2012 – 4th Quarter Report
Support for Conducting Systems & Performance Audits of CASTNET Sites and NADP Monitoring Stations

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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 2012, the network is comprised of 82 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, and several independent partners. AMEC is responsible for operating the EPA and Environment Canada sponsored sites, and Air Resource Specialist, Inc. (ARS) is responsible for operating the NPS 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 continue to operate meteorological sensors. Those sites are BEL116, BVL30, CHE185, and PAL190.

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
Wind Direction	Orientation Accuracy	Parallel to alignment rod/crossarm, or sighted to distant point	≤ ±5° from degrees true
Wind Direction	Linearity	Eight cardinal points on test fixture	≤ ±5° mean absolute error
Wind Direction	Response Threshold	Starting torque tested with torque gauge	< 10 g-cm Climatronics; < 20 g-cm R.M. Young
Wind Speed	Accuracy	Shaft rotational speed generated and measured with certified synchronous motor	≤ ±0.5 mps below 5.0 mps input; ≤ ±5.0% of input at or above 5.0 mps
Wind Speed	Starting Threshold	Starting torque tested with torque gauge	< 0.5 g-cm
Mass Flow Controller	Flow Rate	Comparison with Primary Standard	≤ ± 5.0% of designated rate
Ozone	Slope	Linear regression of multi-point test gas concentration as measured with a certified transfer standard	0.9000 ≤ m ≤ 1.1000
Ozone	Intercept		-5.0 ppb ≤ b ≤ 5.0 ppb
Ozone	Correlation Coefficient		0.9950 ≤ r
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 Sites Visited Fourth Quarter 2012

This report consists of the systems and performance audit results from the CASTNET sites audited during the fourth quarter (October through December) of 2012. The locations and dates of the audits are presented in Table 2.

Table 2. Site Audit Visits

Site ID	Sponsor Agency	Site Location	Visit dates
ACA416	NPS	Acadia NP	10/9/2012
HOW191	EPA	Howland-AmeriFlux	10/10/2012
HOW132	EPA	Howland	10/11/2012

Site ID	Sponsor Agency	Site Location	Visit dates
ASH135	EPA	Ashland	10/12/2012
WST109	EPA	Woodstock	10/22/2012
ABT147	EPA	Abington	10/23/2012
CAT175	EPA	Claryville	10/24/2012
ARE128	EPA	Arendtsville	10/30/2012
PSU 106	EPA	Penn State University	11/1/2012
BEL116	EPA	Beltsville	11/20/2012

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) ozone Performance Evaluations (PE).

Table 3. Site Ozone PE Visits

Site ID	Sponsor Agency	Site Location	Visit dates
CDR119	EPA	Cedar Creek St. Park	10/23/2012
PAR107	EPA	Parsons	10/24/2012
LRL117	EPA	Laurel Hill St. Park	10/25/2012
GRS420	NPS	Great Smoky Mountains NP	11/2/2012
SHN418	NPS	Shenandoah NP - Big Meadows	11/13/2012
BWR139	EPA	Blackwater NWR	11/17/2012
BFT142	EPA	Beaufort	11/29/2012
CND 125	EPA	Candor	11/29/2012

1.4 Audit Results

The observations and results of the systems and performance audits are included in Appendix A, *Audit Report Forms* by site, arranged by audit date.

One kilometer, five kilometer, and forty kilometer radius maps are only included for those sites not previously audited. Other 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, *Site Spot Report Forms*.

The Ozone PE results and observations are included in Appendix C, *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 200 sites. The Atmospheric Integrated Research Monitoring Network (AIRMoN) began operation in 1992 and currently measures event based precipitation events at 7 sites. The Mercury Deposition Network (MDN) measures total mercury in precipitation samples from more than 100 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 2012

This report covers the results from the NADP sites surveyed during the fourth quarter (October through December) of 2012. The station name and dates of the audits are presented in Table 4.

Table 4. Sites Surveyed – Fourth Quarter 2012

Side ID	Network	Survey Date	Station Name
ME96	MDN/NTN	10/3/2012	Casco Bay-Wolfe's Neck Farm
ME09	MDN/NTN	10/15/2012	Greenville Station
ME04	MDN/NTN	10/16/2012	Carrabassett Valley
ME02	MDN/NTN	10/17/2012	Bridgton
ME08	NTN	10/18/2012	Gilead
WV18	AMoN	10/24/2012	Parsons
PA83	NTN	10/25/2012	Laurel Hill State Park
DE02	AIRMoN	10/26/2012	Lewes
PA71	NTN	10/31/2012	Little Buffalo State Park
PA98	NTN	10/31/2012	Frances Slocum State Park
TN11	MDN/NTN	11/1/2012	Great Smoky Mountains National Park-Elkmont
PA 37	MDN	11/2/2012	Waynesburg
PA 02	NTN	11/3/2012	Crooked Creek Lake
PA 72	MDN/NTN	11/4/2012	Milford
MD13	NTN	11/16/2012	UM Wye Center

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

CASNTET Audit Report Forms

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ACA416-Eric Hebert-10/09/2012					
1 10/9/2012	Computer	Hewlett Packard	ACAD	6730b	CNU9335F7W
2 10/9/2012	DAS	Environmental Sys Corp	ACADIA1	8832	unknown2
3 10/9/2012	Delta Temperature	Climatronics	none	100093	3976
4 10/9/2012	Elevation	Elevation	None	1	None
5 10/9/2012	F460 translator	Climatronics	none	100163	683
6 10/9/2012	Filter pack flow pump	Thomas	none	107CAB11	119900011314
7 10/9/2012	Flow Rate	Tylan	none	FC280	AW9403021
8 10/9/2012	Infrastructure	Infrastructure	none	none	none
9 10/9/2012	Mainframe	Climatronics	01342	100081	1288
10 10/9/2012	Met tower	Climatronics	none	unknown	illegible
11 10/9/2012	MFC power supply	Tylan	00045	RO-32	FP902028
12 10/9/2012	Modem	US Robotics	none	33.6 fax modem	unknown
13 10/9/2012	Ozone	ThermoElectron Inc	90744	49C	49C-74536-376
14 10/9/2012	Ozone Standard	ThermoElectron Inc	none	49CPS	49CPS-75057-378
15 10/9/2012	Precipitation	Texas Electronics	02179	TR-525i-HT	illegible
16 10/9/2012	Printer	Hewlett Packard	none	842C	unknown
17 10/9/2012	Relative Humidity	Vaisala	none	HMP45AC	Illegible
18 10/9/2012	Sample Tower	Aluma Tower	none	B	AT-71103-7I-3
19 10/9/2012	Shelter Temperature	unknown	none	none	none
20 10/9/2012	Shield (10 meter)	Climatronics	none	100325	illegible
21 10/9/2012	Shield (2 meter)	Climatronics	none	100325	illegible
22 10/9/2012	Siting Criteria	Siting Criteria	None	1	None
23 10/9/2012	Solar Radiation	Licor	none	LI-200	illegible
24 10/9/2012	Solar Radiation Translator	Climatronics	none	100144	314
25 10/9/2012	Surface Wetness	RM Young	90725	58101	none
26 10/9/2012	Temperature	Climatronics	none	100093	5976
27 10/9/2012	Temperature Translator	Climatronics	03630	100088-2	401
28 10/9/2012	Wind Direction	Climatronics	none	100076	illegible

Site	*Visit Date*	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
29	10/9/2012	Wind Speed	Climatronics	none	100075	1947
30	10/9/2012	Zero air pump	ThermoElectron Inc	none	111	111-30215-237

DAS Data Form

DAS Time Max Error: 0.4

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	unknown2	ACA416	Eric Hebert	10/09/2012	DAS	Primary

Das Date: 10/9 /2012
Das Time: 9:04:00
Das Day: 283

Audit Date 10/9 /2012
Audit Time 9:03:36
Audit Day 283

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

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/9/2012	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
2	0.0000	0.0000	0.0000	V	V	0.0000
2	0.1000	0.1000	0.0997	V	V	-0.0003
2	0.3000	0.3000	0.2993	V	V	-0.0007
2	0.5000	0.4999	0.4999	V	V	0.0000
2	0.7000	0.6999	0.6992	V	V	-0.0007
2	0.9000	0.8999	0.8999	V	V	0.0000
2	1.0000	1.0000	0.9998	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9403021	ACA416	Eric Hebert	10/09/2012	Flow Rate	none

Mfg	Tylan
SN/Owner ID	FP902028 00045
Parameter	MFC power supply

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/6/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.04
1.96%	2.09%			**Cal Factor Full Scale**	5.41
				Rotometer Reading:	1.55

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	-0.01	-0.004	0.04	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.003	0.05	l/m	l/m	
primary	test pt 1	0.000	1.528	1.33	1.363	1.50	l/m	l/m	-1.85%
primary	test pt 2	0.000	1.530	1.33	1.363	1.50	l/m	l/m	-1.94%
primary	test pt 3	0.000	1.532	1.33	1.363	1.50	l/m	l/m	-2.09%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	135 Deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	- 1.0 cm	**Status**	Fail
Sensor Component	Filter Position	**Condition**	Poor	**Status**	Fail
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	6.0 cm	**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	10/09/2012	Ozone	90744

Slope:	0.96212	**Slope:**	0.00000
Intercept	0.29896	**Intercept**	0.00000
CorrCoff	0.99993	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00987	**Intercept**	0.07483
Cert Date	3/23/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.2%	4.3%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.42	0.34	0.00	ppb	
primary	2	33.78	33.37	31.95	ppb	-4.26%
primary	3	64.46	63.75	61.75	ppb	-3.14%
primary	4	82.51	81.62	80.35	ppb	-1.56%
primary	5	210.75	208.61	200.45	ppb	-3.91%

Sensor Component	Condition	Status
Cell B Noise	0.6 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	9.9980	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.1	pass
Span	1.082	pass
Cell B Freq.	93.2 kHz	pass
System Memo		pass
Sample Train	See comments	pass
Cell B Pressure		pass
Cell B Flow	0.73 lpm	pass
Cell A Tmp.	35.7 C	pass
Cell A Pressure	759 mmHg	pass
Cell A Noise	0.4 ppb	pass
Cell A Freq.	104.8 kHz	pass
Cell A Flow	0.73 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	0.000	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	1947	ACA416	Eric Hebert	10/09/2012	Wind Speed	none

Mfg	Climatronics
SN/Owner ID	683 none
Parameter	F460 translator

Prop or Cups SN	2033
Prop or Cups Torque	0.2 **to** 0.2
Prop Correction Fact	N/A

Mfg	RM Young	**Parameter**	wind speed
Serial Number		**Tfer Desc.**	wind speed motor (h
Tfer ID	01262		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/13/2010	**CorrCoff**	1.00000

Mfg	RM Young	**Parameter**	wind speed
Serial Number		**Tfer Desc.**	wind speed motor (l
Tfer ID	01261		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/13/2010	**CorrCoff**	1.00000

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.20	0.74%		
Abs Max Er	0.22	1.64%		

UseDescription:	InputDevice:	Input RPM:	Input m/s:	Output V:	DAS m/s:	Diff/ %Diff:	Difference:
primary	none	0	0.20	0.000	0.0		-0.20
primary	01261	50	1.40	0.000	1.2		-0.20
primary	01261	100	2.57	0.000	2.4		-0.17
primary	01261	170	4.22	0.000	4.0		-0.22
primary	01261	250	6.10	0.000	6.0	-1.64%	
primary	01262	500	11.97	0.000	11.9	-0.58%	
primary	01262	800	19.02	0.000	19.0	0.05%	
primary	01262	2000	47.22	0.000	47.5	0.68%	

Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	Functioning	**Status**	pass
Sensor Component	Prop or Cups Condition	**Condition**	Good	**Status**	pass
Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	ACA416	Eric Hebert	10/09/2012	Wind Direction	none

Mfg	Climatronics	
SN/Owner ID	683	none
Parameter	F460 translator	

Vane SN: 1230 C. A. Align. deg. true:

VaneTorque 5 to 7 180

Mfg	Ushikata	Parameter	wind direction	
Serial Number	190037	Tfer Desc.	transit	
Tfer ID	01265			
Slope	1.00000	Intercept	0.00000	
Cert Date	1/4/2011	CorrCoff	1.00000	
Mfg	RM Young	Parameter	wind direction	
Serial Number		Tfer Desc.	wind direction wheel	
Tfer ID	01266			

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	3.4	1.3		
Abs Max Er	5	4		

UseDescription:	TferID:	Input Raw:	Linearity	Output V:	Output Deg.:	Difference:	Change:	Error:
primary	01266	0	☑	0.000	4	4	45	0
primary	01266	45	☑	0.000	47	2	43	-2
primary	01266	90	☑	0.000	91	1	44	-1
primary	01266	135	☑	0.000	135	0	44	-1
primary	01266	180	☑	0.000	184	4	49	4
primary	01266	225	☑	0.000	229	4	45	0
primary	01266	270	☑	0.000	275	5	46	1
primary	01266	315	☑	0.000	319	4	44	-1
primary	01265	90	☐	0.000	91	1		1
primary	01265	90	☐	0.000	93	3		3
primary	01265	180	☐	0.000	184	4		4
primary	01265	270	☐	0.000	275	5		5
primary	01265	360	☐	0.000	4	4		4

Sensor Component		Condition		Status	
Sensor Component	Mast	Condition	Good	Status	pass
Sensor Component	Condition	Condition	Good	Status	pass
Sensor Component	Sensor Heater	Condition	Functioning	Status	pass
Sensor Component	Sensor Plumb	Condition	Plumb	Status	pass
Sensor Component	Torque	Condition		Status	pass
Sensor Component	Vane Condition	Condition	Good	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	5976	ACA416	Eric Hebert	10/09/2012	Temperature	none

Mfg	Climatronics
SN/Owner ID	401 / 03630
Parameter	Temperature Translator

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01D102193	**Tfer Desc.**	RTD translator
Tfer ID	01231		
Slope	1.00157	**Intercept**	-0.02095
Cert Date	2/10/2012	**CorrCoff**	1.00000

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01H0060	**Tfer Desc.**	RTD probe
Tfer ID	01230		
Slope	1.00157	**Intercept**	-0.02095
Cert Date	2/10/2012	**CorrCoff**	1.00000

DAS 1: Abs Avg Err	DAS 1: Abs Max Er	DAS 2: Abs Avg Err	DAS 2: Abs Max Er
0.05	0.09		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.08	0.10	0.000	0.2	C	0.09
primary	Temp Mid Range	27.99	27.97	0.000	28.0	C	0.05
primary	Temp High Range	49.98	49.92	0.000	49.9	C	0

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

Delta Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	3976	ACA416	Eric Hebert	10/09/2012	Delta Temperature	none

Mfg	Climatronics
SN/Owner ID	401 / 03630
Parameter	Temperature Translator

DAS 1: **DAS 2:**

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01H0060	**Tfer Desc.**	RTD probe
Tfer ID	01230		
Slope	1.00157	**Intercept**	-0.02095
Cert Date	2/10/2012	**CorrCoff**	1.00000

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01D102193	**Tfer Desc.**	RTD translator
Tfer ID	01231		
Slope	1.00157	**Intercept**	-0.02095
Cert Date	2/10/2012	**CorrCoff**	1.00000

Abs Avg Diff	Abs Max Dif	Abs Avg Diff	Abs Max Dif
0.06	0.07		

UseDescription:	Iteration:	OutputTmpSignal:	OutputSignalEng:	OutputSignalEngUnit:	Difference:
primary	1	0.000	0.06	C	0.06
primary	2	0.000	0.07	C	0.07
primary	3	0.000	0.05	C	0.05

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

Humidity Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	Illegible	ACA416	Eric Hebert	10/09/2012	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	124432	**Tfer Desc.**	Hygroclip
Tfer ID	01225		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	6.7	5.1		
Abs Max Er	7.7	5.1		

UseDesc.:	Test type:	Device:	Input RH:	GTL Raw:	RH Corr.:	DAS Volts:	DAS %RH:	Difference:
primary	RH Low Range	Hygroclip	32.8	30.1	32.8	0.385	38.5	5.7
primary	RH Low Range	Hygroclip	52.9	57.4	52.9	0.606	60.6	7.7
primary	RH High Range	Hygroclip	93.6	89.1	93.6	0.885	88.5	-5.1

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

Solar Radiation Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	illegible	ACA416	Eric Hebert	10/09/2012	Solar Radiation	none

Mfg	Climatronics	
SN/Owner ID	314	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	1/6/2010	**CorrCoff**	1.00000

Mfg	Eppley	**Parameter**	solar radiation
Serial Number	34341F3	**Tfer Desc.**	SR transfer sensor
Tfer ID	01245		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/16/2010	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
2.9%	2.6%	0.0%	0.0%

UseDescription:	Measure Date	MeasureTime	Tfer Corr:	DAS w/m2:	PctDifference:
primary	10/9/2012	10:00	575	533	-7.3%
primary	10/9/2012	12:00	689	671	-2.6%
primary	10/9/2012	13:00	619	606	-2.1%
primary	10/9/2012	15:00	285	295	3.5%

Sensor Component	Sensor Level	**Condition**	Full bubble off level	**Status**	Fail
Sensor Component	Sensor Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

Surface Wetness Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	none	ACA416	Eric Hebert	10/09/2012	Surface Wetness	90725

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	wet	N/A	0.955	95.50	V	N/A	% Wet
primary	dry	N/A	0.003	0.28	V	N/A	% Wet

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

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Texas Electronics	illegible	ACA416	Eric Hebert	10/09/2012	Precipitation	02179

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
19.0%	22.0%		

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	10 sec	1.00	1.00	mm	mm	ml	
primary	test 1	231.5	1	10 sec	5.00	5.80	mm	mm	ml	16.0%
primary	test 2	231.5	2	12 sec	5.00	6.10	mm	mm	ml	22.0%

Sensor Component	Condition	Status
System Memo	See comments	pass
Sensor Heater	Not functioning	Fail
Properly Sited	See comments	pass
Gauge Drain Screen	Not installed	Fail
Level	Level	pass
Gauge Clean	Clean	pass
Funnel Clean	Clean	pass
Condition	Good	pass
Gauge Screen	Installed	pass

Infrastructure Data For

Site ID	ACA416	Technician	Eric Hebert	Site Visit Date	10/09/2012

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

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
unknown	none	ACA416	Eric Hebert	10/09/2012	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.53	0.67		

Mfg	Eutechnics	**Parameter**	Shelter Temperatur
Serial Number	01D102193	**Tfer Desc.**	RTD translator
Tfer ID	01231		
Slope	1.00157	**Intercept**	-0.02095
Cert Date	2/10/2012	**CorrCoff**	1.00000
Mfg	Eutechnics	**Parameter**	Shelter Temperatur
Serial Number	01H0060	**Tfer Desc.**	RTD probe
Tfer ID	01230		
Slope	1.00157	**Intercept**	-0.02095
Cert Date	2/10/2012	**CorrCoff**	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	21.82	21.81	0.000	22.2	C	0.39
primary	Temp Mid Range	21.51	21.50	0.000	22.2	C	0.67

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	ACA416	Eric Hebert	10/09/2012	Moisture Present	Tylan	3649	☐	☐
The filter sample tubing has drops of moisture in low sections outside the shelter.								
Ozone	ACA416	Eric Hebert	10/09/2012	Sample Train	ThermoElectron	814	☐	☑
The ozone sample train is composed of materials other than the recommended materials which are Teflon and glass only.								
Precipitation	ACA416	Eric Hebert	10/09/2012	Properly Sited	Texas Electronic	2328	☐	☑
Objects violate the 45 degree rule for the tipping bucket rain gage.								
Precipitation	ACA416	Eric Hebert	10/09/2012	Sensor Heater	Texas Electronic	2328	☐	☐
The tipping bucket heater is generating excessive heat, enough to evaporate water on the funnel.								
Solar Radiation	ACA416	Eric Hebert	10/09/2012	Sensor Level	Licor	3648	☐	☐
The solar radiation sensor is mounted on the meteorological tower and is difficult to access. The site operator does not check the sensor weekly.								

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:** SiteOpsProcedures

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

3 **Parameter:** PollAnalyzerCom

The ozone sample inlet has a stainless steel funnel and stainless steel fittings. The recommended material for ozone sample train is Teflon or glass.

4 **Parameter:** ShelterCleanNotes

The shelter is clean and well organized.

5 **Parameter:** MetSensorComme

The solar radiation sensor is a full bubble off level and bias to the west.

6 **Parameter:** MetOpMaintCom

The tipping bucket heater thermostat has failed in the closed circuit position allowing the heater to be continuously on. The tipping mechanism was beginning to melt. The heater was unplugged during the site audit.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	ACA416	**Technician**	Eric Hebert	**Site Visit Date**	10/09/2012

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**	-16.5
City, State	Bar Harbor, ME		
Zip Code	04609		**Present**
Time Zone	Eastern	**Fire Extinguisher**	☑ Inspected Dec 2011
Primary Operator	Beth Arsenault	**First Aid Kit**	☑
Primary Op. Phone #	(207) 288-8734	**Safety Glasses**	☐
Primary Op. E-mail	Beth_Arsenault@nps.gov	**Safety Hard Hat**	☐
Backup Operator	Bill Gawley	**Climbing Belt**	☐
Backup Op. Phone #	(207) 288-8723	**Security Fence**	☐
Backup Op. E-mail	bill_gawley@nps.gov	**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-rev001

Site ID ACA416 **Technician** Eric Hebert **Site Visit Date** 10/09/2012

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-rev001

Site ID	ACA416	Technician	Eric Hebert	Site Visit Date	10/09/2012

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	
3	Are the tower and sensors plumb?	☑	
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☐	
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	
8	Is the rain gauge plumb?	☑	
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☐	45 degree rule violation
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	
11	Is it inclined approximately 30 degrees?	☑	

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

The solar radiation sensor is a full bubble off level and bias to the west.

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID ACA416 **Technician** Eric Hebert **Site Visit Date** 10/09/2012

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?	☑	

Parameter	Manufacturer	Model	S/N	Client ID
Met tower	Climatronics	unknown	illegible	none
Temperature	Climatronics	100093	5976	none
Delta Temperature	Climatronics	100093	3976	none
Shield (10 meter)	Climatronics	100325	illegible	none
Shield (2 meter)	Climatronics	100325	illegible	none
Surface Wetness	RM Young	58101	none	90725
Precipitation	Texas Electronics	TR-525i-HT	illegible	02179
Relative Humidity	Vaisala	HMP45AC	Illegible	none
Wind Speed	Climatronics	100075	1947	none
Wind Direction	Climatronics	100076	illegible	none
Solar Radiation	Licor	LI-200	illegible	none

Provide any additional 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 tipping bucket heater thermostat has failed in the closed circuit position allowing the heater to be continuously on. The tipping mechanism was beginning to melt. The heater was unplugged during the site audit.

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID ACA416 **Technician** Eric Hebert **Site Visit Date** 10/09/2012

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 and Stainless Steel
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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	AT-71103-7I-3	none
Ozone	ThermoElectron Inc	49C	49C-74536-376	90744
Zero air pump	ThermoElectron Inc	111	111-30215-237	none
Filter pack flow pump	Thomas	107CAB11	119900011314	none
MFC power supply	Tylan	RO-32	FP902028	00045

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

The ozone sample inlet has a stainless steel funnel and stainless steel fittings. The recommended material for ozone sample train is Teflon or glass.

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID ACA416 **Technician** Eric Hebert **Site Visit Date** 10/09/2012

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?		

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6730b	CNU9335F7W	ACAD
DAS	Environmental Sys Corp	8832	unknown2	ACADIA1
F460 translator	Climatronics	100163	683	none
Mainframe	Climatronics	100081	1288	01342
Modem	US Robotics	33.6 fax modem	unknown	none
Printer	Hewlett Packard	842C	unknown	none
Solar Radiation Translator	Climatronics	100144	314	none
Temperature Translator	Climatronics	100088-2	401	03630

Provide any additional 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-rev001

Site ID ACA416 **Technician** Eric Hebert **Site Visit Date** 10/09/2012

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-rev001

Site ID	ACA416	Technician	Eric Hebert	Site Visit Date	10/09/2012

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	☑	Monthly	☑
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-rev001

Site ID ACA416 **Technician** Eric Hebert **Site Visit Date** 10/09/2012

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.

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
HOW191-Eric Hebert-10/10/2012						
1	10/10/2012	DAS	Campbell	000348	CR3000	2127
2	10/10/2012	elevation	Elevation	none	none	none
3	10/10/2012	Filter pack flow pump	Thomas	06022	107CAB18	060400022686
4	10/10/2012	Filter pack flow pump	Thomas	04921	107CAB18	060300019983
5	10/10/2012	Flow Rate	Apex	000645	AXMC105LPMDPCV	illegible
6	10/10/2012	Flow Rate	Apex	000671	AXMC105LPMDPCV	illegible
7	10/10/2012	Infrastructure	Infrastructure	none	none	none
8	10/10/2012	Modem	Raven	06470	H4222-C	0808311250
9	10/10/2012	Ozone	ThermoElectron Inc	unknown	49i A1NAA	1104347326
10	10/10/2012	Ozone Standard	ThermoElectron Inc	000514	49i A3NAA	0922236892
11	10/10/2012	Shelter Temperature	Campbell	none	107-L	none
12	10/10/2012	siting criteria	Siting Criteria	none	none	None
13	10/10/2012	Temperature23.5meter	RM Young	00245	41342VC	Illegible
14	10/10/2012	Temperature2meter	RM Young	04449	41342VC	4547
15	10/10/2012	Zero air pump	Werther International	06908	C 70/4	000821900

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	HOW191	Eric Hebert	10/10/2012	Flow Rate	000671

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/6/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.01
0.17%	0.90%			**Cal Factor Full Scale**	0.99
				Rotometer Reading:	0

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	0.00	0.000	0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.03	0.000	0.04	l/m	l/m	
primary	test pt 1	0.000	1.502	1.49	1.507	1.50	l/m	l/m	-0.16%
primary	test pt 2	0.000	1.505	1.49	1.505	1.50	l/m	l/m	-0.31%
primary	test pt 3	0.000	1.504	1.49	1.505	1.49	l/m	l/m	-0.90%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	135 Deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass

[redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted]

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/6/2012	**CorrCoff**	1.00000

DAS 1:		**DAS 2:**		**Cal Factor Zero**	0
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Full Scale**	1.02
0.34%	0.90%			**Rotometer Reading:**	0

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	-0.01	0.032	0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.033	0.03	l/m	l/m	
primary	test pt 1	0.000	1.513	1.46	1.473	1.51	l/m	l/m	-0.20%
primary	test pt 2	0.000	1.512	1.46	1.473	1.51	l/m	l/m	-0.12%
primary	test pt 3	0.000	1.516	1.46	1.473	1.51	l/m	l/m	-0.38%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	45 Deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.0 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1104347326	HOW191	Eric Hebert	10/10/2012	Ozone	unknown

Slope:	0.98987	**Slope:**	0.00000
Intercept	0.57532	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00987	**Intercept**	0.07483
Cert Date	3/23/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.0%	6.1%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.23	0.15	0.75	ppb	
primary	2	7.49	7.34	7.79	ppb	6.13%
primary	3	18.43	18.17	18.59	ppb	2.31%
primary	4	38.07	37.62	37.81	ppb	0.51%

Sensor Component	Condition	Status
Cell B Noise	1.0 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-0.6	pass
Span	1.025	pass
Cell B Freq.	93.8 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.64 lpm	pass
Cell A Tmp.	34.0 C	pass
Cell A Pressure	700 mmHg	pass
Cell A Noise	0.8 ppb	pass
Cell A Freq.	83.9 kHz	pass
Cell A Flow	0.67 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Infrastructure Data For

Site ID	HOW191	Technician	Eric Hebert	Site Visit Date	10/10/2012

Shelter Make	Shelter Model	Shelter Size

Sensor Component	Condition	Status
Shelter Roof	Good	pass
Sample Tower Type	N/A	pass
Conduit	N/A	pass
Met Tower	N/A	pass
Moisture Trap	Not installed	pass
Power Cables	Good	pass
Rotometer	Not installed	Fail
Sample Tower	Good	pass
Shelter Condition	Good	pass
Shelter Floor	Good	pass
Shelter Temp Control	Functioning	pass
Signal Cable	Good	pass
Tubing Type	1/4 teflon	pass
Shelter Door	Good	pass
Sample Train	Good	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	HOW191	Eric Hebert	10/10/2012	Shelter Temperature	none

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

Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000
Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	20.11	20.10	0.000	19.9	C	-0.22
primary	Temp Mid Range	20.40	20.39	0.000	20.0	C	-0.4
primary	Temp Mid Range	21.75	21.74	0.000	21.6	C	-0.17

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	HOW191	**Technician**	Eric Hebert	**Site Visit Date**	10/10/2012

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		**Present**
Zip Code		**Fire Extinguisher**	☑
Time Zone	Eastern	**First Aid Kit**	☑
Primary Operator	John Lee	**Safety Glasses**	☐
Primary Op. Phone #	(207) 581-2930	**Safety Hard Hat**	☑
Primary Op. E-mail	jtlee@maine.edu	**Climbing Belt**	☑
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**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-rev001

Site ID HOW191 **Technician** Eric Hebert **Site Visit Date** 10/10/2012

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. A second filter is located below the canopy at approximately 2 meters. This is an AmeriFlux site which is approximately 2.5 km to the SW of the HOW132 CASTNET site. See the map included as Figure 1.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID HOW191 **Technician** Eric Hebert **Site Visit Date** 10/10/2012

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 at each CASTNET filter location the meteorological instrumentation is being operated by the University of Maine and AmeriFlux.

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID HOW191 **Technician** Eric Hebert **Site Visit Date** 10/10/2012

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?	☑	

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342	illegible	00245

Provide any additional 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-rev001

Site ID HOW191 **Technician** Eric Hebert **Site Visit Date** 10/10/2012

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?	☐	in 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?	☑	

Parameter	Manufacturer	Model	S/N	Client ID
Filter pack flow pump	Thomas	107CAB18	060300019983	04921
Ozone	ThermoElectron Inc	49i A1NAA	1104347326	unknown
Zero air pump	Werther International	C 70/4	000821900	06908
Filter pack flow pump	Thomas	107CAB18	060400022686	06022

Provide any additional 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 measurements at this location are being conducted at 8 levels through the tree canopy from 2 meters to 23.5 meters. Three minute measurements for each height are aggregated into an hourly average for each height to produce a through-canopy ozone profile.

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID HOW191 **Technician** Eric Hebert **Site Visit Date** 10/10/2012

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	

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR3000	2127	000348
Modem	Raven	H4222-C	0808311250	06470

Provide any additional 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-rev001

Site ID: HOW191 Technician: Eric Hebert Site Visit Date: 10/10/2012

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-rev001

Site ID	HOW191	Technician	Eric Hebert	Site Visit Date	10/10/2012

Site operation procedures

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

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

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

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

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

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	At one location only
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 daily zero, span, and precision checks are conducted through one of the 8 inlets only.

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID	HOW191	Technician	Eric Hebert	Site Visit Date	10/10/2012

Site operation procedures

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

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
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:

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
HOW191-B-Eric Hebert-10/10/2012						
1	10/10/2012	DAS	Campbell	000348	CR3000	2127
2	10/10/2012	Filter pack flow pump	Thomas	06022	107CAB18	060400022686
3	10/10/2012	Flow Rate	Apex	000671	AXMC105LPMDPCV	illegible
4	10/10/2012	Temperature2meter	RM Young	04449	41342VC	4547

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	HOW191-B	Eric Hebert	10/10/2012	Flow Rate	000671

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/6/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.01
				Cal Factor Full Scale	0.99
0.46%	0.90%			**Rotometer Reading:**	0

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	0.00	0.000	0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.03	0.000	0.04	l/m	l/m	
primary	test pt 1	0.000	1.502	1.49	1.507	1.50	l/m	l/m	-0.16%
primary	test pt 2	0.000	1.505	1.49	1.505	1.50	l/m	l/m	-0.31%
primary	test pt 3	0.000	1.504	1.49	1.505	1.49	l/m	l/m	-0.90%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	135 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4547	HOW191-B	Eric Hebert	10/10/2012	Temperature	04449

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.08	0.17		

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01D102193	**Tfer Desc.**	RTD translator
Tfer ID	01231		
Slope	1.00157	**Intercept**	-0.02095
Cert Date	2/10/2012	**CorrCoff**	1.00000

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01H0060	**Tfer Desc.**	RTD probe
Tfer ID	01230		
Slope	1.00157	**Intercept**	-0.02095
Cert Date	2/10/2012	**CorrCoff**	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.05	0.07	0.000	0.1	C	0.07
primary	Temp Mid Range	23.39	23.37	0.000	23.4	C	-0.01
primary	Temp High Range	49.10	49.04	0.000	49.2	C	0.17

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	HOW191-B	Eric Hebert	10/10/2012	System Memo	Apex	3652	☐	☐
This parameter is being measured at 2 meters from the ground and below a tree canopy.								
Temperature	HOW191-B	Eric Hebert	10/10/2012	System Memo	RM Young	3693	☐	☐
This parameter is being measured at 2 meters from the ground and below a tree canopy.								

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
HOW132-Eric Hebert-10/11/2012						
1	10/11/2012	Computer	Dell	000501	D610	unknown
2	10/11/2012	DAS	Campbell	000352	CR3000	2130
3	10/11/2012	Elevation	Elevation	None	1	None
4	10/11/2012	Filter pack flow pump	Thomas	01423	107CA18	00002560587
5	10/11/2012	Flow Rate	Apex	000666	AXMC105LPMDPCV	54763
6	10/11/2012	Infrastructure	Infrastructure	none	none	none
7	10/11/2012	Met tower	Universal Tower	03533	unknown	none
8	10/11/2012	Modem	Raven	06483	H4222-C	0808310816
9	10/11/2012	Ozone	ThermoElectron Inc	000737	49i A1NAA	1105347912
10	10/11/2012	Ozone Standard	ThermoElectron Inc	000373	49i A3NAA	0726124685
11	10/11/2012	Sample Tower	Aluma Tower	03534	A	none
12	10/11/2012	Shelter Temperature	Campbell	none	107-L	unknown
13	10/11/2012	Shield (10 meter)	RM Young	02392	Aspirated 43408	none
14	10/11/2012	Siting Criteria	Siting Criteria	None	1	None
15	10/11/2012	Temperature	RM Young	04448	41342	4546
16	10/11/2012	Zero air pump	Werther International	06928	C 70/4	000822222

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2130	HOW132	Eric Hebert	10/11/2012	DAS	Primary

Das Date: 10/13/2012
Das Time: 12:08:00
Das Day: 287

Audit Date 10/13/2012
Audit Time 12:08:00
Audit Day 287

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		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/9/2012	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.1000	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	0.7002	0.7001	V	V	-0.0001
7	0.9000	0.9002	0.9001	V	V	-0.0001
7	1.0000	1.0003	1.0002	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	54763	HOW132	Eric Hebert	10/11/2012	Flow Rate	000666

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/6/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.018
1.55%	1.72%			**Cal Factor Full Scale**	0.987
				Rotometer Reading:	1.45

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	0.02	0.028	0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.02	0.021	0.00	l/m	l/m	
primary	test pt 1	0.000	1.475	1.52	1.509	1.50	l/m	l/m	1.69%
primary	test pt 2	0.000	1.475	1.52	1.509	1.50	l/m	l/m	1.72%
primary	test pt 3	0.000	1.482	1.52	1.509	1.50	l/m	l/m	1.24%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 Deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.5 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	6.0 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347912	HOW132	Eric Hebert	10/11/2012	Ozone	000737

Slope:	0.98028	**Slope:**	0.00000
Intercept	0.17489	**Intercept**	0.00000
CorrCoff	0.99990	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00987	**Intercept**	0.07483
Cert Date	3/23/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.5%	2.6%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.56	0.48	0.37	ppb	
primary	2	26.77	26.43	25.99	ppb	-1.66%
primary	3	64.52	63.81	63.30	ppb	-0.80%
primary	4	82.44	81.56	80.70	ppb	-1.05%
primary	5	104.95	103.85	101.20	ppb	-2.55%

Sensor Component	Condition	Status
Cell B Noise	1.0 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-0.10	pass
Span	1.035	pass
Cell B Freq.	85.7 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.72 lpm	pass
Cell A Tmp.	33.5 C	pass
Cell A Pressure	738 mmHg	pass
Cell A Noise	0.9 ppb	pass
Cell A Freq.	81.6 kHz	pass
Cell A Flow	0.70 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4546	HOW132	Eric Hebert	10/11/2012	Temperature	04448

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.14	0.25		

Mfg	Eutechnics	Parameter	Temperature
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

Mfg	Eutechnics	Parameter	Temperature
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.14	0.16	0.000	0.1	C	-0.05
primary	Temp Mid Range	23.29	23.27	0.000	23.4	C	0.12
primary	Temp High Range	47.88	47.83	0.000	48.1	C	0.25

Sensor Component		Condition		Status	
Sensor Component	Shield	Condition	Moderately clean	Status	pass
Sensor Component	Blower Status Switch	Condition	Functioning	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	HOW132	Technician	Eric Hebert	Site Visit Date	10/11/2012

Shelter Make	Shelter Model	Shelter Size
Unv. Of Maine	none	2400 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	unknown	HOW132	Eric Hebert	10/11/2012	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.48	0.65		

Mfg	Eutechnics	**Parameter**	Shelter Temperatur
Serial Number	01D102193	**Tfer Desc.**	RTD translator
Tfer ID	01231		
Slope	1.00157	**Intercept**	-0.02095
Cert Date	2/10/2012	**CorrCoff**	1.00000
Mfg	Eutechnics	**Parameter**	Shelter Temperatur
Serial Number	01H0060	**Tfer Desc.**	RTD probe
Tfer ID	01230		
Slope	1.00157	**Intercept**	-0.02095
Cert Date	2/10/2012	**CorrCoff**	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	19.42	19.41	0.000	20.0	C	0.55
primary	Temp Mid Range	18.81	18.80	0.000	19.5	C	0.65
primary	Temp Mid Range	18.40	18.39	0.000	18.6	C	0.24

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator reported that he does not always use gloves to handle the filters consistently.

2 **Parameter:** SiteOpsProcedures

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

3 **Parameter:** SitingCriteriaCom

There is a small power plant about 30 km northeast of the site. It is on-line approximately 50% of the time. The site is near a plantation and within 20 meters of the tree line.

4 **Parameter:** ShelterCleanNotes

The shelter is cleaner than it has been during previous audit visits

5 **Parameter:** PollAnalyzerCom

There is a tree branch that contacts the filter enclosure and the filter pack when the tower is lowered and raised.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	HOW132	**Technician**	Eric Hebert	**Site Visit Date**	10/11/2012

Site Sponsor (agency)	EPA	**USGS Map**	Howland
Operating Group	University of ME	**Map Scale**	
AQS #	23-019-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	45.2158
Deposition Measurement	dry	**QAPP Longitude**	-68.7085
Land Use	woodland- mixed, wetland	**QAPP Elevation Meters**	69
Terrain	flat, gently rolling	**QAPP Declination**	18.02
Conforms to MLM	Yes	**QAPP Declination Date**	
Site Telephone	(207) 745-6841	**Audit Latitude**	45.215607
Site Address 1	Lagrange Rd.	**Audit Longitude**	-68.70851
Site Address 2		**Audit Elevation**	66
County	Penobscot	**Audit Declination**	-17
City, State	Howland, ME		
Zip Code	04453	**Present**	
Time Zone	Eastern	**Fire Extinguisher** ☑	inspected Feb 2007
Primary Operator	John Lee	**First Aid Kit** ☑	
Primary Op. Phone #	(207) 581-2930	**Safety Glasses** ☑	
Primary Op. E-mail	jtlee@maine.edu	**Safety Hard Hat** ☑	
Backup Operator	none	**Climbing Belt** ☑	
Backup Op. Phone #		**Security Fence** ☐	
Backup Op. E-mail		**Secure Shelter** ☑	
		Stable Entry Step ☑	

Shelter Working Room	☑	**Make**	Unv. Of Maine	**Model**	none	**Shelter Size**	2400 cuft
Shelter Clean	☑	**Notes**	The shelter is cleaner than it has been during previous audit visits				
Site OK	☑	**Notes**					

Driving Directions

From Interstate 95, take exit 217 and turn west on route 6. Continue approximately 1.8 miles. Just past the dirt road to the landfill on the right, take the next gravel road on the left. Go through the gate (lock combo 3061) and over the bridge, continue about 1 mile bearing to the right at the gravel pit. The site is behind the equipment shed at the top of a small hill.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID HOW132 **Technician** Eric Hebert **Site Visit Date** 10/11/2012

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km	30 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

There is a small power plant about 30 km northeast of the site. It is on-line approximately 50% of the time. The site is near a plantation and within 20 meters of the tree line.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID HOW132 **Technician** Eric Hebert **Site Visit Date** 10/11/2012

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-rev001

Site ID HOW132 **Technician** Eric Hebert **Site Visit Date** 10/11/2012

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?	☑	
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?	☑	

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342	4546	04448
Shield (10 meter)	RM Young	Aspirated 43408	none	02392
Met tower	Universal Tower	unknown	none	03533

Provide any additional 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-rev001

Site ID HOW132 **Technician** Eric Hebert **Site Visit Date** 10/11/2012

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?	☐	One tree interferring

Pollutant analyzers and deposition equipment operations and maintenance

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	A	none	03534
Ozone	ThermoElectron Inc	49i A1NAA	1105347912	000737
Filter pack flow pump	Thomas	107CA18	00002560587	01423
Zero air pump	Werther International	C 70/4	000822222	06928

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

There is a tree branch that contacts the filter enclosure and the filter pack when the tower is lowered and raised.

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID HOW132 **Technician** Eric Hebert **Site Visit Date** 10/11/2012

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?		

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D610	unknown	000501
DAS	Campbell	CR3000	2130	000352
Modem	Raven	H4222-C	0808310816	06483

Provide any additional 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-rev001

Site ID	HOW132	Technician	Eric Hebert	Site Visit Date	10/11/2012

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	☑	July 1990	☐
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-rev001

Site ID	HOW132	Technician	Eric Hebert	Site Visit Date	10/11/2012

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained on-site by ESE employee
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	no backup operator
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

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

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	N/A	☑
Visual Inspections	☑	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?	☑	
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 sample inlet filter is replaced and the sample train is leak tested once each month.

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID HOW132 **Technician** Eric Hebert **Site Visit Date** 10/11/2012

Site operation procedures

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

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

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

The site operator reported that he does not always use gloves to handle the filters consistently.

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ASH135-Eric Hebert-10/12/2012						
1	10/12/2012	Computer	Dell	000430	D630	unknown
2	10/12/2012	DAS	Campbell	000343	CR3000	2122
3	10/12/2012	Elevation	Elevation	None	1	None
4	10/12/2012	Filter pack flow pump	Thomas	01458	107CA110	028871488
5	10/12/2012	Flow Rate	Apex	000648	AXMC105LPMDPCV	54777
6	10/12/2012	Infrastructure	Infrastructure	none	none	none
7	10/12/2012	Modem	Raven	06471	H4222-C	0808311148
8	10/12/2012	Ozone	ThermoElectron Inc	000743	49i A1NAA	1105347321
9	10/12/2012	Ozone Standard	ThermoElectron Inc	000438	49i A3NAA	CM08200014
10	10/12/2012	Sample Tower	Aluma Tower	03536	A	none
11	10/12/2012	Shelter Temperature	Campbell	none	107-L	none
12	10/12/2012	Siting Criteria	Siting Criteria	None	1	None
13	10/12/2012	Temperature	RM Young	06389	41342	13994
14	10/12/2012	UPS	APC	06797	RS900	unknown
15	10/12/2012	Zero air pump	Werther International	06923	C 70/4	000836208

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2122	ASH135	Eric Hebert	10/12/2012	DAS	Primary

Das Date: 10/12/2012
Das Time: 10:00:15
Das Day: 286

Audit Date 10/12/2012
Audit Time 10:00:15
Audit Day 286

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		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/9/2012	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.1000	0.1000	V	V	0.0000
7	0.3000	0.3001	0.3001	V	V	0.0000
7	0.5000	0.5001	0.5001	V	V	0.0000
7	0.7000	0.7002	0.7002	V	V	0.0000
7	0.9000	0.9002	0.9003	V	V	0.0001
7	1.0000	1.0003	1.0003	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	54777	ASH135	Eric Hebert	10/12/2012	Flow Rate	000648

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/6/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0
0.10%	0.11%			**Cal Factor Full Scale**	1.01
				Rotometer Reading:	1.5

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	0.00	0.003	0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.03	0.070	0.05	l/m	l/m	
primary	test pt 1	0.000	1.509	1.50	1.500	1.51	l/m	l/m	0.07%
primary	test pt 2	0.000	1.508	1.50	1.500	1.51	l/m	l/m	0.11%
primary	test pt 3	0.000	1.512	1.50	1.500	1.51	l/m	l/m	-0.11%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	280 Deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.5 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347321	ASH135	Eric Hebert	10/12/2012	Ozone	000743

Slope:	1.01773	**Slope:**	0.00000
Intercept	-0.34656	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00987	**Intercept**	0.07483
Cert Date	3/23/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.4%	1.5%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.49	0.41	-0.13	ppb	
primary	2	35.73	35.30	35.78	ppb	1.36%
primary	3	66.72	65.99	66.86	ppb	1.32%
primary	4	84.33	83.43	84.70	ppb	1.52%
primary	5	118.09	116.86	118.40	ppb	1.32%

Sensor Component	Condition	Status
Cell B Noise	1.4 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.20	pass
Span	1.059	pass
Cell B Freq.	94.9 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.64 lpm	pass
Cell A Tmp.	32.1 C	pass
Cell A Pressure	720 mmHg	pass
Cell A Noise	1.7 ppb	pass
Cell A Freq.	66.1 kHz	Fail
Cell A Flow	0.70 lpm	pass
Battery Backup	Functioning	pass
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	13994	ASH135	Eric Hebert	10/12/2012	Temperature	06389

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.06	0.09		

Mfg	Eutechnics	Parameter	Temperature
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

Mfg	Eutechnics	Parameter	Temperature
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.03	0.05	0.000	0.1	C	0.09
primary	Temp Mid Range	21.90	21.89	0.000	22.0	C	0.08
primary	Temp High Range	46.61	46.56	0.000	46.6	C	0.01

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

Infrastructure Data For

Site ID	Technician	Site Visit Date
ASH135	Eric Hebert	10/12/2012

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

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ASH135	Eric Hebert	10/12/2012	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.55	0.84		

Mfg	Eutechnics	**Parameter**	Shelter Temperatur
Serial Number	01D102193	**Tfer Desc.**	RTD translator
Tfer ID	01231		
Slope	1.00157	**Intercept**	-0.02095
Cert Date	2/10/2012	**CorrCoff**	1.00000
Mfg	Eutechnics	**Parameter**	Shelter Temperatur
Serial Number	01H0060	**Tfer Desc.**	RTD probe
Tfer ID	01230		
Slope	1.00157	**Intercept**	-0.02095
Cert Date	2/10/2012	**CorrCoff**	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	19.03	19.02	0.000	19.9	C	0.84
primary	Temp Mid Range	18.12	18.11	0.000	18.6	C	0.5
primary	Temp Mid Range	17.95	17.94	0.000	17.6	C	-0.31

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:** ShelterCleanNotes

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

4 **Parameter:** SitingCriteriaCom

There is an evergreen plantation 20 meters south of the site.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	ASH135	**Technician**	Eric Hebert	**Site Visit Date**	10/12/2012

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** ☑	No inspection date
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator	Jodi Reese	**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 good condition, clean, and very well organized.				
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-rev001

Site ID ASH135 **Technician** Eric Hebert **Site Visit Date** 10/12/2012

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

There is an evergreen plantation 20 meters south of the site.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID	ASH135	Technician	Eric Hebert	Site Visit Date	10/12/2012

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-rev001

Site ID ASH135 **Technician** Eric Hebert **Site Visit Date** 10/12/2012

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?	☑	

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342	13994	06389

Provide any additional 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-rev001

Site ID ASH135 **Technician** Eric Hebert **Site Visit Date** 10/12/2012

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	A	none	03536
Ozone	ThermoElectron Inc	49i A1NAA	1105347321	000743
Filter pack flow pump	Thomas	107CA110	028871488	01458
Zero air pump	Werther International	C 70/4	000836208	06923

Provide any additional 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-rev001

Site ID ASH135 **Technician** Eric Hebert **Site Visit Date** 10/12/2012

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?		

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D630	unknown	000430
DAS	Campbell	CR3000	2122	000343
Modem	Raven	H4222-C	0808311148	06471
UPS	APC	RS900	unknown	06797

Provide any additional 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-rev001

Site ID	ASH135	Technician	Eric Hebert	Site Visit Date	10/12/2012

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	☑	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-rev001

Site ID	ASH135	Technician	Eric Hebert	Site Visit Date	10/12/2012

Site operation procedures

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

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☐	As needed	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐	As needed	☑
Analyzer Diagnostics Tests	☑	Weekly	☑
In-line Filter Replacement (at inlet)	☑	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-rev001

Site ID ASH135 **Technician** Eric Hebert **Site Visit Date** 10/12/2012

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:

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
WST109-Eric Hebert-10/22/2012						
1	10/22/2012	Computer	Dell	000291	D520	unknown
2	10/22/2012	DAS	Campbell	000427	CR3000	2526
3	10/22/2012	Elevation	Elevation	None	1	None
4	10/22/2012	Filter pack flow pump	Thomas	00476	107CA18	000025705
5	10/22/2012	Flow Rate	Apex	000466	AXMC105LPMDPCV	43970
6	10/22/2012	Infrastructure	Infrastructure	none	none	none
7	10/22/2012	Met tower	Universal Tower	03532	unknown	none
8	10/22/2012	Modem	Raven	06598	V4221-V	0844349943
9	10/22/2012	Ozone	ThermoElectron Inc	000695	49i A1NAA	1030244801
10	10/22/2012	Ozone Standard	ThermoElectron Inc	000371	49i A3NAA	0726124692
11	10/22/2012	Sample Tower	Aluma Tower	03531	A	none
12	10/22/2012	Shelter Temperature	Campbell	none	107-L	none
13	10/22/2012	Shield (10 meter)	RM Young	00947	Aspirated 43408	none
14	10/22/2012	Siting Criteria	Siting Criteria	None	1	None
15	10/22/2012	Temperature	RM Young	02192	41342	148
16	10/22/2012	Zero air pump	Werther International	06934	P 70/4	000821881

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2526	WST109	Eric Hebert	10/22/2012	DAS	Primary

Das Date: 10/22/2012
Das Time: 10:08:01
Das Day: 296

Audit Date 10/22/2012
Audit Time 10:08:00
Audit Day 296

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

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/9/2012	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.1000	0.1000	V	V	0.0000
7	0.3000	0.3000	0.3000	V	V	0.0000
7	0.5000	0.5001	0.5000	V	V	-0.0001
7	0.7000	0.7001	0.7000	V	V	-0.0001
7	0.9000	0.9001	0.9000	V	V	-0.0001
7	1.0000	1.0002	1.0000	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	43970	WST109	Eric Hebert	10/22/2012	Flow Rate	000466

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/6/2012	**CorrCoff**	1.00000

DAS 1:

A Avg % Diff:	A Max % Di
0.82%	0.89%

DAS 2:

A Avg %Dif	A Max % Di

Cal Factor Zero	-0.01
Cal Factor Full Scale	0.98
Rotometer Reading:	1.55

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	0.01	0.009	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.022	0.01	l/m	l/m	
primary	test pt 1	0.000	1.512	1.53	1.521	1.50	l/m	l/m	-0.79%
primary	test pt 2	0.000	1.512	1.53	1.521	1.50	l/m	l/m	-0.77%
primary	test pt 3	0.000	1.514	1.53	1.521	1.50	l/m	l/m	-0.89%

Sensor Component	Condition	Status
Leak Test		pass
Filter Azimuth	180 deg	pass
Filter Depth	-1.0 cm	Fail
Filter Position	Poor	Fail
Moisture Present	No moisture present	pass
Rotometer Condition	Clean and dry	pass
System Memo	See comments	pass
Tubing Condition	Good	pass
Filter Distance	5.0 cm	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244801	WST109	Eric Hebert	10/22/2012	Ozone	000695

Slope:	0.99876	**Slope:**	0.00000
Intercept	0.16956	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00987	**Intercept**	0.07483
Cert Date	3/23/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.2%	0.5%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.18	0.10	0.30	ppb	
primary	2	24.51	24.19	24.30	ppb	0.45%
primary	3	66.93	66.20	66.34	ppb	0.21%
primary	4	87.89	86.95	86.90	ppb	-0.06%
primary	5	120.58	119.32	119.40	ppb	0.07%

Sensor Component	Condition	Status
Cell B Noise	0.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-0.20	pass
Span	1.030	pass
Cell B Freq.	102.5 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.70 lpm	pass
Cell A Tmp.	31.8 C	pass
Cell A Pressure	707 mmHg	pass
Cell A Noise	1.1 ppb	pass
Cell A Freq.	98.0 kHz	pass
Cell A Flow	0.71 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	148	WST109	Eric Hebert	10/22/2012	Temperature	02192

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.10	0.21		

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01D102193	**Tfer Desc.**	RTD translator
Tfer ID	01231		
Slope	1.00157	**Intercept**	-0.02095
Cert Date	2/10/2012	**CorrCoff**	1.00000

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01H0060	**Tfer Desc.**	RTD probe
Tfer ID	01230		
Slope	1.00157	**Intercept**	-0.02095
Cert Date	2/10/2012	**CorrCoff**	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.09	0.11	0.000	-0.1	C	-0.21
primary	Temp Mid Range	25.57	25.55	0.000	25.6	C	0.06
primary	Temp High Range	48.36	48.31	0.000	48.4	C	0.04

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	Functioning	**Status**	pass
Sensor Component	Blower	**Condition**	Functioning	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
WST109	Eric Hebert	10/22/2012

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-16)	640 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	WST109	Eric Hebert	10/22/2012	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.67	0.76		

Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000
Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	21.91	21.90	0.000	21.3	C	-0.58
primary	Temp Mid Range	22.06	22.05	0.000	21.4	C	-0.68
primary	Temp Mid Range	20.14	20.13	0.000	20.9	C	0.76

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	WST109	Eric Hebert	10/22/2012	Filter Position	Apex	3248	☐	☑

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

Field Systems Comments

1 **Parameter:** DasComments

The sample tower is kinked at the hinge point and is in poor condition. One leg of the met tower is split. Both of these conditions were reported following the two previous site audit visits.

2 **Parameter:** SiteOpsProcedures

The state of NH DES performs monthly multi-point audits of the ozone analyzer. Ozone sample train leak checks are being conducted every two weeks.

3 **Parameter:** SitingCriteriaCom

The site is in a small clearing surrounded by mountain forest. There is a small parking lot used by forest service employees located 50 meters from the site.

4 **Parameter:** SiteOKNotes

State of NH Department of Environmental Services contact is Tom Fazzina (603) 271-0911 and tfazzina@DES.state.NH.US

5 **Parameter:** ShelterCleanNotes

The shelter floor and roof have been repaired. Hand rails have been installed on platform.

6 **Parameter:** MetSensorComme

10-meter temperature is being operated and maintained on the meteorological tower.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	WST109	**Technician**	Eric Hebert	**Site Visit Date**	10/22/2012

Site Sponsor (agency)	EPA	**USGS Map**	Woodstock
Operating Group	IES/USFS	**Map Scale**	
AQS #	33-009-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	43.9446
Deposition Measurement	dry, wet	**QAPP Longitude**	-71.7008
Land Use	woodland - mixed	**QAPP Elevation Meters**	258
Terrain	complex	**QAPP Declination**	15.9
Conforms to MLM	No	**QAPP Declination Date**	12/28/2004
Site Telephone	(603) 726-4935	**Audit Latitude**	43.944519
Site Address 1	234 Mirror Lake Road	**Audit Longitude**	-71.700787
Site Address 2		**Audit Elevation**	255
County	Grafton	**Audit Declination**	-15.3
City, State	Campton, NH		
Zip Code	03223		**Present**
Time Zone	Eastern	**Fire Extinguisher**	☑ Inspected March 2012
Primary Operator	Brenda Minicucci	**First Aid Kit**	☑
Primary Op. Phone #	(603) 726-4204	**Safety Glasses**	☑
Primary Op. E-mail	bminicucci70703@roadrunner.com	**Safety Hard Hat**	☑
Backup Operator	Don Buso	**Climbing Belt**	☑
Backup Op. Phone #	(603) 7264-204	**Security Fence**	☐
Backup Op. E-mail	dbuso@worldpath.net	**Secure Shelter**	☑
		Stable Entry Step	☑

Shelter Working Room ☑ **Make** Ekto **Model** 8810 (s/n 2149-16) **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter floor and roof have been repaired. Hand rails have been installed on platform.

Site OK ☑ **Notes** State of NH Department of Environmental Services contact is Tom Fazzina (603) 271-0911 and tfazzina@DES.state.NH.US

Driving Directions From I-93 take exit 30 and go south on route 3 for approximately 2 miles. Turn right on Mirror Lake road and continue to the end of the road. The site is through the gate on the right.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID WST109 **Technician** Eric Hebert **Site Visit Date** 10/22/2012

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	50 m	☐
Tree line	50 m	10 - 30 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☐

Siting Criteria Comment

The site is in a small clearing surrounded by mountain forest. There is a small parking lot used by forest service employees located 50 meters from the site.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID	WST109	Technician	Eric Hebert	Site Visit Date	10/22/2012

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:

10-meter temperature is being operated and maintained on the meteorological tower.

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID WST109 **Technician** Eric Hebert **Site Visit Date** 10/22/2012

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?	☑	Moderately clean
4	Are the aspirated motors working?	☑	
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	N/A
6	Is the surface wetness sensor grid clean and undamaged?	☑	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	☑	
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	☑	

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342	148	02192
Shield (10 meter)	RM Young	Aspirated 43408	none	00947
Met tower	Universal Tower	unknown	none	03532

Provide any additional 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-rev001

Site ID	WST109	Technician	Eric Hebert	Site Visit Date	10/22/2012

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?	☑	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	A	none	03531
Ozone	ThermoElectron Inc	49i A1NAA	1030244801	000695
Zero air pump	Werther International	P 70/4	000821881	06934
Filter pack flow pump	Thomas	107CA18	000025705	00476

Provide any additional 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-rev001

Site ID WST109 **Technician** Eric Hebert **Site Visit Date** 10/22/2012

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?		

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000291
DAS	Campbell	CR3000	2526	000427
Modem	Raven	V4221-V	0844349943	06598

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

The sample tower is kinked at the hinge point and is in poor condition. One leg of the met tower is split. Both of these conditions were reported following the two previous site audit visits.

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID	WST109	Technician	Eric Hebert	Site Visit Date	10/22/2012

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	☑	July 1990	☐
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-rev001

Site ID	WST109	Technician	Eric Hebert	Site Visit Date	10/22/2012

Site operation procedures

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

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

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

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

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

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

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

The state of NH DES performs monthly multi-point audits of the ozone analyzer. Ozone sample train leak checks are being conducted every two weeks.

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID	WST109	Technician	Eric Hebert	Site Visit Date	10/22/2012

Site operation procedures

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

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

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

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ABT147-Eric Hebert-10/23/2012						
1	10/23/2012	Computer	Dell	000321	D520	unknown
2	10/23/2012	DAS	Campbell	000413	CR3000	2519
3	10/23/2012	Elevation	Elevation	None	1	None
4	10/23/2012	Filter pack flow pump	Thomas	02974	107CAB18	0493002469
5	10/23/2012	Flow Rate	Apex	000467	AXMC105LPMDPCV	43973
6	10/23/2012	Infrastructure	Infrastructure	none	none	none
7	10/23/2012	Met tower	Universal Tower	06486	unknown	none
8	10/23/2012	Modem	Raven	06602	H4223-C	0844430633
9	10/23/2012	Ozone	ThermoElectron Inc	000733	49i A1NAA	1105347322
10	10/23/2012	Ozone Standard	ThermoElectron Inc	000220	49i A3NAA	0622717868
11	10/23/2012	Sample Tower	Aluma Tower	000017	B	AT-61152-A-H8-C
12	10/23/2012	Shelter Temperature	Campbell	none	107-L	none
13	10/23/2012	Shield (10 meter)	RM Young	02804	Aspirated 43408	none
14	10/23/2012	Siting Criteria	Siting Criteria	None	1	None
15	10/23/2012	Temperature	RM Young	06503	41342	14623
16	10/23/2012	UPS	APC	06795	RS900	unknown
17	10/23/2012	Zero air pump	Werther International	06930	P 70/4	000829168

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2519	ABT147	Eric Hebert	10/23/2012	DAS	Primary

Das Date: 10/23/2012 **Audit Date** 10/23/2012
Das Time: 11:00:01 **Audit Time** 11:00:00
Das Day: 297 **Audit Day** 297

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

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/9/2012	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.1000	0.1000	V	V	0.0000
7	0.3000	0.3000	0.2999	V	V	-0.0001
7	0.5000	0.5000	0.4999	V	V	-0.0001
7	0.7000	0.7000	0.6999	V	V	-0.0001
7	0.9000	0.9000	0.8999	V	V	-0.0001
7	1.0000	1.0001	0.9999	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	43973	ABT147	Eric Hebert	10/23/2012	Flow Rate	000467

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/6/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.01
0.19%	0.39%			**Cal Factor Full Scale**	0.99
				Rotometer Reading:	1.55

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	-0.01	0.002	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.02	0.020	0.01	l/m	l/m	
primary	test pt 1	0.000	1.498	1.51	1.506	1.50	l/m	l/m	0.13%
primary	test pt 2	0.000	1.499	1.51	1.506	1.50	l/m	l/m	0.06%
primary	test pt 3	0.000	1.506	1.51	1.506	1.50	l/m	l/m	-0.39%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	240 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.0 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Fair	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347322	ABT147	Eric Hebert	10/23/2012	Ozone	000733

Slope:	0.96006	**Slope:**	0.00000
Intercept	0.29628	**Intercept**	0.00000
CorrCoff	0.99995	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00987	**Intercept**	0.07483
Cert Date	3/23/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.2%	4.2%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.38	0.30	0.14	ppb	
primary	2	33.17	32.77	32.03	ppb	-2.26%
primary	3	64.07	63.36	61.51	ppb	-2.92%
primary	4	83.43	82.54	79.80	ppb	-3.32%
primary	5	116.71	115.49	110.70	ppb	-4.15%

Sensor Component	Condition	Status
Cell B Noise	0.8 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-0.20	pass
Span	1.028	pass
Cell B Freq.	93.0 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.71 lpm	pass
Cell A Tmp.	31.8 C	pass
Cell A Pressure	722 mmHg	pass
Cell A Noise	0.9 ppb	pass
Cell A Freq.	87.1 kHz	pass
Cell A Flow	0.73 lpm	pass
Battery Backup	Not functioning	Fail
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14623	ABT147	Eric Hebert	10/23/2012	Temperature	06503

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01D102193	**Tfer Desc.**	RTD translator
Tfer ID	01231		
Slope	1.00157	**Intercept**	-0.02095
Cert Date	2/10/2012	**CorrCoff**	1.00000

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01H0060	**Tfer Desc.**	RTD probe
Tfer ID	01230		
Slope	1.00157	**Intercept**	-0.02095
Cert Date	2/10/2012	**CorrCoff**	1.00000

DAS 1: Abs Avg Err	DAS 1: Abs Max Er	DAS 2: Abs Avg Err	DAS 2: Abs Max Er
0.09	0.14		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.19	0.21	0.000	0.1	C	-0.14
primary	Temp Mid Range	25.31	25.29	0.000	25.3	C	-0.04
primary	Temp High Range	46.80	46.75	0.000	46.8	C	0.08

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	Functioning	**Status**	pass
Sensor Component	Blower	**Condition**	Functioning	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	ABT147	Technician	Eric Hebert	Site Visit Date	10/23/2012

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-9)	640 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ABT147	Eric Hebert	10/23/2012	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
1.23	3.40		

Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000
Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	20.22	20.21	0.000	23.6	C	3.4
primary	Temp Mid Range	19.71	19.70	0.000	19.9	C	0.16
primary	Temp Mid Range	19.28	19.27	0.000	19.4	C	0.14

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	ABT147	Eric Hebert	10/23/2012	Moisture Present	Apex	3224	☐	☐

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

During the filter change-out it was observed that the filter flow pump was operating when the tower was lowered. This was discussed with the operator and the proper procedure was described by the auditor. The site operator indicated that she had been instructed by AMEC personnel to leave the filter installed and operate the flow pump while the tower was down.

2 **Parameter:** DasComments

The sample tower is no longer grounded. The lower section of the met tower has been replaced.

3 **Parameter:** SitingCriteriaCom

Manure is routinely spread on the hay fields surrounding the site.

4 **Parameter:** ShelterCleanNotes

The shelter is clean and well organized.

5 **Parameter:** MetSensorComme

10-meter temperature is operated and maintained on the meteorological tower.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	ABT147	**Technician**	Eric Hebert	**Site Visit Date**	10/23/2012

Site Sponsor (agency)	EPA	**USGS Map**	Hampton
Operating Group	private	**Map Scale**	
AQS #	09-015-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	41.8402
Deposition Measurement	dry, wet	**QAPP Longitude**	-72.0111
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	209
Terrain	rolling	**QAPP Declination**	14.8
Conforms to MLM	Marginally	**QAPP Declination Date**	2/22/2006
Site Telephone	(860) 974-2273	**Audit Latitude**	41.84046
Site Address 1	80 Ayers Road	**Audit Longitude**	-72.010368
Site Address 2		**Audit Elevation**	202
County	Windham	**Audit Declination**	-14.5
City, State	Abington, CT		
Zip Code	06230	**Fire Extinguisher** ☑	Inspected Nov 1992
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator	Pam Brundage	**Safety Glasses** ☑	
Primary Op. Phone #	(860) 377-7159	**Safety Hard Hat** ☑	
Primary Op. E-mail	pambrundage@charter.net	**Climbing Belt** ☑	
Backup Operator	Andrea Cunningham	**Security Fence** ☐	
Backup Op. Phone #	(860) 974-0262	**Secure Shelter** ☑	
Backup Op. E-mail	abingtonandi@hotmail.com	**Stable Entry Step** ☑	

Present

Shelter Working Room ☑	**Make**	Ekto	**Model**	8810 (s/n 2149-9)	**Shelter Size**	640 cuft
Shelter Clean ☑	**Notes**	The shelter is clean and well organized.				
Site OK ☑	**Notes**					

Driving Directions

From Hartford take I-84 east to exit 69. Continue on route 74 east to route 44. Take route 44 east to Abington. At the traffic light in Abington, turn right (south) on route 97. Continue approximately 1.3 miles to Ayers Road which will be on the left. Ayers Road is a single lane paved road. The site is through the gate at the end of the road, in the field at the top of the hill past the barn.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID ABT147 **Technician** Eric Hebert **Site Visit Date** 10/23/2012

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	10 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

Manure is routinely spread on the hay fields surrounding the site.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID	ABT147	Technician	Eric Hebert	Site Visit Date	10/23/2012

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:

10-meter temperature is operated and maintained on the meteorological tower.

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID ABT147 **Technician** Eric Hebert **Site Visit Date** 10/23/2012

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?	☑	
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?	☑	

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342	14623	06503
Shield (10 meter)	RM Young	Aspirated 43408	none	02804
Met tower	Universal Tower	unknown	none	06486

Provide any additional 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-rev001

Site ID ABT147 **Technician** Eric Hebert **Site Visit Date** 10/23/2012

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?	☑	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	AT-61152-A-H8-C	000017
Ozone	ThermoElectron Inc	49i A1NAA	1105347322	000733
Filter pack flow pump	Thomas	107CAB18	0493002469	02974
Zero air pump	Werther International	P 70/4	000829168	06930

Provide any additional 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-rev001

Site ID ABT147 **Technician** Eric Hebert **Site Visit Date** 10/23/2012

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?		

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000321
DAS	Campbell	CR3000	2519	000413
Modem	Raven	H4223-C	0844430633	06602
UPS	APC	RS900	unknown	06795

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

The sample tower is no longer grounded. The lower section of the met tower has been replaced.

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID	ABT147	Technician	Eric Hebert	Site Visit Date	10/23/2012

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-rev001

Site ID	ABT147	Technician	Eric Hebert	Site Visit Date	10/23/2012

Site operation procedures

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

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

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

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

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

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	SSRF, 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-rev001

Site ID ABT147 **Technician** Eric Hebert **Site Visit Date** 10/23/2012

Site operation procedures

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

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

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

During the filter change-out it was observed that the filter flow pump was operating when the tower was lowered. This was discussed with the operator and the proper procedure was described by the auditor. The site operator indicated that she had been instructed by AMEC personnel to leave the filter installed and operate the flow pump while the tower was down.

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CAT175-Eric Hebert-10/24/2012						
1	10/24/2012	Computer	Dell	000275	D520	unknown
2	10/24/2012	DAS	Campbell	000412	CR3000	2532
3	10/24/2012	Elevation	Elevation	None	1	None
4	10/24/2012	Filter pack flow pump	Brailsford	none	TD-4X2N	none
5	10/24/2012	Flow Rate	Apex	000550	AXMC105LPMDPCV	50740
6	10/24/2012	Infrastructure	Infrastructure	none	none	none
7	10/24/2012	Met tower	Universal Tower	02742	unknown	none
8	10/24/2012	Modem	Raven	06481	H4222-C	0808311025
9	10/24/2012	Sample Tower	Aluma Tower	666359	B	none
10	10/24/2012	Shield (10 meter)	RM Young	none	41003	none
11	10/24/2012	Siting Criteria	Siting Criteria	None	1	None
12	10/24/2012	Temperature	RM Young	06409	41342VO	14042

DAS Data Form

DAS Time Max Error: 0.03

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2532	CAT175	Eric Hebert	10/24/2012	DAS	Primary

Das Date: 10/24/2012 **Audit Date** 10/24/2012
Das Time: 11:16:00 **Audit Time** 11:16:02
Das Day: 298 **Audit Day** 298

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

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/9/2012	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
5	0.0000	0.0000	0.0000	V	V	0.0000
5	0.1000	0.1000	0.1000	V	V	0.0000
5	0.3000	0.3000	0.3001	V	V	0.0001
5	0.5000	0.5001	0.5001	V	V	0.0000
5	0.7000	0.7001	0.7002	V	V	0.0001
5	0.9000	0.9002	0.9002	V	V	0.0000
5	1.0000	1.0002	1.0000	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	50740	CAT175	Eric Hebert	10/24/2012	Flow Rate	000550

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/6/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0
2.63%	2.70%			**Cal Factor Full Scale**	0
				Rotometer Reading:	1.45

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	0.10	0.000	0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.03	l/m	l/m	
primary	test pt 1	0.000	1.461	1.50	0.000	1.50	l/m	l/m	2.70%
primary	test pt 2	0.000	1.462	1.50	0.000	1.50	l/m	l/m	2.57%
primary	test pt 3	0.000	1.462	1.50	0.000	1.50	l/m	l/m	2.61%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	-1.0 cm	**Status**	Fail
Sensor Component	Filter Position	**Condition**	Poor	**Status**	Fail
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14042	CAT175	Eric Hebert	10/24/2012	Temperature	06409

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.16	0.27		

Mfg	Eutechnics	Parameter	Temperature
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

Mfg	Eutechnics	Parameter	Temperature
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.08	0.10	0.000	0.2	C	0.11
primary	Temp Mid Range	13.53	13.53	0.000	13.5	C	-0.08
primary	Temp Mid Range	23.92	23.90	0.000	23.6	C	-0.27
primary	Temp High Range	47.99	47.94	0.000	47.8	C	-0.16

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

Infrastructure Data For

Site ID	CAT175	Technician	Eric Hebert	Site Visit Date	10/24/2012

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 1977-1)	640 cuft

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	CAT175	Eric Hebert	10/24/2012	Filter Position	Apex	3683	☐	☑

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator was not available to meet with the auditor during the audit visit due to a personal family matter.

2 **Parameter:** DasComments

The shelter is not temperature controlled. The site is solar and DC battery powered.

3 **Parameter:** ShelterCleanNotes

The shelter and grounds are neat and clean. The shelter roof has been repaired.

4 **Parameter:** PollAnalyzerCom

Ozone monitoring is no longer being conducted at the site.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	CAT175	**Technician**	Eric Hebert	**Site Visit Date**	10/24/2012

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** ☑	No inspection date
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator	Mike Edwards	**Safety Glasses** ☐	
Primary Op. Phone #	(845) 701-1819	**Safety Hard Hat** ☑	
Primary Op. E-mail	medwards@usadatanet.net	**Climbing Belt** ☑	
Backup Operator	none	**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 and grounds are neat and clean. 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-rev001

Site ID CAT175 **Technician** Eric Hebert **Site Visit Date** 10/24/2012

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-rev001

Site ID CAT175 **Technician** Eric Hebert **Site Visit Date** 10/24/2012

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-rev001

Site ID CAT175 **Technician** Eric Hebert **Site Visit Date** 10/24/2012

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?	☑	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

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342VO	14042	06409
Shield (10 meter)	RM Young	41003	none	none
Met tower	Universal Tower	unknown	none	02742

Provide any additional 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-rev001

Site ID CAT175 **Technician** Eric Hebert **Site Visit Date** 10/24/2012

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	none	666359
Filter pack flow pump	Brailsford	TD-4X2N	none	none

Provide any additional 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-rev001

Site ID CAT175 **Technician** Eric Hebert **Site Visit Date** 10/24/2012

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?		

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000275
DAS	Campbell	CR3000	2532	000412
Modem	Raven	H4222-C	0808311025	06481

Provide any additional 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.

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID	CAT175	Technician	Eric Hebert	Site Visit Date	10/24/2012

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 2001	☐
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-rev001

Site ID CAT175 **Technician** Eric Hebert **Site Visit Date** 10/24/2012

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?	☐	No backup operator
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☐	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-rev001

Site ID CAT175 **Technician** Eric Hebert **Site Visit Date** 10/24/2012

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed afternoons
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, e-mail
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:

The site operator was not available to meet with the auditor during the audit visit due to a personal family matter.

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ARE128-Sandy Grenville-10/30/2012						
1	10/30/2012	Computer	Dell	000244	D520	67FNHB1
2	10/30/2012	DAS	Campbell	000400	CR3000	2524
3	10/30/2012	Elevation	Elevation	None	1	None
4	10/30/2012	Filter pack flow pump	Thomas	02661	107CA110	000012187C
5	10/30/2012	Flow Rate	Apex	000462	AXMC105LPMDPCV	42228
6	10/30/2012	Infrastructure	Infrastructure	none	none	none
7	10/30/2012	Met tower	Universal Tower	03505	unknown	none
8	10/30/2012	Modem	Raven	06591	V4221-V	0844349616
9	10/30/2012	Ozone	ThermoElectron Inc	000609	49i A1NAA	1009241782
10	10/30/2012	Ozone Standard	ThermoElectron Inc	000328	49i A3NAA	0622717850
11	10/30/2012	Sample Tower	Aluma Tower	666361	B	none
12	10/30/2012	Shelter Temperature	Campbell	none	107-L	none
13	10/30/2012	Shield (10 meter)	Climatronics	01167	100325	1272
14	10/30/2012	Siting Criteria	Siting Criteria	None	1	None
15	10/30/2012	Temperature	Climatronics	06678	100093	missing
16	10/30/2012	Zero air pump	Werther International	06866	PC70/4	000815262

DAS Data Form

DAS Time Max Error: 0.07

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2524	ARE128	Sandy Grenville	10/30/2012	DAS	Primary

Das Date: 10/30/2012 **Audit Date** 10/30/2012
Das Time: 15:38:04 **Audit Time** 15:38:00
Das Day: 306 **Audit Day** 306

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

Mfg	Datel	**Parameter**	DAS
Serial Number	15510194	**Tfer Desc.**	Source generator (D
Tfer ID	01320		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/2/2010	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/9/2012	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0000	V	V	0.0001
7	0.1000	0.0998	0.0999	V	V	0.0001
7	0.3000	0.2997	0.2997	V	V	0.0000
7	0.5000	0.4996	0.4996	V	V	0.0000
7	0.7000	0.6996	0.6994	V	V	-0.0002
7	0.9000	0.8996	0.8995	V	V	-0.0001
7	1.0000	0.9993	0.9991	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	42228	ARE128	Sandy Grenville	10/30/2012	Flow Rate	000462

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/27/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
2.78%	3.29%			

Cal Factor Zero	0.01
Cal Factor Full Scale	0.99
Rotometer Reading:	1

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	-0.03	0.035	0.04	l/m	l/m	
primary	leak check	0.000	0.000	-0.01	0.037	0.04	l/m	l/m	
primary	test pt 1	1.532	1.551	1.51	1.511	1.50	l/m	l/m	-3.29%
primary	test pt 2	1.531	1.549	1.51	1.513	1.50	l/m	l/m	-3.16%
primary	test pt 3	1.548	1.529	1.51	1.511	1.50	l/m	l/m	-1.90%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	280 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.0 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	Moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241782	ARE128	Sandy Grenville	10/30/2012	Ozone	000609

Slope:	0.99968	**Slope:**	0.00000
Intercept	0.06764	**Intercept**	0.00000
CorrCoff	0.99993	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.01297	**Intercept**	0.09498
Cert Date	1/23/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.8%	1.9%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.11	0.01	0.77	ppb	
primary	2	36.32	35.76	36.05	ppb	0.81%
primary	3	65.97	65.03	65.24	ppb	0.32%
primary	4	87.27	86.05	84.40	ppb	-1.92%
primary	5	213.43	210.60	211.20	ppb	0.28%

Sensor Component	Condition	Status
Cell B Noise	0.8 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-0.30	pass
Span	1.004	pass
Cell B Freq.	92.5 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.72 lpm	pass
Cell A Tmp.	28.1 C	pass
Cell A Pressure	703 mmHg	pass
Cell A Noise	0.9 ppb	pass
Cell A Freq.	87.9 kHz	pass
Cell A Flow	0.70 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	missing	ARE128	Sandy Grenville	10/30/2012	Temperature	06678

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

Mfg	Eutechnics	Parameter	Temperature
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

Mfg	Eutechnics	Parameter	Temperature
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.05	0.07	0.000	0.0	C	-0.03
primary	Temp Mid Range	25.00	24.98	0.000	24.8	C	-0.21
primary	Temp High Range	45.35	45.30	0.000	45.3	C	0.01

Sensor Component	Shield	Condition	Moderately clean	Status	pass
Sensor Component	Blower Status Switch	Condition	Functioning	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	ARE128	Technician	Sandy Grenville	Site Visit Date	10/30/2012

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2116-7)	640 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ARE128	Sandy Grenville	10/30/2012	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
2.04	2.73		

Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000
Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	17.20	17.19	0.000	19.9	C	2.73
primary	Temp Mid Range	18.90	18.89	0.000	20.7	C	1.84
primary	Temp Mid Range	19.40	19.39	0.000	21.0	C	1.56

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	ARE128	Sandy Grenville	10/30/2012	System Memo	Apex	3308	☐	☐
Additional details can be found in the hardcopy of the site audit report.								
Flow Rate	ARE128	Sandy Grenville	10/30/2012	Moisture Present	Apex	3308	☐	☐
There is moisture present in the dry deposition sample train inside the shelter.								

Field Systems Comments

1 **Parameter:** DasComments

The meteorological tower is grounded but the lightning rod has been removed. The sample tower is not grounded.

2 **Parameter:** SitingCriteriaCom

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

3 **Parameter:** ShelterCleanNotes

The shelter is cluttered and disorganized.

4 **Parameter:** PollAnalyzerCom

Moisture was present in the moisture trap and tubing upon arrival for the audit one day after hurricane Sandy. The system was left open without the filter installed for one day and then the audit of the flow system was performed.

5 **Parameter:** MetOpMaintCom

The 10-meter temperature sensor is being operated and maintained on the meteorological tower.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	ARE128	**Technician**	Sandy Grenville	**Site Visit Date**	10/30/2012

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		
Zip Code	17307	**Fire Extinguisher** ☑	No inspection date
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator	Sharon Scamack	**Safety Glasses** ☑	
Primary Op. Phone #	(717) 677-6116	**Safety Hard Hat** ☑	
Primary Op. E-mail	sks8@psu.edu	**Climbing Belt** ☑	
Backup Operator	Kathy Wholaver	**Security Fence** ☐	
Backup Op. Phone #	(717) 677-6116	**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2116-7)	**Shelter Size**	640 cuft
Shelter Clean	☐	**Notes**	The shelter is cluttered and disorganized.				
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-rev001

Site ID ARE128 **Technician** Sandy Grenville **Site Visit Date** 10/30/2012

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-rev001

Site ID	ARE128	Technician	Sandy Grenville	Site Visit Date	10/30/2012

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-rev001

Site ID ARE128 **Technician** Sandy Grenville **Site Visit Date** 10/30/2012

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?	☑	
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?	☑	

Parameter	Manufacturer	Model	S/N	Client ID
Shield (10 meter)	Climatronics	100325	1272	01167
Temperature	Climatronics	100093	missing	06678
Met tower	Universal Tower	unknown	none	03505

Provide any additional 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 is being operated and maintained on the meteorological tower.

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID	ARE128	Technician	Sandy Grenville	Site Visit Date	10/30/2012

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 present
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	none	666361
Ozone	ThermoElectron Inc	49i A1NAA	1009241782	000609
Filter pack flow pump	Thomas	107CA110	000012187C	02661
Zero air pump	Werther International	PC70/4	000815262	06866

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

Moisture was present in the moisture trap and tubing upon arrival for the audit one day after hurricane Sandy. The system was left open without the filter installed for one day and then the audit of the flow system was performed.

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID ARE128 **Technician** Sandy Grenville **Site Visit Date** 10/30/2012

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 grounded but lightning rod removed, sample tower not grounded	

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	67FNHB1	000244
DAS	Campbell	CR3000	2524	000400
Modem	Raven	V4221-V	0844349616	06591

Provide any additional 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 is grounded but the lightning rod has been removed. The sample tower is not grounded.

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID	ARE128	Technician	Sandy Grenville	Site Visit Date	10/30/2012

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	No page numbers	☐
SSRF	☑		☑
Site Ops Manual	☑	Oct 2010	☑
HASP	☑	Oct 2010	☑
Field Ops Manual	☑	Oct 2001	☑
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-rev001

Site ID ARE128 **Technician** Sandy Grenville **Site Visit Date** 10/30/2012

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	☐		☐
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-rev001

Site ID	ARE128	Technician	Sandy Grenville	Site Visit Date	10/30/2012

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?	☐	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	☐		☐

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

Site Inventory by Site Visit

Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
PSU106-Sandy Grenville-11/03/2012					
1 11/3/2012	Computer	Dell	000268	D520	unknown
2 11/3/2012	DAS	Campbell	000407	CR3000	2512
3 11/3/2012	Elevation	Elevation	None	1	None
4 11/3/2012	Filter pack flow pump	Thomas	06023	107CAB18	060400022676
5 11/3/2012	Flow Rate	Apex	000560	AXMC105LPMDPCV	50732
6 11/3/2012	Infrastructure	Infrastructure	none	none	none
7 11/3/2012	Modem	Raven	06601	V4221-V	0844430833
8 11/3/2012	Ozone	ThermoElectron Inc	000684	49i A1NAA	1030244795
9 11/3/2012	Ozone Standard	ThermoElectron Inc	000684	49i A3NAA	1030244812
10 11/3/2012	Sample Tower	Aluma Tower	02747	A	none
11 11/3/2012	Shelter Temperature	Campbell	none	107-L	none
12 11/3/2012	Siting Criteria	Siting Criteria	None	1	None
13 11/3/2012	Temperature	RM Young	04316	41342VO	4013
14 11/3/2012	Zero air pump	Werther International	06914	C 70/4	000829156

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2512	PSU106	Sandy Grenville	11/03/2012	DAS	Primary

Das Date: 11/3 /2012
Das Time: 11:50:01
Das Day: 308

Audit Date 11/3 /2012
Audit Time 11:50:00
Audit Day 308

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

Mfg	Datel	**Parameter**	DAS
Serial Number	15510194	**Tfer Desc.**	Source generator (D
Tfer ID	01320		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/2/2010	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/9/2012	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0000	V	V	0.0001
7	0.1000	0.0998	0.1000	V	V	0.0002
7	0.3000	0.2997	0.2998	V	V	0.0001
7	0.5000	0.4996	0.4997	V	V	0.0001
7	0.7000	0.6996	0.6996	V	V	0.0000
7	0.9000	0.8995	0.8995	V	V	0.0000
7	1.0000	0.9994	0.9994	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	50732	PSU106	Sandy Grenville	11/03/2012	Flow Rate	000560

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/27/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
4.42%	4.55%			

Cal Factor Zero	-0.01
Cal Factor Full Scale	0.97
Rotometer Reading:	1.5

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	0.00	0.004	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.039	0.03	l/m	l/m	
primary	test pt 1	1.527	1.561	1.53	1.526	1.49	l/m	l/m	-4.55%
primary	test pt 2	1.526	1.558	1.53	1.527	1.49	l/m	l/m	-4.36%
primary	test pt 3	1.524	1.558	1.53	1.526	1.49	l/m	l/m	-4.36%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	250 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.5 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	6.5 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244795	PSU106	Sandy Grenville	11/03/2012	Ozone	000684

Slope:	0.99049	**Slope:**	0.00000
Intercept	0.66213	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.01297	**Intercept**	0.09498
Cert Date	1/23/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.8%	2.1%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	-0.06	-0.15	0.27	ppb	
primary	2	35.81	35.25	36.00	ppb	2.13%
primary	3	66.13	65.18	65.09	ppb	-0.14%
primary	4	86.69	85.48	85.30	ppb	-0.21%
primary	5	214.62	211.77	210.40	ppb	-0.65%

Sensor Component	Condition	Status
Cell B Noise	0.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.000	pass
Span	0.995	pass
Cell B Freq.	96.4 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.71 lpm	pass
Cell A Tmp.	32.9 C	pass
Cell A Pressure	710 mmHg	pass
Cell A Noise	1.1 ppb	pass
Cell A Freq.	87.9 kHz	pass
Cell A Flow	0.68 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4013	PSU106	Sandy Grenville	11/03/2012	Temperature	04316

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.14	0.19		

Mfg	Eutechnics	Parameter	Temperature
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

Mfg	Eutechnics	Parameter	Temperature
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.04	0.06	0.000	0.1	C	0.06
primary	Temp Mid Range	26.86	26.84	0.000	26.7	C	-0.19
primary	Temp High Range	46.43	46.38	0.000	46.2	C	-0.17

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

Infrastructure Data For

Site ID	PSU106	Technician	Sandy Grenville	Site Visit Date	11/03/2012

Shelter Make	Shelter Model	Shelter Size
PSU	N/A	3840 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	PSU106	Sandy Grenville	11/03/2012	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.17	0.33		

Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000
Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	23.60	23.58	0.000	23.3	C	-0.33
primary	Temp Mid Range	23.84	23.82	0.000	23.7	C	-0.13
primary	Temp Mid Range	23.95	23.93	0.000	23.9	C	-0.06

Field Systems Comments

1 **Parameter:** DasComments

The meteorological tower has been removed.

2 **Parameter:** SitingCriteriaCom

The site is within 10 km of State College which has a population of approximately 50,000. The site is located in a university agricultural research field.

3 **Parameter:** ShelterCleanNotes

The shelter is owned by the university and is clean and orderly. The site is part of the Surfrad network.

4 **Parameter:** MetOpMaintCom

The 10-meter temperature sensor is now mounted in a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	PSU106	**Technician**	Sandy Grenville	**Site Visit Date**	11/03/2012

Site Sponsor (agency)	EPA	**USGS Map**	Pine Grove Mills
Operating Group	PSU	**Map Scale**	
AQS #	42-027-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	40.7209
Deposition Measurement	dry	**QAPP Longitude**	-77.9316
Land Use	agriculture	**QAPP Elevation Meters**	376
Terrain	rolling - complex	**QAPP Declination**	10.9
Conforms to MLM	Marginally	**QAPP Declination Date**	9/16/2005
Site Telephone	(814) 237-5778	**Audit Latitude**	40.720902
Site Address 1	PSU Agriculture Research Farm	**Audit Longitude**	-77.931759
Site Address 2	Tadpole Road	**Audit Elevation**	364
County	Centre	**Audit Declination**	-10.7
City, State	Rockspring, PA		
Zip Code	16865	**Fire Extinguisher** ☑	No inspection date
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator	Bob Ziegler	**Safety Glasses** ☑	
Primary Op. Phone #	(814) 863-4526	**Safety Hard Hat** ☑	
Primary Op. E-mail	rfz1@psu.edu	**Climbing Belt** ☑	
Backup Operator	none	**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Shelter Working Room	☑	**Make**	PSU	**Model**	N/A	**Shelter Size**	3840 cuft
Shelter Clean	☑	**Notes**	The shelter is owned by the university and is clean and orderly. The site is part of the Surfrad network.				
Site OK	☑	**Notes**					

Driving Directions From 322 on the east side of State College, take SR 3024 south. After the traffic light at the intersection of route 26, SR 3024 will change to Whitehall Road. Continue on Whitehall road for approximately 3 miles to Fairbrook. Turn left on Tadpole Road in Fairbrook at the church. Continue approximately 0.5 miles, the site will be in the field on the right.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID PSU106 **Technician** Sandy Grenville **Site Visit Date** 11/03/2012

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	State College	☐
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	10 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 within 10 km of State College which has a population of approximately 50,000. The site is located in a university agricultural research field.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID	PSU106	Technician	Sandy Grenville	Site Visit Date	11/03/2012

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-rev001

Site ID	PSU106	Technician	Sandy Grenville	Site Visit Date	11/03/2012

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?	☑	

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342VO	4013	04316

Provide any additional 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 is now mounted in a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID PSU106 **Technician** Sandy Grenville **Site Visit Date** 11/03/2012

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 20 meters
4	Describe dry dep sample tube.		3/8 teflon by 20 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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	A	none	02747
Filter pack flow pump	Thomas	107CAB18	060400022676	06023
Zero air pump	Werther International	C 70/4	000829156	06914
Ozone	ThermoElectron Inc	49i A1NAA	1030244795	000684

Provide any additional 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-rev001

Site ID PSU106 **Technician** Sandy Grenville **Site Visit Date** 11/03/2012

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	

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000268
DAS	Campbell	CR3000	2512	000407
Modem	Raven	V4221-V	0844430833	06601

Provide any additional 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-rev001

Site ID	PSU106	Technician	Sandy Grenville	Site Visit Date	11/03/2012

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	☑	Apr 2009	☑
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-rev001

Site ID	PSU106	Technician	Sandy Grenville	Site Visit Date	11/03/2012

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?	☐	No backup operator
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID	PSU106	Technician	Sandy Grenville	Site Visit Date	11/03/2012

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, logbook, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☐	gloves are not used
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

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

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
BEL116-Eric Hebert-11/20/2012						
1	11/20/2012	Computer	Dell	000280	D520	unknown
2	11/20/2012	DAS	Campbell	000341	CR3000	2120
3	11/20/2012	Elevation	Elevation	None	1	None
4	11/20/2012	Filter pack flow pump	Thomas	02755	107CAB18	1192001881
5	11/20/2012	Flow Rate	Apex	illegible	AXMC105LPMDPCV	illegible
6	11/20/2012	Infrastructure	Infrastructure	none	none	none
7	11/20/2012	Met tower	Universal Tower	06484	unknown	none
8	11/20/2012	Modem	Raven	06382	H4222-C	0802310513
9	11/20/2012	Ozone	ThermoElectron Inc	000692	49i A1NAA	1030244803
10	11/20/2012	Ozone Standard	ThermoElectron Inc	000366	49i A3NAA	0726124695
11	11/20/2012	Precipitation	Texas Electronics	06332	TR-525i-HT	43527-807
12	11/20/2012	Relative Humidity	Rotronic	06219	MP 101A-C4	123962
13	11/20/2012	Sample Tower	Aluma Tower	000127	B	none
14	11/20/2012	Shelter Temperature	Campbell	none	107-L	44281
15	11/20/2012	Shield (10 meter)	RM Young	05042	Aspirated 43408	none
16	11/20/2012	Shield (2 meter)	RM Young	05041	Aspirated 43408	none
17	11/20/2012	Siting Criteria	Siting Criteria	None	1	None
18	11/20/2012	Solar Radiation	Licor	04935	LI-200	PY47675
19	11/20/2012	Solar Radiation Translator	RM Young	04888	70101-X	none
20	11/20/2012	Surface Wetness	RM Young	04608	58101	none
21	11/20/2012	Temperature	RM Young	06308	41342VO	12533
22	11/20/2012	Temperature2meter	RM Young	06309	41342VO	12534
23	11/20/2012	Wind Direction	RM Young	03416	AQ05103-5	17096wdr
24	11/20/2012	Wind Speed	RM Young	03416	AQ05103-5	17096wsp
25	11/20/2012	Zero air pump	Teledyne	000776	701H	606

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2120	BEL116	Eric Hebert	11/20/2012	DAS	Primary

Das Date: 11/20/2012 **Audit Date** 11/20/2012
Das Time: 10:30:01 **Audit Time** 10:30:00
Das Day: 325 **Audit Day** 325

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		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/9/2012	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.1000	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	0.7001	0.7000	V	V	-0.0001
7	0.9000	0.9001	0.9000	V	V	-0.0001
7	1.0000	1.0001	1.0000	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	BEL116	Eric Hebert	11/20/2012	Flow Rate	illegible

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/6/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.02
0.11%	0.16%			**Cal Factor Full Scale**	0.98
				Rotometer Reading:	1.85

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	0.01	0.033	0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.042	0.02	l/m	l/m	
primary	test pt 1	0.000	1.512	1.53	1.528	1.51	l/m	l/m	-0.16%
primary	test pt 2	0.000	1.511	1.53	1.528	1.51	l/m	l/m	-0.07%
primary	test pt 3	0.000	1.512	1.53	1.528	1.51	l/m	l/m	-0.11%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.5 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244803	BEL116	Eric Hebert	11/20/2012	Ozone	000692

Slope:	0.97643	**Slope:**	0.00000
Intercept	0.47920	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00987	**Intercept**	0.07483
Cert Date	3/23/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.6%	2.1%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.19	0.11	0.57	ppb	
primary	2	31.84	31.45	31.11	ppb	-1.08%
primary	3	66.12	65.39	64.34	ppb	-1.61%
primary	4	83.36	82.47	81.30	ppb	-1.42%
primary	5	107.98	106.85	104.60	ppb	-2.11%

Sensor Component	Condition	Status
Cell B Noise	1.0 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-0.20	pass
Span	1.025	pass
Cell B Freq.	101.1 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.69 lpm	pass
Cell A Tmp.	35.9 C	pass
Cell A Pressure	733 mmHg	pass
Cell A Noise	1.1 ppb	pass
Cell A Freq.	88.9 kHz	pass
Cell A Flow	0.70 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	17096wsp	BEL116	Eric Hebert	11/20/2012	Wind Speed	03416

Prop or Cups SN 65736
Prop or Cups Torque 0.2 **to** 0.3
Prop Correction Fact 0.0512

Mfg	RM Young	**Parameter**	wind speed
Serial Number		**Tfer Desc.**	wind speed motor (h
Tfer ID	01262		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/13/2010	**CorrCoff**	1.00000

Mfg	RM Young	**Parameter**	wind speed
Serial Number		**Tfer Desc.**	wind speed motor (l
Tfer ID	01261		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/13/2010	**CorrCoff**	1.00000

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

UseDescription:	InputDevice:	Input RPM:	Input m/s:	Output V:	DAS m/s:	Diff/ %Diff:	Difference:
primary	none	0	0.20	0.000	0.0		-0.20
primary	01262	200	1.02	0.000	1.0		0.00
primary	01262	400	2.05	0.000	2.1		0.00
primary	01262	800	4.10	0.000	4.1		0.00
primary	01262	1200	6.14	0.000	6.1	0.00%	
primary	01262	2400	12.29	0.000	12.3	0.00%	
primary	01262	4000	20.48	0.000	20.5	0.00%	
primary	01262	9400	48.13	0.000	48.1	0.00%	

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

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	17096wdr	BEL116	Eric Hebert	11/20/2012	Wind Direction	03416

Mfg	RM Young	**Parameter**	wind direction
Serial Number		**Tfer Desc.**	wind direction wheel
Tfer ID	01266		

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

VaneTorque 15 **to** 15 360

Mfg	Ushikata	**Parameter**	wind direction
Serial Number	190037	**Tfer Desc.**	transit
Tfer ID	01265		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/4/2011	**CorrCoff**	1.00000

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	2.3	1.3		
Abs Max Er	3	2		

UseDescription:	TferID:	Input Raw:	Linearity	Output V:	Output Deg.:	Difference:	Change:	Error:
primary	01265	90	☐	0.000	88	2		2
primary	01265	180	☐	0.000	177	3		3
primary	01265	270	☐	0.000	267	3		3
primary	01265	360	☐	0.000	1	1		1
primary	01266	0	☑	0.000	1	1	47	2
primary	01266	45	☑	0.000	44	1	43	-2
primary	01266	90	☑	0.000	88	2	44	-1
primary	01266	135	☑	0.000	133	2	45	0
primary	01266	180	☑	0.000	177	3	44	-1
primary	01266	225	☑	0.000	221	4	44	-1
primary	01266	270	☑	0.000	267	3	46	1
primary	01266	315	☑	0.000	314	1	47	2

Sensor Component	Mast	**Condition**	Good	**Status**	pass
Sensor Component	Condition	**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	11/20/2012	Temperature	06308

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.15	0.33		

Mfg	Eutechnics	Parameter	Temperature
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

Mfg	Eutechnics	Parameter	Temperature
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.24	0.26	0.000	0.17	C	-0.09
primary	Temp Mid Range	14.28	14.28	0.000	14.31	C	0.03
primary	Temp High Range	47.01	46.96	0.000	47.29	C	0.33

Sensor Component	Shield	Condition	Moderately clean	Status	pass
Sensor Component	Blower Status Switch	Condition	Functioning	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

2 Meter Temperature Data For

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	12534	BEL116	Eric Hebert	11/20/2012	Temperature2meter	06309

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.17	0.35		

Mfg	Eutechnics	Parameter	Temperature
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

Mfg	Eutechnics	Parameter	Temperature
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

UseDescription:	Test type:	InputTmpRaw	InputTmpCorrected:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Rang	0.24	0.26	0.000	0.14	C	-0.12
primary	Temp Mid Rang	14.28	14.28	0.000	14.31	C	0.03
primary	Temp High Ran	47.01	46.96	0.000	47.31	C	0.35

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Rotronic	123962	BEL116	Eric Hebert	11/20/2012	Relative Humidity	06219

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	124432	**Tfer Desc.**	Hygroclip
Tfer ID	01225		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	7.1	5.9		
Abs Max Er	8.0	5.9		

UseDesc.:	Test type:	Device:	Input RH:	GTL Raw:	RH Corr.:	DAS Volts:	DAS %RH:	Difference:
primary	RH Low Range	Hygroclip	32.8	33.4	32.8	0.389	38.9	6.1
primary	RH Low Range	Hygroclip	52.9	55.1	52.9	0.609	60.9	8.0
primary	RH High Range	Hygroclip	93.6	91.4	93.6	0.995	99.5	5.9

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY47675	BEL116	Eric Hebert	11/20/2012	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	1/6/2010	**CorrCoff**	1.00000	
Mfg	Eppley	**Parameter**	solar radiation	
Serial Number	34341F3	**Tfer Desc.**	SR transfer sensor	
Tfer ID	01245			
Slope	1.00000	**Intercept**	0.00000	
Cert Date	12/16/2010	**CorrCoff**	1.00000	

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
6.4%	6.4%	0.0%	0.0%

UseDescription:	Measure Date	MeasureTime	Tfer Corr:	DAS w/m2:	PctDifference:
primary	11/20/2012	11:00	299	318	6.4%
primary	11/20/2012	12:00	288	304	5.6%
primary	11/20/2012	13:00	216	232	7.4%

Sensor Component	Sensor Level	**Condition**	Level	**Status**	pass
Sensor Component	Sensor Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**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	11/20/2012	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	wet	N/A	1.017	1.02	V	N/A	V
primary	dry	N/A	0.008	0.01	V	N/A	V

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

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Texas Electronics	43527-807	BEL116	Eric Hebert	11/20/2012	Precipitation	06332

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
5.0%	8.0%		

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	8 sec	0.50	0.49	in	in	ml	-2.0%
primary	test 2	231.5	2	10 sec	0.50	0.46	in	in	ml	-8.0%

Sensor Component		Condition		Status	
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Sensor Heater	Condition	Functioning	Status	pass
Sensor Component	Gauge Screen	Condition	Installed	Status	Fail
Sensor Component	Level	Condition	Level	Status	pass
Sensor Component	Gauge Drain Screen	Condition	Installed	Status	pass
Sensor Component	Gauge Clean	Condition	Clean	Status	pass
Sensor Component	Funnel Clean	Condition	Clean	Status	pass
Sensor Component	Condition	Condition	Good	Status	pass
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass

Infrastructure Data For

Site ID	BEL116	Technician	Eric Hebert	Site Visit Date	11/20/2012

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2140-4)	640 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	44281	BEL116	Eric Hebert	11/20/2012	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.10	0.19		

Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000
Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00157	Intercept	-0.02095
Cert Date	2/10/2012	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	23.44	23.42	0.000	23.6	C	0.19
primary	Temp Mid Range	24.27	24.25	0.000	24.2	C	-0.02

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The site operator was incorrectly recording the filter final flow as the filter installed flow (on the SSRF) as instructed by the previous site operator. This was discussed during the audit and the correct procedures were described by the auditor.

2 **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.

3 **Parameter:** ShelterCleanNotes

Larger shelter installed since previous audit visit in 2010.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	BEL116	**Technician**	Eric Hebert	**Site Visit Date**	11/20/2012

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		**Present**
Zip Code	20708	**Fire Extinguisher**	☑ No inspection date
Time Zone	Eastern	**First Aid Kit**	☑
Primary Operator	Dan Goldberg	**Safety Glasses**	☐
Primary Op. Phone #	(301) 405-7638	**Safety Hard Hat**	☑
Primary Op. E-mail	dgoldb@atmos.umd.edu	**Climbing Belt**	☑
Backup Operator	Allison Ring	**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail	aring1@umd.edu	**Stable Entry Step**	☑

Shelter Working Room ☑ **Make** Unknown **Model** Unknown **Shelter Size** Unknown

Shelter Clean ☑ **Notes** Larger shelter installed since previous audit visit in 2010.

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-rev001

Site ID BEL116 **Technician** Eric Hebert **Site Visit Date** 11/20/2012

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-rev001

Site ID	BEL116	Technician	Eric Hebert	Site Visit Date	11/20/2012

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-rev001

Site ID BEL116 **Technician** Eric Hebert **Site Visit Date** 11/20/2012

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?	☑	

Parameter	Manufacturer	Model	S/N	Client ID
Solar Radiation	Licor	LI-200	PY47675	04935
Shield (10 meter)	RM Young	Aspirated 43408	none	05042
Shield (2 meter)	RM Young	Aspirated 43408	none	05041
Surface Wetness	RM Young	58101	none	04608
Temperature	RM Young	41342VO	12533	06308
Temperature2meter	RM Young	41342VO	12534	06309
Relative Humidity	Rotronic	MP 101A-C4	123962	06219
Precipitation	Texas Electronics	TR-525i-HT	43527-807	06332
Met tower	Universal Tower	unknown	none	06484
Wind Speed	RM Young	AQ05103-5	17096wsp	03416
Wind Direction	RM Young	AQ05103-5	17096wdr	03416

Provide any additional 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-rev001

Site ID	BEL116	Technician	Eric Hebert	Site Visit Date	11/20/2012

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?	☑	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	none	000127
Ozone	ThermoElectron Inc	49i A1NAA	1030244803	000692
Filter pack flow pump	Thomas	107CAB18	1192001881	02755
Zero air pump	Teledyne	701H	606	000776

Provide any additional 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-rev001

Site ID BEL116 **Technician** Eric Hebert **Site Visit Date** 11/20/2012

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?		

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000280
DAS	Campbell	CR3000	2120	000341
Modem	Raven	H4222-C	0802310513	06382
Solar Radiation Translator	RM Young	70101-X	none	04888

Provide any additional 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-rev001

Site ID	BEL116	Technician	Eric Hebert	Site Visit Date	11/20/2012

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 2010	☐
Field Ops Manual	☑	Nov 2010	☑
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?	☑	With the exception of final flow
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-rev001

Site ID BEL116 **Technician** Eric Hebert **Site Visit Date** 11/20/2012

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	☐	N/A	☑

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 site operator was incorrectly recording the filter final flow as the filter installed flow (on the SSRF) as instructed by the previous site operator. This was discussed during the audit and the correct procedures were described by the auditor.

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID	BEL116	Technician	Eric Hebert	Site Visit Date	11/20/2012

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?	☑	With noted exceptions
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:

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: 10/28/2012 6:00:22 PM

SiteVisitDate	Site	Technician
10/09/2012	ACA416	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	P	3	0.5	4	0.20	m/s	**P**
2	Wind Speed max error below 5m/s in m/s	P	3	0.5	4	0.22	m/s	**P**
3	Wind Speed average % difference above 5 m/s	P	3	5	4	0.7	%	**P**
4	Wind Speed max % difference above 5 m/s	P	3	5	4	1.6	%	**P**
5	Wind Speed Torque average error	P	3	0.5	1	0.20	g-cm	**P**
6	Wind Speed Torque max error	P	3	0.5	1	0.2	g-cm	**P**
7	Wind Direction Input Deg True average error (de	P	2	5	5	3.4	degrees	**P**
8	Wind Direction Input Deg True max error (deg)	P	2	5	5	5	degrees	**P**
9	Wind Direction Linearity average error (deg)	P	2	5	8	1.2	degrees	**P**
10	Wind Direction Linearity max error (deg)	P	2	5	8	4	degrees	**P**
11	Wind Direction Torque average error	P	2	20	1	6	g-cm	**P**
12	Wind Direction Torque max error	P	2	20	1	7	g-cm	**P**
13	Temperature average error	P	4	0.5	12	0.05	c	**P**
14	Temperature max error	P	4	0.5	12	0.09	c	**P**
15	Delta Temperature average error	P	5	0.5	12	0.06	c	**P**
16	Delta Temperature max error	P	5	0.5	12	0.07	c	**P**
17	Relative Humidity average above 85%	P	6	10	1	5.1	%	**P**
18	Relative Humidity max above 85%	P	6	10	1	5.1	%	**P**
19	Relative Humidity average below 85%	P	6	10	2	6.7	%	**P**
20	Relative Humidity max below 85%	P	6	10	2	7.7	%	**P**
21	Solar Radiation % diff of avg	P	9	10	4	2.91	%	**P**
22	Solar Radiation % diff of max STD value	P	9	10	4	2.6	%	**P**
23	Precipitation average % difference	P	1	10	2	19.0	%	**Fail**
24	Precipitation max % difference	P	1	10	2	22.0	%	**Fail**
25	Ozone Slope	P	0	1.1	4	0.96212	unitless	**P**
26	Ozone Intercept	P	0	5	4	0.29896	ppb	**P**
27	Ozone correlation	P	0	0.995	4	0.99993	unitless	**P**
28	Ozone % difference avg	P	7	10	4	3.2	%	**P**
29	Ozone % difference max	P	7	10	4	4.3	%	**P**
30	Flow Rate average % difference	P	10	5	2	1.96	%	**P**
31	Flow Rate max % difference	P	10	5	2	2.09	%	**P**
32	DAS Time maximum error	P	0	5	1	0.40	min	**P**
33	DAS Voltage average error	P	2	0.003	14	0.0003	V	**P**
34	Surface Wetness Response	P	12	100	1	95.5		**P**

SiteVisitDate	Site	Technician
10/09/2012	ACA416	Eric Hebert

35	Shelter Temperature average error	P	5	1	2	0.53	c	**P**
36	Shelter Temperature max error	P	5	1	2	0.67	c	**P**

SiteVisitDate	Site	Technician
10/09/2012	ACA416	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:** Sample Train **CommentCode** 208

The ozone sample train is composed of materials other than the recommended materials which are Teflon and glass only.

3 **Parameter:** Precipitation **SensorComponent:** Properly Sited **CommentCode** 193

Objects violate the 45 degree rule for the tipping bucket rain gage.

4 **Parameter:** Precipitation **SensorComponent:** Sensor Heater **CommentCode** 104

The tipping bucket heater is generating excessive heat, enough to evaporate water on the funnel.

5 **Parameter:** Solar Radiation **SensorComponent:** Sensor Level **CommentCode** 128

The solar radiation sensor is mounted on the meteorological tower and is difficult to access. The site operator does not check the sensor weekly.

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:** SiteOpsProcedures

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

3 **Parameter:** ShelterCleanNotes

The shelter is clean and well organized.

4 **Parameter:** PollAnalyzerCom

The ozone sample inlet has a stainless steel funnel and stainless steel fittings. The recommended material for ozone sample train is Teflon or glass.

5 **Parameter:** MetSensorComme

The solar radiation sensor is a full bubble off level and bias to the west.

6 **Parameter:** MetOpMaintCom

The tipping bucket heater thermostat has failed in the closed circuit position allowing the heater to be continuously on. The tipping mechanism was beginning to melt. The heater was unplugged during the site audit.

EEMS Spot Report

Data Compiled: 1/18/2013 12:03:13 PM

SiteVisitDate	Site	Technician
10/10/2012	HOW191	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	3	0.26	c	**P**
2	Temperature max error	P	4	0.5	3	0.34	c	**P**
3	Ozone Slope	P	0	1.1	3	0.98987	unitless	**P**
4	Ozone Intercept	P	0	5	3	0.57532	ppb	**P**
5	Ozone correlation	P	0	0.995	3	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	3	3.0	%	**P**
7	Ozone % difference max	P	7	10	3	6.1	%	**P**
8	Flow Rate average % difference	P	11	5	2	0.24	%	**P**
9	Flow Rate max % difference	P	11	5	2	0.38	%	**P**
10	Shelter Temperature average error	P	5	1	3	0.26	c	**P**
11	Shelter Temperature max error	P	5	1	3	0.40	c	**P**

SiteVisitDate	Site	Technician
10/10/2012	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:** 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:** SiteOpsProcedures

The daily zero, span, and precision checks are conducted through one of the 8 inlets only.

2 **Parameter:** SitingCriteriaCom

The CASTNET filter pack at this location is located above a tree canopy at approximately 23.5 meters from the ground. A second filter is located below the canopy at approximately 2 meters. This is an AmeriFlux site which is approximately 2.5 km to the SW of the HOW132 CASTNET site. See the map included as Figure 1.

3 **Parameter:** ShelterCleanNotes

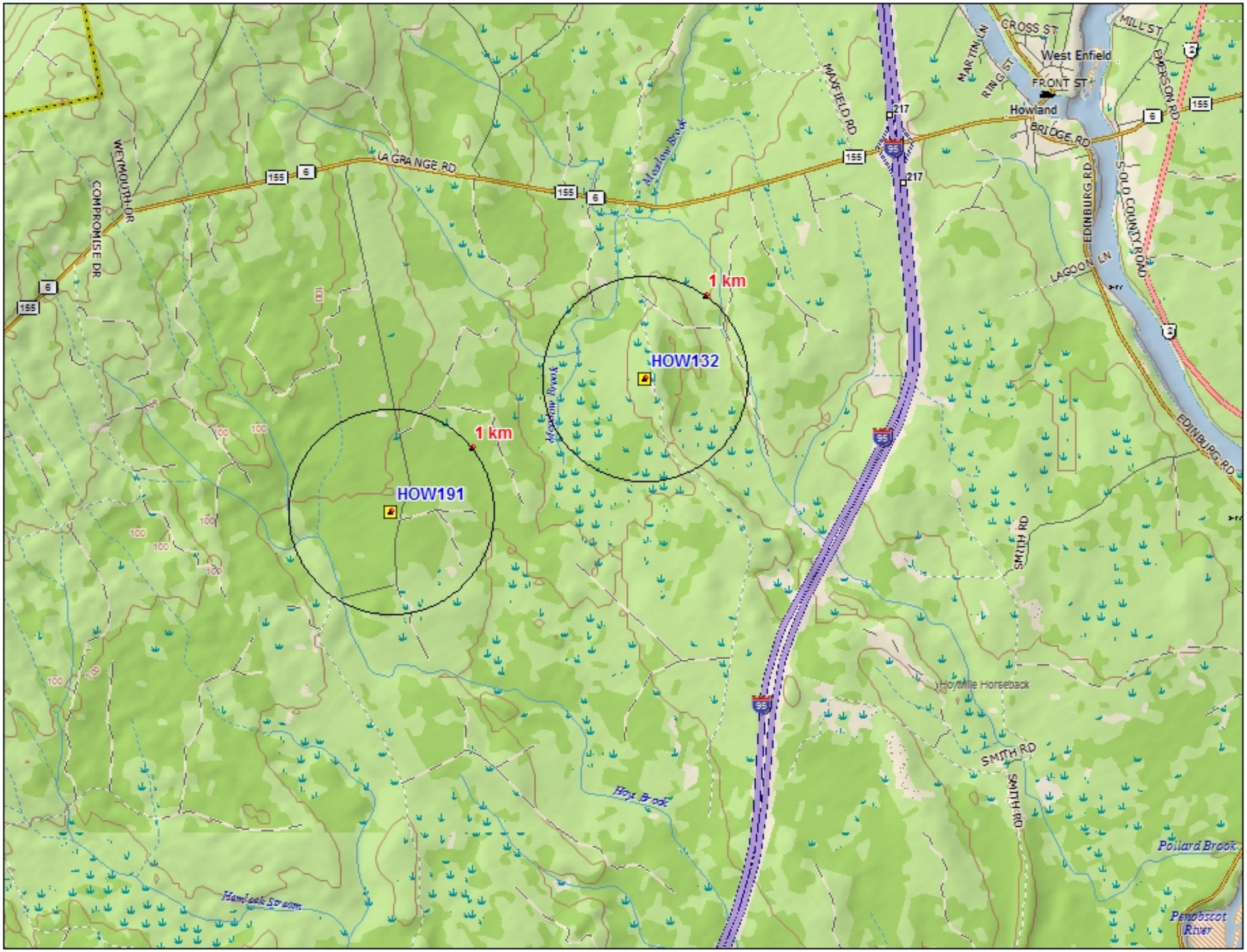
The custom built shelter is clean and organized.

4 **Parameter:** PollAnalyzerCom

Ozone measurements at this location are being conducted at 8 levels through the tree canopy from 2 meters to 23.5 meters. Three minute measurements for each height are aggregated into an hourly average for each height to produce a through-canopy ozone profile.

5 **Parameter:** MetSensorComme

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



MN (16.8° W)

km
0 ½ 1 1½ 2

Data Zoom 12-0

EEMS Spot Report

Data Compiled: 1/17/2013 2:09:52 PM

SiteVisitDate	Site	Technician
10/10/2012	HOW191-B	Eric Hebert

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	0.17	c	**P**
3	Flow Rate average % difference	P	10	5	2	0.46	%	**P**
4	Flow Rate max % difference	P	10	5	2	0.90	%	**P**

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** System Memo **CommentCode** 210

This parameter is being measured at 2 meters from the ground and below a tree canopy.

2 **Parameter:** Temperature **SensorComponent:** System Memo **CommentCode** 210

This parameter is being measured at 2 meters from the ground and below a tree canopy.

EEMS Spot Report

Data Compiled: 10/28/2012 8:20:23 PM

SiteVisitDate	Site	Technician
10/11/2012	HOW132	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	12	0.14	c	**P**
2	Temperature max error	P	4	0.5	12	0.25	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98028	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.17489	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99990	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.5	%	**P**
7	Ozone % difference max	P	7	10	4	2.6	%	**P**
8	Flow Rate average % difference	P	10	5	2	1.55	%	**P**
9	Flow Rate max % difference	P	10	5	2	1.72	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	28	0.0000	V	**P**
12	Shelter Temperature average error	P	5	1	9	0.48	c	**P**
13	Shelter Temperature max error	P	5	1	9	0.65	c	**P**

SiteVisitDate	Site	Technician
10/11/2012	HOW132	Eric Hebert

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator reported that he does not always use gloves to handle the filters consistently.

2 **Parameter:** SiteOpsProcedures

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

3 **Parameter:** SitingCriteriaCom

There is a small power plant about 30 km northeast of the site. It is on-line approximately 50% of the time. The site is near a plantation and within 20 meters of the tree line.

4 **Parameter:** ShelterCleanNotes

The shelter is cleaner than it has been during previous audit visits

5 **Parameter:** PollAnalyzerCom

There is a tree branch that contacts the filter enclosure and the filter pack when the tower is lowered and raised.

EEMS Spot Report

Data Compiled: 10/28/2012 8:55:37 PM

SiteVisitDate	Site	Technician
10/12/2012	ASH135	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	9	0.06	c	**P**
2	Temperature max error	P	4	0.5	9	0.09	c	**P**
3	Ozone Slope	P	0	1.1	4	1.01773	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.34656	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	1.5	%	**P**
8	Flow Rate average % difference	P	10	5	2	0.09	%	**P**
9	Flow Rate max % difference	P	10	5	2	0.11	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	28	0.0000	V	**P**
12	Shelter Temperature average error	P	5	1	9	0.55	c	**P**
13	Shelter Temperature max error	P	5	1	9	0.84	c	**P**

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

There is an evergreen plantation 20 meters south of the site.

4 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 1/7/2013 12:37:55 PM

SiteVisitDate	Site	Technician
10/22/2012	WST109	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.10	c	**P**
2	Temperature max error	P	4	0.5	6	0.21	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99876	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.16956	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.2	%	**P**
7	Ozone % difference max	P	7	10	4	0.5	%	**P**
8	Flow Rate average % difference	P	10	5	3	0.82	%	**P**
9	Flow Rate max % difference	P	10	5	3	0.89	%	**P**
10	DAS Time maximum error	P	0	5	1	0.02	min	**P**
11	DAS Voltage average error	P	7	0.003	21	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	6	0.67	c	**P**
13	Shelter Temperature max error	P	5	1	6	0.76	c	**P**

SiteVisitDate	Site	Technician
10/22/2012	WST109	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.

Field Systems Comments

1 **Parameter:** DasComments

The sample tower is kinked at the hinge point and is in poor condition. One leg of the met tower is split. Both of these conditions were reported following the two previous site audit visits.

2 **Parameter:** SiteOpsProcedures

The state of NH DES performs monthly multi-point audits of the ozone analyzer. Ozone sample train leak checks are being conducted every two weeks.

3 **Parameter:** SitingCriteriaCom

The site is in a small clearing surrounded by mountain forest. There is a small parking lot used by forest service employees located 50 meters from the site.

4 **Parameter:** SiteOKNotes

State of NH Department of Environmental Services contact is Tom Fazzina (603) 271-0911 and tfazzina@DES.state.NH.US

5 **Parameter:** ShelterCleanNotes

The shelter floor and roof have been repaired. Hand rails have been installed on platform.

6 **Parameter:** MetSensorComme

10-meter temperature is being operated and maintained on the meteorological tower.

EEMS Spot Report

Data Compiled: 1/7/2013 1:40:40 PM

SiteVisitDate	Site	Technician
10/23/2012	ABT147	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.09	c	**P**
2	Temperature max error	P	4	0.5	6	0.14	c	**P**
3	Ozone Slope	P	0	1.1	4	0.96006	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.29628	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.2	%	**P**
7	Ozone % difference max	P	7	10	4	4.1	%	**P**
8	Flow Rate average % difference	P	10	5	3	0.20	%	**P**
9	Flow Rate max % difference	P	10	5	3	0.39	%	**P**
10	DAS Time maximum error	P	0	5	1	0.02	min	**P**
11	DAS Voltage average error	P	7	0.003	14	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	6	1.23	c	**Fail**
13	Shelter Temperature max error	P	5	1	6	3.4	c	**Fail**

SiteVisitDate	Site	Technician
10/23/2012	ABT147	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

During the filter change-out it was observed that the filter flow pump was operating when the tower was lowered. This was discussed with the operator and the proper procedure was described by the auditor. The site operator indicated that she had been instructed by AMEC personnel to leave the filter installed and operate the flow pump while the tower was down.

2 **Parameter:** DasComments

The sample tower is no longer grounded. The lower section of the met tower has been replaced.

3 **Parameter:** SitingCriteriaCom

Manure is routinely spread on the hay fields surrounding the site.

4 **Parameter:** ShelterCleanNotes

The shelter is clean and well organized.

5 **Parameter:** MetSensorComme

10-meter temperature is operated and maintained on the meteorological tower.

EEMS Spot Report

Data Compiled: 1/4/2013 2:41:01 PM

SiteVisitDate	Site	Technician
10/23/2012	CDR119	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00905	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.34390	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.3	%	**P**
5	Ozone % difference max	P	7	10	4	2.2	%	**P**

EEMS Spot Report

Data Compiled: 1/7/2013 5:36:38 PM

SiteVisitDate	Site	Technician
10/24/2012	CAT175	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	12	0.15	c	**P**
2	Temperature max error	P	4	0.5	12	0.27	c	**P**
3	Flow Rate average % difference	P	10	5	2	2.63	%	**P**
4	Flow Rate max % difference	P	10	5	2	2.7	%	**P**
5	DAS Time maximum error	P	0	5	1	0.03	min	**P**
6	DAS Voltage average error	P	5	0.003	7	0.0001	V	**P**

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator was not available to meet with the auditor during the audit visit due to a personal family matter.

2 **Parameter:** DasComments

The shelter is not temperature controlled. The site is solar and DC battery powered.

3 **Parameter:** ShelterCleanNotes

The shelter and grounds are neat and clean. The shelter roof has been repaired.

4 **Parameter:** PollAnalyzerCom

Ozone monitoring is no longer being conducted at the site.

EEMS Spot Report

Data Compiled: 1/4/2013 3:19:59 PM

SiteVisitDate	Site	Technician
10/24/2012	PAR107	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00657	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.59606	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.4	%	**P**
5	Ozone % difference max	P	7	10	4	2.6	%	**P**

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** Cell B Freq. **CommentCode** 99

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

EEMS Spot Report

Data Compiled: 1/4/2013 3:42:05 PM

SiteVisitDate	Site	Technician
10/25/2012	LRL117	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.96660	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.56306	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.8	%	**P**
5	Ozone % difference max	P	7	10	4	3.4	%	**P**

EEMS Spot Report

Data Compiled: 1/7/2013 7:11:30 PM

SiteVisitDate	Site	Technician
10/30/2012	ARE128	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.08	c	**P**
2	Temperature max error	P	4	0.5	6	0.21	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99968	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.06764	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99993	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.8	%	**P**
7	Ozone % difference max	P	7	10	4	1.9	%	**P**
8	Flow Rate average % difference	P	10	5	3	2.78	%	**P**
9	Flow Rate max % difference	P	10	5	3	3.29	%	**P**
10	DAS Time maximum error	P	0	5	1	0.07	min	**P**
11	DAS Voltage average error	P	7	0.003	21	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	6	2.04	c	**Fail**
13	Shelter Temperature max error	P	5	1	6	2.73	c	**Fail**

SiteVisitDate	Site	Technician
10/30/2012	ARE128	Sandy Grenville

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** System Memo **CommentCode** 174

Additional details can be found in the hardcopy of the site audit report.

2 **Parameter:** Flow Rate **SensorComponent:** Moisture Present **CommentCode** 204

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

Field Systems Comments

1 **Parameter:** DasComments

The meteorological tower is grounded but the lightning rod has been removed. The sample tower is not grounded.

2 **Parameter:** SitingCriteriaCom

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

3 **Parameter:** PollAnalyzerCom

Moisture was present in the moisture trap and tubing upon arrival for the audit one day after hurricane Sandy. The system was left open without the filter installed for one day and then the audit of the flow system was performed.

4 **Parameter:** ShelterCleanNotes

The shelter is cluttered and disorganized.

5 **Parameter:** MetOpMaintCom

The 10-meter temperature sensor is being operated and maintained on the meteorological tower.

EEMS Spot Report

Data Compiled: 1/4/2013 4:37:12 PM

SiteVisitDate	Site	Technician
11/01/2012	GRS420	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99614	unitless	**P**
2	Ozone Intercept	P	0	5	4	1.25232	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99994	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.9	%	**P**
5	Ozone % difference max	P	7	10	4	3.1	%	**P**

EEMS Spot Report

Data Compiled: 1/8/2013 4:38:48 PM

SiteVisitDate	Site	Technician
11/03/2012	PSU106	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.14	c	**P**
2	Temperature max error	P	4	0.5	6	0.19	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99049	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.66213	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.8	%	**P**
7	Ozone % difference max	P	7	10	4	2.1	%	**P**
8	Flow Rate average % difference	P	10	5	2	4.43	%	**P**
9	Flow Rate max % difference	P	10	5	2	4.55	%	**P**
10	DAS Time maximum error	P	0	5	1	0.02	min	**P**
11	DAS Voltage average error	P	7	0.003	21	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	6	0.17	c	**P**
13	Shelter Temperature max error	P	5	1	6	0.33	c	**P**

Field Systems Comments

1 **Parameter:** DasComments

The meteorological tower has been removed.

2 **Parameter:** SitingCriteriaCom

The site is within 10 km of State College which has a population of approximately 50,000. The site is located in a university agricultural research field.

3 **Parameter:** ShelterCleanNotes

The shelter is owned by the university and is clean and orderly. The site is part of the Surfrad network.

4 **Parameter:** MetOpMaintCom

The 10-meter temperature sensor is now mounted in a naturally aspirated shield on the sample tower.

EEMS Spot Report

Data Compiled: 1/4/2013 5:04:25 PM

SiteVisitDate	Site	Technician
11/13/2012	SHN418	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00815	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.21303	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.9	%	**P**
5	Ozone % difference max	P	7	10	4	1.8	%	**P**

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** Cell A Freq. **CommentCode** 99

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

EEMS Spot Report

Data Compiled: 1/4/2013 3:54:31 PM

SiteVisitDate	Site	Technician
11/17/2012	BWR139	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99669	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.06569	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99992	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.5	%	**P**
5	Ozone % difference max	P	7	10	4	1.0	%	**P**

EEMS Spot Report

Data Compiled: 1/9/2013 5:23:13 PM

SiteVisitDate	Site	Technician
11/20/2012	BEL116	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.17	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.35	c	**P**
3	Wind Speed average error below 5m/s in m/s	P	3	0.5	4	0.05	m/s	**P**
4	Wind Speed max error below 5m/s in m/s	P	3	0.5	4	0.20	m/s	**P**
5	Wind Speed average % difference above 5 m/s	P	3	5	4	0.0	%	**P**
6	Wind Speed max % difference above 5 m/s	P	3	5	4	0.0	%	**P**
7	Wind Speed Torque average error	P	3	0.5	1	0.25	g-cm	**P**
8	Wind Speed Torque max error	P	3	0.5	1	0.3	g-cm	**P**
9	Wind Direction Input Deg True average error (de	P	2	5	4	2.2	degrees	**P**
10	Wind Direction Input Deg True max error (deg)	P	2	5	4	3	degrees	**P**
11	Wind Direction Linearity average error (deg)	P	2	5	8	1.2	degrees	**P**
12	Wind Direction Linearity max error (deg)	P	2	5	8	2	degrees	**P**
13	Wind Direction Torque average error	P	2	20	1	15	g-cm	**P**
14	Wind Direction Torque max error	P	2	20	1	15	g-cm	**P**
15	Temperature average error	P	4	0.5	9	0.15	c	**P**
16	Temperature max error	P	4	0.5	9	0.33	c	**P**
17	Relative Humidity average above 85%	P	6	10	3	5.9	%	**P**
18	Relative Humidity max above 85%	P	6	10	3	5.9	%	**P**
19	Relative Humidity average below 85%	P	6	10	6	7.0	%	**P**
20	Relative Humidity max below 85%	P	6	10	6	8.0	%	**P**
21	Solar Radiation % diff of avg	P	9	10	9	6.35	%	**P**
22	Solar Radiation % diff of max STD value	P	9	10	9	6.4	%	**P**
23	Precipitation average % difference	P	1	10	2	5.0	%	**P**
24	Precipitation max % difference	P	1	10	2	8.0	%	**P**
25	Ozone Slope	P	0	1.1	4	0.97643	unitless	**P**
26	Ozone Intercept	P	0	5	4	0.47920	ppb	**P**
27	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
28	Ozone % difference avg	P	7	10	4	1.6	%	**P**
29	Ozone % difference max	P	7	10	4	2.1	%	**P**
30	Flow Rate average % difference	P	10	5	2	0.11	%	**P**
31	Flow Rate max % difference	P	10	5	2	0.16	%	**P**
32	DAS Time maximum error	P	0	5	1	0.02	min	**P**
33	DAS Voltage average error	P	7	0.003	28	0.0000	V	**P**
34	Surface Wetness Response	P	12	0.5	1	1.02		**P**

SiteVisitDate	Site	Technician
11/20/2012	BEL116	Eric Hebert

35	Shelter Temperature average error	P	5	1	6	0.10	c	**P**
36	Shelter Temperature max error	P	5	1	6	0.19	c	**P**

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The site operator was incorrectly recording the filter final flow as the filter installed flow (on the SSRF) as instructed by the previous site operator. This was discussed during the audit and the correct procedures were described by the auditor.

2 **Parameter:** ShelterCleanNotes

Larger shelter installed since previous audit visit in 2010.

3 **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.

EEMS Spot Report

Data Compiled: 1/4/2013 5:26:04 PM

SiteVisitDate	Site	Technician
11/29/2021	BFT142	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00277	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.04122	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.5	%	**P**
5	Ozone % difference max	P	7	10	4	1.3	%	**P**

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** Cell B Freq. **CommentCode** 99

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

EEMS Spot Report

Data Compiled: 1/4/2013 5:47:24 PM

SiteVisitDate	Site	Technician
11/29/2012	CND125	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01781	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.18162	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.9	%	**P**
5	Ozone % difference max	P	7	10	4	2.3	%	**P**

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** Cell A Freq. **CommentCode** 99

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

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CDR119-Sandy Grenville-10/23/2012						
1	10/23/2012	DAS	Campbell	000332	CR3000	2111
2	10/23/2012	Ozone	ThermoElectron Inc	000611	49i A1NAA	1009241795
3	10/23/2012	Ozone Standard	ThermoElectron Inc	000330	49i A3NAA	0622717854
4	10/23/2012	Sample Tower	Aluma Tower	928376	B	AT-51060-56
5	10/23/2012	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	1009241795	CDR119	Sandy Grenville	10/23/2012	Ozone	000611

Slope:	1.00905	**Slope:**	0.00000
Intercept	0.34390	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.01297	**Intercept**	0.09498
Cert Date	1/23/2012	**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	0.04	-0.05	0.42	ppb	
primary	2	36.10	35.54	36.00	ppb	1.29%
primary	3	64.90	63.97	65.39	ppb	2.22%
primary	4	86.60	85.39	86.00	ppb	0.71%
primary	5	216.00	213.14	215.50	ppb	1.11%

Sensor Component	Condition	Status
Cell B Noise	1.3 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-0.13	pass
Span	1.004	pass
Cell B Freq.	98.1 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.71 lpm	pass
Cell A Tmp.	35.0 C	pass
Cell A Pressure	719 mmHg	pass
Cell A Noise	1.3 ppb	pass
Cell A Freq.	82.9 kHz	pass
Cell A Flow	0.69 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
PAR107-Sandy Grenville-10/24/2012						
1	10/24/2012	DAS	Campbell	000333	CR3000	2112
2	10/24/2012	Ozone	ThermoElectron Inc	000735	49i A1NAA	1105347308
3	10/24/2012	Ozone Standard	ThermoElectron Inc	000704	49i A3NAA	1030244816
4	10/24/2012	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	1105347308	PAR107	Sandy Grenville	10/24/2012	Ozone	000735

Slope:	1.00657	**Slope:**	0.00000
Intercept	0.59606	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.01297	**Intercept**	0.09498
Cert Date	1/23/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.4%	2.6%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.00	-0.09	0.91	ppb	
primary	2	34.83	34.29	35.18	ppb	2.60%
primary	3	65.36	64.42	65.13	ppb	1.10%
primary	4	87.27	86.05	86.80	ppb	0.87%
primary	5	216.83	213.95	216.20	ppb	1.05%

Sensor Component	Condition	Status
Cell B Noise	0.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-0.20	pass
Span	1.013	pass
Cell B Freq.	78.6 kHz	Fail
System Memo	See comments	pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.62 lpm	pass
Cell A Tmp.	34.7 C	pass
Cell A Pressure	701 mmHg	pass
Cell A Noise	0.7 ppb	pass
Cell A Freq.	83.4 kHz	pass
Cell A Flow	0.73 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
LRL117-Sandy Grenville-10/25/2012						
1	10/25/2012	DAS	Campbell	000344	CR300	2123
2	10/25/2012	Ozone	ThermoElectron Inc	000701	49i A1NAA	1030244808
3	10/25/2012	Ozone Standard	ThermoElectron Inc	000327	49i A3NAA	0622717852
4	10/25/2012	Zero air pump	Werther International	06904	C 70/4	000821901

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244808	LRL117	Sandy Grenville	10/25/2012	Ozone	000701

Slope:	0.96660	**Slope:**	0.00000
Intercept	0.56306	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.01297	**Intercept**	0.09498
Cert Date	1/23/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.8%	3.4%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.33	0.23	1.10	ppb	
primary	2	36.30	35.74	34.53	ppb	-3.39%
primary	3	66.22	65.27	63.76	ppb	-2.31%
primary	4	86.54	85.33	83.20	ppb	-2.50%
primary	5	215.29	212.43	205.90	ppb	-3.07%

Sensor Component	Condition	Status
Cell B Noise	1.5 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-0.10	pass
Span	1.015	pass
Cell B Freq.	96.3 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.70 lpm	pass
Cell A Tmp.	32.3 C	pass
Cell A Pressure	696 mmHg	pass
Cell A Noise	1.4 ppb	pass
Cell A Freq.	97.3 kHz	pass
Cell A Flow	0.68 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
GRS420-Eric Hebert-11/01/2012					
1 11/1/2012	DAS	Environmental Sys Corp	none	8832	A4115K
2 11/1/2012	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943903
3 11/1/2012	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460051
4 11/1/2012	Sample Tower	Aluma Tower	90945	B	none
5 11/1/2012	Zero air pump	Thomas	none	917CA18	0000174

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1023943903	GRS420	Eric Hebert	11/01/2012	Ozone	none

Slope:	0.99614	**Slope:**	0.00000
Intercept	1.25232	**Intercept**	0.00000
CorrCoff	0.99994	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00987	**Intercept**	0.07483
Cert Date	3/23/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.9%	3.1%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.13	0.05	0.98	ppb	
primary	2	37.36	36.92	38.06	ppb	3.09%
primary	3	56.33	55.70	57.18	ppb	2.66%
primary	4	87.05	86.12	87.45	ppb	1.54%
primary	5	109.98	108.83	109.10	ppb	0.25%

Sensor Component	Condition	Status
Cell B Noise	0.8 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	1.0008	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.000	pass
Span	1.027	pass
Cell B Freq.	97.7 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.69 lpm	pass
Cell A Tmp.	31.5 C	pass
Cell A Pressure	680 mmHg	pass
Cell A Noise	0.9 ppb	pass
Cell A Freq.	113.2 kHz	pass
Cell A Flow	0.68 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	0.0018	pass

Site Inventory by Site Visit

Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
SHN418-Eric Hebert-11/13/2012					
1 11/13/2012	DAS	Environmental Sys Corp	90643	8816	2529
2 11/13/2012	Ozone	ThermoElectron Inc	none	49i A3NAA	0733726103
3 11/13/2012	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460008
4 11/13/2012	Sample Tower	Aluma Tower	923307	B	none
5 11/13/2012	Zero air pump	Werther International	none	P 70/4	000756726

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	0733726103	SHN418	Eric Hebert	11/13/2012	Ozone	none

Slope:	1.00815	**Slope:**	0.00000
Intercept	-0.21303	**Intercept**	0.00000
CorrCoff	0.99995	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00987	**Intercept**	0.07483
Cert Date	3/23/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.9%	1.8%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.16	0.08	-0.56	ppb	
primary	2	34.62	34.20	34.81	ppb	1.78%
primary	3	65.94	65.22	65.77	ppb	0.84%
primary	4	86.08	85.16	85.55	ppb	0.46%
primary	5	101.82	100.75	101.10	ppb	0.35%

Sensor Component	Condition	Status
Cell B Noise	0.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	0.9996	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	2.1	pass
Span	1.027	\
Cell B Freq.	108.4 kHz	pass
System Memo	See comments	pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.69 lpm	pass
Cell A Tmp.	35.7 C	pass
Cell A Pressure	665 mmHg	pass
Cell A Noise	0.7 ppb	pass
Cell A Freq.	70.0 kHz	Fail
Cell A Flow	0.71 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	0.0033	pass

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
BWR139-Eric Hebert-11/17/2012						
1	11/17/2012	DAS	Campbell	000431	CR3000	2536
2	11/17/2012	Ozone	ThermoElectron Inc	000731	49i A1NAA	1105347309
3	11/17/2012	Ozone Standard	ThermoElectron Inc	000376	49i A3NAA	0726124693
4	11/17/2012	Sample Tower	Aluma Tower	missing	B	none
5	11/17/2012	UPS	APC	06093	RS800	unknown
6	11/17/2012	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	1105347309	BWR139	Eric Hebert	11/17/2012	Ozone	000731

Slope:	0.99669	**Slope:**	0.00000
Intercept	0.06569	**Intercept**	0.00000
CorrCoff	0.99992	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00987	**Intercept**	0.07483
Cert Date	3/23/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.5%	1.0%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.25	0.17	-0.09	ppb	
primary	2	23.74	23.43	23.45	ppb	0.09%
primary	3	62.42	61.73	61.99	ppb	0.42%
primary	4	86.18	85.26	85.70	ppb	0.52%
primary	5	107.78	106.65	105.60	ppb	-0.98%

Sensor Component	Condition	Status
Cell B Noise	0.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Moderately clean	pass
Line Loss	Not tested	pass
Offset	0.000	pass
Span	1.023	pass
Cell B Freq.	82.7 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.74 lpm	pass
Cell A Tmp.	31.5 C	pass
Cell A Pressure	752 mmHg	pass
Cell A Noise	1.0 ppb	pass
Cell A Freq.	90.1 kHz	pass
Cell A Flow	0.75 lpm	pass
Battery Backup	Functioning	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
BFT142-Sandy Grenville-11/29/2021					
1 11/29/2021	DAS	Campbell	000498	CR3000	3815
2 11/29/2021	Ozone	ThermoElectron Inc	000629	49i A1NAA	1009241784
3 11/29/2021	Ozone Standard	ThermoElectron Inc	000219	49i A3NAA	06227833
4 11/29/2021	UPS	APC	05003	XS800	unknown
5 11/29/2021	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	1009241784	BFT142	Sandy Grenville	11/29/2021	Ozone	000629

Slope:	1.00277	**Slope:**	0.00000
Intercept	-0.04122	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.01297	**Intercept**	0.09498
Cert Date	1/23/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.5%	1.3%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.04	-0.05	-0.37	ppb	
primary	2	35.70	35.14	35.60	ppb	1.31%
primary	3	65.75	64.81	64.78	ppb	-0.05%
primary	4	86.18	84.98	85.50	ppb	0.61%
primary	5	111.14	109.62	109.60	ppb	-0.02%

Sensor Component	Condition	Status
Cell B Noise	0.8 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.20	pass
Span	1.041	pass
Cell B Freq.	78.2 kHz	Fail
System Memo	See comments	pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.70 lpm	pass
Cell A Tmp.	32.9 C	pass
Cell A Pressure	777 mmHg	pass
Cell A Noise	0.9 ppb	pass
Cell A Freq.	80.8 kHz	pass
Cell A Flow	0.68 lpm	pass
Battery Backup	Functioning	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CND125-Sandy Grenville-11/29/2012						
1	11/29/2012	DAS	Campbell	000499	CR3000	3816
2	11/29/2012	Ozone	ThermoElectron Inc	000728	49i A1NAA	1105347306
3	11/29/2012	Ozone Standard	ThermoElectron Inc	000543	49i A3NAA	0929938240
4	11/29/2012	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	1105347306	CND125	Sandy Grenville	11/29/2012	Ozone	000728

Slope:	1.01781	**Slope:**	0.00000
Intercept	0.18162	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.01297	**Intercept**	0.09498
Cert Date	1/23/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.9%	2.3%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.10	0.00	0.47	ppb	
primary	2	35.56	35.01	35.59	ppb	1.66%
primary	3	65.48	64.54	65.72	ppb	1.83%
primary	4	85.63	84.43	85.80	ppb	1.62%
primary	5	111.38	109.86	112.40	ppb	2.31%

Sensor Component	Condition	Status
Cell B Noise	0.7 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.000	pass
Span	1.023	pass
Cell B Freq.	100.7 kHz	pass
System Memo	See comments	pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.76 lpm	pass
Cell A Tmp.	32.8 C	pass
Cell A Pressure	740 mmHg	pass
Cell A Noise	0.6 ppb	pass
Cell A Freq.	79.8 kHz	Fail
Cell A Flow	0.69 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass