2016 – 4th Quarter Report
Support for Conducting Systems & Performance Audits of CASTNET Sites and NADP Monitoring Stations

EPA Contract No. EPW12019

Prepared for:

U. S. Environmental Protection Agency

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List of Acronyms and Abbreviations

% diff	percent difference
A/D	analog to digital converter
ARS	Air Resource Specialist, Inc.
ASTM	American Society for Testing and Materials
CASTNET	Clean Air Status and Trends Network
DAS	data acquisition system
DC	direct current
deg	degree
DVM	digital voltmeter
EEMS	Environmental, Engineering & Measurement Services, Inc.
EPA	U.S. Environmental Protection Agency
ESC	Environmental Systems Corporation
FSAD	Field Site Audit Database
GPS	geographical positioning system
lpm	liters per minute
MLM	Multilayer Model
m/s	meters per second
mv	milivolt
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
QAPP	Quality Assurance Project Plan
SOP	standard operating procedure
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 developed under mandate of the 1990 Clean Air Act Amendments. Each site in the network measures acidic gases and particles and other forms of atmospheric pollution using a continuous collection filter aggregated over a one week period. Hourly averages of surface ozone concentrations and selected meteorological variables are also measured.

Site measurements 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 effects research.

CASTNET pollutant flux estimates are calculated as the aggregate product of weekly measured chemical concentrations and model-estimated deposition velocities. Currently, the National Oceanic and Atmospheric Administration's multilayer inferential model (NOAA-MLM) described by Meyers et al. [1998] is used to derive deposition velocity estimates.

As of January 2017, the network is comprised of 95 active rural sampling sites across the Untied States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Environment Canada, Bureau of Land Management (BLM) and several independent partners. AMEC Foster Wheeler (AMEC) is responsible for operating the EPA and Environment Canada sponsored sites, and Air Resource Specialist, Inc. (ARS) is responsible for operating the NPS and BLM 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 evaluated 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. Only four EPA sponsored sites that are operated by AMEC continue to operate meteorological sensors. Those sites are BEL116, BVL30, CHE185,

and PAL190. Five new sites in WY sponsored by EPA and operated by the BLM/ARS also operate meteorological sensors and are BAS601, NEC602, BUF603, FOR604, and SHE604. The meteorological sensors at site BEL116 were audited during the station audit performed in fourth quarter 2016.

Some or all of the additional monitored variables, NOy, CO, and SO_2 have been added to the EPA sponsored sites BVL130, HWF187, PND165, PNF126, GRS420, MAC426, ROM206, and BEL116. Those variables were audited at the HWF187, BEL116, GRS420, MAC426 and PNF126 stations during fourth quarter 2016. All of the trace gas results for those audits were found to be within acceptance criteria. The preliminary reports of those results were delivered following the audits and are not included in this report.

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
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

Sensor	Parameter	Audit Challenge	Acceptance Criteria
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
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, and certified as current.

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 Fourth Quarter 2016

This report consists of the systems and performance and other audit results from the CASTNET sites visited during the fourth quarter (October through December) of 2016. The locations and dates of the site visits for complete audits are presented in Table 2.

Table 2. Site Audit Visits

Side ID	Audit Type	Sponsor	Site Visit Date	Station Name
HWF187	Without met	EPA	10/1/2016	Huntington Wildlife Forest
ACA416	Without met	NPS / Maine	10/05/2016	Acadia National Park
HOW191	Without met	EPA	10/10/2016	Howland Ameriflux
ASH135	Without met	EPA	10/11/2016	Ashland
CAT175	Flow	EPA	10/14/2016	Claryville
CTH110	Without met	EPA	10/15/2016	Connecticut Hill
ARE128	Without met	EPA	10/17/2016	Arendtsville
NPT006	Without met	EPA	10/20/2016	Nez Perce Tribe
DIN431	Without met	NPS	10/25/2016	Dinosaur NM
BEL116	With met	EPA	11/22/2016	Beltsville
PNF126	Without met	EPA	11/26/2016	Cranberry

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) pollutant Performance Evaluations (PE).

Table 3. TTP Pollutant PE Visits

Side ID	PE Audit Type	Sponsor	Site Visit Date	Station Name
HWF187	NOy	EPA	10/2/2016	Huntington Wildlife Forest
VPI120	Ozone	EPA	10/17/2016	Horton Station
CND125	Ozone	EPA	10/17/2016	Candor
PAR107	Ozone	EPA	10/18/2016	Parsons
CDR119	Ozone	EPA	10/18/2016	Cedar Creek
ARE128	Ozone	EPA	10/19/2016	Arendtsville
PED108	Ozone	EPA	10/21/2016	Prince Edward
SHN418	Ozone	NPS	10/21/2016	Shenandoah NP - Big Meadows
GRS420	Ozone	NPS	10/27/2016	Great Smoky NP - Look Rock
GRS420	NOy	NPS	10/27/2016	Great Smoky NP - Look Rock
WSP144	Ozone	EPA	11/7/2016	Washington Crossing State Park
BWR139	Ozone	EPA	11/8/2016	Blackwater NWR
YEL408	Ozone	NPS	11/8/2016	Yellowstone NP
BFT142	Ozone	EPA	11/10/2016	Beaufort
BEL116	SO_2	EPA	11/14/2016	Beltsville
PNF126	NOy	EPA	11/26/2016	Cranberry
MAC426	NOy	NPS	11/28/2016	Mammoth Cave NP

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 systems report where necessary.

Copies of the spot reports that were sent immediately 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.*

2.0 NADP Quarterly Report

2.1 Introduction

The National Atmospheric Deposition Program (NADP) operates three 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 Atmospheric Integrated Research Monitoring Network (AIRMoN) began operation in 1992 and currently measures event based precipitation events at 6 sites. The Mercury Deposition Network (MDN) measures total mercury in precipitation samples from more than 120 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 operates and administers the three precipitation chemistry networks (NTN, MDN and AIRMoN), two atmospheric concentration networks (AMNet and AMoN), two analytical laboratories (the Central Analytical Laboratory (CAL) located at the University of Illinois/Illinois State Water Survey and the Mercury Analytical Laboratory (HAL) located at Frontier Global Sciences), and the network equipment depot (NED).

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 Sites Visited Fourth Quarter 2016

This report covers the results from the NADP sites surveyed during the fourth quarter (October through December) of 2016. The station names and dates of the audits are presented in Table 4.

Table 4. Sites Surveyed – Fourth Quarter 2016

Side ID	Network	Visit Date	Station Name
AK01	NTN	7/11/2016	Poker Creek
AK03	NTN	7/7/2016	Denali National Park-Mt. McKinley
AK97	NTN	7/5/2016	Katmai National Park-King Salmon
CO93	NTN	7/26/2016	Dry Lake
IL46	NTN/AMoN	7/21/2016	Alhambra
IL73	AMoN	7/20/2016	Stockton
IN20	NTN	7/19/2016	Roush Lake
IN22	NTN	7/22/2016	Southwest Purdue Agriculture Center
IN41	NTN	7/19/2016	Agronomy Center for Research and Extension
ID02	NTN	8/5/2016	Priest River Experimental Forest
ID03	NTN/AMoN	8/2/2016	Craters of the Moon National Monument
ID11	NTN	8/3/2016	Reynolds Creek
MI52	MDN/NTN/AMoN	8/15/2016	Ann Arbor
MI99	NTN	8/22/2016	Chassell
MN23	MDN/NTN	8/30/2016	Camp Ripley
MN28	NTN	8/31/2016	Grindstone Lake
MN32	NTN	8/29/2016	Voyageurs National Park-Sullivan Bay
ND00	NTN	8/23/2016	Theodore Roosevelt National Park-Painted Canyon
OR09	NTN	8/11/2016	Silver Lake Ranger Station
OR10	NTN	8/9/2016	H. J. Andrews Experimental Forest

Side ID	Network	Visit Date	Station Name
GA40	MDN/AMoN	10/25/2016	Yorkville
GA99	NTN	10/25/2016	Chula
ME04	MDN/NTN	10/4/2016	Carrabassett Valley
NY67	AMoN	10/15/2016	Connecticut Hill
PA00	MDN/NTN	10/17/2016	Arendtsville
SC05	MDN/NTN/AMoN	10/27/2016	Cape Romain National Wildlife Refuge
SC19	MDN	10/26/2016	Congaree Swamp
TN12	MDN	10/27/2016	Great Smoky Mountains National Park-Clingmans Dome
UT97	MDN/AMoN	10/24/2016	Salt Lake City
GA09	MDN/NTN	11/05/2016	Okefenokee National Wildlife Refuge
GA33	MDN/NTN	11/29/2016	Sapelo Island
MD00	MDN	11/15/2016	Smithsonian Environmental Research Center
NC06	NTN/AMoN	11/10/2016	Beaufort
NC29	NTN	11/09/2016	Hofmann Forest
NC35	NTN	11/09/2016	Clinton Crops Research Station
NC36	NTN	11/08/2016	Jordan Creek
SC06	NTN	11/21/2016	Santee National Wildlife Refuge
WY08	MDN/NTN	11/08/2016	Yellowstone National Park-Tower Falls

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 EEMS' server where the NADP PO and the U.S. EPA POs can access them and download them as needed by login into the server site.

Given the volume of data generated, and the fact that data is distributed and/or is available through EEMS' server, 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*
HWF187-Eric Hebert-10/01/2016						
1	10/1/2016	Computer	Dell	07034	Inspiron 15	Unknown
2	10/1/2016	DAS	Campbell	000356	CR3000	2134
3	10/1/2016	Elevation	Elevation	None	1	None
4	10/1/2016	Filter pack flow pump	Thomas	02358	illegible	illegible
5	10/1/2016	Flow Rate	Apex	000592	AXMC105LPMDPCV	illegible
6	10/1/2016	Infrastructure	Infrastructure	none	none	none
7	10/1/2016	Modem	Raven	06807	H4223-C	0934393748
8	10/1/2016	Ozone	ThermoElectron Inc	000700	49i A1NAA	1030244793
9	10/1/2016	Ozone Standard	ThermoElectron Inc	000445	49i A3NAA	CM08200021
10	10/1/2016	Sample Tower	Aluma Tower	illegible	B	AT-5107-E-4-12
11	10/1/2016	Shelter Temperature	Campbell	none	107-L	unknown
12	10/1/2016	Siting Criteria	Siting Criteria	None	1	None
13	10/1/2016	Temperature	RM Young	06401	41342VO	14034
14	10/1/2016	Zero air pump	Werther International	06931	C 70/4	000836212
15	10/1/2016	Zero air pump	Teledyne	000772	701H	608

DAS Data Form

DAS Time Max Error: 0.33

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2134	HWF187	Eric Hebert	10/01/2016	DAS	Primary

Das Date: 10/1 /2016
Das Time: 10:00:20
Das Day: 275

Audit Date 10/1 /2016
Audit Time 10:00:00
Audit Day 275

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

Mfg Datel **Parameter** DAS
Serial Number 4000392 **Tfer Desc.** Source generator (D
Tfer ID 01321

Mfg Fluke **Parameter** DAS
Serial Number 86590148 **Tfer Desc.** DVM
Tfer ID 01310

Slope 1.00000 **Intercept** 0.00000
Cert Date 12/23/2015 **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	0.1000	0.0999	V	V	-0.0001
7	0.3000	0.3000	0.3000	V	V	0.0000
7	0.5000	0.5000	0.5000	V	V	0.0000
7	0.7000	0.7000	0.7000	V	V	0.0000
7	0.9000	0.9000	0.9000	V	V	0.0000
7	1.0000	1.0000	1.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	HWF187	Eric Hebert	10/01/2016	Flow Rate	000592

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00309	**Intercept**	-0.00231
Cert Date	4/21/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.01
1.12%	1.35%			**Cal Factor Full Scale**	0.98
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.02	0.000	0.01	l/m	l/m	
primary	test pt 1	1.483	1.480	1.52	0.000	1.50	l/m	l/m	1.35%
primary	test pt 2	1.484	1.480	1.52	0.000	1.50	l/m	l/m	1.35%
primary	test pt 3	1.490	1.490	1.52	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**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	7.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	225 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244793	HWF187	Eric Hebert	10/01/2016	Ozone	000700

Slope:	0.98859	**Slope:**	0.00000
Intercept	-0.21053	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00500	**Intercept**	-0.28841
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.5%	1.8%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.21	0.49	0.12	ppb	
primary	2	27.38	27.53	27.03	ppb	-1.82%
primary	3	49.77	49.80	49.16	ppb	-1.29%
primary	4	74.95	74.86	74.02	ppb	-1.12%
primary	5	104.07	103.83	102.20	ppb	-1.57%

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	1.011	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	93.7 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	1.38 lpm	pass
Cell A Pressure	707.1 mmHg	pass
Cell A Tmp.	34.3 C	pass
Cell B Freq.	89.8 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	706.5 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14034	HWF187	Eric Hebert	10/01/2016	Temperature	06401

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00760	**Intercept**	-0.05710
Cert Date	2/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.26	0.33		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.01	0.07	0.000	0.3	C	0.27
primary	Temp Mid Range	30.96	30.78	0.000	30.6	C	-0.17
primary	Temp High Range	46.17	45.88	0.000	45.6	C	-0.33

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 Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	unknown	HWF187	Eric Hebert	10/01/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.46	0.74		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00760	Intercept	-0.05710
Cert Date	2/28/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.93	23.81	0.000	23.6	C	-0.17
primary	Temp Mid Range	21.96	21.85	0.000	22.6	C	0.74

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	HWF187	Technician	Eric Hebert	Site Visit Date	10/01/2016

Shelter Make	Shelter Model	Shelter Size
ESF	none	1630 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	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 Data Form

F-02058-1500-S1-rev002

Site ID	HWF187	**Technician**	Eric Hebert	**Site Visit Date**	10/01/2016

Site Sponsor (agency)	EPA	**USGS Map**	Newcomb
Operating Group	SUNY/ESF	**Map Scale**	
AQS #	36-031-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, Hg	**QAPP Latitude**	43.9732
Deposition Measurement	dry, wet, Hg	**QAPP Longitude**	-74.2232
Land Use	woodland - mixed	**QAPP Elevation Meters**	502
Terrain	complex	**QAPP Declination**	14.5
Conforms to MLM	No	**QAPP Declination Date**	6/17/2004
Site Telephone	(518) 582-4800	**Audit Latitude**	43.973044
Site Address 1	Adirondack Ecological Center	**Audit Longitude**	-74.223317
Site Address 2		**Audit Elevation**	497
County	Essex	**Audit Declination**	-14
City, State	Newcomb, NY		
Zip Code	12852	**Fire Extinguisher** ☑ Present	new in 2015
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☑	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☑	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☐	
Backup Op. E-mail		**Stable Entry Step** ☑	

Shelter Working Room	☑	**Make**	ESF	**Model**	none	**Shelter Size**	1630 cuft
Shelter Clean	☑	**Notes**	The shelter is in good condition.				
Site OK	☑	**Notes**					

Driving Directions From I-87 take exit 29 west to Newcomb. Continue through Newcomb (about 6 miles). Just west of town, turn right (north) at the Adirondack Ecological Center. Continue past the building on the dirt road to the site.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID HWF187 **Technician** Eric Hebert **Site Visit Date** 10/01/2016

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

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	HWF187	Technician	Eric Hebert	Site Visit Date	10/01/2016

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 HWF187 **Technician** Eric Hebert **Site Visit Date** 10/01/2016

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	HWF187	Technician	Eric Hebert	Site Visit Date	10/01/2016

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?	☑	Moisture in tubing only
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 HWF187 **Technician** Eric Hebert **Site Visit Date** 10/01/2016

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	HWF187	Technician	Eric Hebert	Site Visit Date	10/01/2016

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	☑	Nov 2009	☑
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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	HWF187	Technician	Eric Hebert	Site Visit Date	10/01/2016

Site operation procedures

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID HWF187 **Technician** Eric Hebert **Site Visit Date** 10/01/2016

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, 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 HWF187 **Technician** Eric Hebert **Site Visit Date** 10/01/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07034
DAS	Campbell	CR3000	2134	000356
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	illegible	illegible	02358
Flow Rate	Apex	AXMC105LPMDPC	illegible	000592
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4223-C	0934393748	06807
Ozone	ThermoElectron Inc	49i A1NAA	1030244793	000700
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200021	000445
Sample Tower	Aluma Tower	B	AT-5107-E-4-12	illegible
Shelter Temperature	Campbell	107-L	unknown	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VO	14034	06401
Zero air pump	Teledyne	701H	608	000772
Zero air pump	Werther International	C 70/4	000836212	06931

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ACA416-Eric Hebert-10/05/2016						
1	10/5/2016	Computer	Hewlett Packard	none	8460p	CNU20941M6
2	10/5/2016	DAS	Environmental Sys Corp	ACADIA1	8832	unknown2
3	10/5/2016	Elevation	Elevation	None	1	None
4	10/5/2016	Filter pack flow pump	Thomas	none	107CAB11	109500000040
5	10/5/2016	Flow Rate	Tylan	none	FC260	AW02213003
6	10/5/2016	Infrastructure	Infrastructure	none	none	none
7	10/5/2016	Mainframe	Climatronics	01342	100081	1288
8	10/5/2016	Met tower	Climatronics	none	unknown	illegible
9	10/5/2016	MFC power supply	Tylan	none	RO-32	none
10	10/5/2016	Modem	US Robotics	none	33.6 fax modem	unknown
11	10/5/2016	Ozone	ThermoElectron Inc	90744	49C	49C-74536-376
12	10/5/2016	Ozone Standard	ThermoElectron Inc	none	49CPS	49CPS-70752-366
13	10/5/2016	Printer	Hewlett Packard	none	842C	unknown
14	10/5/2016	Relative Humidity	Vaisala	none	missing	missing
15	10/5/2016	Sample Tower	Aluma Tower	none	B	AT-71103-7I-3
16	10/5/2016	Shelter Temperature	unknown	none	none	none
17	10/5/2016	Shield (2 meter)	Climatronics	none	100325	illegible
18	10/5/2016	Siting Criteria	Siting Criteria	None	1	None
19	10/5/2016	Solar Radiation	Licor	none	LI-200	PY16746
20	10/5/2016	Solar Radiation Translator	Climatronics	none	100144	309
21	10/5/2016	Temperature Translator	Climatronics	03630	100088-2	401
22	10/5/2016	Temperature2meter	Climatronics	none	100093	missing
23	10/5/2016	Zero air pump	ThermoElectron Inc	none	111	111-30215-237

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	unknown2	ACA416	Eric Hebert	10/05/2016	DAS	Primary

Das Date: 10/5 /2016
Das Time: 14:00:00
Das Day: 279

Audit Date 10/5 /2016
Audit Time 14:00:35
Audit Day 279

Low Channel:

Avg Diff:	Max Diff:
0.0000	0.0000

High Channel:

Avg Diff:	Max Diff:
0.0000	0.0000

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/23/2015	**CorrCoff**	1.00000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW02213003	ACA416	Eric Hebert	10/05/2016	Flow Rate	none

Mfg	Tylan	
SN/Owner ID	none	none
Parameter	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00309	**Intercept**	-0.00231
Cert Date	4/21/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.03
8.00%	8.00%			**Cal Factor Full Scale**	15.05
				Rotometer Reading:	1.65

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.04	0.0000	0.03	l/m	l/m	
primary	leak check	0.000	0.000	-0.04	0.0000	0.03	l/m	l/m	
primary	test pt 1	1.504	1.500	0.89	0.0000	1.38	l/m	l/m	-8.00%
primary	test pt 2	1.503	1.500	0.89	0.0000	1.38	l/m	l/m	-8.00%
primary	test pt 3	1.500	1.500	0.89	0.0000	1.38	l/m	l/m	-8.00%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Fair	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-74536-376	ACA416	Eric Hebert	10/05/2016	Ozone	90744

Slope:	1.02779	**Slope:**	0.00000
Intercept	0.30046	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00500	**Intercept**	-0.28841
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.2%	3.6%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	-0.22	0.06	0.53	ppb	
primary	2	28.13	28.27	29.28	ppb	3.57%
primary	3	51.39	51.42	53.06	ppb	3.19%
primary	4	77.23	77.13	79.32	ppb	2.84%
primary	5	104.88	104.64	108.10	ppb	3.31%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.2	pass
Span	1.086	pass
Zero Voltage	0.0004	pass
Fullscale Voltage	9.9994	pass
Cell A Freq.	78.3 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.73 lpm	pass
Cell A Pressure	759.4 mmHg	pass
Cell A Tmp.	32.2 C	pass
Cell B Freq.	76.0 kHz	pass
Cell B Noise	0.5 ppb	pass
Cell B Flow	0.73 lpm	pass
Cell B Pressure	760.0 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	missing	ACA416	Eric Hebert	10/05/2016	Temperature2meter	none

Mfg	Climatronics
SN/Owner ID	401 03630
Parameter	Temperature Translator

Mfg	Extech	Parameter	Temperature
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00760	Intercept	-0.05710
Cert Date	2/28/2016	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.12	0.16		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	-0.03	0.03	0.0000	0.18	C	0.15
primary	Temp Mid Rang	23.21	23.09	0.0000	22.93	C	-0.16
primary	Temp High Rang	46.86	46.56	0.0000	46.50	C	-0.06

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	missing	ACA416	Eric Hebert	10/05/2016	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	124432	**Tfer Desc.**	Hygroclip
Tfer ID	01225		
Slope	0.97830	**Intercept**	0.84460
Cert Date	12/24/2015	**CorrCoff**	0.99980

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	2.8			
Abs Max Er	6.8			

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	Hygroclip	32.8	33.0	32.8	0.0000	33.2	0.4
primary	RH Low Range	Hygroclip	52.9	53.5	52.9	0.0000	54.2	1.3
primary	RH Low Range	Hygroclip	75.3	74.9	75.3	0.0000	68.5	-6.8

Sensor Component	RH Filter	**Condition**	Clean	**Status**	pass
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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY16746	ACA416	Eric Hebert	10/05/2016	Solar Radiation	none

Mfg	Climatronics	
SN/Owner ID	309	none
Parameter	Solar Radiation Translator	

Mfg	Eppley	**Parameter**	solar radiation
Serial Number	10765	**Tfer Desc.**	SR transfer translat
Tfer ID	01246		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/29/2015	**CorrCoff**	1.00000

Mfg	Eppley	**Parameter**	solar radiation
Serial Number	34341F3	**Tfer Desc.**	SR transfer sensor
Tfer ID	01245		

DAS 1:		**DAS 2:**	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
8.7%	9.1%	0.0%	0.0%

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	10/6/2016	9:00	571	571	517	-9.4%
primary	10/6/2016	10:00	645	645	584	-9.4%
primary	10/6/2016	11:00	662	662	602	-9.1%
primary	10/6/2016	12:00	626	626	570	-8.9%
primary	10/6/2016	13:00	530	530	489	-7.8%
primary	10/6/2016	14:00	391	391	365	-6.6%

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
unknown	none	ACA416	Eric Hebert	10/05/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.54	1.06		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00760	Intercept	-0.05710
Cert Date	2/28/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.18	23.06	0.000	23.0	C	-0.02
primary	Temp Mid Range	24.25	24.12	0.000	23.1	C	-1.06

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
ACA416	Eric Hebert	10/05/2016

Shelter Make	Shelter Model	Shelter Size
Ekto	8818 (s/n 2920-1)	1152 cuft

Sensor Component	Condition	Status
Sample Tower Type	Type B	pass
Conduit	Good	pass
Met Tower	Good	pass
Moisture Trap	Not installed	Fail
Power Cables	Fair	pass
Shelter Temp Control	Functioning	pass
Rotometer	Installed	pass
Sample Tower	Good	pass
Shelter Condition	Fair	pass
Shelter Door	Good	pass
Shelter Roof	Good	pass
Shelter Floor	Fair	pass
Signal Cable	Fair	pass
Tubing Type	3/8 teflon	pass
Sample Train	Good	pass

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	ACA416	**Technician**	Eric Hebert	**Site Visit Date**	10/05/2016

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		
Time Zone	Eastern		
Primary Operator			
Primary Op. Phone #			
Primary Op. E-mail			
Backup Operator			
Backup Op. Phone #			
Backup Op. E-mail			

	Present		
Fire Extinguisher	☑	Inspected Aug 2016	
First Aid Kit	☐		
Safety Glasses	☐		
Safety Hard Hat	☐		
Climbing Belt	☐		
Security Fence	☐		
Secure Shelter	☑		
Stable Entry Step	☑		

Shelter Working Room	☑	**Make**	Ekto	**Model**	8818 (s/n 2920-1)	**Shelter Size**	1152 cuft
Shelter Clean	☑	**Notes**	The shelter is clean and well organized.				
Site OK	☑	**Notes**					

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

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID ACA416 **Technician** Eric Hebert **Site Visit Date** 10/05/2016

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	Eric Hebert	Site Visit Date	10/05/2016

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:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID ACA416 **Technician** Eric Hebert **Site Visit Date** 10/05/2016

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?	☑	
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 sensor signal cables are beginning to show signs of wear. At the request of the site operator, the meteorological tower was not lowered and the wind sensors were not audited as the site is scheduled for a new shelter and major restructure. Ambient temperature is currently being measured at 2 meters above ground.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID ACA416 **Technician** Eric Hebert **Site Visit Date** 10/05/2016

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?	☐	No moisture traps present
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 flow rate was measured to be 1.50 lpm, however the recorded flow rate on the DAS was 1.38 lpm.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID ACA416 **Technician** Eric Hebert **Site Visit Date** 10/05/2016

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:

The accuracy of the DAS was not tested due to poor wiring conditions at the logger and lack of wiring documentation. It was decided that it was safer not to disturb the signal connections.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	ACA416	Technician	Eric Hebert	Site Visit Date	10/05/2016

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 schedul	☑		☑

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	ACA416	Technician	Eric Hebert	Site Visit Date	10/05/2016

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** Eric Hebert **Site Visit Date** 10/05/2016

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 partly by 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.

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

Site ID ACA416 **Technician** Eric Hebert **Site Visit Date** 10/05/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	8460p	CNU20941M6	none
DAS	Environmental Sys Corp	8832	unknown2	ACADIA1
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB11	109500000040	none
Flow Rate	Tylan	FC260	AW02213003	none
Infrastructure	Infrastructure	none	none	none
Mainframe	Climatronics	100081	1288	01342
Met tower	Climatronics	unknown	illegible	none
MFC power supply	Tylan	RO-32	none	none
Modem	US Robotics	33.6 fax modem	unknown	none
Ozone	ThermoElectron Inc	49C	49C-74536-376	90744
Ozone Standard	ThermoElectron Inc	49CPS	49CPS-70752-366	none
Printer	Hewlett Packard	842C	unknown	none
Relative Humidity	Vaisala	missing	missing	none
Sample Tower	Aluma Tower	B	AT-71103-7I-3	none
Shelter Temperature	unknown	none	none	none
Shield (2 meter)	Climatronics	100325	illegible	none
Siting Criteria	Siting Criteria	1	None	None
Solar Radiation	Licor	LI-200	PY16746	none
Solar Radiation Translator	Climatronics	100144	309	none
Temperature Translator	Climatronics	100088-2	401	03630
Temperature2meter	Climatronics	100093	missing	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*
HOW191-Eric Hebert-10/10/2016						
1	10/10/2016	DAS	Campbell	000419	CR3000	2527
2	10/10/2016	elevation	Elevation	none	none	none
3	10/10/2016	Filter pack flow pump	Thomas	04859	107CAB18	060300019999
4	10/10/2016	Flow Rate	Apex	000645	AXMC105LPMDPCV	illegible
5	10/10/2016	Infrastructure	Infrastructure	none	none	none
6	10/10/2016	Modem	Raven	06470	H4222-C	0808311250
7	10/10/2016	Ozone	ThermoElectron Inc	000616	49i A1NAA	1009241781
8	10/10/2016	Ozone Standard	ThermoElectron Inc	000435	49i A3NAA	CM08200011
9	10/10/2016	Shelter Temperature	Campbell	none	107-L	none
10	10/10/2016	siting criteria	Siting Criteria	none	none	None
11	10/10/2016	Temperature	RM Young	missing	41342	missing
12	10/10/2016	Zero air pump	Werther International	06908	C 70/4	000821900

DAS Data Form

DAS Time Max Error: 0.22

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2527	HOW191	Eric Hebert	10/10/2016	DAS	Primary

Das Date: 10/10/2016 **Audit Date** 10/10/2016
Das Time: 9:20:13 **Audit Time** 9:20:00
Das Day: 284 **Audit Day** 284

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

Mfg Datel **Parameter** DAS
Serial Number 4000392 **Tfer Desc.** Source generator (D
Tfer ID 01321

Mfg Fluke **Parameter** DAS
Serial Number 86590148 **Tfer Desc.** DVM
Tfer ID 01310

Slope 1.00000 **Intercept** 0.00000
Cert Date 12/23/2015 **CorrCoff** 1.00000

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

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	HOW191	Eric Hebert	10/10/2016	Flow Rate	000645

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00309	**Intercept**	-0.00231
Cert Date	4/21/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.01
0.67%	0.67%			**Cal Factor Full Scale**	1
				Rotometer Reading:	0

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	-0.01	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	1.492	1.490	1.49	0.000	1.50	l/m	l/m	0.67%
primary	test pt 2	1.496	1.490	1.49	0.000	1.50	l/m	l/m	0.67%
primary	test pt 3	1.493	1.490	1.49	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**	Not installed	**Status**	Fail
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**	1.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	45 deg	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241781	HOW191	Eric Hebert	10/10/2016	Ozone	000616

Slope:	0.98950	**Slope:**	0.00000
Intercept	-0.77461	**Intercept**	0.00000
CorrCoff	0.99995	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00500	**Intercept**	-0.28841
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.0%	5.3%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.11	0.39	0.13	ppb	
primary	2	29.03	29.17	27.63	ppb	-5.28%
primary	3	49.46	49.50	47.95	ppb	-3.13%
primary	4	76.66	76.56	74.81	ppb	-2.29%
primary	5	106.27	106.02	104.50	ppb	-1.43%

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	1.007	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	83.7 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.57 lpm	pass
Cell A Pressure	704.7 mmHg	pass
Cell A Tmp.	32.6 C	pass
Cell B Freq.	98.9 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.72 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	missing	HOW191	Eric Hebert	10/10/2016	Temperature	missing

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00760	**Intercept**	-0.05710
Cert Date	2/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.08	0.16		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	-0.02	0.04	0.000	0.1	C	0.07
primary	Temp Mid Range	29.98	29.81	0.000	29.8	C	0
primary	Temp High Range	49.54	49.22	0.000	49.1	C	-0.16

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**	See comments	**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	HOW191	Eric Hebert	10/10/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.60	0.89		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00760	Intercept	-0.05710
Cert Date	2/28/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.36	23.24	0.000	23.8	C	0.6
primary	Temp Mid Range	19.80	19.71	0.000	20.6	C	0.89
primary	Temp Mid Range	21.11	21.01	0.000	21.3	C	0.3

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	HOW191	Technician	Eric Hebert	Site Visit Date	10/10/2016

Shelter Make	Shelter Model	Shelter Size
custom	custom	800 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Above canopy	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	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	1/4 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	HOW191	**Technician**	Eric Hebert	**Site Visit Date**	10/10/2016

Site Sponsor (agency)	EPA	**USGS Map**	Howland
Operating Group	University of ME	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry	**QAPP Longitude**	
Land Use	Woodland - mixed	**QAPP Elevation Meters**	
Terrain	flat, gently rolling	**QAPP Declination**	
Conforms to MLM	Yes	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	45.203963
Site Address 1		**Audit Longitude**	-68.740041
Site Address 2		**Audit Elevation**	68
County	Penobscot	**Audit Declination**	-17
City, State	Howland, ME		
Zip Code			
Time Zone	Eastern		
Primary Operator			
Primary Op. Phone #			
Primary Op. E-mail			
Backup Operator			
Backup Op. Phone #			
Backup Op. E-mail			

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

Shelter Working Room	☑	**Make**	custom	**Model**	custom	**Shelter Size**	800 cuft
Shelter Clean	☑	**Notes**	The custom built shelter is clean and organized.				
Site OK	☑	**Notes**					
Driving Directions	Arrange for site visit and access with the site operator.						

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID HOW191 **Technician** Eric Hebert **Site Visit Date** 10/10/2016

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 CASTNET filter pack at this location is located above a tree canopy at approximately 23.5 meters from the ground. This is an AmeriFlux site which is approximately 2.5 km to the SW of the HOW132 CASTNET site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID HOW191 **Technician** Eric Hebert **Site Visit Date** 10/10/2016

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:

Other than a temperature sensor located at the CASTNET filter location the meteorological instrumentation is being operated by the University of Maine and AmeriFlux.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID HOW191 **Technician** Eric Hebert **Site Visit Date** 10/10/2016

1	**Do all the meterological sensors appear to be intact, in good condition, and well maintained?**	☑	N/A
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?**	☑	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 HOW191 **Technician** Eric Hebert **Site Visit Date** 10/10/2016

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?	☑	Above canopy

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 40 meters
4	Describe dry dep sample tube.		1/4 teflon by 40 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☐	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID HOW191 **Technician** Eric Hebert **Site Visit Date** 10/10/2016

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?	24 meter walk-up tower	

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

There were no spare channels configured on the DAS to allow for accuracy testing with the audit system.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	HOW191	Technician	Eric Hebert	Site Visit Date	10/10/2016

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 schedul	☐		☐

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	HOW191	Technician	Eric Hebert	Site Visit Date	10/10/2016

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	☐		☐
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	☑	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	HOW191	Technician	Eric Hebert	Site Visit Date	10/10/2016

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?	☑	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	☑	Monthly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	Semiannually	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

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

The site operator reported that gloves are not consistently used to handle the filter pack.

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

Site ID HOW191 **Technician** Eric Hebert **Site Visit Date** 10/10/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR3000	2527	000419
elevation	Elevation	none	none	none
Filter pack flow pump	Thomas	107CAB18	060300019999	04859
Flow Rate	Apex	AXMC105LPMDPC	illegible	000645
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4222-C	0808311250	06470
Ozone	ThermoElectron Inc	49i A1NAA	1009241781	000616
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200011	000435
Shelter Temperature	Campbell	107-L	none	none
siting criteria	Siting Criteria	none	None	none
Temperature	RM Young	41342	missing	missing
Zero air pump	Werther International	C 70/4	000821900	06908

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ASH135-Eric Hebert-10/11/2016						
1	10/11/2016	Computer	Dell	07070	Inspiron 15	Unknown
2	10/11/2016	DAS	Campbell	000634	CR3000	4933
3	10/11/2016	Elevation	Elevation	None	1	None
4	10/11/2016	Filter pack flow pump	Thomas	01449	107CA110	118700000595
5	10/11/2016	Flow Rate	Apex	000648	AXMC105LPMDPCV	54777
6	10/11/2016	Infrastructure	Infrastructure	none	none	none
7	10/11/2016	Modem	Raven	06471	H4222-C	0808311148
8	10/11/2016	Ozone	ThermoElectron Inc	000620	49i A1NAA	1009241793
9	10/11/2016	Ozone Standard	ThermoElectron Inc	000442	49i A3NAA	CM08200018
10	10/11/2016	Sample Tower	Aluma Tower	03536	A	none
11	10/11/2016	Shelter Temperature	Campbell	none	107-L	none
12	10/11/2016	Siting Criteria	Siting Criteria	None	1	None
13	10/11/2016	Temperature	RM Young	06389	41342	13994
14	10/11/2016	Zero air pump	Werther International	06923	C 70/4	000836208

DAS Data Form

DAS Time Max Error: 0.08

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	4933	ASH135	Eric Hebert	10/11/2016	DAS	Primary

Das Date: 10/11/2016
Das Time: 11:00:55
Das Day: 285

Audit Date 10/11/2016
Audit Time 11:01:00
Audit Day 285

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

Mfg Datel **Parameter** DAS
Serial Number 4000392 **Tfer Desc.** Source generator (D
Tfer ID 01321

Mfg Fluke **Parameter** DAS
Serial Number 86590148 **Tfer Desc.** DVM
Tfer ID 01310

Slope 1.00000 **Intercept** 0.00000
Cert Date 12/23/2015 **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	0.1000	0.1000	V	V	0.0000
7	0.3000	0.3000	0.3001	V	V	0.0001
7	0.5000	0.5000	0.5001	V	V	0.0001
7	0.7000	0.7000	0.7001	V	V	0.0001
7	0.9000	0.9001	0.9002	V	V	0.0001
7	1.0000	1.0001	1.0002	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	54777	ASH135	Eric Hebert	10/11/2016	Flow Rate	000648

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00309	**Intercept**	-0.00231
Cert Date	4/21/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.1
1.35%	1.35%			**Cal Factor Full Scale**	1.11
				Rotometer Reading:	1.35

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.08	0.000	0.02	l/m	l/m	
primary	leak check	0.000	0.000	-0.03	0.000	0.08	l/m	l/m	
primary	test pt 1	1.481	1.480	1.38	0.000	1.50	l/m	l/m	1.35%
primary	test pt 2	1.481	1.480	1.38	0.000	1.50	l/m	l/m	1.35%
primary	test pt 3	1.486	1.480	1.38	0.000	1.50	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**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	6.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	225 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241793	ASH135	Eric Hebert	10/11/2016	Ozone	000620

Slope:	0.84488	**Slope:**	0.00000
Intercept	-1.88979	**Intercept**	0.00000
CorrCoff	0.99996	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00500	**Intercept**	-0.28841
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
19.4%	23.2%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.36	0.64	-1.25	ppb	
primary	2	28.17	28.31	21.73	ppb	-23.24%
primary	3	49.40	49.44	39.78	ppb	-19.54%
primary	4	77.24	77.14	63.84	ppb	-17.24%
primary	5	115.99	115.69	95.60	ppb	-17.37%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Dirty	Fail
Battery Backup	N/A	pass
Offset	-0.20	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	0.25 lpm	Fail
Cell A Pressure	744.4 mmHg	pass
Cell A Tmp.	35.0 C	pass
Cell B Freq.	99.8 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.0 lpm	Fail
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	8 %	Fail
System Memo	See comments	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	13994	ASH135	Eric Hebert	10/11/2016	Temperature	06389

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00760	**Intercept**	-0.05710
Cert Date	2/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.10	0.20		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	-0.03	0.03	0.000	0.2	C	0.2
primary	Temp Mid Range	24.42	24.29	0.000	24.3	C	-0.01
primary	Temp High Range	49.43	49.11	0.000	49.0	C	-0.08

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 Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ASH135	Eric Hebert	10/11/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.77	0.83		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00760	Intercept	-0.05710
Cert Date	2/28/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.25	22.14	0.000	22.9	C	0.71
primary	Temp Mid Range	22.48	22.37	0.000	23.2	C	0.83

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	ASH135	Technician	Eric Hebert	Site Visit Date	10/11/2016

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-17)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type A	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Fair	Status	pass
Sensor Component	Shelter Condition	Condition	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	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	ASH135	**Technician**	Eric Hebert	**Site Visit Date**	10/11/2016

Site Sponsor (agency)	EPA	**USGS Map**	Squa Pan
Operating Group	private	**Map Scale**	
AQS #	23-003-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	46.6039
Deposition Measurement	dry	**QAPP Longitude**	-68.4142
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	235
Terrain	gently rolling	**QAPP Declination**	18.7
Conforms to MLM	Marginally	**QAPP Declination Date**	2/22/2006
Site Telephone	(207) 435-6482	**Audit Latitude**	46.603832
Site Address 1	Radar Road	**Audit Longitude**	-68.413227
Site Address 2		**Audit Elevation**	231
County	Aroostook	**Audit Declination**	-18.2
City, State	Ashland, ME		
Zip Code	04732	**Fire Extinguisher** ☑	New in 2015
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☑	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☑	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2149-17)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in fair condition, clean, and very well organized. Rot is beginning at the bottom of the walls and floor.				
Site OK	☑	**Notes**					

Driving Directions

From I-95 take exit #286 which is route 212. Take route 212 west to route 11. Turn north on route 11 and continue toward Ashland. Approximately 2 miles south of Ashland turn left (west) on Goding Road at the DEP sign. The site is approximately 1.5 miles straight on Goding Rd. (go straight at the 90 deg curve).

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID ASH135 **Technician** Eric Hebert **Site Visit Date** 10/11/2016

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 evergreen plantation previously 20 meters south of the site has been harvested.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	ASH135	Technician	Eric Hebert	Site Visit Date	10/11/2016

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 ASH135 **Technician** Eric Hebert **Site Visit Date** 10/11/2016

1	**Do all the meterological sensors appear to be intact, in good condition, and well maintained?**	☑	N/A
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?**	☑	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 ASH135 **Technician** Eric Hebert **Site Visit Date** 10/11/2016

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 ASH135 **Technician** Eric Hebert **Site Visit Date** 10/11/2016

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

11 **Tower comments?**

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

The met tower has been removed and the 10 meter temperature sensor is mounted in a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	ASH135	Technician	Eric Hebert	Site Visit Date	10/11/2016

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	☑	June 2007	☑
HASP	☑	Oct 2015	☑
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☑		☑

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	ASH135	Technician	Eric Hebert	Site Visit Date	10/11/2016

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	☑	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	☑	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:

The ozone inlet filter is replaced and the sample train is leak tested once each month.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID ASH135 **Technician** Eric Hebert **Site Visit Date** 10/11/2016

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, 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 ASH135 **Technician** Eric Hebert **Site Visit Date** 10/11/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07070
DAS	Campbell	CR3000	4933	000634
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	118700000595	01449
Flow Rate	Apex	AXMC105LPMDPC	54777	000648
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4222-C	0808311148	06471
Ozone	ThermoElectron Inc	49i A1NAA	1009241793	000620
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200018	000442
Sample Tower	Aluma Tower	A	none	03536
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	13994	06389
Zero air pump	Werther International	C 70/4	000836208	06923

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CAT175-Eric Hebert-10/14/2016						
1	10/14/2016	Computer	Dell	07043	Inspiron 15	Unknown
2	10/14/2016	DAS	Campbell	000412	CR3000	2532
3	10/14/2016	Elevation	Elevation	None	1	None
4	10/14/2016	Filter pack flow pump	Brailsford	none	TD-4X2N	none
5	10/14/2016	Flow Rate	Apex	000644	AXMC105LPMDPCV	illegible
6	10/14/2016	Infrastructure	Infrastructure	none	none	none
7	10/14/2016	Modem	Raven	06660	V4221-V	0918425101
8	10/14/2016	Sample Tower	Aluma Tower	666359	B	none
9	10/14/2016	Shield (10 meter)	RM Young	none	41003	none
10	10/14/2016	Siting Criteria	Siting Criteria	None	1	None
11	10/14/2016	Temperature	RM Young	06409	41342VO	14042
12	10/14/2016	UPS	ProSine	04576	1000w	unknown

DAS Data Form

DAS Time Max Error: 0.08

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2532	CAT175	Eric Hebert	10/14/2016	DAS	Primary

Das Date: 10/14/2016 **Audit Date** 10/14/2016
Das Time: 10:09:55 **Audit Time** 10:10:00
Das Day: 288 **Audit Day** 288

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

Mfg Datel **Parameter** DAS
Serial Number 4000392 **Tfer Desc.** Source generator (D
Tfer ID 01321

Mfg Fluke **Parameter** DAS
Serial Number 86590148 **Tfer Desc.** DVM
Tfer ID 01310

Slope 1.00000 **Intercept** 0.00000
Cert Date 12/23/2015 **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	0.1000	0.1000	V	V	0.0000
7	0.3000	0.3000	0.3001	V	V	0.0001
7	0.5000	0.5000	0.5001	V	V	0.0001
7	0.7000	0.7001	0.7002	V	V	0.0001
7	0.9000	0.9002	0.9002	V	V	0.0000
7	1.0000	1.0002	1.0003	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	CAT175	Eric Hebert	10/14/2016	Flow Rate	000644

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00309	**Intercept**	-0.00231
Cert Date	4/21/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.02
1.12%	1.35%			**Cal Factor Full Scale**	1.03
				Rotometer Reading:	1.4

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.02	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.00	l/m	l/m	
primary	test pt 1	1.495	1.490	1.47	0.000	1.51	l/m	l/m	1.34%
primary	test pt 2	1.487	1.480	1.47	0.000	1.50	l/m	l/m	1.35%
primary	test pt 3	1.501	1.500	1.47	0.000	1.51	l/m	l/m	0.67%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Poor	**Status**	Fail
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	-1.0 cm	**Status**	Fail
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14042	CAT175	Eric Hebert	10/14/2016	Temperature	06409

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00760	**Intercept**	-0.05710
Cert Date	2/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.07	0.16		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	-0.04	0.02	0.000	0.2	C	0.16
primary	Temp Mid Range	17.66	17.58	0.000	17.6	C	-0.02
primary	Temp High Range	42.60	42.34	0.000	42.3	C	-0.03

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	CAT175	Technician	Eric Hebert	Site Visit Date	10/14/2016

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 1977-1)	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	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	Poor	Status	Fail
Sensor Component	Shelter Door	Condition	Fair	Status	pass
Sensor Component	Shelter Roof	Condition	Fair	Status	pass
Sensor Component	Shelter Floor	Condition	Poor	Status	Fail
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	CAT175	**Technician**	Eric Hebert	**Site Visit Date**	10/14/2016

Site Sponsor (agency)	EPA	**USGS Map**	Claryville
Operating Group	private	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	41.9423
Deposition Measurement	dry	**QAPP Longitude**	-74.5519
Land Use	woodland - mixed	**QAPP Elevation Meters**	765
Terrain	complex	**QAPP Declination**	13.5
Conforms to MLM	No	**QAPP Declination Date**	2/22/2006
Site Telephone	(845) 798-0947	**Audit Latitude**	41.942325
Site Address 1	Wildcat Mt. Road	**Audit Longitude**	-74.551999
Site Address 2		**Audit Elevation**	754
County	Ulster	**Audit Declination**	-13.2
City, State	Claryville, NY		
Zip Code	12725	**Fire Extinguisher** ☑	New in 2015
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☑	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 1977-1)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is beginning to show signs of deterioration to the floor and walls. There are many unused and possibly depleted batteries stored in the shelter. The vegetation has been allowed to grow. The shelter roof has been repaired.				
Site OK	☑	**Notes**					

Driving Directions

From Liberty, NY go west on route 52 toward Grahamsville. Just before reaching Grahamsville, turn left onto County Road 19 to Claryville. Stay on 19 through Claryville and turn left on Wildcat Mt Road immediately after crossing the bridge at the far end of town. Bear right and follow the semi-paved road for about 0.7 miles to the fork. Go right at the fork and turn left at the first house on the left. The site is about .75 miles up the dirt road behind the house.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID CAT175 **Technician** Eric Hebert **Site Visit Date** 10/14/2016

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	CAT175	Technician	Eric Hebert	Site Visit Date	10/14/2016

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	CAT175	Technician	Eric Hebert	Site Visit Date	10/14/2016

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?	☑	Natural aspiration
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	CAT175	Technician	Eric Hebert	Site Visit Date	10/14/2016

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?	☑	Ozone not measured
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 18 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☐	N/A
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☐	N/A
8	Are there moisture traps in the sample lines?	☐	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Ozone monitoring is no longer being conducted at the site.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CAT175 **Technician** Eric Hebert **Site Visit Date** 10/14/2016

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?	☐	Solar power
8	Is the instrument shelter temperature controlled?	☐	Shelter not temperature controlled

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

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

The shelter is not temperature controlled. The site is solar and DC battery powered. The met tower has been removed and the temperature is being measured from the sample tower at 10 meters above ground.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	CAT175	Technician	Eric Hebert	Site Visit Date	10/14/2016

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	☑	Oct 2015	☑
Field Ops Manual	☐		☐
Calibration Reports	☐		☐
Ozone z/s/p Control Charts	☐	N/A	☐
Preventive maintenance schedul	☐		☐

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	CAT175	Technician	Eric Hebert	Site Visit Date	10/14/2016

Site operation procedures

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

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

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☐	N/A	☑
Manual Rain Gauge Test	☑	N/A	☑
Confirm Reasonableness of Current Values	☑	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	CAT175	Technician	Eric Hebert	Site Visit Date	10/14/2016

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings 95% 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, 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	☐	Not performed	☐
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:

New site operators from the Frost Valley YMCA camp are now operating the site.

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

Site ID CAT175 **Technician** Eric Hebert **Site Visit Date** 10/14/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07043
DAS	Campbell	CR3000	2532	000412
Elevation	Elevation	1	None	None
Filter pack flow pump	Brailsford	TD-4X2N	none	none
Flow Rate	Apex	AXMC105LPMDPC	illegible	000644
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0918425101	06660
Sample Tower	Aluma Tower	B	none	666359
Shield (10 meter)	RM Young	41003	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VO	14042	06409
UPS	ProSine	1000w	unknown	04576

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CTH110-Eric Hebert-10/15/2016						
1	10/15/2016	Computer	Dell	07044	Inspiron 15	Unknown
2	10/15/2016	DAS	Campbell	000415	CR3000	2510
3	10/15/2016	Elevation	Elevation	None	1	None
4	10/15/2016	Filter pack flow pump	Thomas	02664	107CA18	1092135217
5	10/15/2016	Flow Rate	Apex	000557	AXMC105LPMDPCV	unknown
6	10/15/2016	Infrastructure	Infrastructure	none	none	none
7	10/15/2016	Modem	Raven	06599	V4221-V	0844349892
8	10/15/2016	Ozone	ThermoElectron Inc	000735	49i A1NAA	1105347308
9	10/15/2016	Ozone Standard	ThermoElectron Inc	000447	49i A3NAA	CM08200023
10	10/15/2016	Sample Tower	Aluma Tower	666363	B	AT-5107-E-4-10
11	10/15/2016	Shelter Temperature	Campbell	none	107-L	none
12	10/15/2016	Shield (10 meter)	RM Young	none	unknown	none
13	10/15/2016	Siting Criteria	Siting Criteria	None	1	None
14	10/15/2016	Temperature	RM Young	06301	41342	12540
15	10/15/2016	Zero air pump	Werther International	06864	PC70/4	000815261

DAS Data Form

DAS Time Max Error: 0.2

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2510	CTH110	Eric Hebert	10/15/2016	DAS	Primary

Das Date: 10/15/2016
Das Time: 11:40:00
Das Day: 289

Audit Date 10/15/2016
Audit Time 11:40:12
Audit Day 289

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

Mfg Datel **Parameter** DAS
Serial Number 4000392 **Tfer Desc.** Source generator (D
Tfer ID 01321

Mfg Fluke **Parameter** DAS
Serial Number 86590148 **Tfer Desc.** DVM
Tfer ID 01310

Slope 1.00000 **Intercept** 0.00000
Cert Date 12/23/2015 **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	0.1000	0.1000	V	V	0.0000
7	0.3000	0.3000	0.3000	V	V	0.0000
7	0.5000	0.5000	0.5000	V	V	0.0000
7	0.7000	0.7000	0.7000	V	V	0.0000
7	0.9000	0.9000	0.9000	V	V	0.0000
7	1.0000	1.0000	1.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	unknown	CTH110	Eric Hebert	10/15/2016	Flow Rate	000557

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00309	**Intercept**	-0.00231
Cert Date	4/21/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.02
1.35%	1.35%			**Cal Factor Full Scale**	0.95
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.02	0.000	0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.04	0.000	0.06	l/m	l/m	
primary	test pt 1	1.481	1.480	1.59	0.000	1.50	l/m	l/m	1.35%
primary	test pt 2	1.481	1.480	1.59	0.000	1.50	l/m	l/m	1.35%
primary	test pt 3	1.481	1.480	1.59	0.000	1.50	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**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	2.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	Not tested	**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	1105347308	CTH110	Eric Hebert	10/15/2016	Ozone	000735

Slope:	0.98214	**Slope:**	0.00000
Intercept	-0.50545	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00500	**Intercept**	-0.28841
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.7%	4.1%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.34	0.62	-0.07	ppb	
primary	2	28.00	28.14	27.00	ppb	-4.05%
primary	3	48.44	48.48	47.69	ppb	-1.63%
primary	4	76.28	76.18	74.13	ppb	-2.69%
primary	5	112.99	112.71	110.10	ppb	-2.32%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.40	pass
Span	1.014	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	89.6 kHz	pass
Cell A Noise	1.3 ppb	pass
Cell A Flow	0.59 lpm	pass
Cell A Pressure	705.2 mmHg	pass
Cell A Tmp.	32.1 C	pass
Cell B Freq.	98.1 kHz	pass
Cell B Noise	1.4 ppb	pass
Cell B Flow	0.52 lpm	pass
Cell B Pressure	704.9 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	12540	CTH110	Eric Hebert	10/15/2016	Temperature	06301

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00760	**Intercept**	-0.05710
Cert Date	2/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.08	0.21		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	-0.11	-0.05	0.000	0.2	C	0.21
primary	Temp Mid Range	22.79	22.67	0.000	22.7	C	-0.01
primary	Temp High Range	49.26	48.95	0.000	49.0	C	0.03

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 Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CTH110	Eric Hebert	10/15/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.10	0.15		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00760	Intercept	-0.05710
Cert Date	2/28/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.40	23.28	0.000	23.3	C	-0.01
primary	Temp Mid Range	23.93	23.81	0.000	23.7	C	-0.15
primary	Temp Mid Range	23.34	23.22	0.000	23.4	C	0.15

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	CTH110	Technician	Eric Hebert	Site Visit Date	10/15/2016

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2116-6)	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	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 Data Form

F-02058-1500-S1-rev002

Site ID	CTH110	**Technician**	Eric Hebert	**Site Visit Date**	10/15/2016

Site Sponsor (agency)	EPA	**USGS Map**	Mecklenburg
Operating Group	IES	**Map Scale**	
AQS #	36-109-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, ammonia	**QAPP Latitude**	42.4010
Deposition Measurement	dry, wet	**QAPP Longitude**	-76.6535
Land Use	woodland - mixed	**QAPP Elevation Meters**	515
Terrain	rolling	**QAPP Declination**	12.3
Conforms to MLM	No	**QAPP Declination Date**	12/28/2004
Site Telephone	(607) 564-7622	**Audit Latitude**	42.400875
Site Address 1	CR 136 (Connecticut Hill Road)	**Audit Longitude**	-76.653516
Site Address 2		**Audit Elevation**	511
County	Tompkins	**Audit Declination**	-12.0
City, State	Newfield, NY		
Zip Code	14867	**Fire Extinguisher** ☑	New in 2015
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☑	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2116-6)	**Shelter Size**	640 cuft
Shelter Clean	☐	**Notes**	The condition of the shelter floor is beginning to deteriorate.				
Site OK	☑	**Notes**					

Driving Directions

From Ithaca take route 13 south to hwy 327. Bear right onto hwy 327 and go past both the lower and upper entrances for Robert Treman St Park. Turn left at the second left past the upper entrance to the park onto Trumbell Corners Road. Continue on Trumbell Corners Rd for approximately one mile to the stop sign. Turn right at the stop onto Connecticut Hill Road and continue for approximately 1/4 mile where it veers to the right. The site is up the hill on the left just after the turn in the road.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID CTH110 **Technician** Eric Hebert **Site Visit Date** 10/15/2016

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

There is a point source north of Ithaca within 40 km of the site. The tree line is less than 50 m from the site. The siting is acceptable even with the noted exceptions.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CTH110	Technician	Eric Hebert	Site Visit Date	10/15/2016

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	CTH110	Technician	Eric Hebert	Site Visit Date	10/15/2016

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 CTH110 **Technician** Eric Hebert **Site Visit Date** 10/15/2016

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 CTH110 **Technician** Eric Hebert **Site Visit Date** 10/15/2016

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:

The meteorological tower has been removed and the temperature sensor has been moved to the sample tower at 10 meters above the ground. The shield has been changed from aspirated to naturally aspirated.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID CTH110 **Technician** Eric Hebert **Site Visit Date** 10/15/2016

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	☑	Oct 2015	☑
Field Ops Manual	☑	Oct 2015	☑
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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	CTH110	Technician	Eric Hebert	Site Visit Date	10/15/2016

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained at ESE in 1987
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	☐		☐
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☐
Analyzer Diagnostics Tests	☑	Weekly	☑
In-line Filter Replacement (at inlet)	☑	Every 2 weeks	☑
In-line Filter Replacement (at analyze	☑	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID CTH110 **Technician** Eric Hebert **Site Visit Date** 10/15/2016

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
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 CTH110 **Technician** Eric Hebert **Site Visit Date** 10/15/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07044
DAS	Campbell	CR3000	2510	000415
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	1092135217	02664
Flow Rate	Apex	AXMC105LPMDPC	unknown	000557
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0844349892	06599
Ozone	ThermoElectron Inc	49i A1NAA	1105347308	000735
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200023	000447
Sample Tower	Aluma Tower	B	AT-5107-E-4-10	666363
Shelter Temperature	Campbell	107-L	none	none
Shield (10 meter)	RM Young	unknown	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	12540	06301
Zero air pump	Werther International	PC70/4	000815261	06864

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ARE128-Eric Hebert-10/16/2016						
1	10/16/2016	Computer	Dell	07045	Inspiron 15	Unknown
2	10/16/2016	DAS	Campbell	000400	CR3000	2524
3	10/16/2016	Elevation	Elevation	None	1	None
4	10/16/2016	Filter pack flow pump	Thomas	02661	107CA110	000012187C
5	10/16/2016	Flow Rate	Apex	000462	AXMC105LPMDPCV	42228
6	10/16/2016	Infrastructure	Infrastructure	none	none	none
7	10/16/2016	Modem	Raven	06809	V4221-V	093644408
8	10/16/2016	Ozone	ThermoElectron Inc	000621	49i A1NAA	1009241798
9	10/16/2016	Ozone Standard	ThermoElectron Inc	000199	49i A3NAA	0607315737
10	10/16/2016	Sample Tower	Aluma Tower	666361	B	none
11	10/16/2016	Shelter Temperature	Campbell	none	107-L	none
12	10/16/2016	Shield (10 meter)	RM Young	none	unknown	none
13	10/16/2016	Siting Criteria	Siting Criteria	None	1	None
14	10/16/2016	Temperature	Climatronics	06678	100093	missing
15	10/16/2016	Zero air pump	Werther International	06866	PC70/4	000815262

DAS Data Form

DAS Time Max Error: 0.08

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2524	ARE128	Eric Hebert	10/16/2016	DAS	Primary

Das Date: 10/16/2016 **Audit Date** 10/16/2016
Das Time: 15:30:55 **Audit Time** 15:31:00
Das Day: 290 **Audit Day** 290

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

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/23/2015	**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	0.1000	V	V	0.0001
7	0.3000	0.3000	0.2999	V	V	-0.0001
7	0.5000	0.4999	0.4999	V	V	0.0000
7	0.7000	0.6999	0.6998	V	V	-0.0001
7	0.9000	0.8998	0.8997	V	V	-0.0001
7	1.0000	0.9998	0.9998	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	42228	ARE128	Eric Hebert	10/16/2016	Flow Rate	000462

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00309	**Intercept**	-0.00231
Cert Date	4/21/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.04
0.88%	1.32%			**Cal Factor Full Scale**	1.02
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.07	0.000	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	-0.02	0.000	0.01	l/m	l/m	
primary	test pt 1	1.527	1.520	1.50	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 2	1.516	1.510	1.50	0.000	1.51	l/m	l/m	0.00%
primary	test pt 3	1.520	1.520	1.50	0.000	1.50	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**	2.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.5 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 Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241798	ARE128	Eric Hebert	10/16/2016	Ozone	000621

Slope:	0.99462	**Slope:**	0.00000
Intercept	-0.67845	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00500	**Intercept**	-0.28841
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.9%	3.3%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.24	0.52	-0.22	ppb	
primary	2	28.07	28.21	27.28	ppb	-3.30%
primary	3	49.45	49.49	48.63	ppb	-1.74%
primary	4	77.50	77.40	76.61	ppb	-1.02%
primary	5	108.35	108.09	106.60	ppb	-1.38%

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.	97.8 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	710.8 mmHg	pass
Cell A Tmp.	36.9 C	pass
Cell B Freq.	85.9 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.70 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	missing	ARE128	Eric Hebert	10/16/2016	Temperature	06678

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00760	**Intercept**	-0.05710
Cert Date	2/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.21	0.26		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	-0.01	0.05	0.000	0.3	C	0.26
primary	Temp Mid Range	28.17	28.01	0.000	27.9	C	-0.12
primary	Temp High Range	48.89	48.58	0.000	48.3	C	-0.25

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 Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ARE128	Eric Hebert	10/16/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
1.43	1.79		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00760	Intercept	-0.05710
Cert Date	2/28/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	27.21	27.06	0.000	28.9	C	1.79
primary	Temp Mid Range	28.32	28.16	0.000	29.1	C	0.94
primary	Temp Mid Range	26.29	26.15	0.000	27.7	C	1.55

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	ARE128	Technician	Eric Hebert	Site Visit Date	10/16/2016

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2116-7)	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	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 Data Form

F-02058-1500-S1-rev002

Site ID	ARE128	**Technician**	Eric Hebert	**Site Visit Date**	10/16/2016

Site Sponsor (agency)	EPA	**USGS Map**	Arendtsville
Operating Group	PSU/private	**Map Scale**	
AQS #	42-001-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMROVE	**QAPP Latitude**	39.9231
Deposition Measurement	dry, wet, Hg, PM	**QAPP Longitude**	-77.3078
Land Use	agriculture	**QAPP Elevation Meters**	269
Terrain	complex - rolling	**QAPP Declination**	10.9
Conforms to MLM	Marginally	**QAPP Declination Date**	2/22/2006
Site Telephone	(717) 677-9866	**Audit Latitude**	39.923241
Site Address 1	PSU Fruit Research Orchard	**Audit Longitude**	-77.307863
Site Address 2	Winding Road	**Audit Elevation**	266
County	Adams	**Audit Declination**	-11
City, State	Arendtsville, PA		**Present**
Zip Code	17307	**Fire Extinguisher**	☑ New in 2015
Time Zone	Eastern	**First Aid Kit**	☑
Primary Operator		**Safety Glasses**	☑
Primary Op. Phone #		**Safety Hard Hat**	☑
Primary Op. E-mail		**Climbing Belt**	☐
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Step**	☑

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2116-7)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**					
Site OK	☑	**Notes**					

Driving Directions

From Gettysburg take route 34 north to Biglerville. At the intersection of 34 and 234 turn left (west) to Arendtsville. Continue into the town of Arendtsville. At the stop sign next to the gas station, turn left and immediately turn right, onto Chambersburg Street. Continue approximately 0.4 miles and turn right onto Winding Road. There is a sign for Boyer Nursery & Orchard. The site will be visible at the top of the hill in the orchard on the right.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID ARE128 **Technician** Eric Hebert **Site Visit Date** 10/16/2016

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	20 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

The site is located in an active orchard where spraying occurs. Fruit trees are rotated with corn and other crops.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	ARE128	Technician	Eric Hebert	Site Visit Date	10/16/2016

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 ARE128 **Technician** Eric Hebert **Site Visit Date** 10/16/2016

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

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

The 10-meter temperature sensor has been moved to a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID ARE128 **Technician** Eric Hebert **Site Visit Date** 10/16/2016

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?	☑	Moisture in tubing only
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 ARE128 **Technician** Eric Hebert **Site Visit Date** 10/16/2016

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:

The meteorological tower has been removed.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	ARE128	Technician	Eric Hebert	Site Visit Date	10/16/2016

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 2010	☑
HASP	☑	Oct 2015	☑
Field Ops Manual	☑	Oct 2015	☑
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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	ARE128	Technician	Eric Hebert	Site Visit Date	10/16/2016

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Refresher training by Lavery and Howell, July 2006
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Refresher training by Lavery and Howell, July 2006
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	☐		☐
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☐
Analyzer Diagnostics Tests	☑	Weekly	☑
In-line Filter Replacement (at inlet)	☑	Every 2 weeks	☑
In-line Filter Replacement (at analyze	☑	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID ARE128 **Technician** Eric Hebert **Site Visit Date** 10/16/2016

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☐	Gloves not consistently 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	☑	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 handles the filter caps with bare hands but handles the filter pack using the Ziploc filter bag.

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

Site ID ARE128 **Technician** Eric Hebert **Site Visit Date** 10/16/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07045
DAS	Campbell	CR3000	2524	000400
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	000012187C	02661
Flow Rate	Apex	AXMC105LPMDPC	42228	000462
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	093644408	06809
Ozone	ThermoElectron Inc	49i A1NAA	1009241798	000621
Ozone Standard	ThermoElectron Inc	49i A3NAA	0607315737	000199
Sample Tower	Aluma Tower	B	none	666361
Shelter Temperature	Campbell	107-L	none	none
Shield (10 meter)	RM Young	unknown	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	Climatronics	100093	missing	06678
Zero air pump	Werther International	PC70/4	000815262	06866

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
BEL116-Eric Hebert-11/14/2016						
1	11/14/2016	Computer	Dell	07005	Inspiron 15	Unknown
2	11/14/2016	DAS	Campbell	000341	CR3000	2120
3	11/14/2016	Elevation	Elevation	None	1	None
4	11/14/2016	Filter pack flow pump	Thomas	02755	107CAB18	1192001881
5	11/14/2016	Flow Rate	Apex	000596	AXMC105LPMDPCV	illegible
6	11/14/2016	Infrastructure	Infrastructure	none	none	none
7	11/14/2016	Met tower	Universal Tower	06484	unknown	none
8	11/14/2016	Modem	Raven	06475	H4222-C	0808311155
9	11/14/2016	Ozone	ThermoElectron Inc	000684	49i A1NAA	1030244795
10	11/14/2016	Ozone Standard	ThermoElectron Inc	000373	49i A3NAA	0726124685
11	11/14/2016	Precipitation	Texas Electronics	06332	TR-525i-HT	43527-807
12	11/14/2016	Relative Humidity	Vaisala	06752	HMP50UA	missing
13	11/14/2016	Sample Tower	Aluma Tower	000127	B	none
14	11/14/2016	Shelter Temperature	Campbell	none	107-L	44281
15	11/14/2016	Shield (10 meter)	RM Young	05042	Aspirated 43408	none
16	11/14/2016	Shield (2 meter)	RM Young	05041	Aspirated 43408	none
17	11/14/2016	Siting Criteria	Siting Criteria	None	1	None
18	11/14/2016	Solar Radiation	Licor	04935	LI-200	PY47675
19	11/14/2016	Solar Radiation Translator	RM Young	04888	70101-X	none
20	11/14/2016	Surface Wetness	RM Young	04608	58101	none
21	11/14/2016	Temperature	RM Young	06308	41342VO	12533
22	11/14/2016	Temperature2meter	RM Young	06309	41342VO	12534
23	11/14/2016	Wind Direction	RM Young	03190	AQ05305	15461wdr
24	11/14/2016	Wind Speed	RM Young	03190	AQ05305	15461wsp
25	11/14/2016	Zero air pump	Werther International	06913	C 70/4	000829178
26	11/14/2016	Zero air pump	Teledyne	000776	701H	606

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2120	BEL116	Eric Hebert	11/14/2016	DAS	Primary

Das Date: 11/22/2016
Das Time: 11:52:30
Das Day: 327

Audit Date 11/22/2016
Audit Time 11:52:30
Audit Day 327

Low Channel:

Avg Diff:	Max Diff:
0.0000	0.0001

High Channel:

Avg Diff:	Max Diff:
0.0000	0.0001

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/23/2015	**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	0.1000	0.1000	V	V	0.0000
7	0.3000	0.3000	0.3000	V	V	0.0000
7	0.5000	0.5001	0.5001	V	V	0.0000
7	0.7000	0.7001	0.7001	V	V	0.0000
7	0.9000	0.9001	0.9002	V	V	0.0001
7	1.0000	1.0001	1.0002	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	BEL116	Eric Hebert	11/14/2016	Flow Rate	000596

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00309	**Intercept**	-0.00231
Cert Date	4/21/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.01
0.22%	0.66%			**Cal Factor Full Scale**	0.99
				Rotometer Reading:	1.55

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.02	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	1.504	1.500	1.51	0.000	1.50	l/m	l/m	0.00%
primary	test pt 2	1.507	1.500	1.51	0.000	1.50	l/m	l/m	0.00%
primary	test pt 3	1.509	1.510	1.51	0.000	1.50	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**	1.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244795	BEL116	Eric Hebert	11/14/2016	Ozone	000684

Slope:	0.97281	**Slope:**	0.00000
Intercept	-0.80589	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00500	**Intercept**	-0.28841
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
5.1%	8.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	-0.14	0.14	-0.86	ppb	
primary	2	13.03	13.25	12.19	ppb	-8.00%
primary	3	28.56	28.70	27.21	ppb	-5.19%
primary	4	75.58	75.49	72.73	ppb	-3.66%
primary	5	104.80	104.56	100.80	ppb	-3.60%

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	0.997	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	96.1 kHz	pass
Cell A Noise	Not tested	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	733.5 mmHg	pass
Cell A Tmp.	34.3 C	pass
Cell B Freq.	89.5 kHz	pass
Cell B Noise	Not tested	pass
Cell B Flow	0.53 lpm	pass
Cell B Pressure	733.2	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	15461wsp	BEL116	Eric Hebert	11/14/2016	Wind Speed	03190

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	3/7/2016	**CorrCoff**	1.00000

Prop or Cups SN 65736
Prop or Cups Torque 0.3 **to** 0.4
Prop Correction Fact 0.0512

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.05	0.05%		
Abs Max Er	0.18	0.21%		

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		-0.18	
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	48.0	-0.21%		

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

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	15461wdr	BEL116	Eric Hebert	11/14/2016	Wind Direction	03190

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

Mfg	Ushikata	**Parameter**	wind direction
Serial Number	191832	**Tfer Desc.**	transit
Tfer ID	01272		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/9/2015	**CorrCoff**	1.00000

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

VaneTorque 20 **to** 25 180

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	2.0	1.5		
Abs Max Er	3	4		

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01252	0	☑	0.000	0	0	43	-2
primary	01252	45	☑	0.000	44	1	44	-1
primary	01252	90	☑	0.000	87	3	43	-2
primary	01252	135	☑	0.000	132	3	45	0
primary	01252	180	☑	0.000	178	2	46	1
primary	01252	225	☑	0.000	224	1	46	1
primary	01252	270	☑	0.000	273	3	49	4
primary	01252	315	☑	0.000	317	2	44	-1
primary	01272	0	☐	0.000	0	0		0
primary	01272	90	☐	0.000	87	3		3
primary	01272	180	☐	0.000	178	2		2
primary	01272	270	☐	0.000	273	3		3

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

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	12533	BEL116	Eric Hebert	11/14/2016	Temperature	06308

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00760	**Intercept**	-0.05710
Cert Date	2/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.07	0.15		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	-0.08	-0.02	0.000	0.13	C	0.15
primary	Temp Mid Range	21.84	21.73	0.000	21.69	C	-0.04
primary	Temp High Range	50.03	49.71	0.000	49.70	C	-0.01

Sensor Component	Shield	**Condition**	Moderately 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

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	12534	BEL116	Eric Hebert	11/14/2016	Temperature2meter	06309

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00760	**Intercept**	-0.05710
Cert Date	2/28/2016	**CorrCoff**	1.00000

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

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	-0.08	-0.02	0.000	0.17	C	0.19
primary	Temp Mid Range	21.84	21.73	0.000	21.91	C	0.18
primary	Temp High Range	50.03	49.71	0.000	49.90	C	0.19

Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	Shield	**Condition**	Moderately 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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	missing	BEL116	Eric Hebert	11/14/2016	Relative Humidity	06752

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	124432	**Tfer Desc.**	Hygroclip
Tfer ID	01225		
Slope	0.97830	**Intercept**	0.84460
Cert Date	12/24/2015	**CorrCoff**	0.99980

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	4.4			
Abs Max Er	7.2			

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	Hygroclip	32.8	34.0	32.8	0.000	34.4	1.6
primary	RH Low Range	Hygroclip	52.9	56.8	52.9	0.000	60.1	7.2
primary	RH Low Range	Hygroclip	75.3	71.7	75.3	0.000	71.0	-4.3

Sensor Component	RH Filter	**Condition**	Clean	**Status**	pass
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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY47675	BEL116	Eric Hebert	11/14/2016	Solar Radiation	04935

Mfg	RM Young	
SN/Owner ID	none	04888
Parameter	Solar Radiation Translator	

Mfg	Eppley	**Parameter**	solar radiation
Serial Number	10765	**Tfer Desc.**	SR transfer translat
Tfer ID	01246		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/29/2015	**CorrCoff**	1.00000

Mfg	Eppley	**Parameter**	solar radiation
Serial Number	34341F3	**Tfer Desc.**	SR transfer sensor
Tfer ID	01245		

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
8.5%	7.9%	0.0%	0.0%

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	11/22/2016	10:00	481	481	524	8.9%
primary	11/22/2016	11:00	531	531	573	7.9%
primary	11/22/2016	12:00	510	510	552	8.3%
primary	11/22/2016	13:00	454	454	495	9.1%

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 Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Texas Electronics	43527-807	BEL116	Eric Hebert	11/14/2016	Precipitation	06332

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
4.0%	4.0%		

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	tip check	10 manual	1	2 sec	0.10	0.10	in	in	ml	
primary	test 1	231.5	1	10 sec	0.50	0.48	in	in	ml	-4.0%

Sensor Component	Properly Sited	Condition	45 degree rule	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

Surface Wetness Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	none	BEL116	Eric Hebert	11/14/2016	Surface Wetness	04608

Mfg	Ohmite	**Parameter**	surface wetness
Serial Number	296-1200	**Tfer Desc.**	decade box
Tfer ID	01210		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/4/2011	**CorrCoff**	1.00000

☑ **Manual Test Pass**

UseDescription	Test Type	Tfer kOhms	OutputSignal	DAS eng	OutputSignalEngUni	TferUnits	OutputSignalUnit
primary	dry	N/A	0.000	0.01	V	N/A	V
primary	wet	N/A	0.000	1.02	V	N/A	V

Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	Grid Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Grid Angle	**Condition**	about 45 deg	**Status**	pass
Sensor Component	Grid Orientation	**Condition**	North	**Status**	pass
Sensor Component	Grid Condition	**Condition**	Fair	**Status**	pass
Sensor Component	Grid Type	**Condition**	Grid without holes	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	44281	BEL116	Eric Hebert	11/14/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.87	2.18		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00760	Intercept	-0.05710
Cert Date	2/28/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.37	26.23	0.000	26.1	C	-0.14
primary	Temp Mid Range	26.24	26.10	0.000	26.4	C	0.29
primary	Temp Mid Range	20.01	19.92	0.000	22.1	C	2.18

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	BEL116	Technician	Eric Hebert	Site Visit Date	11/14/2016

Shelter Make	Shelter Model	Shelter Size
Unknown	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	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 Data Form

F-02058-1500-S1-rev002

Site ID	BEL116	**Technician**	Eric Hebert	**Site Visit Date**	11/14/2016

Site Sponsor (agency)	EPA	**USGS Map**	Laurel
Operating Group	BARC/private	**Map Scale**	
AQS #	24-033-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, SO2, NOy, NOx, CO, Hg	**QAPP Latitude**	39.0283
Deposition Measurement	dry, wet, Hg	**QAPP Longitude**	-76.8175
Land Use	urban - agriculture	**QAPP Elevation Meters**	46
Terrain	flat	**QAPP Declination**	11.25
Conforms to MLM	No	**QAPP Declination Date**	2/23/2006
Site Telephone	(301) 474-3019	**Audit Latitude**	39.028177
Site Address 1	BARC old airport	**Audit Longitude**	-76.817127
Site Address 2	Springfield Road	**Audit Elevation**	47
County	Prince George's	**Audit Declination**	-11
City, State	Laurel, MD		
Zip Code	20708	**Fire Extinguisher** ☑	New in 2015
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☑	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

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

Driving Directions

From the Baltimore - Washington Parkway (route 295) take exit 11(Powder Mill Road). Go east for approximately 0.5 miles and turn right (south) onto Springfield Road. Continue approximately 0.8 miles and look for a gate on the left. The site is on the right of the dirt road approximately 1 mile through the two gates.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID BEL116 **Technician** Eric Hebert **Site Visit Date** 11/14/2016

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	25 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 between Washington DC and Baltimore, MD near a major transportation corridor. Although the site surroundings are woodland and agriculture, the region surrounding the research center is densely populated and urban.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	BEL116	Technician	Eric Hebert	Site Visit Date	11/14/2016

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?	☑	
11	Is it inclined approximately 30 degrees?	☑	About 45 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:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID BEL116 **Technician** Eric Hebert **Site Visit Date** 11/14/2016

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?**	☑	
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 outer insulation of both temperature sensor signal cables is broken.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	BEL116	Technician	Eric Hebert	Site Visit Date	11/14/2016

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID BEL116 **Technician** Eric Hebert **Site Visit Date** 11/14/2016

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	BEL116	Technician	Eric Hebert	Site Visit Date	11/14/2016

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	☑	Oct 2015	☑
Field Ops Manual	☑	Oct 2015	☑
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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 BEL116 **Technician** Eric Hebert **Site Visit Date** 11/14/2016

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	☑	Weekly	☑
Confirm Reasonableness of Current Values	☑	Weekly	☑
Test Surface Wetness Response	☑	Weekly	☑

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

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

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	SSRF, 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 BEL116 **Technician** Eric Hebert **Site Visit Date** 11/14/2016

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, 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 glove 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 BEL116 **Technician** Eric Hebert **Site Visit Date** 11/14/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07005
DAS	Campbell	CR3000	2120	000341
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	1192001881	02755
Flow Rate	Apex	AXMC105LPMDPC	illegible	000596
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	06484
Modem	Raven	H4222-C	0808311155	06475
Ozone	ThermoElectron Inc	49i A1NAA	1030244795	000684
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124685	000373
Precipitation	Texas Electronics	TR-525i-HT	43527-807	06332
Relative Humidity	Vaisala	HMP50UA	missing	06752
Sample Tower	Aluma Tower	B	none	000127
Shelter Temperature	Campbell	107-L	44281	none
Shield (10 meter)	RM Young	Aspirated 43408	none	05042
Shield (2 meter)	RM Young	Aspirated 43408	none	05041
Siting Criteria	Siting Criteria	1	None	None
Solar Radiation	Licor	LI-200	PY47675	04935
Solar Radiation Translator	RM Young	70101-X	none	04888
Surface Wetness	RM Young	58101	none	04608
Temperature	RM Young	41342VO	12533	06308
Temperature2meter	RM Young	41342VO	12534	06309
Wind Direction	RM Young	AQ05305	15461wdr	03190
Wind Speed	RM Young	AQ05305	15461wsp	03190
Zero air pump	Teledyne	701H	606	000776
Zero air pump	Werther International	C 70/4	000829178	06913

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PNF126-Eric Hebert-11/26/2016						
1	11/26/2016	Computer	Dell	07069	Inspiron 15	Unknown
2	11/26/2016	DAS	Campbell	000346	CR3000	2125
3	11/26/2016	Elevation	Elevation	None	1	None
4	11/26/2016	Filter pack flow pump	Thomas	06030	107CAB18	060400022677
5	11/26/2016	Flow Rate	Apex	000655	AXMC105LPMDPCV	illegible
6	11/26/2016	Infrastructure	Infrastructure	none	none	none
7	11/26/2016	Modem	Raven	06597	V4221-V	0844349884
8	11/26/2016	Ozone	ThermoElectron Inc	000695	49i A1NAA	1030244801
9	11/26/2016	Ozone Standard	ThermoElectron Inc	000437	49i A3NAA	CM08200013
10	11/26/2016	Sample Tower	Aluma Tower	000178	B	none
11	11/26/2016	Shelter Temperature	Campbell	none	107-L	none
12	11/26/2016	Siting Criteria	Siting Criteria	None	1	None
13	11/26/2016	Temperature	RM Young	06536	41342	14797
14	11/26/2016	Zero air pump	Werther International	06885	C 70/4	000814270
15	11/26/2016	Zero air pump	Teledyne	000774	701H	610

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2125	PNF126	Eric Hebert	11/26/2016	DAS	Primary

Das Date: 11/26/2016
Das Time: 11:34:00
Das Day: 331

Audit Date 11/26/2016
Audit Time 11:34:00
Audit Day 331

Low Channel:

Avg Diff:	Max Diff:
0.0000	0.0001

High Channel:

Avg Diff:	Max Diff:
0.0000	0.0001

Mfg Datel **Parameter** DAS
Serial Number 4000392 **Tfer Desc.** Source generator (D
Tfer ID 01321

Mfg Fluke **Parameter** DAS
Serial Number 86590148 **Tfer Desc.** DVM
Tfer ID 01310

Slope 1.00000 **Intercept** 0.00000
Cert Date 12/23/2015 **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	0.1000	0.1000	V	V	0.0000
7	0.3000	0.3000	0.3000	V	V	0.0000
7	0.5000	0.5000	0.5001	V	V	0.0001
7	0.7000	0.7000	0.7001	V	V	0.0001
7	0.9000	0.9001	0.9001	V	V	0.0000
7	1.0000	1.0001	1.0001	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	PNF126	Eric Hebert	11/26/2016	Flow Rate	000655

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00309	**Intercept**	-0.00231
Cert Date	4/21/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.03
1.32%	1.32%			**Cal Factor Full Scale**	0.975
				Rotometer Reading:	1.6

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.02	0.000	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	-0.02	l/m	l/m	
primary	test pt 1	1.526	1.520	1.52	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 2	1.527	1.520	1.52	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 3	1.526	1.520	1.52	0.000	1.50	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**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244801	PNF126	Eric Hebert	11/26/2016	Ozone	000695

Slope:	1.04350	**Slope:**	0.00000
Intercept	-0.27084	**Intercept**	0.00000
CorrCoff	0.99971	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00500	**Intercept**	-0.28841
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.4%	5.3%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	-0.36	-0.07	0.12	ppb	
primary	2	11.29	11.52	11.97	ppb	3.91%
primary	3	28.42	28.56	29.25	ppb	2.42%
primary	4	74.31	74.22	75.50	ppb	1.72%
primary	5	102.19	101.96	107.40	ppb	5.34%

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	1.029	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	96.5 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.61 lpm	pass
Cell A Pressure	622.5 mmHg	pass
Cell A Tmp.	37.7 C	pass
Cell B Freq.	76.0 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.55 lpm	pass
Cell B Pressure	623.0 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14797	PNF126	Eric Hebert	11/26/2016	Temperature	06536

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00760	**Intercept**	-0.05710
Cert Date	2/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.22	0.26		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.04	0.10	0.000	0.4	C	0.26
primary	Temp Mid Range	20.65	20.55	0.000	20.7	C	0.15
primary	Temp High Range	49.58	49.26	0.000	49.5	C	0.26

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 Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	PNF126	Eric Hebert	11/26/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
1.07	1.27		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00760	Intercept	-0.05710
Cert Date	2/28/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.84	26.69	0.000	25.4	C	-1.27
primary	Temp Mid Range	28.76	28.60	0.000	27.4	C	-1.25
primary	Temp Mid Range	27.99	27.84	0.000	27.2	C	-0.69

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	PNF126	Technician	Eric Hebert	Site Visit Date	11/26/2016

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	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Poor	Status	Fail
Sensor Component	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	PNF126	**Technician**	Eric Hebert	**Site Visit Date**	11/26/2016

Site Sponsor (agency)	EPA	**USGS Map**	Carvers Gap
Operating Group	USFS/private	**Map Scale**	
AQS #	37-011-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**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	8287331643	**Audit Latitude**	36.105435
Site Address 1	end of paved road	**Audit Longitude**	-82.045015
Site Address 2	Roaring Creek Road	**Audit Elevation**	1216
County	Avery	**Audit Declination**	-6.3
City, State	, NC		
Zip Code	28657	**Fire Extinguisher** (Present) ☑	New in 2015
Time Zone	Eastern	**First Aid Kit** ☐	
Primary Operator		**Safety Glasses** ☑	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☑	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

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

Shelter Clean ☑ **Notes** The shelter is in fair condition, however the floor is beginning to deteriorate.

Site OK ☑ **Notes**

Driving Directions From Hwy 19E north of Plumb tree, turn west onto Roaring Creek Road. Follow the road to end of pavement always bearing right, and continue 200 meters. Site is off dirt road in the field on the right.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID PNF126 **Technician** Eric Hebert **Site Visit Date** 11/26/2016

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	5 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 in a mountain bowl. The wind pattern from this site would be expected to follow up and down slope patterns. The site is also located in a hay field which is cut 2 or 3 times per year.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	PNF126	Technician	Eric Hebert	Site Visit Date	11/26/2016

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 PNF126 **Technician** Eric Hebert **Site Visit Date** 11/26/2016

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	PNF126	Technician	Eric Hebert	Site Visit Date	11/26/2016

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 PNF126 **Technician** Eric Hebert **Site Visit Date** 11/26/2016

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?	Met tower removed	

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

The sample towers are not grounded.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	PNF126	Technician	Eric Hebert	Site Visit Date	11/26/2016

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	☑	Oct 2015	☑
Field Ops Manual	☑	Oct 2015	☑
Calibration Reports	☐		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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 PNF126 **Technician** Eric Hebert **Site Visit Date** 11/26/2016

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained in Gainesville in 1987
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	☐		☐
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	☑	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 PNF126 **Technician** Eric Hebert **Site Visit Date** 11/26/2016

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
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?	☑	One set of gloves only
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

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

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

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

Site ID PNF126 **Technician** Eric Hebert **Site Visit Date** 11/26/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07069
DAS	Campbell	CR3000	2125	000346
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	060400022677	06030
Flow Rate	Apex	AXMC105LPMDPC	illegible	000655
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0844349884	06597
Ozone	ThermoElectron Inc	49i A1NAA	1030244801	000695
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200013	000437
Sample Tower	Aluma Tower	B	none	000178
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14797	06536
Zero air pump	Teledyne	701H	610	000774
Zero air pump	Werther International	C 70/4	000814270	06885

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: 2/25/2017 10:50:33 AM

SiteVisitDate	Site	Technician
10/05/2016	ACA416	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.12	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.16	c	**P**
3	Relative Humidity average below 85%	P	6	10	3	2.8	%	**P**
4	Relative Humidity max below 85%	P	6	10	3	6.8	%	**P**
5	Solar Radiation % diff of avg	P	9	10	12	8.67	%	**P**
6	Solar Radiation % diff of max STD value	P	9	10	12	9.1	%	**P**
7	Ozone Slope	P	0	1.1	4	1.02779	unitless	**P**
8	Ozone Intercept	P	0	5	4	0.30046	ppb	**P**
9	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
10	Ozone % difference avg	P	7	10	4	3.2	%	**P**
11	Ozone % difference max	P	7	10	4	3.6	%	**P**
12	Flow Rate average % difference	P	10	5	3	8.00	%	**Fail**
13	Flow Rate max % difference	P	10	5	3	8.00	%	**Fail**
14	Shelter Temperature average error	P	5	2	6	0.54	c	**P**
15	Shelter Temperature max error	P	5	2	6	1.06	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Shelter Temperature standard deviation		5	0	6			
2	Temperature2meter Standard Deviation		5	0	3			

SiteVisitDate	Site	Technician
10/05/2016	ACA416	Eric Hebert

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** System Memo **CommentCode:** 199

The DAS calibration factors are not scaled correctly for the installed instrument measuring this parameter.

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

This site is operated partly by 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.

2 **Parameter:** DasComments

The accuracy of the DAS was not tested due to poor wiring conditions at the logger and lack of wiring documentation. It was decided that it was safer not to disturb the signal connections.

3 **Parameter:** SiteOpsProcedures

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

4 **Parameter:** ShelterCleanNotes

The shelter is clean and well organized.

5 **Parameter:** PollAnalyzerCom

The flow rate was measured to be 1.50 lpm, however the recorded flow rate on the DAS was 1.38 lpm.

6 **Parameter:** MetOpMaintCom

The sensor signal cables are beginning to show signs of wear. At the request of the site operator, the meteorological tower was not lowered and the wind sensors were not audited as the site is scheduled for a new shelter and major restructure. Ambient temperature is currently being measured at 2 meters above ground.

EEMS Spot Report

Data Compiled: 2/25/2017 4:45:16 PM

SiteVisitDate	Site	Technician
10/16/2016	ARE128	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	0.21	c	**P**
2	Temperature max error	P	4	0.5	12	0.26	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99462	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.67845	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.9	%	**P**
7	Ozone % difference max	P	7	10	4	3.3	%	**P**
8	Flow Rate average % difference	P	10	5	6	0.88	%	**P**
9	Flow Rate max % difference	P	10	5	6	1.32	%	**P**
10	DAS Time maximum error	P	0	5	1	0.08	min	**P**
11	DAS Voltage average error	P	7	0.003	49	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	12	1.43	c	**P**
13	Shelter Temperature max error	P	5	2	12	1.79	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	49			
2	Shelter Temperature standard deviation		5	0	12			
3	Temperature standard deviation		4	0	12			

SiteVisitDate	Site	Technician
10/16/2016	ARE128	Eric Hebert

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator handles the filter caps with bare hands but handles the filter pack using the Ziploc filter bag.

2 **Parameter:** DasComments

The meteorological tower has been removed.

3 **Parameter:** SitingCriteriaCom

The site is located in an active orchard where spraying occurs. Fruit trees are rotated with corn and other crops.

4 **Parameter:** MetOpMaintCom

The 10-meter temperature sensor has been moved to a naturally aspirated shield on the sample tower.

EEMS Spot Report

Data Compiled: 2/26/2017 11:41:58 AM

SiteVisitDate	Site	Technician
10/19/2016	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	0.98280	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.27955	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 % difference max	P	7	10	4	3.8	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 2/25/2017 12:03:08 PM

SiteVisitDate	Site	Technician
10/11/2016	ASH135	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	15	0.10	c	**P**
2	Temperature max error	P	4	0.5	15	0.20	c	**P**
3	Ozone Slope	P	0	1.1	4	0.84488	unitless	**Fail**
4	Ozone Intercept	P	0	5	4	-1.88979	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
6	Ozone % difference avg	P	7	10	4	19.3	%	**Fail**
7	Ozone % difference max	P	7	10	4	23.2	%	**Fail**
8	Flow Rate average % difference	P	10	5	4	1.35	%	**P**
9	Flow Rate max % difference	P	10	5	4	1.35	%	**P**
10	DAS Time maximum error	P	0	5	1	0.08	min	**P**
11	DAS Voltage average error	P	7	0.003	14	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	10	0.77	c	**P**
13	Shelter Temperature max error	P	5	2	10	0.83	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	14			
2	Shelter Temperature standard deviation		5	0	10			
3	Temperature standard deviation		4	0	15			

SiteVisitDate	Site	Technician
10/11/2016	ASH135	Eric Hebert

Field Performance Comments

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

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

2 **Parameter:** Ozone **SensorComponent:** Cell B Flow **CommentCode:** 99

This analyzer diagnostic check is outside the manufacturer's recommended value.

3 **Parameter:** Ozone **SensorComponent:** Cell A Flow **CommentCode:** 99

This analyzer diagnostic check is outside the manufacturer's recommended value.

4 **Parameter:** Ozone **SensorComponent:** Inlet Filter Conditi **CommentCode:** 91

Ozone inlet filter dirty

Field Systems Comments

1 **Parameter:** DasComments

The met tower has been removed and the 10 meter temperature sensor is mounted in a naturally aspirated shield on the sample tower.

2 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced and the sample train is leak tested once each month.

3 **Parameter:** SitingCriteriaCom

The evergreen plantation previously 20 meters south of the site has been harvested.

4 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, clean, and very well organized. Rot is beginning at the bottom of the walls and floor.

EEMS Spot Report

Data Compiled: 2/25/2017 7:14:59 PM

SiteVisitDate	Site	Technician
11/14/2016	BEL116	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	0.19	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.19	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	0.18	m/s	**P**
5	Wind Speed average % difference above 5 m/s	P	3	5	8	0.1	%	**P**
6	Wind Speed max % difference above 5 m/s	P	3	5	8	0.2	%	**P**
7	Wind Speed Torque average error	P	3	0.5	1	0.35	g-cm	**P**
8	Wind Speed Torque max error	P	3	0.5	1	0.4	g-cm	**P**
9	Wind Direction Input Deg True average error (de	P	2	5	8	2.0	degrees	**P**
10	Wind Direction Input Deg True max error (deg)	P	2	5	8	3	degrees	**P**
11	Wind Direction Linearity average error (deg)	P	2	5	16	1.5	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	22	g-cm	**P**
14	Wind Direction Torque max error	P	2	30	1	25	g-cm	**P**
15	Temperature average error	P	4	0.5	15	0.07	c	**P**
16	Temperature max error	P	4	0.5	15	0.15	c	**P**
17	Relative Humidity average below 85%	P	6	10	3	4.4	%	**P**
18	Relative Humidity max below 85%	P	6	10	3	7.2	%	**P**
19	Solar Radiation % diff of avg	P	9	10	20	8.52	%	**P**
20	Solar Radiation % diff of max STD value	P	9	10	20	7.9	%	**P**
21	Precipitation average % difference	P	1	10	1	4.0	%	**P**
22	Precipitation max % difference	P	1	10	1	4.0	%	**P**
23	Ozone Slope	P	0	1.1	4	0.97281	unitless	**P**
24	Ozone Intercept	P	0	5	4	-0.80589	ppb	**P**
25	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
26	Ozone % difference avg	P	7	10	4	5.1	%	**P**
27	Ozone % difference max	P	7	10	4	8.0	%	**P**
28	Flow Rate average % difference	P	10	5	3	0.22	%	**P**
29	Flow Rate max % difference	P	10	5	3	0.66	%	**P**
30	DAS Time maximum error	P	0	5	1	0.00	min	**P**
31	DAS Voltage average error	P	7	0.003	56	0.0000	V	**P**
32	Surface Wetness Response	P	12	0.5	1	1.02		**P**
33	Shelter Temperature average error	P	5	2	15	0.87	c	**P**

SiteVisitDate	Site	Technician
11/14/2016	BEL116	Eric Hebert

34	Shelter Temperature max error	P	5	2	15	2.18	c	**Fail**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Surface Wetness Manual Test Pass Fail		12	0	1			
2	DAS Voltage maximum error		7	0	56			
3	Temperature2meter Standard Deviation		5	0	3			
4	Shelter Temperature standard deviation		5	0	15			
5	Temperature standard deviation		4	0	15			
6	Precipitation total of % diff		1	0	1			
7	Precipitation total of abs diff mm or in		1	0	1			
8	Precipitation total of DAS mm or in		1	0	1			
9	Precipitation total of equivalent mm or in		1	0	1			

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is located between Washington DC and Baltimore, MD near a major transportation corridor. Although the site surroundings are woodland and agriculture, the region surrounding the research center is densely populated and urban.

2 **Parameter:** MetOpMaintCom

The outer insulation of both temperature sensor signal cables is broken.

EEMS Spot Report

Data Compiled: 2/26/2017 10:32:22 PM

SiteVisitDate	Site	Technician
11/10/2016	BFT142	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	0.98367	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.03766	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.0	%	**P**
5	Ozone % difference max	P	7	10	4	2.4	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 2/26/2017 12:18:22 PM

SiteVisitDate	Site	Technician
11/08/2016	BWR139	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	0.99546	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.32609	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.9	%	**P**
5	Ozone % difference max	P	7	10	4	1.5	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 2/25/2017 12:52:09 PM

SiteVisitDate	Site	Technician
10/14/2016	CAT175	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	15	0.07	c	**P**
2	Temperature max error	P	4	0.5	15	0.16	c	**P**
3	Flow Rate average % difference	P	10	5	3	1.12	%	**P**
4	Flow Rate max % difference	P	10	5	3	1.35	%	**P**
5	DAS Time maximum error	P	0	5	1	0.08	min	**P**
6	DAS Voltage average error	P	7	0.003	21	0.0001	V	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	21			
2	Temperature standard deviation		4	0	15			

SiteVisitDate	Site	Technician
10/14/2016	CAT175	Eric Hebert

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

New site operators from the Frost Valley YMCA camp are now operating the site.

2 **Parameter:** DasComments

The shelter is not temperature controlled. The site is solar and DC battery powered. The met tower has been removed and the temperature is being measured from the sample tower at 10 meters above ground.

3 **Parameter:** ShelterCleanNotes

The shelter is beginning to show signs of deterioration to the floor and walls. There are many unused and possibly depleted batteries stored in the shelter. The vegetation has been allowed to grow. The shelter roof has been repaired.

4 **Parameter:** PollAnalyzerCom

Ozone monitoring is no longer being conducted at the site.

EEMS Spot Report

Data Compiled: 2/26/2017 11:14:02 AM

SiteVisitDate	Site	Technician
10/18/2016	CDR119	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	0.97008	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.20393	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.7	%	**P**
5	Ozone % difference max	P	7	10	4	4.7	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 2/26/2017 10:53:40 AM

SiteVisitDate	Site	Technician
10/17/2016	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	0.98222	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.21269	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.1	%	**P**
5	Ozone % difference max	P	7	10	4	2.3	%	**P**

Records without valid pass/fail criteria

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** Cell B Flow **CommentCode:** 99

This analyzer diagnostic check is outside the manufacturer's recommended value.

EEMS Spot Report

Data Compiled: 2/25/2017 1:30:38 PM

SiteVisitDate	Site	Technician
10/15/2016	CTH110	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	3	0.08	c	**P**
2	Temperature max error	P	4	0.5	3	0.21	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98214	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.50545	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.7	%	**P**
7	Ozone % difference max	P	7	10	4	4.1	%	**P**
8	Flow Rate average % difference	P	10	5	3	1.35	%	**P**
9	Flow Rate max % difference	P	10	5	3	1.35	%	**P**
10	DAS Time maximum error	P	0	5	1	0.20	min	**P**
11	DAS Voltage average error	P	7	0.003	42	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	12	0.10	c	**P**
13	Shelter Temperature max error	P	5	2	12	0.15	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	42			
2	Shelter Temperature standard deviation		5	0	12			
3	Temperature standard deviation		4	0	3			

SiteVisitDate	Site	Technician
10/15/2016	CTH110	Eric Hebert

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** DasComments

The meteorological tower has been removed and the temperature sensor has been moved to the sample tower at 10 meters above the ground. The shield has been changed from aspirated to naturally aspirated.

2 **Parameter:** SiteOpsProcedures

The ozone inlet filter is changed and the sample train is leak tested every two weeks.

3 **Parameter:** SitingCriteriaCom

There is a point source north of Ithaca within 40 km of the site. The tree line is less than 50 m from the site. The siting is acceptable even with the noted exceptions.

4 **Parameter:** ShelterCleanNotes

The condition of the shelter floor is beginning to deteriorate.

EEMS Spot Report

Data Compiled: 2/26/2017 12:01:27 PM

SiteVisitDate	Site	Technician
10/27/2016	GRS420	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	0.98817	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.69307	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.8	%	**P**
5	Ozone % difference max	P	7	10	4	5.7	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 2/25/2017 11:13:35 AM

SiteVisitDate	Site	Technician
10/10/2016	HOW191	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	3	0.08	c	**P**
2	Temperature max error	P	4	0.5	3	0.16	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98950	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.77461	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.0	%	**P**
7	Ozone % difference max	P	7	10	4	5.3	%	**P**
8	Flow Rate average % difference	P	10	5	4	0.67	%	**P**
9	Flow Rate max % difference	P	10	5	4	0.67	%	**P**
10	Shelter Temperature average error	P	5	2	9	0.60	c	**P**
11	Shelter Temperature max error	P	5	2	9	0.89	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Shelter Temperature standard deviation		5	0	9			
2	Temperature standard deviation		4	0	3			

SiteVisitDate	Site	Technician
10/10/2016	HOW191	Eric Hebert

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** System Memo **CommentCode:** 209

This parameter is being measured at 23.5 meters from the ground and above a tree canopy.

2 **Parameter:** Ozone **SensorComponent:** System Memo **CommentCode:** 209

This parameter is being measured at 23.5 meters from the ground and above a tree canopy.

3 **Parameter:** Temperature **SensorComponent:** System Memo **CommentCode:** 209

This parameter is being measured at 23.5 meters from the ground and above a tree canopy.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator reported that gloves are not consistently used to handle the filter pack.

2 **Parameter:** DasComments

There were no spare channels configured on the DAS to allow for accuracy testing with the audit system.

3 **Parameter:** SitingCriteriaCom

The CASTNET filter pack at this location is located above a tree canopy at approximately 23.5 meters from the ground. This is an AmeriFlux site which is approximately 2.5 km to the SW of the HOW132 CASTNET site.

4 **Parameter:** ShelterCleanNotes

The custom built shelter is clean and organized.

5 **Parameter:** MetSensorComme

Other than a temperature sensor located at the CASTNET filter location the meteorological instrumentation is being operated by the University of Maine and AmeriFlux.

EEMS Spot Report

Data Compiled: 2/24/2017 5:26:10 PM

SiteVisitDate	Site	Technician
10/01/2016	HWF187	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	15	0.26	c	**P**
2	Temperature max error	P	4	0.5	15	0.33	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98859	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.21053	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.4	%	**P**
7	Ozone % difference max	P	7	10	4	1.8	%	**P**
8	Flow Rate average % difference	P	10	5	3	1.12	%	**P**
9	Flow Rate max % difference	P	10	5	3	1.35	%	**P**
10	DAS Time maximum error	P	0	5	1	0.33	min	**P**
11	DAS Voltage average error	P	7	0.003	49	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	10	0.45	c	**P**
13	Shelter Temperature max error	P	5	2	10	0.74	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	49			
2	Shelter Temperature standard deviation		5	0	10			
3	Temperature standard deviation		4	0	15			

SiteVisitDate	Site	Technician
10/01/2016	HWF187	Eric Hebert

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced and the sample train is leak tested every other week.

2 **Parameter:** ShelterCleanNotes

The shelter is in good condition.

EEMS Spot Report

Data Compiled: 2/26/2017 11:31:53 AM

SiteVisitDate	Site	Technician
10/18/2016	PAR107	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	0.98764	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.36289	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.5	%	**P**
5	Ozone % difference max	P	7	10	4	2.0	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 2/26/2017 10:23:11 PM

SiteVisitDate	Site	Technician
10/21/2016	PED108	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	0.99524	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.38233	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 % difference max	P	7	10	4	2.2	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 2/25/2017 7:45:19 PM

SiteVisitDate	Site	Technician
11/26/2016	PNF126	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	3	0.22	c	**P**
2	Temperature max error	P	4	0.5	3	0.26	c	**P**
3	Ozone Slope	P	0	1.1	4	1.0435	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.27084	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99971	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.3	%	**P**
7	Ozone % difference max	P	7	10	4	5.3	%	**P**
8	Flow Rate average % difference	P	10	5	3	1.32	%	**P**
9	Flow Rate max % difference	P	10	5	3	1.32	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	49	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	12	1.07	c	**P**
13	Shelter Temperature max error	P	5	2	12	1.27	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	49			
2	Shelter Temperature standard deviation		5	0	12			
3	Temperature standard deviation		4	0	3			

SiteVisitDate	Site	Technician
11/26/2016	PNF126	Eric Hebert

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** DasComments

The sample towers are not grounded.

2 **Parameter:** SitingCriteriaCom

The site is in a mountain bowl. The wind pattern from this site would be expected to follow up and down slope patterns. The site is also located in a hay field which is cut 2 or 3 times per year.

3 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, however the floor is beginning to deteriorate.

EEMS Spot Report

Data Compiled: 2/26/2017 11:50:46 AM

SiteVisitDate	Site	Technician
10/21/2016	SHN418	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	0.98889	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.10568	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99993	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.7	%	**P**
5	Ozone % difference max	P	7	10	4	1.5	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 2/26/2017 11:04:35 AM

SiteVisitDate	Site	Technician
10/17/2016	VPI120	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	0.98939	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.26083	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.7	%	**P**
5	Ozone % difference max	P	7	10	4	2.4	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 2/26/2017 12:09:42 PM

SiteVisitDate	Site	Technician
11/07/2016	WSP144	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	0.96686	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.67538	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99988	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.8	%	**P**
5	Ozone % difference max	P	7	10	4	4.3	%	**P**

Records without valid pass/fail criteria

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
VPI120-Sandy Grenville-10/17/2016						
1	10/17/2016	DAS	Campbell	000402	CR3000	2514
2	10/17/2016	Ozone	ThermoElectron Inc	000628	49i A1NAA	1009241786
3	10/17/2016	Ozone Standard	ThermoElectron Inc	000443	49i A3NAA	CM08200019
4	10/17/2016	Zero air pump	Werther International	06879	C 70/4	000814275

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241786	VPI120	Sandy Grenville	10/17/2016	Ozone	000628

Slope:	0.98939	**Slope:**	0.00000
Intercept	-0.26083	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99524	**Intercept**	-0.33070
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.7%	2.4%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.04	0.37	0.34	ppb	
primary	2	29.99	30.46	29.74	ppb	-2.36%
primary	3	50.06	50.63	49.58	ppb	-2.07%
primary	4	80.00	80.71	79.60	ppb	-1.38%
primary	5	110.04	110.89	109.60	ppb	-1.16%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	Not functioning	Fail
Offset	0.6	pass
Span	1.007	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	89.0 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	660.5 mmHg	pass
Cell A Tmp.	36.4 C	pass
Cell B Freq.	93.5 kHz	pass
Cell B Noise	0.7 ppb	pass
Cell B Flow	0.69 lpm	pass
Cell B Pressure	660.8 mmHg	pass
Cell B Tmp.		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-10/17/2016						
1	10/17/2016	DAS	Campbell	000499	CR3000	3816
2	10/17/2016	Ozone	ThermoElectron Inc	000692	49i A1NAA	1030244803
3	10/17/2016	Ozone Standard	ThermoElectron Inc	000376	49i A3NAA	0726124693
4	10/17/2016	Zero air pump	Werther International	06868	C 70/4	000814284

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244803	CND125	Sandy Grenville	10/17/2016	Ozone	000692

Slope:	0.98222	**Slope:**	0.00000
Intercept	-0.21269	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99524	**Intercept**	-0.33070
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.1%	2.3%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.03	0.36	0.13	ppb	
primary	2	30.04	30.51	29.83	ppb	-2.23%
primary	3	49.98	50.55	49.47	ppb	-2.14%
primary	4	79.92	80.63	78.76	ppb	-2.32%
primary	5	109.70	110.55	108.50	ppb	-1.85%

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.	99.0 kHz	pass
Cell A Noise	0.3 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	726.8 mmHg	pass
Cell A Tmp.	39.1 C	pass
Cell B Freq.	103.9 kHz	pass
Cell B Noise	0.9 kHz	pass
Cell B Flow	0.0 lpm	Fail
Cell B Pressure	726.8 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo	See comments	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	CND125	Sandy Grenville	10/17/2016	Cell B Flow	ThermoElectron	3493	☐	☐

This analyzer diagnostic check is outside the manufacturer's recommended value.

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PAR107-Sandy Grenville-10/18/2016						
1	10/18/2016	DAS	Campbell	000333	CR3000	2112
2	10/18/2016	Ozone	ThermoElectron Inc	000689	49i A1NAA	1030244802
3	10/18/2016	Ozone Standard	ThermoElectron Inc	000436	49i A3NAA	CM08200012
4	10/18/2016	Zero air pump	Werther International	06932	C 70/4	000829174

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244802	PAR107	Sandy Grenville	10/18/2016	Ozone	000689

Slope:	0.98764	**Slope:**	0.00000
Intercept	-0.36289	**Intercept**	0.00000
CorrCoff	0.99995	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99524	**Intercept**	-0.33070
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.5%	2.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.06	0.39	-0.42	ppb	
primary	2	30.04	30.51	30.06	ppb	-1.47%
primary	3	50.02	50.59	49.85	ppb	-1.46%
primary	4	79.95	80.66	79.65	ppb	-1.25%
primary	5	110.03	110.88	108.70	ppb	-1.97%

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.	84.5 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	687.8 mmHg	pass
Cell A Tmp.	35.4 C	pass
Cell B Freq.	82.0 kHz	pass
Cell B Noise	0.7 ppb	pass
Cell B Flow	0.57 lpm	pass
Cell B Pressure	687.8 mmHg	pass
Cell B Tmp.		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*
CDR119-Sandy Grenville-10/18/2016						
1	10/18/2016	DAS	Campbell	000339	CR3000	2118
2	10/18/2016	Ozone	ThermoElectron Inc	000623	49i A1NAA	1009241790
3	10/18/2016	Ozone Standard	ThermoElectron Inc	000365	49i A3NAA	0726124688
4	10/18/2016	Zero air pump	Werther International	06903	C 70/4	000899159

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241790	CDR119	Sandy Grenville	10/18/2016	Ozone	000623

Slope:	0.97008	**Slope:**	0.00000
Intercept	-0.20393	**Intercept**	0.00000
CorrCoff	0.99996	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99524	**Intercept**	-0.33070
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.7%	4.7%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	-0.08	0.25	0.44	ppb	
primary	2	30.11	30.58	29.13	ppb	-4.74%
primary	3	49.84	50.41	48.56	ppb	-3.67%
primary	4	79.99	80.70	77.76	ppb	-3.64%
primary	5	109.57	110.42	107.30	ppb	-2.83%

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	0.993	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	85.5 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	710.4 mmHg	pass
Cell A Tmp.	37.4 C	pass
Cell B Freq.	87.2 kHz	pass
Cell B Noise	0.7 ppb	pass
Cell B Flow	0.70 lpm	pass
Cell B Pressure	710.7 mmHg	pass
Cell B Tmp.		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-10/19/2016						
1	10/19/2016	DAS	Campbell	000400	CR3000	2524
2	10/19/2016	Ozone	ThermoElectron Inc	000621	49i A1NAA	1009241798
3	10/19/2016	Ozone Standard	ThermoElectron Inc	000199	49i A3NAA	0607315737
4	10/19/2016	Zero air pump	Werther International	06866	PC70/4	000815262

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241798	ARE128	Sandy Grenville	10/19/2016	Ozone	000621

Slope:	0.98280	**Slope:**	0.00000
Intercept	-0.27955	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99524	**Intercept**	-0.33070
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.6%	3.8%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.04	0.37	0.45	ppb	
primary	2	29.90	30.37	29.22	ppb	-3.79%
primary	3	50.20	50.77	49.46	ppb	-2.58%
primary	4	80.26	80.97	79.20	ppb	-2.19%
primary	5	110.10	110.95	109.00	ppb	-1.76%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.10	pass
Span	1.011	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	97.6 kHz	pass
Cell A Noise	Not tested	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	711.1 mmHg	pass
Cell A Tmp.	37.3 C	pass
Cell B Freq.	85.8 kHz	pass
Cell B Noise	Not tested	pass
Cell B Flow	0.70 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		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*
PED108-Sandy Grenville-10/21/2016						
1	10/21/2016	DAS	Campbell	000406	CR3000	2511
2	10/21/2016	Ozone	ThermoElectron Inc	000732	49i A1NAA	1105347319
3	10/21/2016	Ozone Standard	ThermoElectron Inc	000214	49i A3NAA	0622717855
4	10/21/2016	Zero air pump	Werther International	06883	C 70/4	000815257

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347319	PED108	Sandy Grenville	10/21/2016	Ozone	000732

Slope:	0.99524	**Slope:**	0.00000
Intercept	-0.38233	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99524	**Intercept**	-0.33070
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.3%	2.2%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.01	0.34	0.02	ppb	
primary	2	30.02	30.49	29.81	ppb	-2.23%
primary	3	50.04	50.61	49.99	ppb	-1.23%
primary	4	79.99	80.70	80.10	ppb	-0.74%
primary	5	109.84	110.69	109.70	ppb	-0.89%

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	1.023	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	96.2 kHz	pass
Cell A Noise	Not tested	pass
Cell A Flow	0.66 lpm	pass
Cell A Pressure	713.6 mmHg	pass
Cell A Tmp.	32.5 C	pass
Cell B Freq.	108.4 kHz	pass
Cell B Noise	Not tested	pass
Cell B Flow	0.73 lpm	pass
Cell B Pressure	713.6 mmHg	pass
Cell B Tmp.		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*
SHN418-Eric Hebert-10/21/2016						
1	10/21/2016	DAS	Environmental Sys Corp	90603	8816	2272
2	10/21/2016	Ozone	ThermoElectron Inc	none	49i A3NAA	0903334535
3	10/21/2016	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460009
4	10/21/2016	Zero air pump	Werther International	none	C 70/4	000855578

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	0903334535	SHN418	Eric Hebert	10/21/2016	Ozone	none

Slope:	0.98889	**Slope:**	0.00000
Intercept	0.10568	**Intercept**	0.00000
CorrCoff	0.99993	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00261	**Intercept**	-0.15202
Cert Date	9/14/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.7%	1.5%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.01	0.16	0.05	ppb	
primary	2	27.14	27.22	27.21	ppb	-0.04%
primary	3	48.13	48.15	47.49	ppb	-1.37%
primary	4	74.98	74.93	74.93	ppb	0.00%
primary	5	103.33	103.21	101.70	ppb	-1.46%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.40	pass
Span	0.999	pass
Zero Voltage	0.0017	pass
Fullscale Voltage	1.0014	pass
Cell A Freq.	74.3 kHz	pass
Cell A Noise	1.5 ppb	pass
Cell A Flow	0.64 lpm	pass
Cell A Pressure	651.8 mmHg	pass
Cell A Tmp.	33.3 C	pass
Cell B Freq.	79.9 kHz	pass
Cell B Noise	1.4 ppb	pass
Cell B Flow	0.65 lpm	pass
Cell B Pressure	652.4 mmHg	pass
Cell B Tmp.		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*
GRS420-Eric Hebert-10/27/2016						
1	10/27/2016	DAS	Environmental Sys Corp	none	8832	A4115K
2	10/27/2016	Ozone	ThermoElectron Inc	90607	49C	49C-61985-333
3	10/27/2016	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450193
4	10/27/2016	Zero air pump	Werther International	none	PC70/4	531385

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-61985-333	GRS420	Eric Hebert	10/27/2016	Ozone	90607

Slope:	0.98817	**Slope:**	0.00000
Intercept	0.69307	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00261	**Intercept**	-0.15202
Cert Date	9/14/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.8%	5.7%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.09	0.24	0.88	ppb	
primary	2	12.78	12.89	13.63	ppb	5.74%
primary	3	27.31	27.39	27.55	ppb	0.58%
primary	4	75.47	75.42	75.33	ppb	-0.12%
primary	5	102.69	102.57	102.00	ppb	-0.56%

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	1.028	pass
Zero Voltage	0.0022	pass
Fullscale Voltage	1.0015	pass
Cell A Freq.	73.3 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.68 lpm	pass
Cell A Pressure	688.0 mmHg	pass
Cell A Tmp.	32.0 C	pass
Cell B Freq.	83.6 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.69 lpm	pass
Cell B Pressure	688.6 mmHg	pass
Cell B Tmp.		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*
WSP144-Eric Hebert-11/07/2016						
1	11/7/2016	DAS	Campbell	000430	CR3000	2525
2	11/7/2016	Ozone	ThermoElectron Inc	000734	49i A1NAA	1105347317
3	11/7/2016	Ozone Standard	ThermoElectron Inc	000543	49i A3NAA	0929938240
4	11/7/2016	Zero air pump	Werther International	06880	C 70/4	000814273

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347317	WSP144	Eric Hebert	11/07/2016	Ozone	000734

Slope:	0.96686	**Slope:**	0.00000
Intercept	-0.67538	**Intercept**	0.00000
CorrCoff	0.99988	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00261	**Intercept**	-0.15202
Cert Date	9/14/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.8%	4.3%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	-0.28	-0.12	-1.62	ppb	
primary	2	24.04	24.12	23.45	ppb	-2.78%
primary	3	44.69	44.72	42.86	ppb	-4.16%
primary	4	70.91	70.87	67.94	ppb	-4.13%
primary	5	107.43	107.30	102.70	ppb	-4.29%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.40	pass
Span	0.997	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	95.5 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	739.6 mmHg	pass
Cell A Tmp.	36.0 C	pass
Cell B Freq.	93.1 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.68 lpm	pass
Cell B Pressure	740.0 mmHg	pass
Cell B Tmp.		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*
BWR139-Eric Hebert-11/08/2016						
1	11/8/2016	DAS	Campbell	000431	CR3000	2536
2	11/8/2016	Ozone	ThermoElectron Inc	000618	49i A1NAA	1009241789
3	11/8/2016	Ozone Standard	ThermoElectron Inc	000697	49i A3NAA	1030244814
4	11/8/2016	Zero air pump	Werther International	06877	C 70/4	000815258

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241789	BWR139	Eric Hebert	11/08/2016	Ozone	000618

Slope:	0.99546	**Slope:**	0.00000
Intercept	-0.32609	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00261	**Intercept**	-0.15202
Cert Date	9/14/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.9%	1.5%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	-0.16	0.00	-0.57	ppb	
primary	2	26.66	26.74	26.34	ppb	-1.50%
primary	3	46.93	46.95	46.69	ppb	-0.55%
primary	4	73.50	73.46	72.99	ppb	-0.64%
primary	5	104.09	103.97	102.90	ppb	-1.03%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.70	pass
Span	1.048	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	94.6 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.73 lpm	pass
Cell A Pressure	747.3 mmHg	pass
Cell A Tmp.	36.4 C	pass
Cell B Freq.	93.7 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.72 lpm	pass
Cell B Pressure	748.5 mmHg	pass
Cell B Tmp.		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*
BFT142-Sandy Grenville-11/10/2016						
1	11/10/2016	DAS	Campbell	000498	CR3000	3815
2	11/10/2016	Ozone	ThermoElectron Inc	000685	49i A1NAA	1030244789
3	11/10/2016	Ozone Standard	ThermoElectron Inc	000453	49i A3NAA	CM08200027
4	11/10/2016	Zero air pump	Werther International	06897	C 70/4	000821893

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244789	BFT142	Sandy Grenville	11/10/2016	Ozone	000685

Slope:	0.98367	**Slope:**	0.00000
Intercept	-0.03766	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99524	**Intercept**	-0.33070
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.0%	2.4%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.07	0.40	0.62	ppb	
primary	2	30.06	30.53	29.79	ppb	-2.42%
primary	3	50.04	50.61	49.43	ppb	-2.33%
primary	4	80.07	80.78	79.63	ppb	-1.42%
primary	5	110.05	110.90	109.10	ppb	-1.62%

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	0.999	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	96.4 kHz	pass
Cell A Noise	1.0 ppb	pass
Cell A Flow	0.73 lpm	pass
Cell A Pressure	733.9 mmHg	pass
Cell A Tmp.	34.9 C	pass
Cell B Freq.	97.6 kHz	pass
Cell B Noise	1.0 ppb	pass
Cell B Flow	0.73 lpm	pass
Cell B Pressure	733.9 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass