2016 – 2nd 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 July 2016, the network is comprised of 95 active rural sampling sites across the Untied States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Environment Canada, Bureau of Land Management (BLM) and several independent partners. AMEC Foster Wheeler (AMEC) is responsible for operating the EPA and Environment Canada sponsored sites, and Air Resource Specialist, Inc. (ARS) is responsible for operating the NPS and BLM sponsored sites.

1.2 Project Objectives

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

Performance audits verify that all evaluated variables are consistent with the accuracy goals as defined in the CASTNET Quality Assurance Project Plan (QAPP). The parameter specific accuracy goals are presented in Table 1. Only four EPA sponsored sites that are operated by AMEC continue to operate meteorological sensors. Those sites are BEL116, BVL30, CHE185,

and PAL190. Five new sites in WY sponsored by EPA and operated by the BLM/ARS also operate meteorological sensors and are BAS601, NEC602, BUF603, FOR604, and SHE604. Only one meteorological station audit (FOR605) was performed during second quarter 2016.

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

Table 1. Performance Audit Challenge and Acceptance Criteria

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

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Ozone	Slope	Linear regression of multi-point test gas concentration as measured with a certified transfer standard	$0.9000 \leq m \leq 1.1000$
Ozone	Intercept		-5.0 ppb $\leq b \leq 5.0$ ppb
Ozone	Correlation Coefficient		$0.9950 \leq r$
DAS	Accuracy	Comparison with certified standard	$\leq \pm 0.003$ VDC

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

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

- Site locations and configurations match those provided in the CASTNET QAPP.
- Meteorological instruments are in good physical and operational condition and are sited to meet EPA ambient monitoring guidelines (EPA-600/4-82-060).
- Sites are accessible, orderly, and if applicable, compliant with OSHA safety standards.
- Sampling lines are free of leaks, kinks, visible contamination, weathering, and moisture.
- Site shelters provide adequate temperature control.
- All ambient air quality instruments are functional, being operated in the appropriate range, and the zero air supply desiccant is unsaturated.
- All instruments are in current calibration.
- Site documentation (maintenance schedules, on-site SOPs, etc.) is current and log book records are complete.
- All maintenance and on-site SOPs are performed on schedule.
- Corrective actions are documented and appropriate for required maintenance/repair activity.
- Site operators demonstrate an adequate knowledge and ability to perform required site activities, including documentation and maintenance activities.

1.3 CASTNET Sites Visited Second Quarter 2016

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

Table 2. Site Audit Visits

Side ID	Audit Type	Sponsor	Site Visit Date	Station Name
COW137	Without Met	EPA	4/13/2016	Coweeta
ESP127	Without Met	EPA	4/14/2016	Edgar Evins SP
CHA467	Without Met	NPS	4/19/2016	Chiricahua NM
GRC474	Without Met	NPS	4/20/2016	Grand Canyon NP
PET427	Without Met	NPS	4/21/2016	Petrified Forest NP
MEV405	Without Met	NPS	5/31/2016	Mesa Verde NP
CAN407	Without Met	NPS	6/1/2016	Canyonlands NP
GRB411	Without Met	NPS	6/3/2016	Great Basin NP
FOR605	Flow + Met	BLM	6/22/2016	Fortification Creek

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

Table 3. TTP Pollutant PE Visits

Side ID	PE Audit Type	Sponsor	Site Visit Date	Station Name
CHE185	Ozone	EPA	4/1/2016	Cherokee Nation
PIN414	Ozone	NPS	4/4/2016	Pinnacles NM
DCP114	Ozone	EPA	4/16/2016	Deer Creek
OXF122	Ozone	EPA	4/16/2016	Oxford
QAK172	Ozone	EPA	4/17/2016	Quaker City
ROM206	NOy	EPA	6/15/2016	Rocky Mountain NP
PND165	Ozone	EPA	6/17/2016	Pinedale
PND165	NOy	EPA	6/17/2016	Pinedale
BAS601	Ozone	BLM	6/21/2016	Basin

1.4 Audit Results

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

Photographs of site conditions are included within each systems report where necessary.

Copies of the spot reports that were sent immediately following the audit of each site are included as Appendix B, *CASTNET Site Spot Report Forms*.

The Ozone PE results and observations are included in Appendix C, *CASTNET Ozone Performance Evaluation Forms.*

2.0 NADP Quarterly Report

2.1 Introduction

The National Atmospheric Deposition Program (NADP) operates three precipitation chemistry networks and two atmospheric concentration networks. The National Trends Network (NTN) has been measuring acidic precipitation since 1978. The network currently has more than 250 sites. The Atmospheric Integrated Research Monitoring Network (AIRMoN) began operation in 1992 and currently measures event based precipitation events at 6 sites. The Mercury Deposition Network (MDN) measures total mercury in precipitation samples from more than 120 stations. The MDN began operation in 1996 and includes sites throughout the US and Canada. The Atmospheric Mercury Network (AMNet) and the Ammonia Monitoring Network (AMoN) measure ambient concentrations of mercury and ammonia, respectively.

The NADP and other long-term monitoring networks provide critical information to the EPA regarding evaluating the effectiveness of emission reduction control programs from the power industry.

The NADP Program Office operates and administers the three precipitation chemistry networks (NTN, MDN and AIRMoN), two atmospheric concentration networks (AMNet and AMoN), two analytical laboratories (the Central Analytical Laboratory (CAL) located at the University of Illinois/Illinois State Water Survey and the Mercury Analytical Laboratory (HAL) located at Frontier Global Sciences), and the network equipment depot (NED).

2.2 Project Objectives

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

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

2.3 Sites Visited Second Quarter 2016

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

Table 4. Sites Surveyed – Second Quarter 2016

Side ID	Network	Visit Date	Station Name
CA66	NTN	4/4/2016	Pinnacles National Monument-Bear Valley
CA88	NTN	4/5/2016	Davis
KY22	NTN	4/15/2016	Lilley Cornett Woods
OH59	AMoN	4/16/2016	Oxford
TN14	NTN	4/05/2016	Hatchie National Wildlife Refuge
CA20	MDN	5/6/2016	Yurok Tribe-Requa
CA45	NTN	5/17/2016	Hopland
CA50	NTN	5/11/2016	Sagehen Creek
CA75	MDN/NTN	5/10/2016	Sequoia National Park-Giant Forest
CA76	NTN	5/13/2016	Montague
CA96	NTN	5/12/2016	Lassen Volcanic National Park-Manzanita Lake
CA99	NTN	5/9/2016	Yosemite National Park-Hodgdon Meadow
MA01	MDN/NTN	5/17/2016	North Atlantic Coastal Lab
MA08	NTN	5/19/2016	Quabbin Reservoir
MA14	NTN	5/18/2016	Nantucket
NC25	AMoN	5/4/2016	Coweeta
NY96	MDN/NTN/AMoN	5/23/2016	Cedar Beach, Southold
WY26	MDN	6/20/2016	Roundtop Mountain

2.4 Survey Results

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

Other items gathered during the surveys (i.e., photographs, Belfort charts, etc.) are uploaded to EEMS' server where the NADP PO and the U.S. EPA POs can access them and download them as needed by login into the server site.

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

APPENDIX A

CASTNET Audit Report Forms

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
COW137-Sandy Grenville-04/13/2016						
1	4/13/2016	Computer	Dell	07049	Inspiron 15	1K2MC12
2	4/13/2016	DAS	Campbell	000401	CR3000	2529
3	4/13/2016	elevation	Elevation	none	1	None
4	4/13/2016	Filter pack flow pump	Thomas	02758	107CAB18	001871
5	4/13/2016	Flow Rate	Apex	000467	AXMC105LPMDPCV	43973
6	4/13/2016	Infrastructure	Infrastructure	none	none	none
7	4/13/2016	Modem	Raven	06806	V4221-V	0936444095
8	4/13/2016	Ozone	ThermoElectron Inc	000726	49i A1NAA	1105347314
9	4/13/2016	Ozone Standard	ThermoElectron Inc	000441	49i A3NAA	CM08200017
10	4/13/2016	Sample Tower	Aluma Tower	03499	A	none
11	4/13/2016	Shelter Temperature	Campbell	none	107-L	none
12	4/13/2016	Siting Criteria	Siting Criteria	None	1	None
13	4/13/2016	Temperature	RM Young	02934	41342	none
14	4/13/2016	UPS	APC	none	650	unknown
15	4/13/2016	Zero air pump	Werther International	06878	C 70/4	000815254

DAS Data Form

DAS Time Max Error: 0.65

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2529	COW137	Sandy Grenville	04/13/2016	DAS	Primary

Das Date: 4 /13/2016
Das Time: 15:30:00
Das Day: 104

Audit Date 4 /13/2016
Audit Time 15:29:21
Audit Day 104

Low Channel:

Avg Diff:	Max Diff:
0.0001	0.0001

High Channel:

Avg Diff:	Max Diff:
0.0001	0.0001

Mfg Datel **Parameter** DAS
Serial Number 15510194 **Tfer Desc.** Source generator (D
Tfer ID 01320

Mfg Fluke **Parameter** DAS
Serial Number 95740135 **Tfer Desc.** DVM
Tfer ID 01311

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2998	0.2997	V	V	-0.0001
7	0.5000	0.4996	0.4996	V	V	0.0000
7	0.7000	0.6996	0.6995	V	V	-0.0001
7	0.9000	0.8994	0.8993	V	V	-0.0001
7	1.0000	0.9993	0.9992	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	43973	COW137	Sandy Grenville	04/13/2016	Flow Rate	000467

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.99091	**Intercept**	0.03172
Cert Date	2/28/2016	**CorrCoff**	0.99988

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.99091	**Intercept**	0.03172
Cert Date	2/28/2016	**CorrCoff**	0.99988

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
1.58%	2.03%			

Cal Factor Zero	-0.01
Cal Factor Full Scale	1
Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.00	l/m	l/m	
primary	test pt 1	1.499	1.480	1.51	0.000	1.50	l/m	l/m	1.35%
primary	test pt 2	1.499	1.480	1.51	0.000	1.51	l/m	l/m	2.03%
primary	test pt 3	1.496	1.480	1.51	0.000	1.50	l/m	l/m	1.35%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.2 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347314	COW137	Sandy Grenville	04/13/2016	Ozone	000726

Slope:	0.99229	**Slope:**	0.00000
Intercept	0.03487	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

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

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.0%	1.4%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.01	0.34	0.69	ppb	
primary	2	30.00	30.47	30.04	ppb	-1.41%
primary	3	50.02	50.59	49.98	ppb	-1.21%
primary	4	79.92	80.63	80.00	ppb	-0.78%
primary	5	109.96	110.81	110.20	ppb	-0.55%

Sensor Component	Condition	Status
22.5 degree rule		pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Battery Backup	Not functioning	fail
Offset	0.2	pass
Span	1.02	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	115.3 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.68 lpm	pass
Cell A Pressure	682.5 mmHg	pass
Cell A Tmp.	31.4 C	pass
Cell B Freq.	95.6 kHz	pass
Cell B Noise	0.5 ppb	pass
Cell B Flow	0.68 lpm	pass
Cell B Pressure	681.9 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	none	COW137	Sandy Grenville	04/13/2016	Temperature	02934

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00772	**Intercept**	0.12514
Cert Date	2/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.07	0.14		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.20	0.07	0.000	0.2	C	0.14
primary	Temp Mid Range	24.73	24.42	0.000	24.4	C	0
primary	Temp High Range	48.94	48.44	0.000	48.4	C	-0.07

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	COW137	Sandy Grenville	04/13/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.30	0.51		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00772	Intercept	0.12514
Cert Date	2/28/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.91	22.61	0.000	22.4	C	-0.19
primary	Temp Mid Range	24.32	24.01	0.000	23.5	C	-0.51
primary	Temp Mid Range	24.12	23.81	0.000	23.6	C	-0.21

Infrastructure Data For

Site ID	COW137	Technician	Sandy Grenville	Site Visit Date	04/13/2016

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	COW137	Sandy Grenville	04/13/2016	System Memo	Apex	3224	☐	☑

There is no plastic bag for the installed filter. The operator uses the received bag for the installed filter to ship the removed filter to the lab.

Field Systems Comments

1 **Parameter:** DasComments

One leg of the meteorological tower has two holes. The shelter heating and air conditioning systems are operating simultaneously.

2 **Parameter:** SitingCriteriaCom

Construction was completed on new building with a parking lot, in October 2004. The parking area is within 60 meters of the site.

3 **Parameter:** ShelterCleanNotes

The shelter is in fair condition with some rot near the air conditioner and at the bottom of the walls. It has degraded since the previous audit.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	COW137	**Technician**	Sandy Grenville	**Site Visit Date**	04/13/2016

Site Sponsor (agency)	EPA/USFS	**USGS Map**	Prentiss
Operating Group	USFS	**Map Scale**	
AQS #	37-113-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	woodland - mixed	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone	8283697919	**Audit Latitude**	35.060527
Site Address 1	Southeastern Forest Experiment Statio	**Audit Longitude**	-83.43034
Site Address 2	3160 Coweeta Lab Road	**Audit Elevation**	683
County	Macon	**Audit Declination**	-5.1
City, State	, NC		
Zip Code	28763	**Fire Extinguisher** ☑	New in 2015
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in fair condition with some rot near the air conditioner and at the bottom of the walls. It has degraded since the previous audit.				
Site OK	☑	**Notes**					
Driving Directions							

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 04/13/2016

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m	60 m	☐
Tree line	50 m	40 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Construction was completed on new building with a parking lot, in October 2004. The parking area is within 60 meters of the site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	COW137	Technician	Sandy Grenville	Site Visit Date	04/13/2016

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 04/13/2016

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 04/13/2016

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 04/13/2016

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

One leg of the meteorological tower has two holes. The shelter heating and air conditioning systems are operating simultaneously.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 04/13/2016

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Feb 2014	☐
HASP	☑	Feb 2014	☐
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?	☑	Minimal information
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	COW137	Technician	Sandy Grenville	Site Visit Date	04/13/2016

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 04/13/2016

Site operation procedures

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

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

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

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

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 04/13/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	1K2MC12	07049
DAS	Campbell	CR3000	2529	000401
elevation	Elevation	1	None	none
Filter pack flow pump	Thomas	107CAB18	001871	02758
Flow Rate	Apex	AXMC105LPMDPC	43973	000467
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0936444095	06806
Ozone	ThermoElectron Inc	49i A1NAA	1105347314	000726
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200017	000441
Sample Tower	Aluma Tower	A	none	03499
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	none	02934
UPS	APC	650	unknown	none
Zero air pump	Werther International	C 70/4	000815254	06878

DAS Data Form

DAS Time Max Error: 0.68

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	3817	ESP127	Sandy Grenville	04/14/2016	DAS	Primary

Das Date: 4 /14/2016
Das Time: 13:24:00
Das Day: 105

Audit Date 4 /14/2016
Audit Time 13:23:19
Audit Day 105

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	15510194	**Tfer Desc.**	Source generator (D
Tfer ID	01320		

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/23/2015	**CorrCoff**	1.00000

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

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	54755	ESP127	Sandy Grenville	04/14/2016	Flow Rate	000642

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.99091	**Intercept**	0.03172
Cert Date	2/28/2016	**CorrCoff**	0.99988

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.99091	**Intercept**	0.03172
Cert Date	2/28/2016	**CorrCoff**	0.99988

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.04
7.36%	7.36%			**Cal Factor Full Scale**	1.02
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	-0.11	0.000	-0.07	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	1.643	1.630	1.50	0.000	1.51	l/m	l/m	-7.36%
primary	test pt 2	1.646	1.630	1.50	0.000	1.51	l/m	l/m	-7.36%
primary	test pt 3	1.644	1.630	1.50	0.000	1.51	l/m	l/m	-7.36%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Fair	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	200 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241785	ESP127	Sandy Grenville	04/14/2016	Ozone	000622

Slope:	0.97500	**Slope:**	0.00000
Intercept	0.63082	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

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

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.3%	2.1%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.01	0.34	0.95	ppb	
primary	2	30.01	30.48	30.48	ppb	0.00%
primary	3	50.04	50.61	49.98	ppb	-1.24%
primary	4	80.02	80.73	79.03	ppb	-2.11%
primary	5	110.00	110.85	108.90	ppb	-1.76%

Sensor Component	Condition	Status
22.5 degree rule		pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.10	pass
Span	1.007	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	94.1 kHz	pass
Cell A Noise	1.5 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	705.5 mmHg	pass
Cell A Tmp.	33.0 C	pass
Cell B Freq.	85.7 kHz	pass
Cell B Noise	1.4 ppb	pass
Cell B Flow	0.95 lpm	pass
Cell B Pressure	705.2 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14803	ESP127	Sandy Grenville	04/14/2016	Temperature	06542

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00772	**Intercept**	0.12514
Cert Date	2/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.23	0.38		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.17	0.04	0.000	0.1	C	0.02
primary	Temp Mid Range	24.64	24.33	0.000	24.0	C	-0.3
primary	Temp High Range	48.73	48.23	0.000	47.9	C	-0.38

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ESP127	Sandy Grenville	04/14/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.69	1.12		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00772	Intercept	0.12514
Cert Date	2/28/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.27	25.94	0.000	27.1	C	1.12
primary	Temp Mid Range	22.61	22.31	0.000	22.8	C	0.48
primary	Temp Mid Range	23.08	22.78	0.000	23.3	C	0.47

Infrastructure Data For

Site ID	ESP127	Technician	Sandy Grenville	Site Visit Date	04/14/2016

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	ESP127	Sandy Grenville	04/14/2016	Moisture Present	Apex	3540	☐	☐
There is moisture present in the dry deposition sample train inside the shelter.								
Shelter Temperature	ESP127	Sandy Grenville	04/14/2016	System Memo	Campbell	3016	☐	☐
The shelter thermostat for cooling has been bypassed and the air conditioning system is no longer being controlled by the shelter thermostat.								
Shelter Temperature	ESP127	Sandy Grenville	04/14/2016	System Memo	Campbell	3016	☐	☐
The shelter heating and air conditioning systems are operating simultaneously.								

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The shelter floor and roof are currently undergoing repairs.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	ESP127	**Technician**	Sandy Grenville	**Site Visit Date**	04/14/2016

Site Sponsor (agency)	EPA	**USGS Map**	Silver Point
Operating Group	private, TN DEC	**Map Scale**	
AQS #	47-041-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry	**QAPP Longitude**	
Land Use	woodland - mixed	**QAPP Elevation Meters**	
Terrain	rolling - complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone	(615) 597-6556	**Audit Latitude**	36.03893
Site Address 1	Craft Center Rd.	**Audit Longitude**	-85.73305
Site Address 2	Hurricane Bridge	**Audit Elevation**	302
County	DeKalb	**Audit Declination**	-3.5
City, State	Smithville, TN		
Zip Code	37166	**Fire Extinguisher** ☑	No inspection date
Time Zone	Central	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☑	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☑	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☐	**Notes**	The shelter floor and roof are currently undergoing repairs.				
Site OK	☑	**Notes**					

Driving Directions

From interstate 40 take exit 273, south on 56. Immediately after crossing the Hurricane Bridge over the Caney Fork River, turn left at the sign for Tennessee Tech and the Appalachian Center for Crafts. Continue about 1 mile to the locked (518) yellow gate on the right. The site is up the hill through the gate.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 04/14/2016

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 04/14/2016

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 04/14/2016

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	ESP127	Technician	Sandy Grenville	Site Visit Date	04/14/2016

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 04/14/2016

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 04/14/2016

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☐
SSRF	☑		☑
Site Ops Manual	☑	Oct 2010	☐
HASP	☑	Nov 2010	☐
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?	☑	Minimal information
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	ESP127	Technician	Sandy Grenville	Site Visit Date	04/14/2016

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 04/14/2016

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, call-in
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

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

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

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

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 04/14/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	894MC12	07060
DAS	Campbell	CR3000	3817	illegible
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	0493002476	02975
Flow Rate	Apex	AXMC105LPMDPC	54755	000642
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4223-C	0844355622	06606
Ozone	ThermoElectron Inc	49i A1NAA	1009241785	000622
Ozone Standard	ThermoElectron Inc	49i A3NAA	0622717852	000327
Sample Tower	Aluma Tower	A	none	03550
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	14803	06542
Zero air pump	Werther International	C 70/4	000829161	06909

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CHA467-Martin Valvur-04/19/2016						
1	4/19/2016	Computer	Hewlett Packard	none	65606	5CB22906V1
2	4/19/2016	DAS	Environmental Sys Corp	90611	8816	2613
3	4/19/2016	Elevation	Elevation	None	1	None
4	4/19/2016	Filter pack flow pump	Thomas	01564	107CA18	0688001769
5	4/19/2016	flow rate	Tylan	none	FC280SAV	AW9706014
6	4/19/2016	Infrastructure	Infrastructure	none	none	none
7	4/19/2016	MFC power supply	Tylan	none	RO-32	FP99706005
8	4/19/2016	Modem	US Robotics	09615	56k	unknown
9	4/19/2016	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460007
10	4/19/2016	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460051
11	4/19/2016	Sample Tower	Aluma Tower	03566	A	none
12	4/19/2016	Shelter Temperature	ARS	none	none	none
13	4/19/2016	Siting Criteria	Siting Criteria	None	1	None
14	4/19/2016	Temperature	RM Young	none	41342	018535
15	4/19/2016	Zero air pump	Werther International	none	PC70/4	000665785

DAS Data Form

DAS Time Max Error: 2.17

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2613	CHA467	Martin Valvur	04/19/2016	DAS	Primary

Das Date: 4 /19/2016 **Audit Date** 4 /19/2016
Das Time: 7:51:00 **Audit Time** 7:48:50
Das Day: 110 **Audit Day** 110

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0003	0.0005	0.0003	0.0005

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/23/2015	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
11	0.0000	-0.0002	0.0001	V	V	0.0003
11	0.1000	0.0999	0.0999	V	V	0.0000
11	0.3000	0.2999	0.3001	V	V	0.0002
11	0.5000	0.4997	0.4999	V	V	0.0002
11	0.7000	0.6999	0.7004	V	V	0.0005
11	0.9000	0.8991	0.8995	V	V	0.0004
11	1.0000	1.0000	1.0005	V	V	0.0005

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9706014	CHA467	Martin Valvur	04/19/2016	flow rate	none

Mfg	Tylan
SN/Owner ID	FP99706005 none
Parameter	MFC power supply

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	0.99895	**Intercept**	0.01185
Cert Date	2/10/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.389
0.55%	0.91%			**Cal Factor Full Scale**	5.812
				Rotometer Reading:	3.3

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.39	-0.3593	0.00	l/m	l/m	
primary	leak check	0.000	0.000	-0.39	-0.3595	0.00	l/m	l/m	
primary	test pt 1	2.999	2.990	2.40	2.4069	3.00	l/m	l/m	0.20%
primary	test pt 2	2.992	2.980	2.40	2.4048	3.00	l/m	l/m	0.54%
primary	test pt 3	2.984	2.970	2.40	2.4037	3.00	l/m	l/m	0.91%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Poor	**Status**	fail
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	-0.5 cm	**Status**	fail
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460007	CHA467	Martin Valvur	04/19/2016	Ozone	none

Slope:	0.97534	**Slope:**	0.00000
Intercept	-0.87010	**Intercept**	0.00000
CorrCoff	0.99990	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	0.99832	**Intercept**	-0.26452
Cert Date	1/29/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
4.8%	6.7%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.58	0.84	0.67	ppb	
primary	2	30.02	30.33	28.29	ppb	-6.73%
primary	3	46.93	47.27	44.47	ppb	-5.92%
primary	4	75.79	76.18	73.55	ppb	-3.45%
primary	5	112.92	113.37	110.05	ppb	-2.93%

Sensor Component	Condition	Status
22.5 degree rule		pass
Sample Train	Good	pass
Inlet Filter Condition	Moderately clean	pass
Battery Backup	N/A	pass
Offset	0.000	pass
Span	1.004	pass
Zero Voltage	0.000	pass
Fullscale Voltage	1.000	pass
Cell A Freq.	81.8 kHz	pass
Cell A Noise	0.4 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	625.4 mmHg	pass
Cell A Tmp.	32.9 C	pass
Cell B Freq.	73.3 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	018535	CHA467	Martin Valvur	04/19/2016	Temperature	none

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99980	**Intercept**	-0.02840
Cert Date	1/19/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.08	0.14		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.34	0.37	0.4027	0.4	C	0.04
primary	Temp Mid Range	23.44	23.47	0.7335	23.4	C	-0.07
primary	Temp High Range	47.40	47.44	0.9753	47.6	C	0.14

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	CHA467	Martin Valvur	04/19/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.59	1.21		

Mfg	Fluke	Parameter	Shelter Temperatur
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99980	Intercept	-0.02840
Cert Date	1/19/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.09	23.12	0.000	23.6	C	0.47
primary	Temp Mid Range	22.38	22.41	0.000	23.6	C	1.21
primary	Temp Mid Range	23.80	23.83	0.000	23.9	C	0.09

Infrastructure Data For

Site ID	Technician	Site Visit Date
CHA467	Martin Valvur	04/19/2016

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	CHA467	Martin Valvur	04/19/2016	Filter Position	Tylan	458	☐	☑

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The site operator routinely reviews the previous week's data.

2 **Parameter:** SitingCriteriaCom

A large point source is located 40 km northwest of the site, just southwest of Wilcox.

3 **Parameter:** ShelterCleanNotes

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

4 **Parameter:** MetSensorComme

The temperature sensor is mounted on the south side of the meteorological tower.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CHA467	**Technician**	Martin Valvur	**Site Visit Date**	04/19/2016

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Bowie Mountain South
Operating Group	NPS	**Map Scale**	
AQS #	04-003-8001	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, neph, IMPROVE	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	desert range, woodland - mixed	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone	(520) 824-4182	**Audit Latitude**	32.009405
Site Address 1	13063 East Bontia Canyon Road	**Audit Longitude**	-109.389058
Site Address 2		**Audit Elevation**	1569
County	Cochise	**Audit Declination**	9.6
City, State	Wilcox, AZ		**Present**
Zip Code	85632	**Fire Extinguisher**	☑ March 2012
Time Zone	Mountain	**First Aid Kit**	☑
Primary Operator		**Safety Glasses**	☐
Primary Op. Phone #		**Safety Hard Hat**	☐
Primary Op. E-mail		**Climbing Belt**	☑
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Step**	☑

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

Shelter Clean ☑ **Notes** The shelter is in good condition, clean, well organized, and well maintained.

Site OK ☑ **Notes**

Driving Directions From I-10 take exit 344 (Wilcox AZ). Continue south on route 186 from Wilcox to Chiricahua National Monument, approximately 30 miles and turn left at route 181 (follow sign for Chiricahua National Monument). Continue another few miles to park entrance. The site is just before the fee both on the north side of the road about 150 meters.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID CHA467 **Technician** Martin Valvur **Site Visit Date** 04/19/2016

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

Siting Distances OK ☑

Siting Criteria Comment

A large point source is located 40 km northwest of the site, just southwest of Wilcox.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CHA467	Technician	Martin Valvur	Site Visit Date	04/19/2016

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

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

The temperature sensor is mounted on the south side of the meteorological tower.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	CHA467	Technician	Martin Valvur	Site Visit Date	04/19/2016

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	CHA467	Technician	Martin Valvur	Site Visit Date	04/19/2016

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 15 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☐	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CHA467 **Technician** Martin Valvur **Site Visit Date** 04/19/2016

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID CHA467 **Technician** Martin Valvur **Site Visit Date** 04/19/2016

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	Dataview	☑
SSRF	☑		☑
Site Ops Manual	☑		☑
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?	☑	Flow & observation sections
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID CHA467 **Technician** Martin Valvur **Site Visit Date** 04/19/2016

Site operation procedures

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

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

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

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

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

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

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

The site operator routinely reviews the previous week's data.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID CHA467 **Technician** Martin Valvur **Site Visit Date** 04/19/2016

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	Dataview and 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	☐		☐

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

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

Site ID CHA467 **Technician** Martin Valvur **Site Visit Date** 04/19/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	65606	5CB22906V1	none
DAS	Environmental Sys Corp	8816	2613	90611
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	0688001769	01564
flow rate	Tylan	FC280SAV	AW9706014	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP99706005	none
Modem	US Robotics	56k	unknown	09615
Ozone	ThermoElectron Inc	49i A3NAA	CM08460007	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	CM08460051	none
Sample Tower	Aluma Tower	A	none	03566
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	018535	none
Zero air pump	Werther International	PC70/4	000665785	none

DAS Data Form

DAS Time Max Error: 0.18

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2270	GRC474	Martin Valvur	04/20/2016	DAS	Primary

Das Date: 4 /20/2016 **Audit Date** 4 /20/2016
Das Time: 11:19:11 **Audit Time** 11:19:00
Das Day: 111 **Audit Day** 111

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0004	0.0007	0.0004	0.0007

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/23/2015	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
12	0.0000	0.0002	0.0003	V	V	0.0001
12	0.1000	0.0998	0.0995	V	V	-0.0003
12	0.3000	0.3002	0.2997	V	V	-0.0005
12	0.5000	0.4996	0.4995	V	V	-0.0001
12	0.7000	0.6999	0.6996	V	V	-0.0003
12	0.9000	0.8995	0.9000	V	V	0.0005
12	1.0000	0.9996	1.0003	V	V	0.0007

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9805027	GRC474	Martin Valvur	04/20/2016	flow rate	none

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

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	0.99895	**Intercept**	0.01185
Cert Date	2/10/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.13
0.99%	1.29%			**Cal Factor Full Scale**	5.414
				Rotometer Reading:	3.55

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.16	-0.1194	0.00	l/m	l/m	
primary	leak check	0.000	0.000	-0.14	-0.0979	0.03	l/m	l/m	
primary	test pt 1	2.960	2.950	2.69	2.7036	2.99	l/m	l/m	1.29%
primary	test pt 2	2.963	2.950	2.69	2.7031	2.99	l/m	l/m	1.22%
primary	test pt 3	2.979	2.970	2.69	2.7031	2.98	l/m	l/m	0.47%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	3.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	235 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1023943902	GRC474	Martin Valvur	04/20/2016	Ozone	none

Slope:	0.96775	**Slope:**	0.00000
Intercept	-0.55396	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	0.99832	**Intercept**	-0.26452
Cert Date	1/29/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
4.4%	5.7%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.71	0.97	0.57	ppb	
primary	2	31.56	31.87	30.04	ppb	-5.74%
primary	3	50.34	50.68	48.38	ppb	-4.54%
primary	4	74.77	75.16	72.35	ppb	-3.74%
primary	5	108.83	109.27	105.20	ppb	-3.72%

Sensor Component	Condition	Status
22.5 degree rule		pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.1	pass
Span	1.003	pass
Zero Voltage	0.0002	pass
Fullscale Voltage	0.9998	pass
Cell A Freq.	89.8 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.57 lpm	pass
Cell A Pressure	593.7 mmHg	pass
Cell A Tmp.	39.2 C	pass
Cell B Freq.	87.5 kHz	pass
Cell B Noise	0.7 ppb	pass
Cell B Flow	0.58 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	17626	GRC474	Martin Valvur	04/20/2016	Temperature	none

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99980	**Intercept**	-0.02840
Cert Date	1/19/2016	**CorrCoff**	1.00000

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

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.40	0.43	0.5046	0.5	C	0.02
primary	Temp Mid Range	23.91	23.94	0.7403	24.0	C	0.08
primary	Temp High Range	46.01	46.05	0.9614	46.2	C	0.11

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	GRC474	Martin Valvur	04/20/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.71	0.83		

Mfg	Fluke	Parameter	Shelter Temperatur
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99980	Intercept	-0.02840
Cert Date	1/19/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.16	25.19	0.000	26.0	C	0.83
primary	Temp Mid Range	25.24	25.27	0.000	26.0	C	0.69
primary	Temp Mid Range	25.46	25.49	0.000	26.1	C	0.6

Infrastructure Data For

Site ID	GRC474	Technician	Martin Valvur	Site Visit Date	04/20/2016

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	GRC474	**Technician**	Martin Valvur	**Site Visit Date**	04/20/2016

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Grand Canyon
Operating Group	NPS	**Map Scale**	
AQS #	04-005-8001	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, UV-B	**QAPP Latitude**	
Deposition Measurement	dry, wet, IMPROVE	**QAPP Longitude**	
Land Use	woodland - evergreen	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone	(928) 638-2031	**Audit Latitude**	36.058642
Site Address 1	2D Albright Ave	**Audit Longitude**	-112.183575
Site Address 2	PO Box 129	**Audit Elevation**	2070
County	Coconino	**Audit Declination**	11.5
City, State	Grand Canyon, AZ		**Present**
Zip Code	86023	**Fire Extinguisher**	☑ No inspection date
Time Zone	Arizona	**First Aid Kit**	☑
Primary Operator		**Safety Glasses**	☑
Primary Op. Phone #		**Safety Hard Hat**	☑
Primary Op. E-mail		**Climbing Belt**	☐
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Step**	☑

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in good condition, clean, neat, and well organized.				
Site OK	☑	**Notes**					

Driving Directions

From Flagstaff, AZ take route 180 north to the Grand Canyon National Park. The site operator's office is in the Mckee building on Albright Ave. Obtain a pass to travel the West Rim Road. The gate code is #1965. The site is a few miles along the rim road on the left just past the Abyss.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID GRC474 **Technician** Martin Valvur **Site Visit Date** 04/20/2016

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID GRC474 **Technician** Martin Valvur **Site Visit Date** 04/20/2016

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID GRC474 **Technician** Martin Valvur **Site Visit Date** 04/20/2016

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	GRC474	Technician	Martin Valvur	Site Visit Date	04/20/2016

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID GRC474 **Technician** Martin Valvur **Site Visit Date** 04/20/2016

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☑	☑
10	Is the sample tower stable and grounded?	☑	☐
11	Tower comments?	Sample tower not grounded but bolted to the shelter	

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID GRC474 **Technician** Martin Valvur **Site Visit Date** 04/20/2016

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	Dataview	☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2015	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑	Not current	☐
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?	☑	Flow & observation sections
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	GRC474	Technician	Martin Valvur	Site Visit Date	04/20/2016

Site operation procedures

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

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	Every 3 or 4 weeks	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☑
Analyzer Diagnostics Tests	☑	Alarm values only	☑
In-line Filter Replacement (at inlet)	☑	Every 3 or 4 weeks	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID GRC474 **Technician** Martin Valvur **Site Visit Date** 04/20/2016

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings 95% of the time
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	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:

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID GRC474 **Technician** Martin Valvur **Site Visit Date** 04/20/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB22906T9	none
DAS	Environmental Sys Corp	8816	2270	90602
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	1192001865	02910
flow rate	Tylan	FC280SAV	AW9805027	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	illegible	none
Modem	Sierra wireless	GX450	LA54620247001003	none
Ozone	ThermoElectron Inc	49i A3NAA	1023943902	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1130450196	none
Printer	Hewlett Packard	842C	unknown	none
Sample Tower	Aluma Tower	B	none	03570
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	17626	none
Zero air pump	Werther International	PC70/4	531380	none

DAS Data Form

DAS Time Max Error: 2.12

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2526	PET427	Martin Valvur	04/21/2016	DAS	Primary

Das Date: 4 /21/2016 **Audit Date** 4 /21/2016
Das Time: 10:48:53 **Audit Time** 10:51:00
Das Day: 112 **Audit Day** 112

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0005	0.0009	0.0005	0.0009

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/23/2015	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
13	0.0000	-0.0005	0.0004	V	V	0.0009
13	0.1000	0.0996	0.0997	V	V	0.0001
13	0.3000	0.3002	0.3004	V	V	0.0002
13	0.5000	0.4993	0.4998	V	V	0.0005
13	0.7000	0.6999	0.7006	V	V	0.0007
13	0.9000	0.9014	0.9020	V	V	0.0006
13	1.0000	0.9999	1.0005	V	V	0.0006

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Mykrolis	AW9510056	PET427	Martin Valvur	04/21/2016	Flow Rate	none

Mfg	Mykrolis	
SN/Owner ID	FP9510004	none
Parameter	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	0.99895	**Intercept**	0.01185
Cert Date	2/10/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
1.12%	1.85%			

Cal Factor Zero	-0.077
Cal Factor Full Scale	4.986
Rotometer Reading:	3.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.09	0.0927	0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.10	0.1008	0.02	l/m	l/m	
primary	test pt 1	2.989	2.980	3.09	3.0721	3.04	l/m	l/m	1.85%
primary	test pt 2	2.999	2.990	3.09	3.0725	3.03	l/m	l/m	1.44%
primary	test pt 3	3.034	3.030	3.08	3.0781	3.03	l/m	l/m	0.07%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460048	PET427	Martin Valvur	04/21/2016	Ozone	none

Slope:	0.97261	**Slope:**	0.00000
Intercept	-0.41686	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	0.99832	**Intercept**	-0.26452
Cert Date	1/29/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.5%	3.8%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.61	0.87	0.51	ppb	
primary	2	31.28	31.59	30.42	ppb	-3.70%
primary	3	51.94	52.29	50.28	ppb	-3.84%
primary	4	76.74	77.13	74.34	ppb	-3.62%
primary	5	108.43	108.87	105.70	ppb	-2.91%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.1	pass
Span	0.989	pass
Zero Voltage	0.0002	pass
Fullscale Voltage	0.9999	pass
Cell A Freq.	62.1 kHz	pass
Cell A Noise	0.4 ppb	pass
Cell A Flow	0.66 lpm	pass
Cell A Pressure	608.9 mmHg	pass
Cell A Tmp.	36.0 C	pass
Cell B Freq.	70.2 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.66 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	7036	PET427	Martin Valvur	04/21/2016	Temperature	none

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99980	**Intercept**	-0.02840
Cert Date	1/19/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.22	0.27		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.16	0.19	0.0000	-0.1	C	-0.27
primary	Temp Mid Range	24.39	24.42	0.0000	24.3	C	-0.16
primary	Temp High Range	47.92	47.96	0.0000	47.7	C	-0.23

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	PET427	Martin Valvur	04/21/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.38	0.76		

Mfg	Fluke	Parameter	Shelter Temperatur
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99980	Intercept	-0.02840
Cert Date	1/19/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	29.55	29.58	0.000	29.4	C	-0.15
primary	Temp Mid Range	29.61	29.64	0.000	29.9	C	0.24
primary	Temp Mid Range	28.71	28.74	0.000	29.5	C	0.76

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
PET427	Martin Valvur	04/21/2016

Shelter Make	Shelter Model	Shelter Size
Ekto	8814	896 cuft

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

completing the site observation section of the SSRF was discussed with the operator. The filter bag is used as a glove to remove and install the dry deposition filter pack.

2 **Parameter:** DasComments

The heating and air conditioning systems run simultaneously.

3 **Parameter:** DocumentationCo

The most recent calibration and maintenance report is not available onsite.

4 **Parameter:** ShelterCleanNotes

The shelter is dusty, but in good condition, well organized and maintained.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	PET427	**Technician**	Martin Valvur	**Site Visit Date**	04/21/2016

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Padilla Tank
Operating Group	NPS	**Map Scale**	
AQS #	04-017-0119	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, neph	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	desert	**QAPP Elevation Meters**	
Terrain	flat	**QAPP Declination**	
Conforms to MLM	Yes	**QAPP Declination Date**	
Site Telephone	(928) 524-6668	**Audit Latitude**	34.822508
Site Address 1		**Audit Longitude**	-109.892485
Site Address 2		**Audit Elevation**	1712
County	Navajo	**Audit Declination**	10.5
City, State	Petrified Forest, AZ		**Present**
Zip Code	85942	**Fire Extinguisher**	☑ Inspected April 2016
Time Zone	Mountain	**First Aid Kit**	☐
Primary Operator		**Safety Glasses**	☐
Primary Op. Phone #		**Safety Hard Hat**	☐
Primary Op. E-mail		**Climbing Belt**	☐
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Step**	☑

Shelter Working Room	☑	**Make**	Ekto	**Model**	8814	**Shelter Size**	896 cuft
Shelter Clean	☑	**Notes**	The shelter is dusty, but in good condition, well organized and maintained.				
Site OK	☑	**Notes**					

Driving Directions

From I-40 take exit 311 to the Petrified Forest . The site operator's office is located in the visitors center. The site is another 25 miles further south on the park road near the Rainbow Forest at the south end of the park, 1.5 miles west of the main road on a closed side road. The gate at the side road is usually open. The park ranger horse stable is located past the site on the side road.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID PET427 **Technician** Martin Valvur **Site Visit Date** 04/21/2016

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	PET427	Technician	Martin Valvur	Site Visit Date	04/21/2016

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID PET427 **Technician** Martin Valvur **Site Visit Date** 04/21/2016

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	PET427	Technician	Martin Valvur	Site Visit Date	04/21/2016

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID PET427 **Technician** Martin Valvur **Site Visit Date** 04/21/2016

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

The heating and air conditioning systems run simultaneously.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID PET427 **Technician** Martin Valvur **Site Visit Date** 04/21/2016

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	Dataview	☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2015	☑
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?	☑	Flow & observation sections
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☑	Control charts not used

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

The most recent calibration and maintenance report is not available onsite.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	PET427	Technician	Martin Valvur	Site Visit Date	04/21/2016

Site operation procedures

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

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

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually	☑
Visual Inspections	☑	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	☑	Every 4 weeks	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☐
Analyzer Diagnostics Tests	☑	Alarm values only	☑
In-line Filter Replacement (at inlet)	☑	Every 4 weeks	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Semiannually	☑

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID PET427 **Technician** Martin Valvur **Site Visit Date** 04/21/2016

Site operation procedures

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

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

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

completing the site observation section of the SSRF was discussed with the operator. The filter bag is used as a glove to remove and install the dry deposition filter pack.

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

Site ID PET427 **Technician** Martin Valvur **Site Visit Date** 04/21/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB22906TB	none
DAS	Environmental Sys Corp	8816	2526	90641
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB114	none	none
Flow Rate	Mykrolis	FC280SAV-4S	AW9510056	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Mykrolis	RO-32	FP9510004	none
Modem	US Robotics	56k	unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	CM08460048	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1211052489	none
Sample Tower	Aluma Tower	B	none	none
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	7036	none
Zero air pump	Werther International	PC 70/4	531382	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MEV405-Martin Valvur-05/31/2016						
1	5/31/2016	Computer	Hewlett Packard	none	EliteBook	CNV347CS41
2	5/31/2016	DAS	Environmental Sys Corp	90613	8816	2616
3	5/31/2016	Elevation	Elevation	None	1	None
4	5/31/2016	Filter pack flow pump	Thomas	01718	107CA18	00000599
5	5/31/2016	flow rate	Tylan	none	FC280AV-4S	AW9403013
6	5/31/2016	Infrastructure	Infrastructure	none	none	none
7	5/31/2016	MFC power supply	Tylan	none	RO-32	FP9710002
8	5/31/2016	Modem	Sierra wireless	none	GX450	LA54620331001003
9	5/31/2016	Ozone	ThermoElectron Inc	none	49C	0425208058
10	5/31/2016	Ozone Standard	ThermoElectron Inc	90717	49C	49C-66823-354
11	5/31/2016	Sample Tower	Aluma Tower	illegible	B	none
12	5/31/2016	Shelter Temperature	ARS	none	none	none
13	5/31/2016	Siting Criteria	Siting Criteria	None	1	None
14	5/31/2016	Temperature2meter	RM Young	none	41342	15106
15	5/31/2016	Zero air pump	Werther International	none	PC40/4	526289

DAS Data Form

DAS Time Max Error: 3

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2616	MEV405	Martin Valvur	05/31/2016	DAS	Primary

Das Date: 5 /31/2016
Das Time: 7:38:00
Das Day: 152

Audit Date 5 /31/2016
Audit Time 7:35:00
Audit Day 152

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

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/23/2015	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0003	-0.0005	V	V	-0.0002
7	0.1000	0.1002	0.1004	V	V	0.0002
7	0.3000	0.2996	0.2995	V	V	-0.0001
7	0.5000	0.4993	0.4992	V	V	-0.0001
7	0.7000	0.7000	0.7002	V	V	0.0002
7	0.9000	0.8993	0.8992	V	V	-0.0001
7	1.0000	1.0002	1.0001	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9403013	MEV405	Martin Valvur	05/31/2016	flow rate	none

Mfg	Tylan
SN/Owner ID	FP9710002 none
Parameter	MFC power supply

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	0.99895	**Intercept**	0.01185
Cert Date	2/10/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
7.20%	8.94%			

Cal Factor Zero	0.08
Cal Factor Full Scale	5.505
Rotometer Reading:	3.75

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.01	-0.055	0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.11	0.123	0.22	l/m	l/m	
primary	test pt 1	3.140	3.130	2.69	2.688	3.00	l/m	l/m	-4.28%
primary	test pt 2	3.282	3.270	2.68	2.685	3.00	l/m	l/m	-8.38%
primary	test pt 3	3.301	3.290	2.68	2.687	3.00	l/m	l/m	-8.94%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	7.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	360 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	0425208058	MEV405	Martin Valvur	05/31/2016	Ozone	none

Slope:	1.01172	**Slope:**	0.00000
Intercept	-1.62584	**Intercept**	0.00000
CorrCoff	0.99817	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	0.99832	**Intercept**	-0.26452
Cert Date	1/29/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
4.6%	6.3%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.75	1.01	1.38	ppb	
primary	2	30.45	30.76	28.82	ppb	-6.31%
primary	3	50.54	50.89	48.31	ppb	-5.07%
primary	4	74.40	74.79	71.34	ppb	-4.61%
primary	5	101.42	101.85	104.36	ppb	2.46%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.6	pass
Span	1.019	pass
Zero Voltage	0.0001	pass
Fullscale Voltage	1.0001	pass
Cell A Freq.	80.2 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.68 lpm	pass
Cell A Pressure	570 mmHg	pass
Cell A Tmp.	36.9 C	pass
Cell B Freq.	110.3 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.58 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

2 Meter Temperature Data For

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	15106	MEV405	Martin Valvur	05/31/2016	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99980	Intercept	-0.02840
Cert Date	1/19/2016	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.33	0.49		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.28	0.31	0.000	0.80	C	0.49
primary	Temp Mid Rang	24.24	24.27	0.000	24.64	C	0.37
primary	Temp High Rang	47.26	47.30	0.000	47.43	C	0.13

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	MEV405	Martin Valvur	05/31/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.21	0.46		

Mfg	Fluke	Parameter	Shelter Temperatur
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99980	Intercept	-0.02840
Cert Date	1/19/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.49	24.52	0.000	24.4	C	-0.08
primary	Temp Mid Range	24.39	24.42	0.000	24.3	C	-0.1
primary	Temp Mid Range	24.79	24.82	0.000	24.4	C	-0.46

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	MEV405	Technician	Martin Valvur	Site Visit Date	05/31/2016

Shelter Make	Shelter Model	Shelter Size
Ekto	888	512 cuft

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

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

A large parking lot for park service employees is located approximately 30 meters north of the site.

2 **Parameter:** ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	MEV405	**Technician**	Martin Valvur	**Site Visit Date**	05/31/2016

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Moccasin Mesa
Operating Group	NPS	**Map Scale**	
AQS #	08-083-0101	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, wet, IMPROVE	**QAPP Longitude**	
Land Use	woodland - evergreen	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	37.198398
Site Address 1	Natural Resources	**Audit Longitude**	-108.490462
Site Address 2	Mesa Verde National Park	**Audit Elevation**	2170
County	Montezuma	**Audit Declination**	10.3
City, State	Cortez, CO		**Present**
Zip Code	81330	**Fire Extinguisher**	☑ No inspection date
Time Zone	Mountain	**First Aid Kit**	☑
Primary Operator		**Safety Glasses**	☐
Primary Op. Phone #		**Safety Hard Hat**	☐
Primary Op. E-mail		**Climbing Belt**	☐
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Step**	☑

Shelter Working Room	☑	**Make**	Ekto	**Model**	888	**Shelter Size**	512 cuft
Shelter Clean	☑	**Notes**	The shelter is in good condition, clean, and well organized.				
Site OK	☑	**Notes**					

Driving Directions From the main entrance on highway 160, go through the park gate and drive about 35 minutes to mile marker 19. Just after mile marker 19 turn right on the paved service road. The air quality office is the stone building about 200 yards down the road. Continue on the same road to the site.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID MEV405 **Technician** Martin Valvur **Site Visit Date** 05/31/2016

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

Siting Distances OK ☐

Siting Criteria Comment

A large parking lot for park service employees is located approximately 30 meters north of the site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID MEV405 **Technician** Martin Valvur **Site Visit Date** 05/31/2016

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	MEV405	Technician	Martin Valvur	Site Visit Date	05/31/2016

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	MEV405	Technician	Martin Valvur	Site Visit Date	05/31/2016

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 10 meters
4	Describe dry dep sample tube.		3/8 teflon by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID MEV405 **Technician** Martin Valvur **Site Visit Date** 05/31/2016

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID MEV405 **Technician** Martin Valvur **Site Visit Date** 05/31/2016

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	Dataview	☑
SSRF	☑		☑
Site Ops Manual	☑		☐
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?	☑	Flow & observation sections
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID MEV405 **Technician** Martin Valvur **Site Visit Date** 05/31/2016

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID MEV405 **Technician** Martin Valvur **Site Visit Date** 05/31/2016

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
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?	☑	Uses bag as glove
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

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

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

Site ID MEV405 **Technician** Martin Valvur **Site Visit Date** 05/31/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	EliteBook	CNV347CS41	none
DAS	Environmental Sys Corp	8816	2616	90613
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	00000599	01718
flow rate	Tylan	FC280AV-4S	AW9403013	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP9710002	none
Modem	Sierra wireless	GX450	LA54620331001003	none
Ozone	ThermoElectron Inc	49C	0425208058	none
Ozone Standard	ThermoElectron Inc	49C	49C-66823-354	90717
Sample Tower	Aluma Tower	B	none	illegible
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	15106	none
Zero air pump	Werther International	PC40/4	526289	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CAN407-Martin Valvur-06/01/2016						
1	6/1/2016	Computer	Hewlett Packard	none	EliteBook	CNV1360668
2	6/1/2016	DAS	Environmental Sys Corp	09638	8816	2523
3	6/1/2016	Elevation	Elevation	None	1	None
4	6/1/2016	Filter pack flow pump	Thomas	none	107CA18A	00005251
5	6/1/2016	flow rate	Mykrolis	03388	FC280SAV-4S	AW9403022
6	6/1/2016	Infrastructure	Infrastructure	none	none	none
7	6/1/2016	Met tower	Universal Tower	01357	unknown	none
8	6/1/2016	Modem	Sierra wireless	none	GX450	LA54620441001003
9	6/1/2016	Ozone	ThermoElectron Inc	none	49i A3NAA	1030745086
10	6/1/2016	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1030745084
11	6/1/2016	Sample Tower	Aluma Tower	illegible	B	none
12	6/1/2016	Shelter Temperature	ARS	none	none	none
13	6/1/2016	Siting Criteria	Siting Criteria	None	1	None
14	6/1/2016	Temperature2meter	Climatronics	none	100093	5708
15	6/1/2016	Zero air pump	Twin Tower Engineering	90721	TT70/E4	526297

DAS Data Form

DAS Time Max Error: 0.33

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2523	CAN407	Martin Valvur	06/01/2016	DAS	Primary

Das Date: 6 /1 /2016
Das Time: 8:37:40
Das Day: 153

Audit Date 6 /1 /2016
Audit Time 8:38:00
Audit Day 153

Low Channel:

Avg Diff:	Max Diff:
0.0001	0.0002

High Channel:

Avg Diff:	Max Diff:
0.0001	0.0002

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/23/2015	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
12	0.0000	-0.0008	-0.0007	V	V	0.0001
12	0.1000	0.0999	0.0998	V	V	-0.0001
12	0.3000	0.2997	0.2997	V	V	0.0000
12	0.5000	0.4994	0.4996	V	V	0.0002
12	0.7000	0.6999	0.7000	V	V	0.0001
12	0.9000	0.9001	0.9003	V	V	0.0002
12	1.0000	1.0002	1.0004	V	V	0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Mykrolis	AW9403022	CAN407	Martin Valvur	06/01/2016	flow rate	03388

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	0.99895	**Intercept**	0.01185
Cert Date	2/10/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.029
2.28%	2.56%			**Cal Factor Full Scale**	5.452
				Rotometer Reading:	3.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.02	0.019	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.025	0.00	l/m	l/m	
primary	test pt 1	2.965	2.960	2.77	2.784	3.03	l/m	l/m	2.20%
primary	test pt 2	2.956	2.950	2.76	2.773	3.01	l/m	l/m	2.07%
primary	test pt 3	2.941	2.930	2.76	2.770	3.01	l/m	l/m	2.56%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030745086	CAN407	Martin Valvur	06/01/2016	Ozone	none

Slope:	0.99509	**Slope:**	0.00000
Intercept	-0.50561	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	0.99832	**Intercept**	-0.26452
Cert Date	1/29/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.6%	2.6%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.64	0.90	0.64	ppb	
primary	2	30.90	31.21	30.60	ppb	-1.95%
primary	3	51.80	52.15	50.80	ppb	-2.59%
primary	4	75.60	75.99	75.20	ppb	-1.04%
primary	5	110.30	110.75	109.90	ppb	-0.77%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.2	pass
Span	1.016	pass
Zero Voltage	-0.0002	pass
Fullscale Voltage	0.9997	pass
Cell A Freq.	78.5 kHz	pass
Cell A Noise	0.5 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	601.7 mmHg	pass
Cell A Tmp.	37.6 C	pass
Cell B Freq.	83.9 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.69 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

2 Meter Temperature Data For

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	5708	CAN407	Martin Valvur	06/01/2016	Temperature2meter	none

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99980	**Intercept**	-0.02840
Cert Date	1/19/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.02	0.03		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.27	0.30	0.000	0.27	C	-0.03
primary	Temp Mid Rang	25.61	25.64	0.000	25.62	C	-0.02
primary	Temp High Rang	46.81	46.85	0.000	46.84	C	-0.01

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	CAN407	Martin Valvur	06/01/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.83	1.01		

Mfg	Fluke	Parameter	Shelter Temperatur
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99980	Intercept	-0.02840
Cert Date	1/19/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.62	24.65	0.000	25.4	C	0.73
primary	Temp Mid Range	24.89	24.92	0.000	25.7	C	0.76
primary	Temp Mid Range	24.54	24.57	0.000	25.6	C	1.01

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	CAN407	Technician	Martin Valvur	Site Visit Date	06/01/2016

Shelter Make	Shelter Model	Shelter Size
NPS	R46453	640 cuft

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

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The small parking lot at the visitors center is approximately 100m to the northeast.

2 **Parameter:** ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CAN407	**Technician**	Martin Valvur	**Site Visit Date**	06/01/2016

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Musselman Arch
Operating Group	NPS	**Map Scale**	
AQS #	49-037-0101	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	woodland - mixed, desert range	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone	(435) 259-4141	**Audit Latitude**	38.458323
Site Address 1	Visitors Center	**Audit Longitude**	-109.82126
Site Address 2	route 313	**Audit Elevation**	1794
County	San Juan	**Audit Declination**	11.6
City, State	Moab, UT		**Present**
Zip Code	84532	**Fire Extinguisher**	☑ Inspected April 2015
Time Zone	Mountain	**First Aid Kit**	☑ in vehicle
Primary Operator		**Safety Glasses**	☐
Primary Op. Phone #		**Safety Hard Hat**	☐
Primary Op. E-mail		**Climbing Belt**	☐
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Step**	☑

Shelter Working Room ☑ **Make** NPS **Model** R46453 **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter is in good condition, well organized and well maintained.

Site OK ☑ **Notes**

Driving Directions From I-70, take exit 180 south on route 191. Approximately 9 miles north of Moab, turn right (west) on route 313 at the sign for Canyonlands National Park. Follow 313 west for 25 miles passing the state park and continuing straight to Canyonlands. The site is at the end of the dirt road behind the visitors center, in the maintenance area.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID CAN407 **Technician** Martin Valvur **Site Visit Date** 06/01/2016

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

Siting Distances OK ☑

Siting Criteria Comment

The small parking lot at the visitors center is approximately 100m to the northeast.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID CAN407 **Technician** Martin Valvur **Site Visit Date** 06/01/2016

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	CAN407	Technician	Martin Valvur	Site Visit Date	06/01/2016

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID CAN407 **Technician** Martin Valvur **Site Visit Date** 06/01/2016

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 10 meters
4	Describe dry dep sample tube.		3/8 teflon by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CAN407 **Technician** Martin Valvur **Site Visit Date** 06/01/2016

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID CAN407 **Technician** Martin Valvur **Site Visit Date** 06/01/2016

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	Dataview	☑
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?	☑	Flow & observation sections
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	CAN407	Technician	Martin Valvur	Site Visit Date	06/01/2016

Site operation procedures

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

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

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☑	Weekly	☑
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	☑	Monthly	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☐
Analyzer Diagnostics Tests	☑	Alarm values only 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	☑	As needed	☑

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID CAN407 **Technician** Martin Valvur **Site Visit Date** 06/01/2016

Site operation procedures

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

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

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

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

Site ID CAN407 **Technician** Martin Valvur **Site Visit Date** 06/01/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	EliteBook	CNV1360668	none
DAS	Environmental Sys Corp	8816	2523	09638
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18A	00005251	none
flow rate	Mykrolis	FC280SAV-4S	AW9403022	03388
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	01357
Modem	Sierra wireless	GX450	LA54620441001003	none
Ozone	ThermoElectron Inc	49i A3NAA	1030745086	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1030745084	none
Sample Tower	Aluma Tower	B	none	illegible
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	Climatronics	100093	5708	none
Zero air pump	Twin Tower Engineering	TT70/E4	526297	90721

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GRB411-Martin Valvur-06/03/2016					
6/3/2016	Computer	Hewlett Packard	none	ProBook	5CB22906VO
6/3/2016	DAS	Environmental Sys Corp	90635	8816	2507
6/3/2016	Elevation	Elevation	None	1	None
6/3/2016	Filter pack flow pump	Thomas	none	107CAB115	0000109-840
6/3/2016	flow rate	Tylan	03387	FC280AV	AW9403026
6/3/2016	Infrastructure	Infrastructure	none	none	none
6/3/2016	Met tower	Climatronics	01358	18 inch taper	none
6/3/2016	MFC power supply	Tylan	03681	RO-32	FP9404004
6/3/2016	Modem	US Robotics	none	56.6k	24CGG57C027R
6/3/2016	Ozone	ThermoElectron Inc	90565	49C	49C-59285-322
6/3/2016	Ozone Standard	ThermoElectron Inc	none	49C	0330302753
6/3/2016	Sample Tower	Aluma Tower	none	B	AT-5381-F9-2
6/3/2016	Shelter Temperature	ARS	none	none	80
6/3/2016	Siting Criteria	Siting Criteria	None	1	None
6/3/2016	Temperature2meter	RM Young	none	41342	018532
6/3/2016	Zero air pump	Werther International	90722	TT70/4E	507782

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2507	GRB411	Martin Valvur	06/03/2016	DAS	Primary

Das Date:	6 /3 /2016	**Audit Date**	6 /3 /2016
Das Time:	8:38:45	**Audit Time**	8:38:15
Das Day:	155	**Audit Day**	155

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

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/23/2015	**CorrCoff**	1.00000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9403026	GRB411	Martin Valvur	06/03/2016	flow rate	03387

Mfg	Tylan
SN/Owner ID	FP9404004 / 03681
Parameter	MFC power supply

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	0.99895	**Intercept**	0.01185
Cert Date	2/10/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
1.21%	2.25%			

Cal Factor Zero	0.342
Cal Factor Full Scale	5.894
Rotometer Reading:	3.75

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.28	-0.250	0.06	l/m	l/m	
primary	leak check	0.000	0.000	-0.28	-0.242	0.07	l/m	l/m	
primary	test pt 1	3.079	3.070	2.39	2.395	3.00	l/m	l/m	-2.25%
primary	test pt 2	2.986	2.980	2.39	2.394	3.00	l/m	l/m	0.70%
primary	test pt 3	2.990	2.980	2.39	2.395	3.00	l/m	l/m	0.67%

Sensor Component		Condition		Status	
Sensor Component	Leak Test	Condition		Status	pass
Sensor Component	Tubing Condition	Condition	Good	Status	pass
Sensor Component	Filter Position	Condition	Poor	Status	Fail
Sensor Component	Rotometer Condition	Condition	Clean and dry	Status	pass
Sensor Component	Moisture Present	Condition	No moisture present	Status	pass
Sensor Component	Filter Distance	Condition	6.0 cm	Status	pass
Sensor Component	Filter Depth	Condition	-2.5 cm	Status	Fail
Sensor Component	Filter Azimuth	Condition	200 deg	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-59285-322	GRB411	Martin Valvur	06/03/2016	Ozone	90565

Slope:	0.95038	**Slope:**	0.00000
Intercept	-1.97991	**Intercept**	0.00000
CorrCoff	0.99957	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	0.99832	**Intercept**	-0.26452
Cert Date	1/29/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
9.7%	14.2%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.86	1.12	0.52	ppb	
primary	2	31.50	31.81	27.30	ppb	-14.18%
primary	3	52.80	53.15	47.50	ppb	-10.63%
primary	4	78.20	78.59	72.10	ppb	-8.26%
primary	5	113.00	113.45	107.00	ppb	-5.69%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.2	pass
Span	0.998	pass
Zero Voltage	-0.0005	pass
Fullscale Voltage	0.9993	pass
Cell A Freq.	78.8 kHz	pass
Cell A Noise	0.5 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	588.3 mmHg	pass
Cell A Tmp.	38.7 C	pass
Cell B Freq.	70.3 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.65 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	> 8%	Fail
System Memo	See comments	pass

2 Meter Temperature Data For

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	018532	GRB411	Martin Valvur	06/03/2016	Temperature2meter	none

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99980	**Intercept**	-0.02840
Cert Date	1/19/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.1	0.15		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.18	0.21	0.000	0.36	C	0.15
primary	Temp Mid Rang	24.38	24.41	0.000	24.51	C	0.1
primary	Temp High Rang	49.13	49.17	0.000	49.11	C	-0.06

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	80	GRB411	Martin Valvur	06/03/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.66	0.81		

Mfg	Fluke	Parameter	Shelter Temperatur
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99980	Intercept	-0.02840
Cert Date	1/19/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.36	25.39	0.000	26.2	C	0.76
primary	Temp Mid Range	25.53	25.56	0.000	26.4	C	0.81
primary	Temp Mid Range	26.45	26.48	0.000	26.9	C	0.41

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	GRB411	Technician	Martin Valvur	Site Visit Date	06/03/2016

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2652-1)	640 cuft

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	GRB411	Martin Valvur	06/03/2016	Filter Position	Tylan	698	☐	☑

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

A digital to analog test of the data logger could not be performed since there were no available channels on the logger to test.

2 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, The shelter floor has missing and crumbled tiles.

3 **Parameter:** PollAnalyzerCom

An ozone sample line test was performed which indicated a loss > 8% at 50 ppb in the sample line.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	GRB411	**Technician**	Martin Valvur	**Site Visit Date**	06/03/2016

Site Sponsor (agency)	NPS	**USGS Map**	Lehman Caves
Operating Group	NPS	**Map Scale**	
AQS #	32-033-0101	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**	39.0053
Deposition Measurement	dry, wet	**QAPP Longitude**	-114.2158
Land Use	woodland - evergreen	**QAPP Elevation Meters**	2060
Terrain	complex (dessert basin and mountain)	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone	(775) 234-7104	**Audit Latitude**	39.005121
Site Address 1	Great Basin Nat. Park	**Audit Longitude**	-114.215932
Site Address 2	Hwy 488	**Audit Elevation**	2058
County	White Pine	**Audit Declination**	12.5
City, State	Baker, NV		
Zip Code	89311		**Present**
Time Zone	Pacific	**Fire Extinguisher**	☑
Primary Operator		**First Aid Kit**	☑
Primary Op. Phone #		**Safety Glasses**	☐
Primary Op. E-mail		**Safety Hard Hat**	☐
Backup Operator		**Climbing Belt**	☐
Backup Op. Phone #		**Security Fence**	☐
Backup Op. E-mail		**Secure Shelter**	☑
		Stable Entry Step	☑

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2652-1)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in fair condition, The shelter floor has missing and crumbled tiles.				
Site OK	☑	**Notes**					

Driving Directions

From Las Vegas travel north on Interstate 15 to exit 109 in Beaver, Utah. Travel west on 21 to Garrison, Nevada and turn left on route 487 and continue to Baker. Turn left on 488 in Baker and follow the signs to Great Basin National Park. The site is on the left of the road to the residential and office area.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID GRB411 **Technician** Martin Valvur **Site Visit Date** 06/03/2016

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID GRB411 **Technician** Martin Valvur **Site Visit Date** 06/03/2016

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	GRB411	Technician	Martin Valvur	Site Visit Date	06/03/2016

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID GRB411 **Technician** Martin Valvur **Site Visit Date** 06/03/2016

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

An ozone sample line test was performed which indicated a loss > 8% at 50 ppb in the sample line.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID GRB411 **Technician** Martin Valvur **Site Visit Date** 06/03/2016

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

A digital to analog test of the data logger could not be performed since there were no available channels on the logger to test.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID GRB411 **Technician** Martin Valvur **Site Visit Date** 06/03/2016

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	GRB411	Technician	Martin Valvur	Site Visit Date	06/03/2016

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID GRB411 **Technician** Martin Valvur **Site Visit Date** 06/03/2016

Site operation procedures

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

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

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

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

Site ID GRB411 **Technician** Martin Valvur **Site Visit Date** 06/03/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	ProBook	5CB22906VO	none
DAS	Environmental Sys Corp	8816	2507	90635
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB115	0000109-840	none
flow rate	Tylan	FC280AV	AW9403026	03387
Infrastructure	Infrastructure	none	none	none
Met tower	Climatronics	18 inch taper	none	01358
MFC power supply	Tylan	RO-32	FP9404004	03681
Modem	US Robotics	56.6k	24CGG57C027R	none
Ozone	ThermoElectron Inc	49C	49C-59285-322	90565
Ozone Standard	ThermoElectron Inc	49C	0330302753	none
Sample Tower	Aluma Tower	B	AT-5381-F9-2	none
Shelter Temperature	ARS	none	80	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	018532	none
Zero air pump	Werther International	TT70/4E	507782	90722

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
FOR605-Martin Valvur-06/22/2016						
1	6/22/2016	DAS	Campbell	49922	CR1000	illegible
2	6/22/2016	elevation	Elevation	none	none	none
3	6/22/2016	Flow Rate	AALBORG	none	GFMS-012446	196706-5
4	6/22/2016	Infrastructure	Infrastructure	none	none	none
5	6/22/2016	Precipitation	Handar	none	444A	2998
6	6/22/2016	Relative Humidity	Vaisala	none	HMP45AC	Y3730020
7	6/22/2016	siting criteria	Siting Criteria	none	none	None
8	6/22/2016	Solar Radiation	Licor	none	LI-200	PY47986
9	6/22/2016	Temperature2meter	Vaisala	none	HMP45AC	Y3730020
10	6/22/2016	Wind Direction	Met One	illegible	024	J5213
11	6/22/2016	Wind Speed	Met One	none	014	39022

DAS Data Form

DAS Time Max Error: 1.68

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	illegible	FOR605	Martin Valvur	06/22/2016	DAS	Primary

Das Date: 6 /22/2016 **Audit Date** 6 /22/2016
Das Time: 7:55:41 **Audit Time** 7:54:00
Das Day: 174 **Audit Day** 174

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

Mfg	HY	**Parameter**	DAS
Serial Number	12010039329	**Tfer Desc.**	Source generator (D
Tfer ID	01322		
Slope	1.00000	**Intercept**	0.00000
Cert Date	6/15/2014	**CorrCoff**	1.00000
Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/23/2015	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
4	0.9000	0.0000	0.0000	V	V	0.0000
4	1.0000	0.0000	0.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
AALBORG	196706-5	FOR605	Martin Valvur	06/22/2016	Flow Rate	none

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	0.99895	**Intercept**	0.01185
Cert Date	2/10/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.33
2.90%	3.53%			**Cal Factor Full Scale**	0.00185
				Rotometer Reading:	0

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.35	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.36	l/m	l/m	
primary	test pt 1	3.300	3.290	0.00	0.000	3.37	l/m	l/m	2.43%
primary	test pt 2	3.289	3.280	0.00	0.000	3.37	l/m	l/m	2.74%
primary	test pt 3	3.272	3.260	0.00	0.000	3.38	l/m	l/m	3.53%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Fair	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	N/A	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	3.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	160 deg	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Met One	39022	FOR605	Martin Valvur	06/22/2016	Wind Speed	none

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	12/11/2015	**CorrCoff**	1.00000

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	12/11/2015	**CorrCoff**	1.00000

Prop or Cups SN	N/A	
Prop or Cups Torque	0.4	**to** 0.5
Prop Correction Fact	N/A	

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.09	0.80%		
Abs Max Er	0.31	1.89%		

UseDescription:	Input Device	Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.45	0.0	0.5		0.00	
primary	01261	40	1.67	0.0	1.6		-0.03	
primary	01261	80	2.75	0.0	2.4		-0.31	
primary	01261	140	4.26	0.0	4.2		-0.02	
primary	01261	210	6.07	0.0	6.0	-0.49%		
primary	01262	400	11.11	0.0	11.2	0.81%		
primary	01262	800	22.22	0.0	21.8	-1.89%		
primary	01262	1800	48.44	0.0	48.4	0.00%		

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

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Met One	J5213	FOR605	Martin Valvur	06/22/2016	Wind Direction	illegible

Mfg	Ushikata	**Parameter**	wind direction
Serial Number	191832	**Tfer Desc.**	transit
Tfer ID	01272		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/19/2015	**CorrCoff**	1.00000

Vane SN: N/A **C. A. Align. deg. true:**
VaneTorque 0 **to** 0 177

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	12.5			
Abs Max Er	13			

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01272	87	☐	0.000	76	12		12
primary	01272	177	☐	0.000	165	12		12
primary	01272	267	☐	0.000	254	13		13
primary	01272	357	☐	0.000	344	13		13

Sensor Component		Condition		Status	
Sensor Component	Sensor Heater	Condition	N/A	Status	pass
Sensor Component	Mast	Condition	Good	Status	pass
Sensor Component	Sensor Plumb	Condition	Plumb	Status	pass
Sensor Component	Condition	Condition	Good	Status	pass
Sensor Component	Torque	Condition	Not tested	Status	pass
Sensor Component	Vane Condition	Condition	Good	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
Vaisala	Y3730020	FOR605	Martin Valvur	06/22/2016	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99980	Intercept	-0.02840
Cert Date	1/19/2016	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
1.27	2.22		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	1.16	1.19	0.000	3.41	C	2.22
primary	Temp Mid Rang	27.19	27.22	0.000	28.61	C	1.39
primary	Temp Mid Rang	34.96	35.00	0.000	36.36	C	1.36
primary	Temp Mid Rang	32.14	32.17	0.000	32.26	C	0.09

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	Y3730020	FOR605	Martin Valvur	06/22/2016	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	75296	**Tfer Desc.**	GTL
Tfer ID	01220		
Slope	0.98507	**Intercept**	1.69354
Cert Date	1/23/2016	**CorrCoff**	0.99870

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.5	2.1		
Abs Max Er	0.9	2.1		

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	GTL	32.8	31.6	32.8	0.000	32.1	-0.7
primary	RH Low Range	GTL	52.9	51.6	52.9	0.000	52.9	0.0
primary	RH Low Range	GTL		20.1	20.1	0.000	21.0	0.9
primary	RH High Range	GTL	93.6	90.9	93.6	0.000	91.5	-2.1

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY47986	FOR605	Martin Valvur	06/22/2016	Solar Radiation	none

Mfg	RM Young	**Parameter**	solar radiation
Serial Number	PY89592	**Tfer Desc.**	SR transfer sensor
Tfer ID	01244		
Slope	1.34000	**Intercept**	27.00000
Cert Date	7/3/2016	**CorrCoff**	0.99700

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
0.1%	0.1%	0.0%	0.0%

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	6/22/2016	9:00	915	663	665	0.3%
primary	6/22/2016	10:00	1102	802	801	-0.1%
primary	6/22/2016	11:00	1235	901	901	0.0%
primary	6/22/2016	12:00	1297	948	949	0.1%
primary	6/22/2016	13:00	1296	947	951	0.4%

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

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Handar	2998	FOR605	Martin Valvur	06/22/2016	Precipitation	none

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

Mfg	PMP	Parameter	Precipitation
Serial Number	EW-06134-50	Tfer Desc.	250ml graduate
Tfer ID	01250		
Slope	1.00000	Intercept	0.00000
Cert Date	9/5/2005	CorrCoff	1.00000

UseDesc.	Test type	TferVolume	Iteration	TimePerTip	Eq.Ht	DAS eng	Eq.HtUnit	OSE Unit	TferUnits	PctDifference
primary	test 1	231.5	1	10 sec	7.25	7.11	mm	mm	ml	-1.9%
primary	test 2	231.5	2	10 sec	7.25	7.11	mm	mm	ml	-1.9%
primary	test 3	231.5	3	10 sec	7.25	7.11	mm	mm	ml	-1.9%

Sensor Component	Gauge Drain Screen	Condition	Installed	Status	pass
Sensor Component	Funnel Clean	Condition	Dirty	Status	pass
Sensor Component	Condition	Condition	Fair	Status	pass
Sensor Component	Properly Sited	Condition	45 degree rule	Status	pass
Sensor Component	Gauge Screen	Condition	Installed	Status	pass
Sensor Component	Gauge Clean	Condition	Dirty	Status	pass
Sensor Component	Level	Condition	Level	Status	pass
Sensor Component	Sensor Heater	Condition	N/A	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	FOR605	Technician	Martin Valvur	Site Visit Date	06/22/2016

Shelter Make	Shelter Model	Shelter Size

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	FOR605	Martin Valvur	06/22/2016	System Memo	AALBORG	4202	☐	☑

The recorded flow rate data are accurate as recorded. The flow rate is not at the target flow rate.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The dry deposition sample height is approximately 6 meters and not 10 meters. The observation section of the SSRF is not used. The site operator mentioned that he occasionally does not receive site support in a timely manner.

2 **Parameter:** DocumentationCo

There is no documentation available at the site since there is no place to store documents. The site does not have a computer or shelter other than the small enclosure. The site operator completes a site checklist which remains in his vehicle. Information from the checklist is later filed at his office. Per instruction from ARS the COC portion of the SSRF is not being used.

3 **Parameter:** SitingCriteriaCom

The site is located in a wellfield with oil and gas operations nearby.

4 **Parameter:** ShelterCleanNotes

This is a small footprint site with instruments mounted in enclosure on tripod tower.

5 **Parameter:** PollAnalyzerCom

The enclosure protecting the dry deposition filter pack is much smaller in diameter than the normal filter pack enclosure. The geometry of the enclosure may effect particulate collection making data not directly comparable to other CASTNET sites.

6 **Parameter:** MetSensorComme

The wind direction bearing torque could not be tested since it was not possible to remove the sensor from the tower without changing the sensor alignment.

7 **Parameter:** MetOpMaintCom

The temperature and relative humidity sensor is a combination sensor which cannot be submersed making it difficult to audit throughout a range of temperatures. The height of the temperature and humidity measurement is 1.2 meters above the ground.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	FOR605	**Technician**	Martin Valvur	**Site Visit Date**	06/22/2016

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	BLM	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type	Met One		
Air Pollutant Analyzer		**QAPP Latitude**	
Deposition Measurement	dry	**QAPP Longitude**	
Land Use	Range	**QAPP Elevation Meters**	
Terrain	Rolling	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	44.339232
Site Address 1		**Audit Longitude**	-105.92023
Site Address 2		**Audit Elevation**	1402
County	Campbell	**Audit Declination**	9.3
City, State	Gillette, WY		
Zip Code	82716		**Present**
Time Zone	Mountain	**Fire Extinguisher**	☐
Primary Operator		**First Aid Kit**	☐
Primary Op. Phone #		**Safety Glasses**	☐
Primary Op. E-mail		**Safety Hard Hat**	☐
Backup Operator		**Climbing Belt**	☐
Backup Op. Phone #		**Security Fence**	☐
Backup Op. E-mail		**Secure Shelter**	☑
		Stable Entry Step	☑

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

Shelter Clean ☐ **Notes** This is a small footprint site with instruments mounted in enclosure on tripod tower.

Site OK ☐ **Notes**

Driving Directions

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID FOR605 **Technician** Martin Valvur **Site Visit Date** 06/22/2016

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

Siting Distances OK ☑

Siting Criteria Comment

The site is located in a wellfield with oil and gas operations nearby.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	FOR605	Technician	Martin Valvur	Site Visit Date	06/22/2016

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

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

The wind direction bearing torque could not be tested since it was not possible to remove the sensor from the tower without changing the sensor alignment.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID FOR605 **Technician** Martin Valvur **Site Visit Date** 06/22/2016

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

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

The temperature and relative humidity sensor is a combination sensor which cannot be submersed making it difficult to audit throughout a range of temperatures. The height of the temperature and humidity measurement is 1.2 meters above the ground.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	FOR605	Technician	Martin Valvur	Site Visit Date	06/22/2016

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		N/A
4	Describe dry dep sample tube.		3/8 teflon by 8 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?	☐	

Provide any additional 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 enclosure protecting the dry deposition filter pack is much smaller in diameter than the normal filter pack enclosure. The geometry of the enclosure may effect particulate collection making data not directly comparable to other CASTNET sites.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID FOR605 **Technician** Martin Valvur **Site Visit Date** 06/22/2016

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID FOR605 **Technician** Martin Valvur **Site Visit Date** 06/22/2016

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

1	Is the station log properly completed during every site visit?	☐	
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☐	
4	Are ozone z/s/p control charts properly completed and current?	☑	N/A

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

There is no documentation available at the site since there is no place to store documents. The site does not have a computer or shelter other than the small enclosure. The site operator completes a site checklist which remains in his vehicle. Information from the checklist is later filed at his office. Per instruction from ARS the COC portion of the SSRF is not being used.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	FOR605	Technician	Martin Valvur	Site Visit Date	06/22/2016

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	FOR605	Technician	Martin Valvur	Site Visit Date	06/22/2016

Site operation procedures

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

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

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

The dry deposition sample height is approximately 6 meters and not 10 meters. The observation section of the SSRF is not used. The site operator mentioned that he occasionally does not receive site support in a timely manner.

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

Site ID FOR605 **Technician** Martin Valvur **Site Visit Date** 06/22/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR1000	illegible	49922
elevation	Elevation	none	none	none
Flow Rate	AALBORG	GFMS-012446	196706-5	none
Infrastructure	Infrastructure	none	none	none
Precipitation	Handar	444A	2998	none
Relative Humidity	Vaisala	HMP45AC	Y3730020	none
siting criteria	Siting Criteria	none	None	none
Solar Radiation	Licor	LI-200	PY47986	none
Temperature2meter	Vaisala	HMP45AC	Y3730020	none
Wind Direction	Met One	024	J5213	illegible
Wind Speed	Met One	014	39022	none

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: 7/6/2016 9:24:49 AM

SiteVisitDate	Site	Technician
06/21/2016	BAS601	Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.95939	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.02332	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.4	%	**P**
5	Ozone % difference max	P	7	10	4	5.4	%	**P**

EEMS Spot Report

Data Compiled: 6/10/2016 10:58:12 AM

SiteVisitDate	Site	Technician
06/01/2016	CAN407	Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99509	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.50561	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.6	%	**P**
5	Ozone % difference max	P	7	10	4	2.6	%	**P**
6	Flow Rate average % difference	P	10	5	9	2.27	%	**P**
7	Flow Rate max % difference	P	10	5	9	2.56	%	**P**
8	DAS Time maximum error	P	0	5	1	0.33	min	**P**
9	DAS Voltage average error	P	12	0.003	49	0.0001	V	**P**
10	Shelter Temperature average error	P	5	2	15	0.83	c	**P**
11	Shelter Temperature max error	P	5	2	15	1.01	c	**P**

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The small parking lot at the visitors center is approximately 100m to the northeast.

2 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 7/11/2016 9:05:07 AM

SiteVisitDate	Site	Technician
04/19/2016	CHA467	Martin Valvur

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	0.14	c	**P**
3	Ozone Slope	P	0	1.1	4	0.97534	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.8701	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99990	unitless	**P**
6	Ozone % difference avg	P	1	10	4	4.8	%	**P**
7	Ozone % difference max	P	1	10	4	6.7	%	**P**
8	Flow Rate average % difference	P	10	5	9	0.55	%	**P**
9	Flow Rate max % difference	P	10	5	9	0.91	%	**P**
10	DAS Time maximum error	P	0	5	1	2.17	min	**P**
11	DAS Voltage average error	P	11	0.003	56	0.0003	V	**P**
12	Shelter Temperature average error	P	5	2	15	0.59	c	**P**
13	Shelter Temperature max error	P	5	2	15	1.21	c	**P**

SiteVisitDate	Site	Technician
04/19/2016	CHA467	Martin Valvur

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The site operator routinely reviews the previous week's data.

2 **Parameter:** SitingCriteriaCom

A large point source is located 40 km northwest of the site, just southwest of Wilcox.

3 **Parameter:** ShelterCleanNotes

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

4 **Parameter:** MetSensorComme

The temperature sensor is mounted on the south side of the meteorological tower.

EEMS Spot Report

Data Compiled: 7/6/2016 10:09:47 AM

SiteVisitDate	Site	Technician
04/01/2016	CHE185	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.97361	unitless	**P**
2	Ozone Intercept	P	0	5	4	1.6448	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99973	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.4	%	**P**
5	Ozone % difference max	P	7	10	4	6.2	%	**P**

EEMS Spot Report

Data Compiled: 7/11/2016 9:46:59 AM

SiteVisitDate	Site	Technician
04/13/2016	COW137	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	9	0.07	c	**P**
2	Temperature max error	P	4	0.5	9	0.14	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99229	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.03487	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.0	%	**P**
7	Ozone % difference max	P	7	10	4	1.4	%	**P**
8	Flow Rate average % difference	P	10	5	4	1.58	%	**P**
9	Flow Rate max % difference	P	10	5	4	2.03	%	**P**
10	DAS Time maximum error	P	0	5	1	0.65	min	**P**
11	DAS Voltage average error	P	7	0.003	49	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	12	0.30	c	**P**
13	Shelter Temperature max error	P	5	2	12	0.51	c	**P**

SiteVisitDate	Site	Technician
04/13/2016	COW137	Sandy Grenville

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** System Memo **CommentCode** 81

There is no plastic bag for the installed filter. The operator uses the received bag for the installed filter to ship the removed filter to the lab.

Field Systems Comments

1 **Parameter:** DasComments

One leg of the meteorological tower has two holes. The shelter heating and air conditioning systems are operating simultaneously.

2 **Parameter:** SitingCriteriaCom

Construction was completed on new building with a parking lot, in October 2004. The parking area is within 60 meters of the site.

3 **Parameter:** ShelterCleanNotes

The shelter is in fair condition with some rot near the air conditioner and at the bottom of the walls. It has degraded since the previous audit.

EEMS Spot Report

Data Compiled: 7/11/2016 10:11:58 AM

SiteVisitDate	Site	Technician
04/16/2016	DCP114	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.97443	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.55974	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.7	%	**P**
5	Ozone % difference max	P	7	10	4	2.1	%	**P**

EEMS Spot Report

Data Compiled: 7/11/2016 9:59:20 AM

SiteVisitDate	Site	Technician
04/14/2016	ESP127	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	12	0.23	c	**P**
2	Temperature max error	P	4	0.5	12	0.38	c	**P**
3	Ozone Slope	P	0	1.1	4	0.97500	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.63082	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.3	%	**P**
7	Ozone % difference max	P	7	10	4	2.1	%	**P**
8	Flow Rate average % difference	P	10	5	4	7.36	%	**Fail**
9	Flow Rate max % difference	P	10	5	4	7.36	%	**Fail**
10	DAS Time maximum error	P	0	5	1	0.68	min	**P**
11	DAS Voltage average error	P	7	0.003	49	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	12	0.69	c	**P**
13	Shelter Temperature max error	P	5	2	12	1.12	c	**P**

SiteVisitDate	Site	Technician
04/14/2016	ESP127	Sandy Grenville

Field Performance Comments

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

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

2 **Parameter:** Shelter Temperatur **SensorComponent:** System Memo **CommentCode** 215

The shelter thermostat for cooling has been bypassed and the air conditioning system is no longer being controlled by the shelter thermostat.

3 **Parameter:** Shelter Temperatur **SensorComponent:** System Memo **CommentCode** 214

The shelter heating and air conditioning systems are operating simultaneously.

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The shelter floor and roof are currently undergoing repairs.

EEMS Spot Report

Data Compiled: 7/11/2016 11:15:54 AM

SiteVisitDate	Site	Technician
06/22/2016	FOR605	Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	4	1.26	c	**Fail**
2	Temperature2meter max error	P	5	0.5	4	2.22	c	**Fail**
3	Wind Speed average error below 5m/s in m/s	P	3	0.5	4	0.09	m/s	**P**
4	Wind Speed max error below 5m/s in m/s	P	3	0.5	4	0.31	m/s	**P**
5	Wind Speed average % difference above 5 m/s	P	3	5	4	0.8	%	**P**
6	Wind Speed max % difference above 5 m/s	P	3	5	4	1.9	%	**P**
7	Wind Speed Torque average error	P	3	0.5	1	0.45	g-cm	**P**
8	Wind Speed Torque max error	P	3	0.5	1	0.5	g-cm	**Fail**
9	Wind Direction Input Deg True average error (de	P	2	5	4	12.5	degrees	**Fail**
10	Wind Direction Input Deg True max error (deg)	P	2	5	4	13	degrees	**Fail**
11	Relative Humidity average above 85%	P	6	10	1	2.1	%	**P**
12	Relative Humidity max above 85%	P	6	10	1	2.1	%	**P**
13	Relative Humidity average below 85%	P	6	10	3	0.5	%	**P**
14	Relative Humidity max below 85%	P	6	10	3	0.9	%	**P**
15	Solar Radiation % diff of avg	P	9	10	10	0.14	%	**P**
16	Solar Radiation % diff of max STD value	P	9	10	10	0.10	%	**P**
17	Precipitation average % difference	P	1	10	3	1.9	%	**P**
18	Precipitation max % difference	P	1	10	3	1.9	%	**P**
19	Flow Rate average % difference	P	10	5	3	2.9	%	**P**
20	Flow Rate max % difference	P	10	5	3	3.53	%	**P**
21	DAS Time maximum error	P	0	5	1	1.68	min	**P**
22	DAS Voltage average error	P	4	0.003	4	0.0000	V	**P**

SiteVisitDate	Site	Technician
06/22/2016	FOR605	Martin Valvur

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** System Memo **CommentCode** 77

The recorded flow rate data are accurate as recorded. The flow rate is not at the target flow rate.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The dry deposition sample height is approximately 6 meters and not 10 meters. The observation section of the SSRF is not used. The site operator mentioned that he occasionally does not receive site support in a timely manner.

2 **Parameter:** DocumentationCo

There is no documentation available at the site since there is no place to store documents. The site does not have a computer or shelter other than the small enclosure. The site operator completes a site checklist which remains in his vehicle. Information from the checklist is later filed at his office. Per instruction from ARS the COC portion of the SSRF is not being used.

3 **Parameter:** SitingCriteriaCom

The site is located in a wellfield with oil and gas operations nearby.

4 **Parameter:** ShelterCleanNotes

This is a small footprint site with instruments mounted in enclosure on tripod tower.

5 **Parameter:** PollAnalyzerCom

The enclosure protecting the dry deposition filter pack is much smaller in diameter than the normal filter pack enclosure. The geometry of the enclosure may effect particulate collection making data not directly comparable to other CASTNET sites.

6 **Parameter:** MetSensorComme

The wind direction bearing torque could not be tested since it was not possible to remove the sensor from the tower without changing the sensor alignment.

7 **Parameter:** MetOpMaintCom

The temperature and relative humidity sensor is a combination sensor which cannot be submersed making it difficult to audit throughout a range of temperatures. The height of the temperature and humidity measurement is 1.2 meters above the ground.

EEMS Spot Report

Data Compiled: 6/10/2016 12:01:50 PM

SiteVisitDate	Site	Technician
06/03/2016	GRB411	Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.95038	unitless	**P**
2	Ozone Intercept	P	0	5	4	-1.97991	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99957	unitless	**P**
4	Ozone % difference avg	P	7	10	4	9.7	%	**P**
5	Ozone % difference max	P	7	10	4	14.2	%	**Fail**
6	Flow Rate average % difference	P	10	5	9	1.21	%	**P**
7	Flow Rate max % difference	P	10	5	9	2.25	%	**P**
8	Shelter Temperature average error	P	5	2	15	0.66	c	**P**
9	Shelter Temperature max error	P	5	2	15	0.81	c	**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:** DasComments

A digital to analog test of the data logger could not be performed since there were no available channels on the logger to test.

2 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, The shelter floor has missing and crumbled tiles.

3 **Parameter:** PollAnalyzerCom

An ozone sample line test was performed which indicated a loss > 8% at 50 ppb in the sample line.

EEMS Spot Report

Data Compiled: 7/11/2016 9:25:03 AM

SiteVisitDate	Site	Technician
04/20/2016	GRC474	Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	9	0.07	c	**P**
2	Temperature max error	P	4	0.5	9	0.11	c	**P**
3	Ozone Slope	P	0	1.1	4	0.96775	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.55396	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	4.4	%	**P**
7	Ozone % difference max	P	7	10	4	5.7	%	**P**
8	Flow Rate average % difference	P	10	5	8	0.99	%	**P**
9	Flow Rate max % difference	P	10	5	8	1.29	%	**P**
10	DAS Time maximum error	P	0	5	1	0.18	min	**P**
11	DAS Voltage average error	P	12	0.003	56	0.0004	V	**P**
12	Shelter Temperature average error	P	5	2	15	0.71	c	**P**
13	Shelter Temperature max error	P	5	2	15	0.83	c	**P**

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 6/10/2016 9:41:44 AM

SiteVisitDate	Site	Technician
05/31/2016	MEV405	Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01172	unitless	**P**
2	Ozone Intercept	P	0	5	4	-1.62584	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99817	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.6	%	**P**
5	Ozone % difference max	P	7	10	4	6.3	%	**P**
6	Flow Rate average % difference	P	10	5	9	7.2	%	**Fail**
7	Flow Rate max % difference	P	10	5	9	8.94	%	**Fail**
8	DAS Time maximum error	P	0	5	1	3.00	min	**P**
9	DAS Voltage average error	P	7	0.003	28	0.0001	V	**P**
10	Shelter Temperature average error	P	5	2	15	0.21	c	**P**
11	Shelter Temperature max error	P	5	2	15	0.46	c	**P**

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

A large parking lot for park service employees is located approximately 30 meters north of the site.

2 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 7/11/2016 10:09:30 AM

SiteVisitDate	Site	Technician
04/16/2016	OXF122	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.98772	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.26958	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.4	%	**P**
5	Ozone % difference max	P	7	10	4	1.6	%	**P**

EEMS Spot Report

Data Compiled: 7/11/2016 9:32:27 AM

SiteVisitDate	Site	Technician
04/21/2016	PET427	Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	15	0.22	c	**P**
2	Temperature max error	P	4	0.5	15	0.27	c	**P**
3	Ozone Slope	P	0	1.1	4	0.97261	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.41686	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.5	%	**P**
7	Ozone % difference max	P	7	10	4	3.8	%	**P**
8	Flow Rate average % difference	P	11	5	4	1.12	%	**P**
9	Flow Rate max % difference	P	11	5	4	1.85	%	**P**
10	DAS Time maximum error	P	0	5	1	2.12	min	**P**
11	DAS Voltage average error	P	13	0.003	49	0.0005	V	**P**
12	Shelter Temperature average error	P	5	2	15	0.38	c	**P**
13	Shelter Temperature max error	P	5	2	15	0.76	c	**P**

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

completing the site observation section of the SSRF was discussed with the operator. The filter bag is used as a glove to remove and install the dry deposition filter pack.

2 **Parameter:** DasComments

The heating and air conditioning systems run simultaneously.

3 **Parameter:** DocumentationCo

The most recent calibration and maintenance report is not available onsite.

4 **Parameter:** ShelterCleanNotes

The shelter is dusty, but in good condition, well organized and maintained.

EEMS Spot Report

Data Compiled: 7/11/2016 9:01:18 AM

SiteVisitDate	Site	Technician
04/04/2016	PIN414	Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.03331	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.71228	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99990	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.1	%	**P**
5	Ozone % difference max	P	7	10	4	3.3	%	**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: 7/6/2016 8:41:22 AM

SiteVisitDate	Site	Technician
06/17/2016	PND165	Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.97932	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.7121	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99980	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.3	%	**P**
5	Ozone % difference max	P	7	10	4	8.7	%	**P**

Field Performance Comments

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

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

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

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

EEMS Spot Report

Data Compiled: 7/11/2016 10:14:33 AM

SiteVisitDate	Site	Technician
04/17/2016	QAK172	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.96998	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.98659	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.3	%	**P**
5	Ozone % difference max	P	7	10	4	2.1	%	**P**

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CHE185-Eric Hebert-04/01/2016						
1	4/1/2016	DAS	Environmental Sys Corp	73955	8832	A0656-b
2	4/1/2016	Ozone	Monitor Labs, Inc.	54901	ML9811	191
3	4/1/2016	Sample Tower	Aluma Tower	000054	B	AT-81213-T12
4	4/1/2016	Zero air pump	Ecotech	none	8301LC	01-0658

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Monitor Labs, Inc.	191	CHE185	Eric Hebert	04/01/2016	Ozone	54901

Slope:	0.97361	**Slope:**	0.00000
Intercept	1.64480	**Intercept**	0.00000
CorrCoff	0.99973	**CorrCoff**	0.00000

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

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.4%	6.2%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	1.00	1.28	3.10	ppb	
primary	2	26.95	27.10	28.78	ppb	6.20%
primary	3	49.15	49.19	47.91	ppb	-2.60%
primary	4	80.35	80.23	80.20	ppb	-0.04%
primary	5	106.69	106.44	105.50	ppb	-0.88%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	N/A	pass
Span	N/A	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	N/A	pass
Cell A Noise	N/A	pass
Cell A Flow	0.50 lpm	pass
Cell A Pressure	N/A	pass
Cell A Tmp.	N/A	pass
Cell B Freq.	N/A	pass
Cell B Noise	N/A	pass
Cell B Flow	N/A	pass
Cell B Pressure	N/A	pass
Cell B Tmp.	N/A	pass
Line Loss	~ 4%	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PIN414-Martin Valvur-04/04/2016						
1	4/4/2016	DAS	Environmental Sys Corp	90612	8816	2615
2	4/4/2016	Ozone	ThermoElectron Inc	90765	49C	49c-74530376
3	4/4/2016	Ozone Standard	ThermoElectron Inc	none	49C	0425208055
4	4/4/2016	Zero air pump	Werther International	none	PC 70/4	000706556

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49c-74530376	PIN414	Martin Valvur	04/04/2016	Ozone	90765

Slope:	1.03331	**Slope:**	0.00000
Intercept	-0.71228	**Intercept**	0.00000
CorrCoff	0.99990	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	0.99832	**Intercept**	-0.26452
Cert Date	1/29/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.2%	3.3%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.40	0.66	-0.42	ppb	
primary	2	27.77	28.08	28.10	ppb	0.07%
primary	3	49.72	50.06	51.70	ppb	3.28%
primary	4	79.94	80.33	82.90	ppb	3.20%
primary	5	109.80	110.24	112.50	ppb	2.05%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.90	pass
Span	0.999	pass
Zero Voltage	0.0002	pass
Fullscale Voltage	1.0004	pass
Cell A Freq.	71.7 kHz	pass
Cell A Noise	0.5 ppb	pass
Cell A Flow	0.79 lpm	pass
Cell A Pressure	719.4 mmHg	pass
Cell A Tmp.	30.4 C	pass
Cell B Freq.	51.7 kHz	pass
Cell B Noise	0.5 ppb	pass
Cell B Flow	0.79 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo	See comments	pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
DCP114-Sandy Grenville-04/16/2016						
1	4/16/2016	DAS	Campbell	000345	CR3000	2124
2	4/16/2016	Ozone	ThermoElectron Inc	000615	49i A1NAA	1009241787
3	4/16/2016	Ozone Standard	ThermoElectron Inc	000515	49i A3NAA	0922236891
4	4/16/2016	Zero air pump	Werther International	06939	PC70/4	000829175

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241787	DCP114	Sandy Grenville	04/16/2016	Ozone	000615

Slope:	0.97443	**Slope:**	0.00000
Intercept	0.55974	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

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

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.7%	2.1%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.01	0.34	1.05	ppb	
primary	2	30.02	30.49	29.95	ppb	-1.77%
primary	3	50.02	50.59	49.89	ppb	-1.38%
primary	4	79.94	80.65	79.35	ppb	-1.61%
primary	5	110.00	110.85	108.50	ppb	-2.12%

Sensor Component	Condition	Status
22.5 degree rule		pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.000	pass
Span	0.999	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	93.7 kHz	pass
Cell A Noise	1.0 ppb	pass
Cell A Flow	0.73 lpm	pass
Cell A Pressure	728.1 mmHg	pass
Cell A Tmp.	38.1 C	pass
Cell B Freq.	92.0 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.74 lpm	pass
Cell B Pressure	728.7 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
OXF122-Sandy Grenville-04/16/2016						
1	4/16/2016	DAS	Campbell	000425	CR3000	2528
2	4/16/2016	Ozone	ThermoElectron Inc	000737	49i A1NAA	1105347312
3	4/16/2016	Ozone Standard	ThermoElectron Inc	000372	49i A3NAA	0726124884
4	4/16/2016	Zero air pump	Werther International	06911	PC70/4	000829167

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347312	OXF122	Sandy Grenville	04/16/2016	Ozone	000737

Slope:	0.98772	**Slope:**	0.00000
Intercept	-0.26958	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

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

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.4%	1.7%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.01	0.34	-0.30	ppb	
primary	2	30.01	30.48	30.14	ppb	-1.12%
primary	3	50.03	50.60	50.01	ppb	-1.17%
primary	4	80.02	80.73	79.40	ppb	-1.65%
primary	5	109.95	110.80	109.00	ppb	-1.62%

Sensor Component	Condition	Status
22.5 degree rule		pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.50	pass
Span	1.023	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	99.8 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	707.1 mmHg	pass
Cell A Tmp.	33.6 C	pass
Cell B Freq.	100.9 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.75 lpm	pass
Cell B Pressure	707.7 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
QAK172-Sandy Grenville-04/17/2016						
1	4/17/2016	DAS	Campbell	000418	CR3000	2518
2	4/17/2016	Ozone	ThermoElectron Inc	000613	49i A1NAA	1009241783
3	4/17/2016	Ozone Standard	ThermoElectron Inc	000368	49i A3NAA	0726124682
4	4/17/2016	Zero air pump	Werther International	06870	PC70/4	000814278

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241783	QAK172	Sandy Grenville	04/17/2016	Ozone	000613

Slope:	0.96998	**Slope:**	0.00000
Intercept	0.98659	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

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

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.3%	2.1%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.01	0.34	1.41	ppb	
primary	2	29.99	30.46	30.43	ppb	-0.10%
primary	3	50.01	50.58	49.96	ppb	-1.23%
primary	4	80.01	80.72	79.39	ppb	-1.65%
primary	5	110.00	110.85	108.50	ppb	-2.12%

Sensor Component	Condition	Status
22.5 degree rule		pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.10	pass
Span	1.001	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	91.9 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	713.2 mmHg	pass
Cell A Tmp.	30.7 C	pass
Cell B Freq.	99.6 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	713.8 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PND165-Martin Valvur-06/17/2016					
1 6/17/2016	DAS	Campbell	000403	CR3000	2516
2 6/17/2016	Ozone	ThermoElectron Inc	000619	49i A1NAA	1009241791
3 6/17/2016	Ozone Standard	ThermoElectron Inc	000329	49i A3NAA	0622717853
4 6/17/2016	Sample Tower	Aluma Tower	000055	B	AT-81213-J12
5 6/17/2016	Zero air system	Teledyne	000773	701H	609

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241791	PND165	Martin Valvur	06/17/2016	Ozone	000619

Slope:	0.97932	**Slope:**	0.00000
Intercept	-0.71210	**Intercept**	0.00000
CorrCoff	0.99980	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	0.99832	**Intercept**	-0.26452
Cert Date	1/29/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
4.3%	8.7%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.61	0.87	0.96	ppb	
primary	2	30.66	30.97	28.27	ppb	-8.72%
primary	3	50.56	50.91	49.24	ppb	-3.28%
primary	4	74.66	75.05	73.11	ppb	-2.58%
primary	5	108.72	109.16	106.30	ppb	-2.62%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.6	pass
Span	1.033	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	102.2 kHz	pass
Cell A Noise	0.5 ppb	pass
Cell A Flow	1.45 lpm	Fail
Cell A Pressure	563.8 mmHg	pass
Cell A Tmp.	35.1 C	pass
Cell B Freq.	92.6 kHz	pass
Cell B Noise	0.7 ppb	pass
Cell B Flow	0.0 lpm	Fail
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	< 1 %	pass
System Memo	See comments	pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
BAS601-Martin Valvur-06/21/2016						
1	6/21/2016	DAS	Campbell	none	CR1000	41006
2	6/21/2016	Ozone	ThermoElectron Inc	L0534684	49i A1NAA	1214552973
3	6/21/2016	Ozone Standard	ThermoElectron Inc	none	49i E3CAA	1214552971
4	6/21/2016	Zero air pump	Thomas	none	107CAB18	100800033636

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1214552973	BAS601	Martin Valvur	06/21/2016	Ozone	L0534684

Slope:	0.95939	**Slope:**	0.00000
Intercept	0.02332	**Intercept**	0.00000
CorrCoff	0.99996	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	0.99832	**Intercept**	-0.26452
Cert Date	1/29/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
4.4%	5.4%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.38	0.64	1.04	ppb	
primary	2	29.67	29.98	28.37	ppb	-5.37%
primary	3	50.37	50.71	48.42	ppb	-4.52%
primary	4	73.64	74.02	71.14	ppb	-3.89%
primary	5	106.10	106.54	102.40	ppb	-3.89%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.4	pass
Span	1.024	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	100.8 kHz	pass
Cell A Noise	1.0 ppb	pass
Cell A Flow	0.65 lpm	pass
Cell A Pressure	643.3 mmHg	pass
Cell A Tmp.	49.3 C	pass
Cell B Freq.	81.9 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.70 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass