	10/30/2018	**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	0.14	0.13	0.24	ppb		0.11
primary	2	15.86	15.82	14.83	ppb		-0.99
primary	3	37.01	36.94	35.50	ppb	-3.98	
primary	4	69.19	69.07	66.90	ppb	-3.19	
primary	5	115.50	115.31	112.80	ppb	-2.2	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.30	pass
Span	1.015	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	73.4 kHz	pass
Cell A Noise	0.85 ppb	pass
Cell A Flow	1.21 lpm	pass
Cell A Pressure	581.2 mmHg	pass
Cell A Tmp.	31.01 C	pass
Cell B Freq.	76.6 kHz	pass
Cell B Noise	0.85 ppb	pass
Cell B Flow	N/A	pass
Cell B Pressure	581.3 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ASH135-Korey Devins-09/19/2019						
1	9/19/2019	DAS	Campbell	000847	CR3000	11444
2	9/19/2019	Ozone	ThermoElectron Inc	000730	49i A1NAA	1105347325
3	9/19/2019	Ozone Standard	ThermoElectron Inc	000442	49i A3NAA	CM08200018
4	9/19/2019	Zero air pump	Werther International	06923	C 70/4	000836208

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347325	ASH135	Korey Devins	09/19/2019	Ozone	000730

Slope:	0.99454	**Slope:**	0.00000
Intercept	-2.50547	**Intercept**	0.00000
CorrCoff:	0.99993	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00800	**Intercept**	-0.40210
Cert Date	3/26/2019	**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	0.62	1.01	-2.13	ppb		-3.14
primary	2	14.51	14.79	12.28	ppb		-2.51
primary	3	36.54	36.64	34.55	ppb	-5.87	
primary	4	65.99	65.86	63.35	ppb	-3.89	
primary	5	111.62	111.13	107.60	ppb	-3.23	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Moderately clean	pass
Battery Backup	N/A	pass
Offset	0.30	pass
Span	1.010	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	98.0 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	734.5 mmHg	pass
Cell A Tmp.	35.5 C	pass
Cell B Freq.	97.3 kHz	pass
Cell B Noise	0.7 ppb	pass
Cell B Flow	0.61 lpm	pass
Cell B Pressure	735.1 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ABT147-Korey Devins-09/25/2019						
1	9/25/2019	DAS	Campbell	000413	CR3000	2519
2	9/25/2019	Ozone	ThermoElectron Inc	000627	49i A1NAA	1009241772
3	9/25/2019	Ozone Standard	ThermoElectron Inc	000449	49i A3NAA	CM08200025
4	9/25/2019	Zero air pump	Werther International	06930	P 70/4	000829168

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241772	ABT147	Korey Devins	09/25/2019	Ozone	000627

Slope:	0.99630	**Slope:**	0.00000
Intercept	-0.32338	**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	1.00800	**Intercept**	-0.40210
Cert Date	3/26/2019	**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	0.63	0.31	ppb		-0.32
primary	2	16.05	16.32	15.93	ppb		-0.39
primary	3	36.56	36.66	36.17	ppb	-1.35	
primary	4	67.39	67.25	66.73	ppb	-0.78	
primary	5	110.13	109.65	108.90	ppb	-0.69	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.10	pass
Span	1.008	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	95.3 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	713.8 mmHg	pass
Cell A Tmp.	34.8 C	pass
Cell B Freq.	95.8 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	714.4 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass