2013 – 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 June 2013, the network is comprised of 93 active rural sampling sites across the Untied States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Environment Canada, and several independent partners. AMEC is responsible for operating the EPA and Environment Canada sponsored sites, and Air Resource Specialist, Inc. (ARS) is responsible for operating the NPS sponsored sites.

1.2 Project Objectives

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

Performance audits verify that all evaluated variables are consistent with the accuracy goals as defined in the CASTNET Quality Assurance Project Plan (QAPP). The parameter specific accuracy goals are presented in Table 1. Only four EPA sponsored sites continue to operate meteorological sensors. Those sites are BEL116, BVL30, CHE185, and PAL190.

Table 1. Performance Audit Challenge and Acceptance Criteria

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Precipitation	Response	10 manual tips	1 DAS count per tip
Precipitation	Accuracy	2 introductions of known amounts of water	≤ ±10.0% of input amount
Relative Humidity	Accuracy	Compared to reference instrument or standard solution	≤ ±10.0% RH
Solar Radiation	Accuracy	Compared to WRR traceable standard	≤ ±10.0% of daytime average
Surface Wetness	Response	Distilled water spray mist	Positive response
Surface Wetness	Sensitivity	1% decade resistance	N/A
Temperature	Accuracy	Comparison to 3 NIST measured baths (~ 0° C, ambient, ~ full-scale)	≤ ± 0.5° C
Temperature Difference	Accuracy	Comparison to station temperature sensor	≤ ± 0.50° C
Wind Direction	Orientation Accuracy	Parallel to alignment rod/crossarm, or sighted to distant point	≤ ±5° from degrees true
Wind Direction	Linearity	Eight cardinal points on test fixture	≤ ±5° mean absolute error
Wind Direction	Response Threshold	Starting torque tested with torque gauge	< 10 g-cm Climatronics; < 20 g-cm R.M. Young
Wind Speed	Accuracy	Shaft rotational speed generated and measured with certified synchronous motor	≤ ±0.5 mps below 5.0 mps input; ≤ ±5.0% of input at or above 5.0 mps
Wind Speed	Starting Threshold	Starting torque tested with torque gauge	< 0.5 g-cm
Mass Flow Controller	Flow Rate	Comparison with Primary Standard	≤ ± 5.0% of designated rate
Ozone	Slope	Linear regression of multi-point test gas concentration as measured with a certified transfer standard	0.9000 ≤ m ≤ 1.1000
Ozone	Intercept		-5.0 ppb ≤ b ≤ 5.0 ppb
Ozone	Correlation Coefficient		0.9950 ≤ r
DAS	Accuracy	Comparison with certified standard	≤ ± 0.003 VDC

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

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

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

1.3 Sites Visited Second Quarter 2013

This report consists of the systems and performance audit results from the CASTNET sites audited during the first quarter (April through June) of 2013. The locations and dates of the audits are presented in Table 2.

Table 2. Site Audit Visits

Side ID	Audit Type	Sponsor	Site Visit Date	Station Name
CNT169	Audit w/o met	EPA	5/14/2013	Centennial
DCP114	Audit w/o met	EPA	4/22/2013	Deer Creek St. Park
GTH161	Audit w/o met	EPA	6/13/2013	Gothic

Side ID	**Audit Type**	**Sponsor**	**Site Visit Date**	**Station Name**
KNZ184	Audit w/o met	EPA	4//26/2013	Konza Prairie
LAV410	Audit with met	NPS	5/7/2013	Lassen Volcanic NP
OXF122	Audit w/o met	EPA	5/8/2013	Oxford
PIN414	Audit with met	NPS	4/11/2013	Pinnacles NM
PND165	Audit w/o met	EPA	5/12/2013	Pinedale
QAK172	Audit w/o met	EPA	5/9/2013	Quaker City
ROM206	Audit w/o met	EPA	6/11/2013	Rocky Mountain NP
ROM406	Audit with met	NPS	6/10/2013	Rocky Mountain NP (NPS)
SAN189	Audit w/o met	EPA	4/25/2013	Santee Sioux
SEK430	Audit with met	NPS	5/3/2013	Sequoia NP - Ash Mountain
YEL408	Audit with met	NPS	6/6/2013	Yellowstone NP
YOS404	Audit with met	NPS	5/1/2013	Yosemite NP

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

Table 3. Site Ozone PE Visits

Site ID	**Sponsor Agency**	**Site Location**	**Visit dates**
CAN407	NPS	Canyonlands NP	4/19/2013
CHA467	NPS	Chiricahua NM	4/1/1013
DEN417	NPS	Denali NP	6/15/2013
GRB411	EPA	Great Basin NP	4/16/2013
GRC474	NPS	Grand Canyon NP	4/4/2013
JOT403	NPS	Joshua Tree NP	4/8/2013
MCK231	EPA	Mackville (precision site)	5/18/2013
MEV405	NPS	Mesa Verde NP	4/18/2013
MOR409	NPS	Mount Rainier NP	6/17/2013
PET427	NPS	Petrified Forest NP	4/2/2013
PNF126	EPA	Cranberry	5/12/2013

1.4 Audit Results

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

One kilometer, five kilometer, and forty kilometer radius maps are only included for those sites not previously audited. Other photographs of site conditions are included within each systems report where necessary.

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

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

2.0 NADP Quarterly Report

2.1 Introduction

The National Atmospheric Deposition Program (NADP) operates three precipitation chemistry networks and two atmospheric concentration networks. The National Trends Network (NTN) has been measuring acidic precipitation since 1978. The network currently has more than 200 sites. The Atmospheric Integrated Research Monitoring Network (AIRMoN) began operation in 1992 and currently measures event based precipitation events at 7 sites. The Mercury Deposition Network (MDN) measures total mercury in precipitation samples from more than 100 stations. The MDN began operation in 1996 and includes sites throughout the US and Canada. The Atmospheric Mercury Network (AMNet) and the Ammonia Monitoring Network (AMoN) measure ambient concentrations of mercury and ammonia, respectively.

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

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

2.2 Project Objectives

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

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

2.3 Sites Visited Second Quarter 2013

This report covers the results from the NADP sites surveyed during the first quarter (April through June) of 2013. The station name and dates of the audits are presented in Table 4.

Table 4. Sites Surveyed – Second Quarter 2013

Side ID	Network	Survey Date	Station Name
AK01	NTN	6/14/2013	Poker Creek
AK03	NTN	6/15/2013	Denali National Park-Mt. McKinley
AK06	MDN/NTN	6/14/2013	Gates of the Arctic National Park - Bettles
AK97	NTN	6/9/2013	Katmai National Park-King Salmon
AK98	MDN	6/11/2013	Kodiak
AZ02	MDN	4/3/2013	Sycamore Canyon
CA20	MDN	5/9/2013	Yurok Tribe-Requa
CA42	NTN	4/10/2013	Tanbark Flat
CA45	NTN	5/6/2013	Hopland
CA50	NTN	4/28/2013	Sagehen Creek
CA66	NTN	4/11/2013	Pinnacles National Monument-Bear Valley
CA67	NTN/AMoN	4/8/2013	Joshua Tree National Park-Black Rock
CA75	MDN/NTN	5/3/2013	Sequoia National Park-Giant Forest
CA76	NTN	5/10/2013	Montague
CA88	NTN	4/30/2013	Davis
CA94	MDN/NTN	4/9/2013	Converse Flats
CA96	NTN	5/7/2013	Lassen Volcanic National Park-Manzanita Lake
CA99	NTN	5/1/2013	YosemiteNational Park - Hogdon Meadow
IN34	NTN	4/23/2013	Indiana Dunes National Lakeshore
KY35	NTN	5/7/2013	Clark State Fish Hatchery
MA01	MDN/NTN	5/21/2013	North Atlantic Coastal Lab
MA08	NTN	5/22/2013	Quabbin Reservoir
MD08	MDN/NTN/AMoN	5/10/2013	Piney Reservoir
MD15	NTN	5/28/2013	Smith Island
MD18	NTN	5/24/2013	Assateague Island National Seashore-Woodcock

Side ID	Network	Survey Date	Station Name
MT07	NTN	6/5/2013	Clancy
MT95	MDN	6/3/2013	Badger Peak
NY96	NTN	5/23/2013	Cedar Beach, Southold
OH17	NTN	5/8/2013	Delware
SC03	MDN/NTN	4/2/2013	Savannah River
TN00	AIRMoN	4/29/2013	Walker Branch Watershed
WA98	NTN	6/17/2013	Columbia River Gorge
WV05	NTN	4/20/2013	Cedar Creek State Park
WV18	NTN	4/19/2013	Parsons
WY00	NTN	5/14/2013	Snowy Range
WY02	NTN	5/15/2013	Sinks Canyon
WY06	NTN	5/12/2013	Pinedale
WY08	MDN/NTN	6/4/2013	Yellowstone National Park-Tower Falls
WY26	MDN	5/16/2013	Roundtop Mountain
WY95	NTN	5/14/2013	Brooklyn Lake
WY97	NTN	5/15/2013	South Pass City
WY98	NTN	5/13/2013	Gypsum Creek

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

PIN414-Eric Hebert-04/11/2013

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
1	4/11/2013	Computer	Gateway	none	Solo	unknown
2	4/11/2013	DAS	Environmental Sys Corp	90612	8816	2615
3	4/11/2013	Elevation	Elevation	None	1	None
4	4/11/2013	F460 translator	Climatronics	none	100163	788
5	4/11/2013	Filter pack flow pump	Thomas	none	107CA18	1088002897
6	4/11/2013	Flow Rate	Tylan	03385	FC280	AW9403017
7	4/11/2013	Infrastructure	Infrastructure	none	none	none
8	4/11/2013	MFC power supply	Tylan	03685	RO-32	FP9404005
9	4/11/2013	Modem	US Robotics	none	33.6 fax modem	unknown
10	4/11/2013	Ozone	ThermoElectron Inc	90765	49C	49c-74530376
11	4/11/2013	Ozone Standard	ThermoElectron Inc	90752	49C	49C-74532-376
12	4/11/2013	Precipitation	Climatronics	91040	100508-2	illegible
13	4/11/2013	Printer	Hewlett Packard	none	842C	unknown
14	4/11/2013	Relative Humidity	Vaisala	none	HMP45ASP	A1040016
15	4/11/2013	Sample Tower	Aluma Tower	928348	B	AT-5381-F9-3
16	4/11/2013	Shelter Temperature	ARS	none	none	none
17	4/11/2013	Siting Criteria	Siting Criteria	None	1	None
18	4/11/2013	Solar Radiation	Licor	none	LI-200	PY29490
19	4/11/2013	Solar Radiation Translator	Climatronics	none	100144	350
20	4/11/2013	Temperature	Climatronics	none	100093	missing
21	4/11/2013	Temperature Translator	Climatronics	none	100088-2	397
22	4/11/2013	Wind Direction	Climatronics	none	100076	1808
23	4/11/2013	Wind Speed	Climatronics	91053	100076	4559
24	4/11/2013	Zero air pump	Werther International	none	PC 70/4	000706555

DAS Data Form

DAS Time Max Error: 0.67

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2615	PIN414	Eric Hebert	04/11/2013	DAS	Primary

Das Date: 4 /11/2013
Das Time: 17:03:30
Das Day: 101

Audit Date 4 /11/2013
Audit Time 17:04:10
Audit Day 101

Low Channel:

Avg Diff: 0.0003
Max Diff: 0.0007

High Channel:

Avg Diff: 0.0001
Max Diff: 0.0002

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

Mfg Fluke
Parameter DAS
Serial Number 86590148
Tfer Desc. DVM
Tfer ID 01310
Slope 1.00000
Intercept 0.00000
Cert Date 1/27/2013
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
2	0.0000	0.0000	-0.0001	V	V	-0.0001
2	0.1000	0.1000	0.1000	V	V	0.0000
2	0.3000	0.3000	0.3001	V	V	0.0001
2	0.5000	0.5000	0.5003	V	V	0.0003
2	0.7000	0.7000	0.7004	V	V	0.0004
2	0.9000	0.9000	0.9005	V	V	0.0005
2	1.0000	1.0000	1.0007	V	V	0.0007
9	0.0000	0.0000	0.0000	V	V	0.0000
9	0.1000	0.1000	0.1002	V	V	0.0002
9	0.3000	0.3000	0.3000	V	V	0.0000
9	0.5000	0.5000	0.4999	V	V	-0.0001
9	0.7000	0.7000	0.7002	V	V	0.0002
9	0.9000	0.9000	0.8999	V	V	-0.0001
9	1.0000	1.0000	1.0002	V	V	0.0002

Flow Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
Tylan	AW9403017	PIN414	Eric Hebert	04/11/2013	Flow Rate	03385

Mfg	Tylan	
SN/Owner ID	FP9404005	03685
Parameter	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/8/2013	**CorrCoff**	1.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.11%	0.14%		

Cal Factor Zero	0
Cal Factor Full Scale	0
Rotometer Reading:	2.95

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalI	PctDifference:
primary	pump off	0.000	0.000	-0.53	-0.476	0.03	l/m	l/m	
primary	leak check	0.000	0.000	-0.53	-0.476	0.03	l/m	l/m	
primary	test pt 1	0.000	3.024	2.49	2.254	3.02	l/m	l/m	-0.14%
primary	test pt 2	0.000	3.023	2.49	2.254	3.02	l/m	l/m	-0.11%
primary	test pt 3	0.000	3.022	2.49	2.254	3.02	l/m	l/m	-0.07%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.0 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Fair	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass

Ozone Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
ThermoElectron Inc	49c-74530376	PIN414	Eric Hebert	04/11/2013	Ozone	90765

Slope:	0.98686	**Slope:**	0.00000
Intercept	0.13471	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

DAS 1: **DAS 2:**

A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.1%	1.7%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	0.99720	**Intercept**	0.18428
Cert Date	1/2/2013	**CorrCoff**	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.05	-0.13	-0.01	ppb	
primary	2	30.65	30.55	30.03	ppb	-1.70%
primary	3	49.69	49.64	49.40	ppb	-0.48%
primary	4	84.48	84.53	83.76	ppb	-0.91%
primary	5	109.50	109.62	108.10	ppb	-1.39%

Sensor Component	Cell B Noise	**Condition**	0.4 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	1.0016	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	Offset	**Condition**	1.2	**Status**	pass
Sensor Component	Span	**Condition**	1.002	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	72.1 kHz	**Status**	Fail
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.75 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	38.7 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	707 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.6 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	77.2 kHz	**Status**	Fail
Sensor Component	Cell A Flow	**Condition**	0.76 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	0.0006	**Status**	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	4559	PIN414	Eric Hebert	04/11/2013	Wind Speed	91053

Mfg Climatronics

SN/Owner ID 788 none

Parameter F460 translator

Prop or Cups SN 2333

Prop or Cups Torque 0.4 **to** 0.5

Prop Correction Fact N/A

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

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

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.01	0.28%		
Abs Max Er	0.03	0.33%		

UseDescription:	InputDevice:	Input RPM:	Input m/s:	Output V:	DAS m/s:	Diff/ %Diff:	Difference:
primary	00000	0	0.20	0.000	0.2		0.03
primary	00000	50	1.40	0.000	1.4		0.00
primary	00000	100	2.57	0.000	2.6		0.01
primary	00000	170	4.22	0.000	4.2		0.01
primary	00000	250	6.10	0.000	6.1	0.33%	
primary	00000	500	11.97	0.000	12.0	0.17%	
primary	00000	800	19.02	0.000	19.1	0.32%	
primary	00000	2000	47.22	0.000	47.4	0.30%	

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

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	1808	PIN414	Eric Hebert	04/11/2013	Wind Direction	none

Mfg Climatronics

SN/Owner ID 788 none

Parameter F460 translator

Vane SN: 3503

C. A. Align. deg. true: 3

VaneTorque 8 **to** 8

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

	DAS 1:		DAS 2:	
	Orientation	**Linearity:**	**Orientation**	**Linearity:**
Abs Avg Err	3.4	2.3		
Abs Max Er	6	6		

UseDescription:	TferID:	Input Raw:	Linearity	Output V:	Output Deg.:	Difference:	Change:	Error:
primary	01266	0	☑	0.000	0	0	46	1
primary	01266	45	☑	0.000	43	2	43	-2
primary	01266	90	☑	0.000	87	3	44	-1
primary	01266	135	☑	0.000	132	3	45	0
primary	01266	180	☑	0.000	183	3	51	6
primary	01266	225	☑	0.000	223	2	40	-5
primary	01266	270	☑	0.000	270	0	47	2
primary	01266	315	☑	0.000	314	1	44	-1
primary	01265	3	☐	0.000	0	3		3
primary	01265	93	☐	0.000	88	5		5
primary	01265	93	☐	0.000	87	6		6
primary	01265	183	☐	0.000	183	0		0
primary	01265	273	☐	0.000	270	3		3

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

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	missing	PIN414	Eric Hebert	04/11/2013	Temperature	none

Mfg Climatronics

SN/Owner ID 397 none

Parameter Temperature Translator

Mfg Extech **Parameter** Temperature

Serial Number H232679 **Tfer Desc.** RTD

Tfer ID 01228

Slope 1.00732 **Intercept** -0.12380

Cert Date 1/12/2013 **CorrCoff** 1.00000

DAS 1:		**DAS 2:**	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.08	0.11		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	-0.07	0.05	0.000	0.2	C	0.1
primary	Temp Mid Range	17.35	17.35	0.000	17.2	C	-0.11
primary	Temp High Range	45.87	45.66	0.000	45.7	C	0.02

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	A1040016	PIN414	Eric Hebert	04/11/2013	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	124432	**Tfer Desc.**	Hygroclip
Tfer ID	01225		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/29/2013	**CorrCoff**	1.00000

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	2.5	4.0		
Abs Max Er	4.2	4.0		

UseDesc.:	Test type:	Device:	Input RH:	GTL Raw:	RH Corr.:	DAS Volts:	DAS %RH:	Difference:
primary	RH Low Range	Hygroclip	32.8	30.3	32.8	0.320	32.0	-0.8
primary	RH Low Range	Hygroclip	52.9	48.9	52.9	0.487	48.7	-4.2
primary	RH High Range	Hygroclip	93.6	88.1	93.6	0.896	89.6	-4.0

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY29490	PIN414	Eric Hebert	04/11/2013	Solar Radiation	none

Mfg Climatronics

SN/Owner ID 350 none

Parameter Solar Radiation Translator

Mfg Eppley **Parameter** solar radiation

Serial Number 10765 **Tfer Desc.** SR transfer translat

Tfer ID 01246

Slope 1.00000 **Intercept** 0.00000

Cert Date 1/6/2010 **CorrCoff** 1.00000

Mfg Eppley **Parameter** solar radiation

Serial Number 34341F3 **Tfer Desc.** SR transfer sensor

Tfer ID 01245

Slope 1.00000 **Intercept** 0.00000

Cert Date 12/16/2010 **CorrCoff** 1.00000

DAS 1:		DAS 2:	
% Diff of Avg	%Diff of Max	%Diff of Avg	%Diff of Max
9.4%	9.0%	0.0%	0.0%

UseDescription:	Measure Date	MeasureTime	Tfer Corr:	DAS w/m2:	PctDifference:
primary	4/12/2013	6:00	59	66	11.9%
primary	4/12/2013	7:00	372	307	-17.5%
primary	4/12/2013	8:00	565	506	-10.4%
primary	4/12/2013	9:00	741	670	-9.6%
primary	4/12/2013	10:00	872	790	-9.4%
primary	4/12/2013	11:00	941	851	-9.6%
primary	4/12/2013	12:00	943	858	-9.0%
primary	4/12/2013	13:00	879	803	-8.6%
primary	4/12/2013	14:00	740	685	-7.4%

Sensor Component Sensor Level **Condition** 1/2 bubble off level **Status** pass

Sensor Component Sensor Clean **Condition** Clean **Status** pass

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

Sensor Component System Memo **Condition** **Status** pass

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	PIN414	Eric Hebert	04/11/2013	Precipitation	91040

DAS 1:

A Avg % Diff:	A Max % Di
2.0%	4.0%

DAS 2:

A Avg %Dif	A Max % Di

Mfg PMP

Parameter Precipitation

Serial Number EW-06134-50

Tfer Desc. 250ml graduate

Tfer ID 01250

Slope 1.00000

Intercept 0.00000

Cert Date 9/5/2005

CorrCoff 1.00000

UseDesc.	Test type:	TferVolume:	Iteration:	TimePerTip:	Eq.Ht:	DAS eng:	Eq.HtUnit:	OSE Unit:	TferUnits:	PctDifference
primary	tip check	10 manual	1	2 sec	1.00	1.00	mm	mm	ml	
primary	test 1	231.5	1	10 sec	5.00	5.00	mm	mm	ml	0.0%
primary	test 2	231.5	2	10 sec	5.00	4.80	mm	mm	ml	-4.0%

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

Infrastructure Data For

Site ID PIN414 **Technician** Eric Hebert **Site Visit Date** 04/11/2013

Shelter Make	**Shelter Model**	**Shelter Size**
Alan pre-fab	s/n 861168 1808	512 cuft

Sensor Component	Shelter Roof	**Condition**	Poor	**Status**	Fail
Sensor Component	Sample Tower Type	**Condition**	Type B	**Status**	pass
Sensor Component	Met Tower	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Trap	**Condition**	Not installed	**Status**	Fail
Sensor Component	Power Cables	**Condition**	Fair	**Status**	pass
Sensor Component	Rotometer	**Condition**	Installed	**Status**	pass
Sensor Component	Conduit	**Condition**	Fair	**Status**	pass
Sensor Component	Sample Tower	**Condition**	Good	**Status**	pass
Sensor Component	Shelter Condition	**Condition**	Poor	**Status**	Fail
Sensor Component	Shelter Floor	**Condition**	Poor	**Status**	Fail
Sensor Component	Shelter Temp Control	**Condition**	Functioning	**Status**	pass
Sensor Component	Signal Cable	**Condition**	Fair	**Status**	pass
Sensor Component	Tubing Type	**Condition**	1/2 inch Teflon	**Status**	pass
Sensor Component	Shelter Door	**Condition**	Good	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	PIN414	Eric Hebert	04/11/2013	Shelter Temperature	none

DAS 1:

Abs Avg Err	Abs Max Er
1.28	2.09

DAS 2:

Abs Avg Err	Abs Max Er

Mfg Extech

Parameter Shelter Temperatur

Serial Number H232679

Tfer Desc. RTD

Tfer ID 01228

Slope 1.00732

Intercept -0.12380

Cert Date 1/12/2013

CorrCoff 1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	20.17	20.15	0.000	22.2	C	2.09
primary	Temp Mid Range	24.51	24.45	0.000	23.4	C	-1.04
primary	Temp Mid Range	22.50	22.46	0.000	23.2	C	0.71

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	PIN414	Eric Hebert	04/11/2013	Cell B Freq.	ThermoElectron	2770	☐	☑
This analyzer diagnostic check is outside the manufacturer's recommended value.								
Ozone	PIN414	Eric Hebert	04/11/2013	Cell A Freq.	ThermoElectron	2770	☐	☑
This analyzer diagnostic check is outside the manufacturer's recommended value.								
Precipitation	PIN414	Eric Hebert	04/11/2013	Properly Sited	Climatronics	2767	☐	☑
Objects violate the 45 degree rule for the tipping bucket rain gage.								
Precipitation	PIN414	Eric Hebert	04/11/2013	Sensor Heater	Climatronics	2767	☐	☐
The tipping bucket rain gauge heater is not functioning.								
Wind Direction	PIN414	Eric Hebert	04/11/2013	Condition	Climatronics	3738	☐	☑
The upper and lower sections of the wind sensor body are loose. This condition will cause premature failure of the sensor and can affect data accuracy.								

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator reported that the flow pump is routinely turned on while the tower is down after the dry deposition filter is installed. She reported that she was instructed by ARS to operate the flow pump while the tower was in the down position to check for proper filter pack installation. It was discussed that this is not a proper check of filter installation since air flow could be going through the connector with the connector completely locked in place. The operator reported that the plastic bag is used to handle the filter and that gloves are not used. The site operator reported that the ozone inlet filter is changed while the dry deposition filter is still installed and exposed on the tower.

2 **Parameter:** SiteOpsProcedures

The site operator reviews data each week to ensure proper operation of sensors and instruments.

3 **Parameter:** ShelterCleanNotes

Shelter has some loose tiles and signs of a leak in the SW corner. It is somewhat cluttered with equipment that is unused and some that requires installation. The lighting is poor.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID PIN414 **Technician** Eric Hebert **Site Visit Date** 04/11/2013

Site Sponsor (agency)	NPS	**USGS Map**	North Chalone Peak
Operating Group	NPS	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**	36.4850
Deposition Measurement	dry, wet	**QAPP Longitude**	-121.1556
Land Use	woodland - scrub	**QAPP Elevation Meters**	335
Terrain	complex	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone	(831) 389-4586	**Audit Latitude**	36.483235
Site Address 1	5000 Hwy 146	**Audit Longitude**	-121.156876
Site Address 2		**Audit Elevation**	317
County	San Benito	**Audit Declination**	13.5
City, State	Paicines, CA		

			Present		
Zip Code	95043	**Fire Extinguisher**	☑	inspected 5/19/2012	
Time Zone	Pacific	**First Aid Kit**	☑		
Primary Operator		**Safety Glasses**	☑		
Primary Op. Phone #		**Safety Hard Hat**	☐		
Primary Op. E-mail		**Climbing Belt**	☐		
Backup Operator		**Security Fence**	☐		
Backup Op. Phone #		**Secure Shelter**	☑		
Backup Op. E-mail		**Stable Entry Step**	☑		

Shelter Working Room ☑ **Make** Alan pre-fab **Model** s/n 861168 1808 **Shelter Size** 512 cuft

Shelter Clean ☑ **Notes** Shelter has some loose tiles and signs of a leak in the SW corner. It is somewhat cluttered with equipment that is unused and some that requires installation. The lighting is poor.

Site OK ☑ **Notes**

Driving Directions From Hollister proceed south on route 25 to highway 146 and the entrance to Pinnacles National Monument. Turn west on 146 and continue to the fee station. Less than 1/2 mile from the fee station the site will be visible 100 yards from the road on the right up a hill.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID PIN414 **Technician** Eric Hebert **Site Visit Date** 04/11/2013

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form F-02058-1500-S3-rev001

Site ID PIN414 **Technician** Eric Hebert **Site Visit Date** 04/11/2013

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?	☑	1/2 bubble off level
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:

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID PIN414 **Technician** Eric Hebert **Site Visit Date** 04/11/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Precipitation	Climatronics	100508-2	illegible	91040
Solar Radiation	Licor	LI-200	PY29490	none
Relative Humidity	Vaisala	HMP45ASP	A1040016	none
Temperature	Climatronics	100093	missing	none
Wind Direction	Climatronics	100076	1808	none
Wind Speed	Climatronics	100076	4559	91053

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

Field Systems Data Form F-02058-1500-S5-rev001

Site ID PIN414 **Technician** Eric Hebert **Site Visit Date** 04/11/2013

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.		1/2 teflon by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☐	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	AT-5381-F9-3	928348
Ozone	ThermoElectron Inc	49C	49c-74530376	90765
MFC power supply	Tylan	RO-32	FP9404005	03685
Filter pack flow pump	Thomas	107CA18	1088002897	none
Zero air pump	Werther International	PC 70/4	000706555	none

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

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID PIN414

Technician Eric Hebert

Site Visit Date 04/11/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

11 Tower comments?

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Gateway	Solo	unknown	none
DAS	Environmental Sys Corp	8816	2615	90612
F460 translator	Climatronics	100163	788	none
Modem	US Robotics	33.6 fax modem	unknown	none
Printer	Hewlett Packard	842C	unknown	none
Solar Radiation Translator	Climatronics	100144	350	none
Temperature Translator	Climatronics	100088-2	397	none

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

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID PIN414 **Technician** Eric Hebert **Site Visit Date** 04/11/2013

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	DataView2	☑
SSRF	☑		☑
Site Ops Manual	☑	Jan 2006	☑
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?	☑	Dataview checklists
2	Are the Site Status Report Forms being completed and current?	☑	Flow section only
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID PIN414 **Technician** Eric Hebert **Site Visit Date** 04/11/2013

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Trained by previous operator, ARS provides updates semiannually
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 and semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	Every 2 weeks	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☑	As needed	☑
Analyzer Diagnostics Tests	☑	Alarm values only	☐
In-line Filter Replacement (at inlet)	☑	Every 2 weeks	☑
In-line Filter Replacement (at analyze	☐	N/A	☐
Sample Line Check for Dirt/Water	☐	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

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

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

The site operator reviews data each week to ensure proper operation of sensors and instruments.

Field Systems Data Form F-02058-1500-S9-rev001

Site ID PIN414 **Technician** Eric Hebert **Site Visit Date** 04/11/2013

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings 90%
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 and dataview checklists
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?	☑	Bag used as glove, gloves not used
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

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

The site operator reported that the flow pump is routinely turned on while the tower is down after the dry deposition filter is installed. She reported that she was instructed by ARS to operate the flow pump while the tower was in the down position to check for proper filter pack installation. It was discussed that this is not a proper check of filter installation since air flow could be going through the connector with the connector completely locked in place. The operator reported that the plastic bag is used to handle the filter and that gloves are not used. The site operator reported that the ozone inlet filter is changed while the dry deposition filter is still installed and exposed on the tower.

Site Inventory by Site Visit

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number
DCP114-Sandy Grenville-04/22/2013						
1	4/22/2013	DAS	Campbell	000345	CR3000	2124
2	4/22/2013	Elevation	Elevation	None	1	None
3	4/22/2013	Filter pack flow pump	Thomas	04926	107CAB18	100300020819
4	4/22/2013	Flow Rate	Apex	000659	AXMC105LPMDPCV	54748
5	4/22/2013	Infrastructure	Infrastructure	none	none	none
6	4/22/2013	Modem	Raven	06479	H4222-C	0808311283
7	4/22/2013	Ozone	ThermoElectron Inc	000732	49i A1NAA	1105347319
8	4/22/2013	Ozone Standard	ThermoElectron Inc	000545	49i A3NAA	0929938241
9	4/22/2013	Sample Tower	Aluma Tower	000030	B	AT-81056-J-4
10	4/22/2013	Shelter Temperature	Campbell	none	107-L	none
11	4/22/2013	Siting Criteria	Siting Criteria	None	1	None
12	4/22/2013	Temperature	RM Young	02828	41342	illegible
13	4/22/2013	Zero air pump	Werther International	06939	PC70/4	000829175

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2124	DCP114	Sandy Grenville	04/22/2013	DAS	Primary

Das Date: 4 /22/2013
Das Time: 14:31:37
Das Day: 112

Audit Date 4 /22/2013
Audit Time 14:31:37
Audit Day 112

Low Channel:

Avg Diff: 0.0001
Max Diff: 0.0001

High Channel:

Avg Diff: 0.0001
Max Diff: 0.0001

Mfg Datel
Parameter DAS
Serial Number 15510194
Tfer Desc. Source generator (D
Tfer ID 01320
Slope 1.00000
Intercept 0.00000
Cert Date 2/13/2012
CorrCoff 1.00000

Mfg Fluke
Parameter DAS
Serial Number 95740135
Tfer Desc. DVM
Tfer ID 01311
Slope 1.00000
Intercept 0.00000
Cert Date 1/26/2013
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0001	V	V	0.0001
7	0.1000	0.0999	0.1000	V	V	0.0001
7	0.3000	0.2998	0.2998	V	V	0.0000
7	0.5000	0.4997	0.4998	V	V	0.0001
7	0.7000	0.6997	0.6997	V	V	0.0000
7	0.9000	0.8996	0.8997	V	V	0.0001
7	1.0000	0.9994	0.9995	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	54748	DCP114	Sandy Grenville	04/22/2013	Flow Rate	000659

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	1.00000	**Intercept**	0.00000
Cert Date	6/13/2012	**CorrCoff**	1.00000
Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/27/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.64%	1.70%		

Cal Factor Zero -0.09

Cal Factor Full Scale 0.98

Rotometer Reading: 1.5

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalI	PctDifference:
primary	pump off	0.000	0.000	0.01	0.007	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.001	-0.02	l/m	l/m	
primary	test pt 1	1.541	1.524	1.53	1.518	1.50	l/m	l/m	-1.57%
primary	test pt 2	1.542	1.525	1.52	1.515	1.50	l/m	l/m	-1.64%
primary	test pt 3	1.543	1.526	1.52	1.518	1.50	l/m	l/m	-1.70%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	Not tested	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.0 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.0 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347319	DCP114	Sandy Grenville	04/22/2013	Ozone	000732

Slope:	0.99300	**Slope:**	0.00000
Intercept	0.92403	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

DAS 1: **DAS 2:**

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
1.0%	2.6%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00308	**Intercept**	-0.17961
Cert Date	4/2/2013	**CorrCoff**	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.00	0.17	1.17	ppb	
primary	2	31.00	31.08	31.90	ppb	2.64%
primary	3	50.74	50.76	51.09	ppb	0.65%
primary	4	80.16	80.09	80.30	ppb	0.26%
primary	5	103.74	103.60	104.00	ppb	0.39%

Sensor Component	Cell B Noise	**Condition**	0.5 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	< 1 %	**Status**	pass
Sensor Component	Offset	**Condition**	-0.60	**Status**	pass
Sensor Component	Span	**Condition**	0.998	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	99.5 kHz	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.73 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	36.6 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	725 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	113.8 kHz	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.74 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass

Temperature Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
RM Young	illegible	DCP114	Sandy Grenville	04/22/2013	Temperature	02828

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00435	**Intercept**	-0.08480
Cert Date	1/12/2013	**CorrCoff**	1.00000

DAS 1: **DAS 2:**

Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.13	0.15		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	-0.10	-0.02	0.000	0.1	C	0.1
primary	Temp Mid Range	24.51	24.49	0.000	24.6	C	0.15
primary	Temp High Range	48.36	48.23	0.000	48.4	C	0.13

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	Functioning	**Status**	pass
Sensor Component	Blower	**Condition**	Not functioning	**Status**	Fail
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

Infrastructure Data For

Site ID DCP114 **Technician** Sandy Grenville **Site Visit Date** 04/22/2013

Shelter Make	**Shelter Model**	**Shelter Size**
Ekto	8810 (s/n 2149-13)	640 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	DCP114	Sandy Grenville	04/22/2013	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.11	0.12		

Mfg	Extech	**Parameter**	Shelter Temperatur
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00435	**Intercept**	-0.08480
Cert Date	1/12/2013	**CorrCoff**	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	25.84	25.81	0.000	25.7	C	-0.1
primary	Temp Mid Range	25.14	25.12	0.000	25.0	C	-0.11
primary	Temp Mid Range	25.07	25.05	0.000	24.9	C	-0.12

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Temperature	DCP114	Sandy Grenville	04/22/2013	Blower	RM Young	1006	☐	☑

The forced-air blower for the shield is not functioning.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator is following procedures and doing a very good job with filter handling.

2 **Parameter:** DasComments

One leg of the meteorological sensor tower is damaged and has a hole near the midpoint of the tower.

3 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced and the sample line is leak-tested every two weeks.

4 **Parameter:** SitingCriteriaCom

The site is located in a wooded thicket within a state park. The area surrounding the park is almost completely intensive agriculture. The site may not be regionally representative.

5 **Parameter:** ShelterCleanNotes

The shelter is currently in fair condition. There are loose floor tiles. There are signs of rodent infestation.

6 **Parameter:** MetOpMaintCom

The blower for the aspirated temperature sensor shield is not functioning. This will affect sensor accuracy and data quality.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID DCP114 **Technician** Sandy Grenville **Site Visit Date** 04/22/2013

Site Sponsor (agency)	EPA	**USGS Map**	Mount Sterling
Operating Group	private / state	**Map Scale**	
AQS #	39-047-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	39.6358
Deposition Measurement	dry, wet	**QAPP Longitude**	-83.2600
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	267
Terrain	flat	**QAPP Declination**	6.25
Conforms to MLM	Marginally	**QAPP Declination Date**	2/23/2006
Site Telephone	(740) 869-4722	**Audit Latitude**	39.635888
Site Address 1	Waterloo Road	**Audit Longitude**	-83.260563
Site Address 2	Deer Creek State Park	**Audit Elevation**	264
County	Fayette	**Audit Declination**	-6.3
City, State	Mount Sterling, OH	**Present**	
Zip Code	43143	**Fire Extinguisher** ☑	No inspection date
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☑	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator	none	**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Shelter Working Room ☑ **Make** Ekto **Model** 8810 (s/n 2149-13) **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter is currently in fair condition. There are loose floor tiles. There are signs of rodent infestation.

Site OK ☑ **Notes**

Driving Directions From Circleville take 22/56 west. Stay on 22 through Williamsport. Turn right (north) onto route 207 and follow the signs for the park office and lodge. After crossing the river, turn right at the sign for the park office, golf course, and lodge. Continue approximately 1.5 miles and turn right again into the park. Go past the office and golf course and take the next right onto a stone road. Continue to the end and turn left. The site is on the left before the gas pipeline.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID DCP114 **Technician** Sandy Grenville **Site Visit Date** 04/22/2013

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

Siting Distances OK ☐

Siting Criteria Comment

The site is located in a wooded thicket within a state park. The area surrounding the park is almost completely intensive agriculture. The site may not be regionally representative.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID DCP114

Technician Sandy Grenville

Site Visit Date 04/22/2013

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

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

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID DCP114

Technician Sandy Grenville

Site Visit Date 04/22/2013

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	
2	Are all the meteorological sensors operational online, and reporting data?	☑	
3	Are the shields for the temperature and RH sensors clean?	☑	Moderately clean
4	Are the aspirated motors working?	☑	Not functioning
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	N/A
6	Is the surface wetness sensor grid clean and undamaged?	☑	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	☑	
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	☑	

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342	illegible	02828

Provide any additional 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 blower for the aspirated temperature sensor shield is not functioning. This will affect sensor accuracy and data quality.

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID DCP114 **Technician** Sandy Grenville **Site Visit Date** 04/22/2013

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?	☐	Small trees within 10 meters

Pollutant analyzers and deposition equipment operations and maintenance

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	AT-81056-J-4	000030
Filter pack flow pump	Thomas	107CAB18	100300020819	04926
Zero air pump	Werther International	PC70/4	000829175	06939
Ozone	ThermoElectron Inc	49i A1NAA	1105347319	000732

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

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID DCP114 **Technician** Sandy Grenville **Site Visit Date** 04/22/2013

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 are not grounded

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR3000	2124	000345
Modem	Raven	H4222-C	0808311283	06479

Provide any additional 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 sensor tower is damaged and has a hole near the midpoint of the tower.

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID DCP114

Technician Sandy Grenville

Site Visit Date 04/22/2013

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A
Wind speed sensor	☐	☐	☑
Wind direction sensor	☐	☐	☑
Temperature sensor	☐	☑	☐
Relative humidity sensor	☐	☐	☑
Solar radiation sensor	☐	☐	☑
Surface wetness sensor	☐	☐	☑
Wind sensor translator	☐	☐	☑
Temperature translator	☐	☐	☑
Humidity sensor translator	☐	☐	☑
Solar radiation translator	☐	☐	☑
Tipping bucket rain gauge	☐	☐	☑
Ozone analyzer	☑	☐	☐
Filter pack flow controller	☐	☑	☐
Filter pack MFC power supply	☐	☐	☑

	Yes	No	N/A
Data logger	☐	☑	☐
Data logger	☐	☐	☑
Strip chart recorder	☐	☐	☑
Computer	☑	☐	☐
Modem	☐	☑	☐
Printer	☐	☐	☑
Zero air pump	☐	☑	☐
Filter flow pump	☐	☑	☐
Surge protector	☐	☐	☑
UPS	☐	☐	☑
Lightning protection device	☐	☐	☑
Shelter heater	☐	☑	☐
Shelter air conditioner	☐	☑	☐

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☐		☐
HASP	☑	Nov 2009	☑
Field Ops Manual	☑	July 1990	☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☑
Preventive maintenance schedul	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID DCP114 **Technician** Sandy Grenville **Site Visit Date** 04/22/2013

Site operation procedures

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

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

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

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

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

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

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

The ozone inlet filter is replaced and the sample line is leak-tested every two weeks.

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID DCP114 **Technician** Sandy Grenville **Site Visit Date** 04/22/2013

Site operation procedures

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

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

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

The site operator is following procedures and doing a very good job with filter handling.

Site Inventory by Site Visit

Site Visit	Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
SAN189-Sandy Grenville-04/25/2013						
1	4/25/2013	Computer	Dell	000271	D520	unknown
2	4/25/2013	DAS	Campbell	000360	CR3000	2138
3	4/25/2013	Elevation	Elevation	None	1	None
4	4/25/2013	Filter pack flow pump	Thomas	06026	107CAB18	060400022659
5	4/25/2013	flow rate	Tylan	000174	FC280SAV	AW423006
6	4/25/2013	Infrastructure	Infrastructure	none	none	none
7	4/25/2013	MFC power supply	MACTEC	none	none	none
8	4/25/2013	Modem	Raven	06453	V4221-V	0808337397
9	4/25/2013	Ozone	ThermoElectron Inc	000740	49i A1NAA	1105347311
10	4/25/2013	Ozone Standard	ThermoElectron Inc	000444	49i A3NAA	CM08200020
11	4/25/2013	Sample Tower	Aluma Tower	000207	B	none
12	4/25/2013	Shelter Temperature	Campbell	none	107-L	223461
13	4/25/2013	Siting Criteria	Siting Criteria	None	1	None
14	4/25/2013	Temperature	RM Young	06537	41342VC	14798
15	4/25/2013	Zero air pump	Werther International	06875	C 70/4	000814272

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2138	SAN189	Sandy Grenville	04/25/2013	DAS	Primary

Das Date: 4 /25/2013
Das Time: 15:46:01
Das Day: 115

Audit Date 4 /25/2013
Audit Time 15:46:01
Audit Day 115

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

Mfg Datel
Parameter DAS
Serial Number 15510194
Tfer Desc. Source generator (D
Tfer ID 01320
Slope 1.00000
Intercept 0.00000
Cert Date 2/13/2012
CorrCoff 1.00000

Mfg Fluke
Parameter DAS
Serial Number 95740135
Tfer Desc. DVM
Tfer ID 01311
Slope 1.00000
Intercept 0.00000
Cert Date 1/26/2013
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	0.2999	0.2998	V	V	-0.0001
7	0.5000	0.4997	0.4997	V	V	0.0000
7	0.7000	0.6997	0.6996	V	V	-0.0001
7	0.9000	0.8996	0.8995	V	V	-0.0001
7	1.0000	0.9994	0.9993	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW423006	SAN189	Sandy Grenville	04/25/2013	flow rate	000174

Mfg MACTEC

SN/Owner ID none none

Parameter MFC power supply

Mfg BIOS **Parameter** Flow Rate

Serial Number 103471 **Tfer Desc.** nexus

Tfer ID 01420

Slope 1.00000 **Intercept** 0.00000

Cert Date 6/13/2012 **CorrCoff** 1.00000

Mfg BIOS **Parameter** Flow Rate

Serial Number 103424 **Tfer Desc.** BIOS cell

Tfer ID 01410

Slope 1.00000 **Intercept** 0.00000

Cert Date 1/27/2012 **CorrCoff** 1.00000

DAS 1: **DAS 2:**

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
1.13%	1.15%		

Cal Factor Zero -0.02

Cal Factor Full Scale 1.01

Rotometer Reading: 1.5

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalI	PctDifference:
primary	pump off	0.000	0.000	-0.11	-0.011	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	-0.11	-0.011	-0.03	l/m	l/m	
primary	test pt 1	3.121	2.966	2.82	2.816	3.00	l/m	l/m	1.15%
primary	test pt 2	3.121	2.966	2.82	2.817	3.00	l/m	l/m	1.15%
primary	test pt 3	3.121	2.968	2.82	2.816	3.00	l/m	l/m	1.08%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.5 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	3.5 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347311	SAN189	Sandy Grenville	04/25/2013	Ozone	000740

Slope:	0.95175	**Slope:**	0.00000
Intercept	1.21042	**Intercept**	0.00000
CorrCoff	0.99993	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.0%	3.6%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00308	**Intercept**	-0.17961
Cert Date	4/2/2013	**CorrCoff**	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.00	0.17	1.85	ppb	
primary	2	30.02	30.10	29.50	ppb	-1.99%
primary	3	51.62	51.64	49.76	ppb	-3.64%
primary	4	82.16	82.08	79.69	ppb	-2.91%
primary	5	101.29	101.15	97.60	ppb	-3.51%

Sensor Component	Cell B Noise	**Condition**	0.4 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	< 1 %	**Status**	pass
Sensor Component	Offset	**Condition**	-0.10	**Status**	pass
Sensor Component	Span	**Condition**	1.005	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	83.7 kHz	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.65 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	35.9 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	688 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.4 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	92.0 kHz	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.68 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass

Temperature Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
RM Young	14798	SAN189	Sandy Grenville	04/25/2013	Temperature	06537

Mfg Extech
Parameter Temperature
Serial Number H232734
Tfer Desc. RTD
Tfer ID 01227
Slope 1.00435
Intercept -0.08480
Cert Date 1/12/2013
CorrCoff 1.00000

DAS 1:		**DAS 2:**	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.11	0.24		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.32	0.40	0.000	0.5	C	0.09
primary	Temp Mid Range	24.20	24.18	0.000	24.2	C	-0.01
primary	Temp High Range	48.31	48.19	0.000	48.0	C	-0.24

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

Infrastructure Data For

Site ID SAN189 **Technician** Sandy Grenville **Site Visit Date** 04/25/2013

Shelter Make	**Shelter Model**	**Shelter Size**
Shelter One	E8109-26012	720 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	223461	SAN189	Sandy Grenville	04/25/2013	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.34	0.65		

Mfg Extech

Parameter Shelter Temperatur

Serial Number H232734

Tfer Desc. RTD

Tfer ID 01227

Slope 1.00435

Intercept -0.08480

Cert Date 1/12/2013

CorrCoff 1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	27.38	27.35	0.000	27.4	C	0.04
primary	Temp Mid Range	27.38	27.35	0.000	27.7	C	0.32
primary	Temp Mid Range	23.36	23.34	0.000	22.7	C	-0.65

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator was observed to be not completely familiar with all aspects of CASTNET site operation. Additional training is recommended. Flow rate leak checks are not performed although they are reported. The initial and final flow rates are not recorded correctly. These observations were reported following the previous audit.

2 **Parameter:** SiteOpsProcedures

CASTNET procedures including filter pack leak check and filter pack final flow rate are not being performed correctly. Additional training is recommended.

3 **Parameter:** ShelterCleanNotes

The shelter is in very good condition, however somewhat cluttered.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID SAN189 **Technician** Sandy Grenville **Site Visit Date** 04/25/2013

Site Sponsor (agency)	EPA
Operating Group	Santee Sioux Nation
AQS #	31-107-9991
Meteorological Type	R.M. Young
Air Pollutant Analyzer	Ozone, SO2, NOx, CO
Deposition Measurement	dry
Land Use	range
Terrain	rolling
Conforms to MLM	Yes
Site Telephone	(402) 857-2546
Site Address 1	SR S54D
Site Address 2	Santee Sioux Indian Reservation
County	Knox
City, State	Niobrara, NE
Zip Code	68760
Time Zone	Central
Primary Operator	
Primary Op. Phone #	
Primary Op. E-mail	
Backup Operator	
Backup Op. Phone #	
Backup Op. E-mail	

USGS Map	Santee
Map Scale	
Map Date	
QAPP Latitude	
QAPP Longitude	
QAPP Elevation Meters	429
QAPP Declination	
QAPP Declination Date	6/21/2006
Audit Latitude	42.829154
Audit Longitude	-97.854128
Audit Elevation	434
Audit Declination	5.0

	Present	
Fire Extinguisher	☑	No inspection date
First Aid Kit	☑	
Safety Glasses	☐	
Safety Hard Hat	☐	
Climbing Belt	☐	
Security Fence	☐	
Secure Shelter	☑	
Stable Entry Step	☑	

Shelter Working Room ☑ **Make** Shelter One **Model** E8109-26012 **Shelter Size** 720 cuft

Shelter Clean ☑ **Notes** The shelter is in very good condition, however somewhat cluttered.

Site OK ☑ **Notes**

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

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID SAN189 **Technician** Sandy Grenville **Site Visit Date** 04/25/2013

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID SAN189 **Technician** Sandy Grenville **Site Visit Date** 04/25/2013

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

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

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID SAN189 **Technician** Sandy Grenville **Site Visit Date** 04/25/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342VC	14798	06537

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

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID SAN189 **Technician** Sandy Grenville **Site Visit Date** 04/25/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	none	000207
MFC power supply	MACTEC	none	none	none
Ozone	ThermoElectron Inc	49i A1NAA	1105347311	000740
Filter pack flow pump	Thomas	107CAB18	060400022659	06026
Zero air pump	Werther International	C 70/4	000814272	06875

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

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID SAN189 **Technician** Sandy Grenville **Site Visit Date** 04/25/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

11 Tower comments?

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000271
DAS	Campbell	CR3000	2138	000360
Modem	Raven	V4221-V	0808337397	06453

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

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID SAN189 **Technician** Sandy Grenville **Site Visit Date** 04/25/2013

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 2005	☐
HASP	☑	Feb 2005	☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID SAN189 **Technician** Sandy Grenville **Site Visit Date** 04/25/2013

Site operation procedures

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

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

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

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

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

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

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

CASTNET procedures including filter pack leak check and filter pack final flow rate are not being performed correctly. Additional training is recommended.

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID SAN189 **Technician** Sandy Grenville **Site Visit Date** 04/25/2013

Site operation procedures

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

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

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

The site operator was observed to be not completely familiar with all aspects of CASTNET site operation. Additional training is recommended. Flow rate leak checks are not performed although they are reported. The initial and final flow rates are not recorded correctly. These observations were reported following the previous audit.

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
KNZ184-Sandy Grenville-04/26/2013						
1	4/26/2013	Computer	Dell	000278	D520	unknown
2	4/26/2013	DAS	Campbell	000361	CR3000	2139
3	4/26/2013	Elevation	Elevation	None	1	None
4	4/26/2013	Filter pack flow pump	Thomas	04925	107CAB18D	100300020744
5	4/26/2013	Flow Rate	Apex	000654	AXMC105LPMDPCV	54774
6	4/26/2013	Infrastructure	Infrastructure	none	none	none
7	4/26/2013	Modem	Raven	06478	V4221-V	0808311141
8	4/26/2013	Ozone	ThermoElectron Inc	000616	49i A1NAA	1009241781
9	4/26/2013	Ozone Standard	ThermoElectron Inc	000495	49i A3NAA	0622717849
10	4/26/2013	Sample Tower	Aluma Tower	missing	B	none
11	4/26/2013	Shelter Temperature	Campbell	none	107-L	none
12	4/26/2013	Siting Criteria	Siting Criteria	None	1	None
13	4/26/2013	Temperature	RM Young	04686	41342VC	6700
14	4/26/2013	Zero air pump	Werther International	000626	PC 70/4	000815300

DAS Data Form

DAS Time Max Error: 0

Mfg	**Serial Number**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Use Desc.**
Campbell	2139	KNZ184	Sandy Grenville	04/26/2013	DAS	Primary

Das Date: 4 /26/2013
Das Time: 17:37:25
Das Day: 116

Audit Date 4 /26/2013
Audit Time 17:37:25
Audit Day 116

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

Mfg Datel
Parameter DAS
Serial Number 15510194
Tfer Desc. Source generator (D
Tfer ID 01320
Slope 1.00000
Intercept 0.00000
Cert Date 2/13/2012
CorrCoff 1.00000

Mfg Fluke
Parameter DAS
Serial Number 95740135
Tfer Desc. DVM
Tfer ID 01311
Slope 1.00000
Intercept 0.00000
Cert Date 1/26/2013
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.1000	V	V	0.0001
7	0.3000	0.2998	0.2998	V	V	0.0000
7	0.5000	0.4997	0.4997	V	V	0.0000
7	0.7000	0.6997	0.6997	V	V	0.0000
7	0.9000	0.8996	0.8995	V	V	-0.0001
7	1.0000	0.9995	0.9994	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	54774	KNZ184	Sandy Grenville	04/26/2013	Flow Rate	000654

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	1.00000	**Intercept**	0.00000
Cert Date	6/13/2012	**CorrCoff**	1.00000

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

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.08%	0.13%		

Cal Factor Zero -0.01

Cal Factor Full Scale 1.01

Rotometer Reading: 3

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalI	PctDifference:
primary	pump off	0.000	0.000	0.00	0.002	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.006	0.00	l/m	l/m	
primary	test pt 1	3.048	2.994	2.96	2.954	2.99	l/m	l/m	-0.13%
primary	test pt 2	3.055	2.993	2.96	2.953	2.99	l/m	l/m	-0.10%
primary	test pt 3	3.051	2.990	2.96	2.948	2.99	l/m	l/m	0.00%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	360 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.5 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	6700	KNZ184	Sandy Grenville	04/26/2013	Temperature	04686

Mfg Extech **Parameter** Temperature

Serial Number H232734 **Tfer Desc.** RTD

Tfer ID 01227

Slope 1.00435 **Intercept** -0.08480

Cert Date 1/12/2013 **CorrCoff** 1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.17	0.19		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.04	0.12	0.000	0.3	C	0.17
primary	Temp Mid Range	27.26	27.23	0.000	27.4	C	0.14
primary	Temp High Range	48.58	48.45	0.000	48.6	C	0.19

Sensor Component Shield **Condition** Clean **Status** pass

Sensor Component Blower Status Switch **Condition** Functioning **Status** pass

Sensor Component Blower **Condition** Functioning **Status** pass

Sensor Component System Memo **Condition** **Status** pass

Infrastructure Data For

Site ID KNZ184 **Technician** Sandy Grenville **Site Visit Date** 04/26/2013

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

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

Shelter Temperature Data For

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
Campbell	none	KNZ184	Sandy Grenville	04/26/2013	Shelter Temperature	none

DAS 1:		**DAS 2:**	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.93	1.17		

Mfg	Extech	**Parameter**	Shelter Temperatur
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00435	**Intercept**	-0.08480
Cert Date	1/12/2013	**CorrCoff**	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	24.93	24.91	0.000	23.7	C	-1.17
primary	Temp Mid Range	26.84	26.81	0.000	25.9	C	-0.95
primary	Temp Mid Range	27.00	26.97	0.000	26.3	C	-0.67

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

One clean glove is used to handle the filter for removal and installation.

2 **Parameter:** SiteOpsProcedures

Ozone monitor not operating.

3 **Parameter:** SitingCriteriaCom

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

4 **Parameter:** ShelterCleanNotes

The shelter is very clean, neat, well organized and well maintained.

5 **Parameter:** PollAnalyzerCom

By request of the Kansas Department of Health and Environment, the site ozone monitor was not operating at the time of the site audit.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID KNZ184 **Technician** Sandy Grenville **Site Visit Date** 04/26/2013

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

			Present	
Zip Code	66502	**Fire Extinguisher**	☑	Inspected Feb 2002
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**	☑	

Shelter Working Room ☑ **Make** Wells Cargo **Model** EW1211 (s/n 1WC20 **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter is very clean, neat, well organized and well maintained.

Site OK ☑ **Notes**

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

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID KNZ184 **Technician** Sandy Grenville **Site Visit Date** 04/26/2013

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 at a Long Term Ecological Research site operated by KSU.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID KNZ184 **Technician** Sandy Grenville **Site Visit Date** 04/26/2013

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

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

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID KNZ184 **Technician** Sandy Grenville **Site Visit Date** 04/26/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342VC	6700	04686

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

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID KNZ184 **Technician** Sandy Grenville **Site Visit Date** 04/26/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	none	missing
Ozone	ThermoElectron Inc	49i A1NAA	1009241781	000616
Filter pack flow pump	Thomas	107CAB18D	100300020744	04925
Zero air pump	Werther International	PC 70/4	000815300	000626

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

By request of the Kansas Department of Health and Environment, the site ozone monitor was not operating at the time of the site audit.

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID KNZ184 **Technician** Sandy Grenville **Site Visit Date** 04/26/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

1 Do the DAS instruments appear to be in good condition and well maintained? ☑

2 Are all the components of the DAS operational? (printers, modem, backup, etc) ☑

3 Do the analyzer and sensor signal leads pass through lightning protection circuitry? ☑

4 Are the signal connections protected from the weather and well maintained? ☑

5 Are the signal leads connected to the correct DAS channel? ☑

6 Are the DAS, sensor translators, and shelter properly grounded? ☑

7 Does the instrument shelter have a stable power source? ☑

8 Is the instrument shelter temperature controlled? ☑

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

11 Tower comments?

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000278
DAS	Campbell	CR3000	2139	000361
Modem	Raven	V4221-V	0808311141	06478

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

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID KNZ184 **Technician** Sandy Grenville **Site Visit Date** 04/26/2013

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2001	☐
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID KNZ184 **Technician** Sandy Grenville **Site Visit Date** 04/26/2013

Site operation procedures

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

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

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

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

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

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

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

Ozone monitor not operating.

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID KNZ184 **Technician** Sandy Grenville **Site Visit Date** 04/26/2013

Site operation procedures

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

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

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

One clean glove is used to handle the filter for removal and installation.

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
YOS404-Eric Hebert-05/01/2013						
1	5/1/2013	DAS	Environmental Sys Corp	90645	8816	2558
2	5/1/2013	Elevation	Elevation	None	1	None
3	5/1/2013	F460 translator	Climatronics	none	100163	1101
4	5/1/2013	Filter pack flow pump	Thomas	00253	107CA18	0688001767
5	5/1/2013	flow rate	Tylan	none	FC280SAV	AW02213002
6	5/1/2013	Infrastructure	Infrastructure	none	none	none
7	5/1/2013	Met tower	unknown	none	unknown	none
8	5/1/2013	MFC power supply	Tylan	03870	RO-32	FP9508008
9	5/1/2013	Modem	US Robotics	none	V.92	unknown
10	5/1/2013	Ozone	ThermoElectron Inc	90763	49C	49C-74534-376
11	5/1/2013	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450190
12	5/1/2013	Precipitation	Climatronics	illegible	100508-2	illegible
13	5/1/2013	Relative Humidity	Rotronic	none	MP 601A	59018
14	5/1/2013	Sample Tower	Aluma Tower	none	B	none
15	5/1/2013	Shelter Temperature	ARS	none	none	none
16	5/1/2013	Siting Criteria	Siting Criteria	None	1	None
17	5/1/2013	Solar Radiation	Licor	none	LI-200	PY77051
18	5/1/2013	Solar Radiation Translator	RM Young	03184	70101-X	none
19	5/1/2013	Temperature	RM Young	none	41342	18748
20	5/1/2013	Wind Direction	Climatronics	90832	100076	4058
21	5/1/2013	Wind Speed	Climatronics	91022	100075	4088
22	5/1/2013	Zero air pump	Werther International	none	PC70/4	531397

DAS Data Form

DAS Time Max Error: 1.4

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2558	YOS404	Eric Hebert	05/01/2013	DAS	Primary

Das Date: 5 /2 /2013
Das Time: 11:15:24
Das Day: 122

Audit Date 5 /2 /2013
Audit Time 11:14:00
Audit Day 122

Low Channel:		**High Channel:**	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0000	0.0001	0.0001	0.0003

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

Mfg Fluke
Parameter DAS
Serial Number 86590148
Tfer Desc. DVM
Tfer ID 01310
Slope 1.00000
Intercept 0.00000
Cert Date 1/27/2013
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
6	0.0000	0.0000	0.0000	V	V	0.0000
6	0.1000	0.1000	0.1000	V	V	0.0000
6	0.3000	0.3000	0.3000	V	V	0.0000
6	0.5000	0.5000	0.5000	V	V	0.0000
6	0.7000	0.7000	0.7001	V	V	0.0001
6	0.9000	0.9001	0.9001	V	V	0.0000
6	1.0000	1.0001	1.0001	V	V	0.0000
15	0.0000	0.0000	0.0000	V	V	0.0000
15	0.1000	0.1000	0.0999	V	V	-0.0001
15	0.3000	0.3000	0.3001	V	V	0.0001
15	0.5000	0.5000	0.4999	V	V	-0.0001
15	0.7000	0.7000	0.6999	V	V	-0.0001
15	0.9000	0.9000	0.8997	V	V	-0.0003
15	1.0000	1.0000	0.9999	V	V	-0.0001

Flow Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
Tylan	AW02213002	YOS404	Eric Hebert	05/01/2013	flow rate	none

Mfg Tylan

SN/Owner ID FP9508008 03870

Parameter MFC power supply

Mfg BIOS

Parameter Flow Rate

Serial Number 122974

Tfer Desc. BIOS 220-H

Tfer ID 01416

Slope 1.00000

Intercept 0.00000

Cert Date 1/8/2013

CorrCoff 1.00000

DAS 1:

DAS 2:

A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.14%	3.22%		

Cal Factor Zero 0.28

Cal Factor Full Scale 10.88

Rotometer Reading: 3.45

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalI	PctDifference:
primary	pump off	0.000	0.000	-0.20	-0.1670	-0.07	l/m	l/m	
primary	leak check	0.000	0.000	-0.19	-0.1680	-0.06	l/m	l/m	
primary	test pt 1	0.000	3.086	1.26	1.2770	2.99	l/m	l/m	-3.10%
primary	test pt 2	0.000	3.090	1.26	1.2770	2.99	l/m	l/m	-3.22%
primary	test pt 3	0.000	3.086	1.26	1.2770	2.99	l/m	l/m	-3.11%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	135 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	- 1.0 cm	**Status**	Fail
Sensor Component	Filter Position	**Condition**	Poor	**Status**	Fail
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	3.5 cm	**Status**	pass

Ozone Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
ThermoElectron Inc	49C-74534-376	YOS404	Eric Hebert	05/01/2013	Ozone	90763

Slope:	1.00354	**Slope:**	0.00000
Intercept	-0.98519	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.3%	1.9%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	0.99720	**Intercept**	0.18428
Cert Date	1/2/2013	**CorrCoff**	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.65	0.46	-0.72	ppb	
primary	2	30.22	30.12	29.56	ppb	-1.86%
primary	3	49.95	49.90	48.96	ppb	-1.88%
primary	4	79.75	79.78	79.21	ppb	-0.71%
primary	5	109.60	109.72	109.00	ppb	-0.66%

Sensor Component	Cell B Noise	**Condition**	1.1 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	1.0031	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	Offset	**Condition**	0.3	**Status**	pass
Sensor Component	Span	**Condition**	1.012	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	85.1 kHz	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.62 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	36.5 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	621 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	2.0 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	78.6kHz	**Status**	Fail
Sensor Component	Cell A Flow	**Condition**	0.62 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	0.0044	**Status**	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	4088	YOS404	Eric Hebert	05/01/2013	Wind Speed	91022

Mfg	Climatronics	
SN/Owner ID	1101	none
Parameter	F460 translator	

Prop or Cups SN 2335

Prop or Cups Torque 0.3 **to** 0.3

Prop Correction Fact N/A

Mfg	RM Young	**Parameter**	wind speed
Serial Number		**Tfer Desc.**	wind speed motor (h
Tfer ID	01262		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/13/2010	**CorrCoff**	1.00000
Mfg	RM Young	**Parameter**	wind speed
Serial Number		**Tfer Desc.**	wind speed motor (l
Tfer ID	01261		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/13/2010	**CorrCoff**	1.00000

	DAS 1:		DAS 2:	
	Low Range	High Range	Low Range	High Range
Abs Avg Err	0.02	0.70%		
Abs Max Er	0.03	0.75%		

UseDescription:	InputDevice:	Input RPM:	Input m/s:	Output V:	DAS m/s:	Diff/ %Diff:	Difference:
primary	00000	0	0.20	0.0000	0.2		0.02
primary	00000	50	1.40	0.0000	1.4		-0.01
primary	00000	100	2.57	0.0000	2.6		-0.01
primary	00000	170	4.22	0.0000	4.2		-0.03
primary	00000	250	6.10	0.0000	6.1	-0.66%	
primary	00000	500	11.97	0.0000	11.9	-0.75%	
primary	00000	800	19.02	0.0000	18.9	-0.68%	
primary	00000	2000	47.22	0.0000	46.9	-0.70%	

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

Wind Direction Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
Climatronics	4058	YOS404	Eric Hebert	05/01/2013	Wind Direction	90832

Mfg Climatronics

SN/Owner ID 1101 none

Parameter F460 translator

Vane SN: 3063

C. A. Align. deg. true: 2

VaneTorque 8 **to** 8

Mfg Ushikata

Parameter wind direction

Serial Number 190037

Tfer Desc. transit

Tfer ID 01265

Slope 1.00000

Intercept 0.00000

Cert Date 1/4/2011

CorrCoff 1.00000

Mfg RM Young

Parameter wind direction

Serial Number

Tfer Desc. wind direction wheel

Tfer ID 01266

	DAS 1:		**DAS 2:**	
	Orientation	**Linearity:**	**Orientation**	**Linearity:**
Abs Avg Err	10.8	1.5		
Abs Max Er	13	4		

UseDescription:	TferID:	Input Raw:	Linearity	Output V:	Output Deg.:	Difference:	Change:	Error:
primary	01266	0	☑	0.0000	353	7	46	1
primary	01266	45	☑	0.0000	34	11	41	-4
primary	01266	90	☑	0.0000	79	11	45	0
primary	01266	135	☑	0.0000	124	11	45	0
primary	01266	180	☑	0.0000	172	8	48	3
primary	01266	225	☑	0.0000	215	10	43	-2
primary	01266	270	☑	0.0000	261	9	46	1
primary	01266	315	☑	0.0000	307	8	46	1
primary	01265	2	☐	0.0000	353	9		9
primary	01265	92	☐	0.0000	79	13		13
primary	01265	182	☐	0.0000	172	10		10
primary	01265	272	☐	0.0000	261	11		11

Sensor Component	Mast	**Condition**	Good	**Status**	pass
Sensor Component	Condition	**Condition**	Poor	**Status**	Fail
Sensor Component	Sensor Heater	**Condition**	Functioning	**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	Torque	**Condition**	Good	**Status**	pass
Sensor Component	Vane Condition	**Condition**	Poor	**Status**	Fail
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	18748	YOS404	Eric Hebert	05/01/2013	Temperature	none

Mfg Extech
Parameter Temperature
Serial Number H232679
Tfer Desc. RTD
Tfer ID 01228
Slope 1.00732
Intercept -0.12380
Cert Date 1/12/2013
CorrCoff 1.00000

DAS 1: Abs Avg Err	Abs Max Er	DAS 2: Abs Avg Err	Abs Max Er
0.05	0.12		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	-0.03	0.09	0.0000	0.1	C	-0.04
primary	Temp Mid Range	25.31	25.25	0.0000	25.3	C	0
primary	Temp High Range	47.26	47.04	0.0000	47.2	C	0.12

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Rotronic	59018	YOS404	Eric Hebert	05/01/2013	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	124432	**Tfer Desc.**	Hygroclip
Tfer ID	01225		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/29/2013	**CorrCoff**	1.00000

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	3.3	2.1		
Abs Max Er	4.3	2.1		

UseDesc.:	Test type:	Device:	Input RH:	GTL Raw:	RH Corr.:	DAS Volts:	DAS %RH:	Difference:
primary	RH Low Range	Hygroclip	32.8	34.8	32.8	0.3497	35.0	2.2
primary	RH Low Range	Hygroclip	52.9	55.1	52.9	0.5724	57.2	4.3
primary	RH High Range	Hygroclip	93.6	89.4	93.6	0.9574	95.7	2.1

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY77051	YOS404	Eric Hebert	05/01/2013	Solar Radiation	none

Mfg RM Young

SN/Owner ID none 03184

Parameter Solar Radiation Translator

Mfg Eppley **Parameter** solar radiation

Serial Number 10765 **Tfer Desc.** SR transfer translat

Tfer ID 01246

Slope 1.00000 **Intercept** 0.00000

Cert Date 1/6/2010 **CorrCoff** 1.00000

Mfg Eppley **Parameter** solar radiation

Serial Number 34341F3 **Tfer Desc.** SR transfer sensor

Tfer ID 01245

Slope 1.00000 **Intercept** 0.00000

Cert Date 12/16/2010 **CorrCoff** 1.00000

DAS 1:		**DAS 2:**	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
3.8%	4.8%	0.0%	0.0%

UseDescription:	Measure Date	MeasureTime	Tfer Corr:	DAS w/m2:	PctDifference:
primary	5/2/2013	8:00	668	651	-2.5%
primary	5/2/2013	9:00	840	809	-3.7%
primary	5/2/2013	10:00	962	919	-4.5%
primary	5/2/2013	11:00	1018	969	-4.8%
primary	5/2/2013	12:00	1007	960	-4.7%
primary	5/2/2013	13:00	933	896	-4.0%
primary	5/2/2013	14:00	802	776	-3.2%
primary	5/2/2013	15:00	622	610	-1.9%

Sensor Component Sensor Level **Condition** 1/2 bubble off level **Status** pass

Sensor Component Sensor Clean **Condition** Clean **Status** pass

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

Sensor Component System Memo **Condition** **Status** pass

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	YOS404	Eric Hebert	05/01/2013	Precipitation	illegible

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

DAS 1: A Avg % Diff:	DAS 1: A Max % Di	DAS 2: A Avg %Dif	DAS 2: A Max % Di
3.0%	4.0%		

UseDesc.	Test type:	TferVolume:	Iteration:	TimePerTip:	Eq.Ht:	DAS eng:	Eq.HtUnit:	OSE Unit:	TferUnits:	PctDifference
primary	tip check	10 manual	1	2 sec	1.00	1.00	mm	mm	ml	
primary	test 1	231.5	1	8 sec	5.00	4.80	mm	mm	ml	-4.0%
primary	test 2	231.5	2	10 sec	5.00	4.90	mm	mm	ml	-2.0%

Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Sensor Heater	**Condition**	Functioning	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	Gauge Drain Screen	**Condition**	Not installed	**Status**	Fail
Sensor Component	Level	**Condition**	Level	**Status**	pass
Sensor Component	Gauge Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Funnel Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Gauge Screen	**Condition**	Not installed	**Status**	Fail

Infrastructure Data For

Site ID YOS404 **Technician** Eric Hebert **Site Visit Date** 05/01/2013

Shelter Make	Shelter Model	Shelter Size
Ekto	8812 (s/n 3515-2)	768 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	YOS404	Eric Hebert	05/01/2013	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
2.83	3.60		

Mfg Extech

Parameter Shelter Temperatur

Serial Number H232679

Tfer Desc. RTD

Tfer ID 01228

Slope 1.00732

Intercept -0.12380

Cert Date 1/12/2013

CorrCoff 1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	24.40	24.35	0.000	26.5	C	2.11
primary	Temp Mid Range	24.69	24.63	0.000	27.4	C	2.78
primary	Temp Mid Range	24.71	24.65	0.000	21.1	C	-3.6

Site Visit Comments

<table>
<tr><th>Parameter</th><th>Site</th><th>Technician</th><th>S.V. Date</th><th>Component</th><th>Mfg</th><th>Serial No.</th><th>Hazard</th><th>Problem</th></tr>
<tr><td>Flow Rate</td><td>YOS404</td><td>Eric Hebert</td><td>05/01/2013</td><td>Filter Position</td><td>Tylan</td><td>1254</td><td>☐</td><td>☑</td></tr>
<tr><td colspan="9">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.</td></tr>
<tr><td>Ozone</td><td>YOS404</td><td>Eric Hebert</td><td>05/01/2013</td><td>Cell A Freq.</td><td>ThermoElectron</td><td>438</td><td>☐</td><td>☑</td></tr>
<tr><td colspan="9">This analyzer diagnostic check is outside the manufacturer's recommended value.</td></tr>
<tr><td>Wind Direction</td><td>YOS404</td><td>Eric Hebert</td><td>05/01/2013</td><td>Vane Condition</td><td>Climatronics</td><td>3750</td><td>☐</td><td>☑</td></tr>
<tr><td colspan="9">The wind direction vane is slightly bent and could be causing additional bias in wind direction measurements.</td></tr>
<tr><td>Wind Direction</td><td>YOS404</td><td>Eric Hebert</td><td>05/01/2013</td><td>Condition</td><td>Climatronics</td><td>3750</td><td>☐</td><td>☐</td></tr>
<tr><td colspan="9">The upper and lower sections of the wind sensor body are loose. This condition will cause premature failure of the sensor and can affect data accuracy.</td></tr>
<tr><td>Wind Speed</td><td>YOS404</td><td>Eric Hebert</td><td>05/01/2013</td><td>Condition</td><td>Climatronics</td><td>3751</td><td>☐</td><td>☐</td></tr>
<tr><td colspan="9">The upper and lower sections of the wind sensor body are loose. This condition will cause premature failure of the sensor and can affect data accuracy.</td></tr>
</table>

Field Systems Comments

1 **Parameter:** PollAnalyzerCom

The DAS full scale and zero factors for the ozone channel are set to 497 and -3 respectively. The usual settings are 500 and 0. This may not be a problem but it does contribute to the error observed during the ozone accuracy check. It is possible that polled data at the central polling station have different factors.

2 **Parameter:** ShelterCleanNotes

The site is neat, clean, and well organized.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	YOS404	**Technician**	Eric Hebert	**Site Visit Date**	05/01/2013

Site Sponsor (agency)	NPS	**USGS Map**		El Capitan
Operating Group	NPS	**Map Scale**		
AQS #	06-043-0003	**Map Date**		
Meteorological Type	Climatronics			
Air Pollutant Analyzer	Ozone, CO, NOx, IMPROVE	**QAPP Latitude**		37.7133
Deposition Measurement	dry	**QAPP Longitude**		-119.7061
Land Use	mountain top, woodland - evergreen	**QAPP Elevation Meters**		1605
Terrain	complex	**QAPP Declination**		
Conforms to MLM	Marginally	**QAPP Declination Date**		
Site Telephone	(209) 372-4411	**Audit Latitude**		37.713251
Site Address 1	Turtleback Dome	**Audit Longitude**		-119.706196
Site Address 2		**Audit Elevation**		1599
County	Mariposa	**Audit Declination**		13.5
City, State	Yosemite National Park, CA		**Present**	
Zip Code	95389	**Fire Extinguisher**	☐	Not present
Time Zone	Pacific	**First Aid Kit**	☐	
Primary Operator		**Safety Glasses**	☐	
Primary Op. Phone #		**Safety Hard Hat**	☐	
Primary Op. E-mail		**Climbing Belt**	☐	
Backup Operator		**Security Fence**	☐	
Backup Op. Phone #		**Secure Shelter**	☑	
Backup Op. E-mail		**Stable Entry Step**	☑	

Shelter Working Room ☑	**Make**	Ekto	**Model**	8812 (s/n 3515-2)	**Shelter Size**	768 cuft

Shelter Clean ☑ **Notes** The site is neat, clean, and well organized.

Site OK ☑ **Notes**

Driving Directions From Mariposa take route 140 into Yosemite. From the loop road, take route 41 toward Oakhurst. Continue uphill and through the tunnel. Approximately one mile past the tunnel look for a dirt road on the left. Continue approximately 1/2 mile past the gate to the communication station at the top of Turtleback Dome. The site is another 100 yards on the path behind the station.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID YOS404 **Technician** Eric Hebert **Site Visit Date** 05/01/2013

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form F-02058-1500-S3-rev001

Site ID YOS404 **Technician** Eric Hebert **Site Visit Date** 05/01/2013

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

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

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID YOS404 **Technician** Eric Hebert **Site Visit Date** 05/01/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Precipitation	Climatronics	100508-2	illegible	illegible
Relative Humidity	Rotronic	MP 601A	59018	none
Met tower	unknown	unknown	none	none
Wind Direction	Climatronics	100076	4058	90832
Wind Speed	Climatronics	100075	4088	91022
Temperature	RM Young	41342	18748	none
Solar Radiation	Licor	LI-200	PY77051	none

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

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID YOS404 **Technician** Eric Hebert **Site Visit Date** 05/01/2013

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?	☐	Not present
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	none	none
Ozone	ThermoElectron Inc	49C	49C-74534-376	90763
Filter pack flow pump	Thomas	107CA18	0688001767	00253
MFC power supply	Tylan	RO-32	FP9508008	03870
Zero air pump	Werther International	PC70/4	531397	none

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

The DAS full scale and zero factors for the ozone channel are set to 497 and -3 respectively. The usual settings are 500 and 0. This may not be a problem but it does contribute to the error observed during the ozone accuracy check. It is possible that polled data at the central polling station have different factors.

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID YOS404 **Technician** Eric Hebert **Site Visit Date** 05/01/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

11 Tower comments?

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Environmental Sys Corp	8816	2558	90645
F460 translator	Climatronics	100163	1101	none
Modem	US Robotics	V.92	unknown	none
Solar Radiation Translator	RM Young	70101-X	none	03184

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

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID YOS404 **Technician** Eric Hebert **Site Visit Date** 05/01/2013

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	DataView2	☑
SSRF	☑		☑
Site Ops Manual	☑	Jan 2006	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑	10/11/2012	☐
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 section only
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID YOS404 **Technician** Eric Hebert **Site Visit Date** 05/01/2013

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

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-rev001

Site ID YOS404 **Technician** Eric Hebert **Site Visit Date** 05/01/2013

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

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

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

Site Inventory by Site Visit

SEK430-Eric Hebert-05/03/2013

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
1	5/3/2013	Computer	Gateway	none	Solo	B2500251306
2	5/3/2013	DAS	Environmental Sys Corp	90649	8816	2562
3	5/3/2013	Elevation	Elevation	None	1	None
4	5/3/2013	Filter pack flow pump	Thomas	none	107CAB11A	109500000039
5	5/3/2013	flow rate	Tylan	03384	FC280AV	AW9403014
6	5/3/2013	Infrastructure	Infrastructure	none	none	none
7	5/3/2013	Met tower	Aluma Tower	none	B	none
8	5/3/2013	MFC power supply	Tylan	03679	RO-32	FP9403015
9	5/3/2013	Modem	US Robotics	none	56k	unknown
10	5/3/2013	Ozone	ThermoElectron Inc	90835	49C	0520012327
11	5/3/2013	Ozone Standard	ThermoElectron Inc	90729	49C	49C-90523-366
12	5/3/2013	Precipitation	Novalynx	none	260-2500	0977
13	5/3/2013	Printer	Hewlett Packard	none	842C	unknown
14	5/3/2013	Relative Humidity	Rotronic	none	MP 100	14103
15	5/3/2013	Shelter Temperature	ARS	none	none	none
16	5/3/2013	Shield (10 meter)	RM Young	90810	Aspirated 43408	none
17	5/3/2013	Siting Criteria	Siting Criteria	None	1	None
18	5/3/2013	Solar Radiation	Licor	none	LI-200	PY37610
19	5/3/2013	Solar Radiation Translator	RM Young	none	70101-X	none
20	5/3/2013	Temperature	RM Young	none	41342	8472
21	5/3/2013	Temperature Translator	RM Young	00819	41406-X	063143
22	5/3/2013	Wind Direction	RM Young	90850	AQ05103-5	59339wdr
23	5/3/2013	Wind Speed	RM Young	90850	AQ05103-5	59339wsp
24	5/3/2013	Zero air pump	Werther International	none	PC 70/4	627676

DAS Data Form

DAS Time Max Error: 0.33

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2562	SEK430	Eric Hebert	05/03/2013	DAS	Primary

Das Date: 5 /3 /2013
Das Time: 13:14:45
Das Day: 124

Audit Date 5 /3 /2013
Audit Time 13:14:25
Audit Day 124

Low Channel:

Avg Diff: 0.0002
Max Diff: 0.0004

High Channel:

Avg Diff: 0.0002
Max Diff: 0.0003

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

Mfg Fluke
Parameter DAS
Serial Number 86590148
Tfer Desc. DVM
Tfer ID 01310
Slope 1.00000
Intercept 0.00000
Cert Date 1/27/2013
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
2	0.0000	0.0000	0.0000	V	V	0.0000
2	0.1000	0.1000	0.1000	V	V	0.0000
2	0.3000	0.3000	0.3001	V	V	0.0001
2	0.5000	0.5000	0.5002	V	V	0.0002
2	0.7000	0.7000	0.7003	V	V	0.0003
2	0.9000	0.9000	0.9003	V	V	0.0003
2	1.0000	1.0000	1.0004	V	V	0.0004
9	0.0000	0.0000	0.0000	V	V	0.0000
9	0.1000	0.1000	0.1000	V	V	0.0000
9	0.3000	0.3000	0.3001	V	V	0.0001
9	0.5000	0.5000	0.5002	V	V	0.0002
9	0.7000	0.7000	0.7002	V	V	0.0002
9	0.9000	0.9000	0.9003	V	V	0.0003
9	1.0000	1.0001	1.0004	V	V	0.0003

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9403014	SEK430	Eric Hebert	05/03/2013	flow rate	03384

Mfg Tylan

SN/Owner ID FP9403015 03679

Parameter MFC power supply

Mfg BIOS

Parameter Flow Rate

Serial Number 122974

Tfer Desc. BIOS 220-H

Tfer ID 01416

Slope 1.00000

Intercept 0.00000

Cert Date 1/8/2013

CorrCoff 1.00000

DAS 1:

DAS 2:

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
0.20%	0.31%		

Cal Factor Zero 0.13

Cal Factor Full Scale 5.56

Rotometer Reading: 3.05

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalI	PctDifference:
primary	pump off	0.000	0.000	-0.08	-0.0570	0.07	l/m	l/m	
primary	leak check	0.000	0.000	-0.08	-0.0570	0.07	l/m	l/m	
primary	test pt 1	0.000	2.999	2.45	2.6370	2.99	l/m	l/m	-0.31%
primary	test pt 2	0.000	2.996	2.45	2.6370	2.99	l/m	l/m	-0.20%
primary	test pt 3	0.000	2.987	2.45	2.6370	2.99	l/m	l/m	0.09%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	360 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	- 0.5 cm	**Status**	Fail
Sensor Component	Filter Position	**Condition**	Poor	**Status**	Fail
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass
Sensor Component	Tubing Condition	**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	System Memo	**Condition**	See comments	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	0520012327	SEK430	Eric Hebert	05/03/2013	Ozone	90835

Slope:	0.98730	**Slope:**	0.00000
Intercept	0.82037	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

DAS 1:

DAS 2:

A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.9%	2.4%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	0.99720	**Intercept**	0.18428
Cert Date	1/2/2013	**CorrCoff**	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	-0.38	-0.56	0.16	ppb	
primary	2	24.51	24.39	24.97	ppb	2.38%
primary	3	54.75	54.71	54.91	ppb	0.37%
primary	4	83.46	83.50	83.33	ppb	-0.20%
primary	5	109.66	109.78	109.10	ppb	-0.62%

Sensor Component	Cell B Noise	**Condition**	1.1 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	0.9994	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	Offset	**Condition**	0.2	**Status**	pass
Sensor Component	Span	**Condition**	1.016	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	97.0 kHz	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.68 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	39.7 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	698 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	113.4 kHz	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.67 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	-0.0006	**Status**	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	59339wsp	SEK430	Eric Hebert	05/03/2013	Wind Speed	90850

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

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

Prop or Cups SN 62005

Prop or Cups Torque 0.4 **to** 0.4

Prop Correction Fact 0.0512

	DAS 1:		DAS 2:	
	Low Range	High Range	Low Range	High Range
Abs Avg Err	0.07	0.25%		
Abs Max Er	0.19	0.49%		

UseDescription:	InputDevice:	Input RPM:	Input m/s:	Output V:	DAS m/s:	Diff/ %Diff:	Difference:
primary	none	0	0.20	0.0000	0.0		-0.19
primary	01262	200	1.02	0.0000	1.0		0.02
primary	01262	400	2.05	0.0000	2.1		0.04
primary	01262	800	4.10	0.0000	4.1		0.03
primary	01262	1200	6.14	0.0000	6.2	0.49%	
primary	01262	2400	12.29	0.0000	12.3	0.24%	
primary	01262	4000	20.48	0.0000	20.5	0.20%	
primary	01262	9400	48.13	0.0000	48.2	0.06%	

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

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	59339wdr	SEK430	Eric Hebert	05/03/2013	Wind Direction	90850

Mfg Ushikata **Parameter** wind direction

Serial Number 190037 **Tfer Desc.** transit

Tfer ID 01265

Slope 1.00000 **Intercept** 0.00000

Cert Date 1/4/2011 **CorrCoff** 1.00000

Mfg RM Young **Parameter** wind direction

Serial Number **Tfer Desc.** wind direction wheel

Tfer ID 01266

Vane SN: N/A **C. A. Align. deg. true:** 1

VaneTorque 14 **to** 14

	DAS 1:		DAS 2:	
	Orientation	**Linearity:**	**Orientation**	**Linearity:**
Abs Avg Err	2.8	1.8		
Abs Max Er	5	3		

UseDescription:	TferID:	Input Raw:	Linearity	Output V:	Output Deg.:	Difference:	Change:	Error:
primary	01266	0	☑	0.0000	356	4	42	-3
primary	01266	45	☑	0.0000	44	1	48	3
primary	01266	90	☑	0.0000	88	2	44	-1
primary	01266	135	☑	0.0000	132	3	44	-1
primary	01266	180	☑	0.0000	180	0	48	3
primary	01266	225	☑	0.0000	223	2	43	-2
primary	01266	270	☑	0.0000	269	1	46	1
primary	01266	315	☑	0.0000	314	1	45	0
primary	01265	1	☐	0.0000	356	5		5
primary	01265	91	☐	0.0000	88	3		3
primary	01265	181	☐	0.0000	180	1		1
primary	01265	271	☐	0.0000	269	2		2

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

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	8472	SEK430	Eric Hebert	05/03/2013	Temperature	none

Mfg	RM Young	
SN/Owner ID	063143	00819
Parameter	Temperature Translator	

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00732	**Intercept**	-0.12380
Cert Date	1/12/2013	**CorrCoff**	1.00000

DAS 1: Abs Avg Err	DAS 1: Abs Max Er	DAS 2: Abs Avg Err	DAS 2: Abs Max Er
0.13	0.21		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.14	0.26	0.0000	0.1	C	-0.21
primary	Temp Mid Range	19.46	19.44	0.0000	19.3	C	-0.11
primary	Temp High Range	44.08	43.88	0.0000	43.8	C	-0.08

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	Blower	**Condition**	Not functioning	**Status**	Fail
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

Humidity Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
Rotronic	14103	SEK430	Eric Hebert	05/03/2013	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	124432	**Tfer Desc.**	Hygroclip
Tfer ID	01225		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/29/2013	**CorrCoff**	1.00000

	DAS 1:		**DAS 2:**	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	2.0	2.0		
Abs Max Er	2.9	2.0		

UseDesc.:	Test type:	Device:	Input RH:	GTL Raw:	RH Corr.:	DAS Volts:	DAS %RH:	Difference:
primary	RH Low Range	Hygroclip	32.8	33.8	32.8	0.3178	31.8	-1.0
primary	RH Low Range	Hygroclip	52.9	51.4	52.9	0.4995	50.0	-2.9
primary	RH High Range	Hygroclip	93.6	89.9	93.6	0.9163	91.6	-2.0

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY37610	SEK430	Eric Hebert	05/03/2013	Solar Radiation	none

Mfg RM Young

SN/Owner ID none none

Parameter Solar Radiation Translator

DAS 1:		**DAS 2:**	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
1.7%	2.2%	0.0%	0.0%

Mfg Eppley **Parameter** solar radiation

Serial Number 10765 **Tfer Desc.** SR transfer translat

Tfer ID 01246

Slope 1.00000 **Intercept** 0.00000

Cert Date 1/6/2010 **CorrCoff** 1.00000

Mfg Eppley **Parameter** solar radiation

Serial Number 34341F3 **Tfer Desc.** SR transfer sensor

Tfer ID 01245

Slope 1.00000 **Intercept** 0.00000

Cert Date 12/16/2010 **CorrCoff** 1.00000

UseDescription:	Measure Date	MeasureTime	Tfer Corr:	DAS w/m2:	PctDifference:
primary	5/3/2013	16:00	349	388	11.2%
primary	5/4/2013	9:00	757	773	2.1%
primary	5/4/2013	10:00	913	893	-2.2%

Sensor Component Sensor Level **Condition** Not tested **Status** pass

Sensor Component Sensor Clean **Condition** Clean **Status** pass

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

Sensor Component System Memo **Condition** **Status** pass

Precipitation Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
Novalynx	0977	SEK430	Eric Hebert	05/03/2013	Precipitation	none

DAS 1:

A Avg % Diff:	**A Max % Di**
4.7%	5.5%

DAS 2:

A Avg %Dif	**A Max % Di**

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

UseDesc.	Test type:	TferVolume:	Iteration:	TimePerTip:	Eq.Ht:	DAS eng:	Eq.HtUnit:	OSE Unit:	TferUnits:	PctDifference
primary	tip check	10 manual	1	3 sec	2.50	2.50	mm	mm	ml	
primary	test 1	231.5	1	10 sec	7.14	6.86	mm	mm	ml	-3.9%
primary	test 2	563	1	10 sec	14.28	13.49	mm	mm	ml	-5.5%

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

Infrastructure Data For

Site ID SEK430 **Technician** Eric Hebert **Site Visit Date** 05/03/2013

Shelter Make	**Shelter Model**	**Shelter Size**
Alan pre-fab	s/n 861166 1808	512 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	SEK430	Eric Hebert	05/03/2013	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
1.42	1.50		

Mfg Extech

Parameter Shelter Temperatur

Serial Number H232679

Tfer Desc. RTD

Tfer ID 01228

Slope 1.00732

Intercept -0.12380

Cert Date 1/12/2013

CorrCoff 1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	23.06	23.02	0.000	24.4	C	1.37
primary	Temp Mid Range	22.97	22.93	0.000	24.4	C	1.5
primary	Temp Mid Range	23.10	23.06	0.000	24.5	C	1.39

Site Visit Comments

<table>
<tr><th>Parameter</th><th>Site</th><th>Technician</th><th>S.V. Date</th><th>Component</th><th>Mfg</th><th>Serial No.</th><th>Hazard</th><th>Problem</th></tr>
<tr><td>Flow Rate</td><td>SEK430</td><td>Eric Hebert</td><td>05/03/2013</td><td>Filter Position</td><td>Tylan</td><td>1414</td><td>☐</td><td>☑</td></tr>
<tr><td colspan="9">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.</td></tr>
<tr><td>Precipitation</td><td>SEK430</td><td>Eric Hebert</td><td>05/03/2013</td><td>Sensor Heater</td><td>Novalynx</td><td>1409</td><td>☐</td><td>☑</td></tr>
<tr><td colspan="9">The tipping bucket rain gauge heater is not functioning.</td></tr>
<tr><td>Precipitation</td><td>SEK430</td><td>Eric Hebert</td><td>05/03/2013</td><td>Properly Sited</td><td>Novalynx</td><td>1409</td><td>☐</td><td>☑</td></tr>
<tr><td colspan="9">Objects violate the 45 degree rule for the tipping bucket rain gage.</td></tr>
<tr><td>Temperature</td><td>SEK430</td><td>Eric Hebert</td><td>05/03/2013</td><td>Blower</td><td>RM Young</td><td>1405</td><td>☐</td><td>☑</td></tr>
<tr><td colspan="9">The forced-air blower for the shield is not functioning.</td></tr>
</table>

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is a wooded area with spaced trees on three sides and a steep drop in elevation on the west side. Although not strictly conforming to siting criteria it is elevated in a wide valley and representative of the area. Some trees have been trimmed since the previous site audit. Trees are still within 5 meters, however none are higher than the CASTNET sample inlets.

2 **Parameter:** ShelterCleanNotes

The shelter is aging but is in fair condition and kept clean, neat, and well organized.

3 **Parameter:** MetSensorComme

The rain gauge is mounted near the tower.

4 **Parameter:** MetOpMaintCom

The temperature sensor aspirated shield blower is not functioning which will impact temperature data accuracy.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID SEK430 **Technician** Eric Hebert **Site Visit Date** 05/03/2013

Site Sponsor (agency) NPS
Operating Group NPS
AQS # 06-107-0009
Meteorological Type R.M. Young
Air Pollutant Analyzer Ozone, IMPROVE, BAM
Deposition Measurement dry
Land Use woodland - mixed
Terrain complex
Conforms to MLM Marginally
Site Telephone
Site Address 1 Southern Sierra Research Center
Site Address 2 Highway 198
County Tulare
City, State Sequoia National Park, CA
Zip Code 93262
Time Zone Pacific
Primary Operator
Primary Op. Phone #
Primary Op. E-mail
Backup Operator
Backup Op. Phone #
Backup Op. E-mail

USGS Map Case Mountain
Map Scale
Map Date
QAPP Latitude
QAPP Longitude
QAPP Elevation Meters
QAPP Declination
QAPP Declination Date
Audit Latitude 36.489469
Audit Longitude -118.829153
Audit Elevation 510
Audit Declination 13.1

	Present	
Fire Extinguisher	☑	Inspected May 2012
First Aid Kit	☐	
Safety Glasses	☐	
Safety Hard Hat	☑	
Climbing Belt	☐	
Security Fence	☐	
Secure Shelter	☑	
Stable Entry Step	☑	

Shelter Working Room ☑ **Make** Alan pre-fab **Model** s/n 861166 1808 **Shelter Size** 512 cuft
Shelter Clean ☑ **Notes** The shelter is aging but is in fair condition and kept clean, neat, and well organized.
Site OK ☑ **Notes**

Driving Directions From highway 99 take 198 east through Three Rivers. Continue approximately 7 miles to the entrance to Sequoia National Park. Less than one mile past the Fee both, take the first paved road to the right at the Southern Sierra Research Center. The site is on the hill behind the center.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID SEK430 **Technician** Eric Hebert **Site Visit Date** 05/03/2013

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	40 m	☐
Tree line	50 m	5 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☐

Siting Criteria Comment

The site is a wooded area with spaced trees on three sides and a steep drop in elevation on the west side. Although not strictly conforming to siting criteria it is elevated in a wide valley and representative of the area. Some trees have been trimmed since the previous site audit. Trees are still within 5 meters, however none are higher than the CASTNET sample inlets.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID SEK430 **Technician** Eric Hebert **Site Visit Date** 05/03/2013

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

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

The rain gauge is mounted near the tower.

Field Systems Data Form F-02058-1500-S4-rev001

Site ID SEK430 **Technician** Eric Hebert **Site Visit Date** 05/03/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Met tower	Aluma Tower	B	none	none
Solar Radiation	Licor	LI-200	PY37610	none
Precipitation	Novalynx	260-2500	0977	none
Temperature	RM Young	41342	8472	none
Shield (10 meter)	RM Young	Aspirated 43408	none	90810
Wind Direction	RM Young	AQ05103-5	59339wdr	90850
Wind Speed	RM Young	AQ05103-5	59339wsp	90850
Relative Humidity	Rotronic	MP 100	14103	none

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

The temperature sensor aspirated shield blower is not functioning which will impact temperature data accuracy.

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID SEK430 **Technician** Eric Hebert **Site Visit Date** 05/03/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 16 meters
4	Describe dry dep sample tube.		3/8 teflon by 15 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Parameter	Manufacturer	Model	S/N	Client ID
Ozone	ThermoElectron Inc	49C	0520012327	90835
Filter pack flow pump	Thomas	107CAB11A	109500000039	none
MFC power supply	Tylan	RO-32	FP9403015	03679
Zero air pump	Werther International	PC 70/4	627676	none

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

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID SEK430 **Technician** Eric Hebert **Site Visit Date** 05/03/2013

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?	☐	The shelter ground may not be adequate
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? The met sensors are mounted on the sample tower.

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Gateway	Solo	B2500251306	none
DAS	Environmental Sys Corp	8816	2562	90649
Modem	US Robotics	56k	unknown	none
Printer	Hewlett Packard	842C	unknown	none
Solar Radiation Translator	RM Young	70101-X	none	none
Temperature Translator	RM Young	41406-X	063143	00819

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

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID SEK430 **Technician** Eric Hebert **Site Visit Date** 05/03/2013

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A
Wind speed sensor	☐	☑	☐
Wind direction sensor	☐	☑	☐
Temperature sensor	☐	☑	☐
Relative humidity sensor	☐	☑	☐
Solar radiation sensor	☐	☑	☐
Surface wetness sensor	☐	☑	☐
Wind sensor translator	☐	☑	☐
Temperature translator	☐	☑	☐
Humidity sensor translator	☐	☐	☑
Solar radiation translator	☐	☑	☐
Tipping bucket rain gauge	☐	☑	☐
Ozone analyzer	☑	☐	☐
Filter pack flow controller	☐	☑	☐
Filter pack MFC power supply	☐	☑	☐

	Yes	No	N/A
Data logger	☑	☐	☐
Data logger	☐	☐	☑
Strip chart recorder	☐	☐	☑
Computer	☐	☑	☐
Modem	☐	☑	☐
Printer	☐	☑	☐
Zero air pump	☐	☑	☐
Filter flow pump	☐	☑	☐
Surge protector	☐	☐	☑
UPS	☐	☐	☑
Lightning protection device	☐	☐	☑
Shelter heater	☐	☑	☐
Shelter air conditioner	☑	☐	☐

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

	Present		Current
Station Log	☑	DataView2	☑
SSRF	☑		☑
Site Ops Manual	☑	Jan 2006	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☐	Not available on-site	☐
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?	☑	SSRFs are reviewed before sending
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID SEK430 **Technician** Eric Hebert **Site Visit Date** 05/03/2013

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID SEK430

Technician Eric Hebert

Site Visit Date 05/03/2013

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 and observation sections only
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

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

Site Inventory by Site Visit

Site Visit Date		***Parameter***	***Mfg***	***Owner ID***	***Model Number***	***Serial Number***
LAV410-Eric Hebert-05/07/2013						
1	5/7/2013	Computer	Gateway	0019275982	Solo	B52500251350
2	5/7/2013	DAS	Environmental Sys Corp	90535	8816	2026
3	5/7/2013	Elevation	Elevation	None	1	None
4	5/7/2013	F460 translator	Climatronics	00853	100163	unknown
5	5/7/2013	Filter pack flow pump	Thomas	00253	107CA18	0688001767
6	5/7/2013	flow rate	Tylan	03379	FC280AV	AW9403023
7	5/7/2013	Infrastructure	Infrastructure	none	none	none
8	5/7/2013	Mainframe	Climatronics	none	100081	1377
9	5/7/2013	Mainframe power supply	Climatronics	none	101074	858
10	5/7/2013	Met tower	Rohn	none	unknown	none
11	5/7/2013	MFC power supply	Tylan	03684	RO-32	FP9404003
12	5/7/2013	Modem	US Robotics	none	56k	unknown
13	5/7/2013	Ozone	ThermoElectron Inc	90834	49C	49C-520012-328
14	5/7/2013	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1030745083
15	5/7/2013	Precipitation	Texas Electronics	none	TR-525i-HT	20895-398
16	5/7/2013	Printer	Hewlett Packard	none	842C	unknown
17	5/7/2013	Relative Humidity	Rotronic	none	MP 601A	52062
18	5/7/2013	Sample Tower	Aluma Tower	923314	B	AT-5324-F6-O
19	5/7/2013	Shelter Temperature	ARS	none	none	003
20	5/7/2013	Shield (10 meter)	Climatronics	01199	100325	1290
21	5/7/2013	Siting Criteria	Siting Criteria	None	1	None
22	5/7/2013	Solar Radiation	Licor	none	LI-200	PY49113
23	5/7/2013	Solar Radiation Translator	Climatronics	none	100144	391
24	5/7/2013	Temperature	Climatronics	03794	100093	ARS101
25	5/7/2013	Temperature Translator	Climatronics	03629	100088-2	398
26	5/7/2013	Wind Direction	Climatronics	90831	100076	1494
27	5/7/2013	Wind Speed	Climatronics	90843	100075	4265
28	5/7/2013	Zero air pump	Werther International	none	PC70/4	434533

DAS Data Form

DAS Time Max Error: 0.15

Mfg	**Serial Number**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Use Desc.**
Environmental Sys	2026	LAV410	Eric Hebert	05/07/2013	DAS	Primary

Das Date: 5 /7 /2013
Das Time: 15:09:00
Das Day: 127

Audit Date 5 /7 /2013
Audit Time 15:09:09
Audit Day 127

Low Channel:		**High Channel:**	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0000	0.0001	0.0001	0.0002

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

Mfg Fluke
Parameter DAS
Serial Number 86590148
Tfer Desc. DVM
Tfer ID 01310
Slope 1.00000
Intercept 0.00000
Cert Date 1/27/2013
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
2	0.0000	0.0000	0.0000	V	V	0.0000
2	0.1000	0.1000	0.1000	V	V	0.0000
2	0.3000	0.3001	0.3001	V	V	0.0000
2	0.5000	0.5001	0.5001	V	V	0.0000
2	0.7000	0.7002	0.7001	V	V	-0.0001
2	0.9000	0.9002	0.9001	V	V	-0.0001
2	1.0000	1.0003	1.0002	V	V	-0.0001
9	0.0000	0.0000	0.0000	V	V	0.0000
9	0.1000	0.1000	0.1000	V	V	0.0000
9	0.3000	0.3001	0.3000	V	V	-0.0001
9	0.5000	0.5001	0.5000	V	V	-0.0001
9	0.7000	0.7002	0.7001	V	V	-0.0001
9	0.9000	0.9002	0.9000	V	V	-0.0002
9	1.0000	1.0003	1.0003	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9403023	LAV410	Eric Hebert	05/07/2013	flow rate	03379

Mfg Tylan

SN/Owner ID FP9404003 03684

Parameter MFC power supply

Mfg BIOS

Parameter Flow Rate

Serial Number 122974

Tfer Desc. BIOS 220-H

Tfer ID 01416

Slope 1.00000

Intercept 0.00000

Cert Date 1/8/2013

CorrCoff 1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
1.13%	1.26%		

Cal Factor Zero 0.32

Cal Factor Full Scale 5.9

Rotometer Reading: 4.3

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalI	PctDifference:
primary	pump off	0.000	0.000	-0.34	-0.2790	0.01	l/m	l/m	
primary	leak check	0.000	0.000	-0.32	-0.2560	0.03	l/m	l/m	
primary	test pt 1	0.000	2.963	2.40	2.4030	3.00	l/m	l/m	1.26%
primary	test pt 2	0.000	2.965	2.40	2.4030	3.00	l/m	l/m	1.18%
primary	test pt 3	0.000	2.972	2.40	2.4030	3.00	l/m	l/m	0.95%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	- 1.0 cm	**Status**	Fail
Sensor Component	Filter Position	**Condition**	Poor	**Status**	Fail
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-520012-328	LAV410	Eric Hebert	05/07/2013	Ozone	90834

Slope:	0.98219	**Slope:**	0.00000
Intercept	1.20291	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.0%	2.1%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	0.99720	**Intercept**	0.18428
Cert Date	1/2/2013	**CorrCoff**	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.18	0.00	1.29	ppb	
primary	2	29.23	29.12	29.72	ppb	2.06%
primary	3	50.74	50.69	51.10	ppb	0.81%
primary	4	82.58	82.62	82.05	ppb	-0.69%
primary	5	115.13	115.26	114.60	ppb	-0.57%

Sensor Component	Cell B Noise	**Condition**	Not tested	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	Not tested	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	Offset	**Condition**	0.000	**Status**	pass
Sensor Component	Span	**Condition**	1.002	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	67 kHz	**Status**	Fail
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.63 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	34.4 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	608 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	Not tested	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	64 kHz	**Status**	Fail
Sensor Component	Cell A Flow	**Condition**	0.63 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	Not tested	**Status**	pass

Wind Speed Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
Climatronics	4265	LAV410	Eric Hebert	05/07/2013	Wind Speed	90843

Mfg Climatronics

SN/Owner ID unknown 00853

Parameter F460 translator

Prop or Cups SN 573

Prop or Cups Torque 0.3 **to** 0.3

Prop Correction Fact N/A

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

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

	DAS 1:		**DAS 2:**	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.01	0.10%		
Abs Max Er	0.03	0.25%		

UseDescription:	InputDevice:	Input RPM:	Input m/s:	Output V:	DAS m/s:	Diff/ %Diff:	Difference:
primary	none	0	0.20	0.0000	0.2		0.00
primary	01261	50	1.40	0.0000	1.4		0.00
primary	01261	100	2.57	0.0000	2.6		0.03
primary	01261	170	4.22	0.0000	4.2		-0.02
primary	01261	250	6.10	0.0000	6.1	0.00%	
primary	01262	500	11.97	0.0000	12.0	0.25%	
primary	01262	800	19.02	0.0000	19.0	-0.11%	
primary	01262	2000	47.22	0.0000	47.2	-0.04%	

Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	Functioning	**Status**	pass
Sensor Component	Prop or Cups Condition	**Condition**	Poor	**Status**	Fail
Sensor Component	Condition	**Condition**	Fair	**Status**	pass
Sensor Component	Torque	**Condition**	Good	**Status**	pass

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	1494	LAV410	Eric Hebert	05/07/2013	Wind Direction	90831

Mfg Climatronics

SN/Owner ID unknown 00853

Parameter F460 translator

Vane SN: 3946

C. A. Align. deg. true: 0

VaneTorque 5 **to** 10

Mfg Ushikata **Parameter** wind direction

Serial Number 190037 **Tfer Desc.** transit

Tfer ID 01265

Slope 1.00000 **Intercept** 0.00000

Cert Date 1/4/2011 **CorrCoff** 1.00000

Mfg RM Young **Parameter** wind direction

Serial Number **Tfer Desc.** wind direction wheel

Tfer ID 01266

	DAS 1:		DAS 2:	
	Orientation	Linearity:	Orientation	Linearity:
Abs Avg Err	3.3	2.0		
Abs Max Er	5	4		

UseDescription:	TferID:	Input Raw:	Linearity	Output V:	Output Deg.:	Difference:	Change:	Error:
primary	01266	0	☑	0.0000	2	2	41	-4
primary	01266	45	☑	0.0000	46	1	44	-1
primary	01266	90	☑	0.0000	92	2	46	1
primary	01266	135	☑	0.0000	138	3	46	1
primary	01266	180	☑	0.0000	184	4	46	1
primary	01266	225	☑	0.0000	226	1	42	-3
primary	01266	270	☑	0.0000	275	5	49	4
primary	01266	315	☑	0.0000	321	6	46	1
primary	01265	0	☐	0.0000	2	2		2
primary	01265	90	☐	0.0000	92	2		2
primary	01265	180	☐	0.0000	184	4		4
primary	01265	270	☐	0.0000	275	5		5

Sensor Component Mast **Condition** Good **Status** pass

Sensor Component Condition **Condition** Poor **Status** Fail

Sensor Component Sensor Heater **Condition** Functioning **Status** pass

Sensor Component Sensor Plumb **Condition** Plumb **Status** pass

Sensor Component Torque **Condition** Good **Status** pass

Sensor Component Vane Condition **Condition** Good **Status** pass

Sensor Component System Memo **Condition** See comments **Status** pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	ARS101	LAV410	Eric Hebert	05/07/2013	Temperature	03794

Mfg Climatronics

SN/Owner ID 398 03629

Parameter Temperature Translator

Mfg Extech

Parameter Temperature

Serial Number H232679

Tfer Desc. RTD

Tfer ID 01228

Slope 1.00732

Intercept -0.12380

Cert Date 1/12/2013

CorrCoff 1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.15	0.34		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.05	0.17	0.0000	0.2	C	0.04
primary	Temp Mid Range	20.25	20.23	0.0000	20.2	C	-0.08
primary	Temp High Range	47.91	47.68	0.0000	47.3	C	-0.34

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

Humidity Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
Rotronic	52062	LAV410	Eric Hebert	05/07/2013	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	124432	**Tfer Desc.**	Hygroclip
Tfer ID	01225		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/29/2013	**CorrCoff**	1.00000

	DAS 1:		**DAS 2:**	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	8.0	1.0		
Abs Max Er	11.4	1.0		

UseDesc.:	Test type:	Device:	Input RH:	GTL Raw:	RH Corr.:	DAS Volts:	DAS %RH:	Difference:
primary	RH Low Range	Hygroclip	32.8	39.3	32.8	0.3735	37.4	4.6
primary	RH Low Range	Hygroclip	52.9	58.7	52.9	0.6427	64.3	11.4
primary	RH High Range	Hygroclip	93.6	89.4	93.6	0.9464	94.6	1.0

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY49113	LAV410	Eric Hebert	05/07/2013	Solar Radiation	none

Mfg Climatronics

SN/Owner ID 391 none

Parameter Solar Radiation Translator

Mfg Eppley **Parameter** solar radiation

Serial Number 10765 **Tfer Desc.** SR transfer translat

Tfer ID 01246

Slope 1.00000 **Intercept** 0.00000

Cert Date 1/6/2010 **CorrCoff** 1.00000

Mfg Eppley **Parameter** solar radiation

Serial Number 34341F3 **Tfer Desc.** SR transfer sensor

Tfer ID 01245

Slope 1.00000 **Intercept** 0.00000

Cert Date 12/16/2010 **CorrCoff** 1.00000

DAS 1:		DAS 2:	
% Diff of Avg	%Diff of Max	%Diff of Avg	%Diff of Max
9.7%	11.4%	0.0%	0.0%

UseDescription:	Measure Date	MeasureTime	Tfer Corr:	DAS w/m2:	PctDifference:
primary	5/7/2013	11:00	359	400	11.4%
primary	5/7/2013	12:00	157	173	10.2%
primary	5/7/2013	13:00	100	108	8.0%
primary	5/7/2013	14:00	80	87	8.8%
primary	5/7/2013	15:00	75	81	8.0%
primary	5/7/2013	16:00	73	77	5.5%

Sensor Component		Condition		Status	
Sensor Component	Sensor Level	**Condition**	1/2 bubble off level	**Status**	pass
Sensor Component	Sensor Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Precipitation Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
Texas Electronics	20895-398	LAV410	Eric Hebert	05/07/2013	Precipitation	none

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

DAS 1:

DAS 2:

A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.0%	4.0%		

UseDesc.	Test type:	TferVolume:	Iteration:	TimePerTip:	Eq.Ht:	DAS eng:	Eq.HtUnit:	OSE Unit:	TferUnits:	PctDifference
primary	tip check	10 manual	1	2 sec	1.00	1.00	mm	mm	ml	
primary	test 1	231.5	1	8 sec	5.00	4.90	mm	mm	ml	-2.0%
primary	test 2	231.5	2	10 sec	5.00	4.80	mm	mm	ml	-4.0%

Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	Functioning	**Status**	pass
Sensor Component	Properly Sited	**Condition**	See comments	**Status**	pass
Sensor Component	Gauge Drain Screen	**Condition**	Installed	**Status**	pass
Sensor Component	Level	**Condition**	1/2 bubble off level	**Status**	pass
Sensor Component	Gauge Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Funnel Clean	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Gauge Screen	**Condition**	Installed	**Status**	pass

Infrastructure Data For

Site ID LAV410 **Technician** Eric Hebert **Site Visit Date** 05/07/2013

Shelter Make	**Shelter Model**	**Shelter Size**
		1150 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	003	LAV410	Eric Hebert	05/07/2013	Shelter Temperature	none

DAS 1:

Abs Avg Err	Abs Max Er
1.27	1.68

DAS 2:

Abs Avg Err	Abs Max Er

Mfg Extech

Parameter Shelter Temperatur

Serial Number H232679

Tfer Desc. RTD

Tfer ID 01228

Slope 1.00732

Intercept -0.12380

Cert Date 1/12/2013

CorrCoff 1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	21.48	21.45	0.000	22.7	C	1.2
primary	Temp Mid Range	21.61	21.58	0.000	22.5	C	0.93
primary	Temp Mid Range	20.90	20.87	0.000	22.6	C	1.68

Site Visit Comments

<table>
<tr><th>Parameter</th><th>Site</th><th>Technician</th><th>S.V. Date</th><th>Component</th><th>Mfg</th><th>Serial No.</th><th>Hazard</th><th>Problem</th></tr>
<tr><td>Flow Rate</td><td>LAV410</td><td>Eric Hebert</td><td>05/07/2013</td><td>Filter Position</td><td>Tylan</td><td>1345</td><td>☐</td><td>☑</td></tr>
<tr><td colspan="9">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.</td></tr>
<tr><td>Ozone</td><td>LAV410</td><td>Eric Hebert</td><td>05/07/2013</td><td>Cell B Freq.</td><td>ThermoElectron</td><td>1344</td><td>☐</td><td>☑</td></tr>
<tr><td colspan="9">This analyzer diagnostic check is outside the manufacturer's recommended value.</td></tr>
<tr><td>Ozone</td><td>LAV410</td><td>Eric Hebert</td><td>05/07/2013</td><td>Cell A Freq.</td><td>ThermoElectron</td><td>1344</td><td>☐</td><td>☑</td></tr>
<tr><td colspan="9">This analyzer diagnostic check is outside the manufacturer's recommended value.</td></tr>
<tr><td>Precipitation</td><td>LAV410</td><td>Eric Hebert</td><td>05/07/2013</td><td>System Memo</td><td>Texas Electronic</td><td>1339</td><td>☐</td><td>☑</td></tr>
<tr><td colspan="9">The edge of the tipping bucket funnel rests on the pipe that supports the rain gauge. This causes the funnel to be out of level.</td></tr>
<tr><td>Precipitation</td><td>LAV410</td><td>Eric Hebert</td><td>05/07/2013</td><td>Properly Sited</td><td>Texas Electronic</td><td>1339</td><td>☐</td><td>☑</td></tr>
<tr><td colspan="9">Objects violate the 45 degree rule for the tipping bucket rain gage.</td></tr>
<tr><td>Wind Direction</td><td>LAV410</td><td>Eric Hebert</td><td>05/07/2013</td><td>Condition</td><td>Climatronics</td><td>3135</td><td>☐</td><td>☑</td></tr>
<tr><td colspan="9">The upper and lower sections of the wind sensor body are loose. This condition will cause premature failure of the sensor and can affect data accuracy.</td></tr>
<tr><td>Wind Speed</td><td>LAV410</td><td>Eric Hebert</td><td>05/07/2013</td><td>Prop or Cups Con</td><td>Climatronics</td><td>2759</td><td>☐</td><td>☑</td></tr>
<tr><td colspan="9">Both set screws are stripped.</td></tr>
</table>

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

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

2 **Parameter:** DocumentationCo

The most recent calibration and verification results are not available on-site.

3 **Parameter:** SitingCriteriaCom

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

4 **Parameter:** ShelterCleanNotes

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

5 **Parameter:** MetSensorComme

The rain gauge funnel is contacting the tipping bucket mounting post causing it to be 1/2 bubble off level. Objects violate the 45 degree rule.

6 **Parameter:** MetOpMaintCom

The signal cables are showing signs of wear.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID LAV410 **Technician** Eric Hebert **Site Visit Date** 05/07/2013

Site Sponsor (agency)	NPS	**USGS Map**		Manzanita Lake
Operating Group	NPS	**Map Scale**		
AQS #		**Map Date**		
Meteorological Type	Climatronics			
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**		40.5403
Deposition Measurement	dry, wet	**QAPP Longitude**		-121.5764
Land Use	woodland - evergreen	**QAPP Elevation Meters**		1756
Terrain	complex	**QAPP Declination**		
Conforms to MLM	Marginally	**QAPP Declination Date**		
Site Telephone	(530) 335-7214	**Audit Latitude**		40.539991
Site Address 1	38050 Hwy 36E	**Audit Longitude**		-121.576462
Site Address 2		**Audit Elevation**		1755
County	Shasta	**Audit Declination**		14.5
City, State	Mineral, CA		**Present**	
Zip Code	96063	**Fire Extinguisher**	☐	Out for service
Time Zone	Pacific	**First Aid Kit**	☑	
Primary Operator		**Safety Glasses**	☐	
Primary Op. Phone #		**Safety Hard Hat**	☐	
Primary Op. E-mail		**Climbing Belt**	☐	
Backup Operator		**Security Fence**	☐	
Backup Op. Phone #		**Secure Shelter**	☑	
Backup Op. E-mail		**Stable Entry Step**	☑	

Shelter Working Room ☑ **Make** **Model** **Shelter Size** 1150 cuft

Shelter Clean ☑ **Notes** The inside equipment is located in room within the fire station, clean, neat, and organized.

Site OK ☑ **Notes**

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

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID LAV410 **Technician** Eric Hebert **Site Visit Date** 05/07/2013

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

Siting Distances OK ☐

Siting Criteria Comment

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

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID LAV410 **Technician** Eric Hebert **Site Visit Date** 05/07/2013

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?	☑	1/2 bubble off level
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	
8	Is the rain gauge plumb?	☐	1/2 bubble off level (pic)
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 rain gauge funnel is contacting the tipping bucket mounting post causing it to be 1/2 bubble off level. Objects violate the 45 degree rule.

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID LAV410 **Technician** Eric Hebert **Site Visit Date** 05/07/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Shield (10 meter)	Climatronics	100325	1290	01199
Wind Speed	Climatronics	100075	4265	90843
Wind Direction	Climatronics	100076	1494	90831
Solar Radiation	Licor	LI-200	PY49113	none
Met tower	Rohn	unknown	none	none
Relative Humidity	Rotronic	MP 601A	52062	none
Precipitation	Texas Electronics	TR-525i-HT	20895-398	none
Temperature	Climatronics	100093	ARS101	03794

Provide any additional 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 signal cables are showing signs of wear.

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID LAV410 **Technician** Eric Hebert **Site Visit Date** 05/07/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	AT-5324-F6-O	923314
Ozone	ThermoElectron Inc	49C	49C-520012-328	90834
Filter pack flow pump	Thomas	107CA18	0688001767	00253
MFC power supply	Tylan	RO-32	FP9404003	03684
Zero air pump	Werther International	PC70/4	434533	none

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

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID LAV410 **Technician** Eric Hebert **Site Visit Date** 05/07/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

11 Tower comments?

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Gateway	Solo	B52500251350	0019275982
DAS	Environmental Sys Corp	8816	2026	90535
F460 translator	Climatronics	100163	unknown	00853
Mainframe	Climatronics	100081	1377	none
Mainframe power supply	Climatronics	101074	858	none
Modem	US Robotics	56k	unknown	none
Printer	Hewlett Packard	842C	unknown	none
Solar Radiation Translator	Climatronics	100144	391	none
Temperature Translator	Climatronics	100088-2	398	03629

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

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID LAV410 **Technician** Eric Hebert **Site Visit Date** 05/07/2013

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	DataView2	☑
SSRF	☑		☑
Site Ops Manual	☑	July 2012	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☐	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?	☑	
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 verification results are not available on-site.

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID LAV410 **Technician** Eric Hebert **Site Visit Date** 05/07/2013

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Informal training provided by ARS during maintenance visits
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 and semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	Every 2 weeks	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☑	As needed	☑
Analyzer Diagnostics Tests	☑	Alarm values only	☑
In-line Filter Replacement (at inlet)	☑	Every 2 weeks	☑
In-line Filter Replacement (at analyze	☐		☑
Sample Line Check for Dirt/Water	☐		☐
Zero Air Desiccant Check	☐		☐

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

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

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

Field Systems Data Form F-02058-1500-S9-rev001

Site ID LAV410 **Technician** Eric Hebert **Site Visit Date** 05/07/2013

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed 80% in morining
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, dataview
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
OXF122-Sandy Grenville-05/08/2013						
1	5/8/2013	Computer	Dell	000246	D520	unknown
2	5/8/2013	DAS	Campbell	000425	CR3000	2528
3	5/8/2013	Elevation	Elevation	None	1	None
4	5/8/2013	Filter pack flow pump	Thomas	04924	107CAB18	100300020817
5	5/8/2013	Flow Rate	Apex	000547	AXMC105LPMDPCV	50743
6	5/8/2013	Infrastructure	Infrastructure	none	none	none
7	5/8/2013	Modem	Raven	06468	H4222-C	0808310523
8	5/8/2013	Ozone	ThermoElectron Inc	000693	49i A1NAA	1030244806
9	5/8/2013	Ozone Standard	ThermoElectron Inc	000199	49i A3NAA	0607315737
10	5/8/2013	Sample Tower	Aluma Tower	000018	B	AT-61152-A-H8-E
11	5/8/2013	Shelter Temperature	Campbell	none	107-L	10755-148
12	5/8/2013	Siting Criteria	Siting Criteria	None	1	None
13	5/8/2013	Temperature	RM Young	02823	41342	illegible
14	5/8/2013	UPS	APC	05072	RS800	unknown
15	5/8/2013	Zero air pump	Werther International	06911	PC70/4	000829167

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2528	OXF122	Sandy Grenville	05/08/2013	DAS	Primary

Das Date: 5 /8 /2013
Audit Date 5 /8 /2013

Das Time: 11:10:01
Audit Time 11:10:00

Das Day: 128
Audit Day 128

Low Channel:
High Channel:

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

Mfg Datel
Parameter DAS
Serial Number 15510194
Tfer Desc. Source generator (D
Tfer ID 01320
Slope 1.00000
Intercept 0.00000
Cert Date 2/13/2012
CorrCoff 1.00000

Mfg Fluke
Parameter DAS
Serial Number 95740135
Tfer Desc. DVM
Tfer ID 01311
Slope 1.00000
Intercept 0.00000
Cert Date 1/26/2013
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.1000	V	V	0.0001
7	0.3000	0.2998	0.2999	V	V	0.0001
7	0.5000	0.4997	0.4997	V	V	0.0000
7	0.7000	0.6996	0.6996	V	V	0.0000
7	0.9000	0.8995	0.8995	V	V	0.0000
7	1.0000	0.9995	0.9994	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	50743	OXF122	Sandy Grenville	05/08/2013	Flow Rate	000547

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	1.00000	**Intercept**	0.00000
Cert Date	6/13/2012	**CorrCoff**	1.00000
Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/27/2012	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.12%	0.20%		

Cal Factor Zero	-0.032
Cal Factor Full Scale	0.966
Rotometer Reading:	1.5

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalI	PctDifference:
primary	pump off	0.000	0.000	0.01	0.013	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.005	-0.03	l/m	l/m	
primary	test pt 1	1.539	1.499	1.54	1.533	1.50	l/m	l/m	-0.08%
primary	test pt 2	1.544	1.500	1.54	1.532	1.50	l/m	l/m	-0.20%
primary	test pt 3	1.543	1.499	1.54	1.535	1.50	l/m	l/m	0.07%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	360 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	6.4 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	3 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244806	OXF122	Sandy Grenville	05/08/2013	Ozone	000693

Slope:	0.99852	**Slope:**	0.00000
Intercept	0.14735	**Intercept**	0.00000
CorrCoff	0.99992	**CorrCoff**	0.00000

DAS 1:

DAS 2:

A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.7%	1.7%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00308	**Intercept**	-0.17961
Cert Date	4/2/2013	**CorrCoff**	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	-0.50	-0.31	0.30	ppb	
primary	2	30.57	30.65	30.12	ppb	-1.73%
primary	3	49.19	49.21	49.02	ppb	-0.39%
primary	4	80.49	80.42	81.00	ppb	0.72%
primary	5	100.76	100.62	100.50	ppb	-0.12%

Sensor Component	Cell B Noise	**Condition**	2.9 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	< 1 %	**Status**	pass
Sensor Component	Offset	**Condition**	0.10	**Status**	pass
Sensor Component	Span	**Condition**	1.023	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	126.9 kHz	**Status**	fail
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.72 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	33.4 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	713 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	2.9 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	98.3 kHz	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.72 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	Functioning	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	illegible	OXF122	Sandy Grenville	05/08/2013	Temperature	02823

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00435	**Intercept**	-0.08480
Cert Date	1/12/2013	**CorrCoff**	1.00000

DAS 1:		**DAS 2:**	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.44	0.97		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.90	0.98	0.000	0.0	C	-0.97
primary	Temp Mid Range	24.50	24.48	0.000	24.6	C	0.12
primary	Temp High Range	48.70	48.57	0.000	48.8	C	0.23

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

Infrastructure Data For

Site ID OXF122 **Technician** Sandy Grenville **Site Visit Date** 05/08/2013

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2107-4)	640 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	10755-148	OXF122	Sandy Grenville	05/08/2013	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.45	0.52		

Mfg Extech

Parameter Shelter Temperatur

Serial Number H232734

Tfer Desc. RTD

Tfer ID 01227

Slope 1.00435

Intercept -0.08480

Cert Date 1/12/2013

CorrCoff 1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	23.20	23.18	0.000	23.7	C	0.52
primary	Temp Mid Range	23.10	23.08	0.000	23.5	C	0.42
primary	Temp Mid Range	23.40	23.38	0.000	23.8	C	0.42

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	OXF122	Sandy Grenville	05/08/2013	Cell B Freq.	ThermoElectron	3365	☐	☑

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Due to the high operator turn-over rate, the operators are unfamiliar with some minor aspects of site operation.

2 **Parameter:** DasComments

The met tower is operated by the university and the temperature sensor has been moved to the sample tower in a naturally aspirated shield.

3 **Parameter:** SitingCriteriaCom

The site is located in university agriculture research facility.

4 **Parameter:** ShelterCleanNotes

The shelter roof is in poor condition with several leaks.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID OXF122 **Technician** Sandy Grenville **Site Visit Date** 05/08/2013

Site Sponsor (agency)	EPA	**USGS Map**	Oxford
Operating Group	Miami University	**Map Scale**	
AQS #	39-017-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	39.5314
Deposition Measurement	dry, wet	**QAPP Longitude**	-84.7231
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	284
Terrain	gently rolling	**QAPP Declination**	5.2
Conforms to MLM	Yes	**QAPP Declination Date**	2/23/2007
Site Telephone	(513) 523-6912	**Audit Latitude**	39.531115
Site Address 1	Ecological Research Center	**Audit Longitude**	-84.723547
Site Address 2	Somerville Rd.	**Audit Elevation**	284
County	Butler	**Audit Declination**	-5.6

			Present	
City, State	Oxford, OH			
Zip Code	45056	**Fire Extinguisher**	☑	Inspected Nov 1992
Time Zone	Eastern	**First Aid Kit**	☑	
Primary Operator		**Safety Glasses**	☑	
Primary Op. Phone #		**Safety Hard Hat**	☐	
Primary Op. E-mail		**Climbing Belt**	☐	
Backup Operator		**Security Fence**	☐	
Backup Op. Phone #		**Secure Shelter**	☑	
Backup Op. E-mail		**Stable Entry Step**	☑	

Shelter Working Room ☑ **Make** Ekto **Model** 8810 (s/n 2107-4) **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter roof is in poor condition with several leaks.

Site OK ☑ **Notes**

Driving Directions From Oxford proceed north on route 732. Just outside of town bear right onto Somerville Road. Continue approximately 1/2 mile and turn right at the sign for the Ecological Research Center. Stay on the dirt road past the buildings. The road will turn to the right along the tree line. The site is in the field on the right.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID OXF122 **Technician** Sandy Grenville **Site Visit Date** 05/08/2013

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	25 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 university agriculture research facility.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID OXF122

Technician Sandy Grenville

Site Visit Date 05/08/2013

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

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

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID OXF122 **Technician** Sandy Grenville **Site Visit Date** 05/08/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342	illegible	02823

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

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID OXF122 **Technician** Sandy Grenville **Site Visit Date** 05/08/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	AT-61152-A-H8-E	000018
Ozone	ThermoElectron Inc	49i A1NAA	1030244806	000693
Filter pack flow pump	Thomas	107CAB18	100300020817	04924
Zero air pump	Werther International	PC70/4	000829167	06911

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

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID OXF122 **Technician** Sandy Grenville **Site Visit Date** 05/08/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

11 Tower comments?

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000246
DAS	Campbell	CR3000	2528	000425
Modem	Raven	H4222-C	0808310523	06468
UPS	APC	RS800	unknown	05072

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

The met tower is operated by the university and the temperature sensor has been moved to the sample tower in a naturally aspirated shield.

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID OXF122 **Technician** Sandy Grenville **Site Visit Date** 05/08/2013

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A
Wind speed sensor	☐	☐	☑
Wind direction sensor	☐	☐	☑
Temperature sensor	☑	☐	☐
Relative humidity sensor	☐	☐	☑
Solar radiation sensor	☐	☐	☑
Surface wetness sensor	☐	☐	☑
Wind sensor translator	☐	☐	☑
Temperature translator	☐	☐	☑
Humidity sensor translator	☐	☐	☑
Solar radiation translator	☐	☐	☑
Tipping bucket rain gauge	☐	☐	☑
Ozone analyzer	☑	☐	☐
Filter pack flow controller	☐	☑	☐
Filter pack MFC power supply	☐	☑	☐

	Yes	No	N/A
Data logger	☐	☑	☐
Data logger	☐	☐	☑
Strip chart recorder	☐	☐	☑
Computer	☑	☐	☐
Modem	☐	☑	☐
Printer	☐	☐	☑
Zero air pump	☐	☑	☐
Filter flow pump	☐	☑	☐
Surge protector	☐	☐	☑
UPS	☐	☑	☐
Lightning protection device	☐	☐	☑
Shelter heater	☐	☑	☐
Shelter air conditioner	☐	☑	☐

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2001	☐
HASP	☑	Nov 2009	☑
Field Ops Manual	☑	July 1990	☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

Field Systems Data Form F-02058-1500-S8-rev001

Site ID OXF122 **Technician** Sandy Grenville **Site Visit Date** 05/08/2013

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID OXF122 **Technician** Sandy Grenville **Site Visit Date** 05/08/2013

Site operation procedures

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

Due to the high operator turn-over rate, the operators are unfamiliar with some minor aspects of site operation.

Site Inventory by Site Visit

Site Visit	Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
QAK172-Sandy Grenville-05/09/2013						
1	5/9/2013	Computer	Dell	000456	D530	unknown
2	5/9/2013	DAS	Campbell	000418	CR3000	2518
3	5/9/2013	Elevation	Elevation	None	1	None
4	5/9/2013	Filter pack flow pump	Thomas	02357	107CAB18	1089005314
5	5/9/2013	flow rate	Tylan	05094	FC280V	AW801210
6	5/9/2013	Infrastructure	Infrastructure	none	none	none
7	5/9/2013	MFC power supply	MACTEC	05037	none	none
8	5/9/2013	Modem	Raven	06467	V4221-V	0808338316
9	5/9/2013	Ozone	ThermoElectron Inc	000739	49i A1NAA	1105347318
10	5/9/2013	Ozone Standard	ThermoElectron Inc	000511	49i A3NAA	0922236888
11	5/9/2013	Sample Tower	Aluma Tower	666368	B	AT-5107-E-4-8
12	5/9/2013	Shelter Temperature	Campbell	60712	107-L	230826
13	5/9/2013	Siting Criteria	Siting Criteria	None	1	None
14	5/9/2013	Temperature	RM Young	06540	41342	14801
15	5/9/2013	UPS	APC	06798	RS900	unknown
16	5/9/2013	Zero air pump	Werther International	06870	PC70/4	000814278

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2518	QAK172	Sandy Grenville	05/09/2013	DAS	Primary

Das Date: 5 /9 /2013

Das Time: 13:34:03

Das Day: 129

Audit Date 5 /9 /2013

Audit Time 13:34:03

Audit Day 129

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

Mfg Datel

Parameter DAS

Serial Number 15510194

Tfer Desc. Source generator (D

Tfer ID 01320

Slope 1.00000

Intercept 0.00000

Cert Date 2/13/2012

CorrCoff 1.00000

Mfg Fluke

Parameter DAS

Serial Number 95740135

Tfer Desc. DVM

Tfer ID 01311

Slope 1.00000

Intercept 0.00000

Cert Date 1/26/2013

CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0001	V	V	0.0001
7	0.1000	0.0999	0.1000	V	V	0.0001
7	0.3000	0.2998	0.2998	V	V	0.0000
7	0.5000	0.4997	0.4998	V	V	0.0001
7	0.7000	0.6997	0.6997	V	V	0.0000
7	0.9000	0.8996	0.8996	V	V	0.0000
7	1.0000	0.9995	0.9996	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW801210	QAK172	Sandy Grenville	05/09/2013	flow rate	05094

Mfg	MACTEC	
SN/Owner ID	none	05037
Parameter	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	1.00000	**Intercept**	0.00000
Cert Date	6/13/2012	**CorrCoff**	1.00000
Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/27/2012	**CorrCoff**	1.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.43%	2.47%		

Cal Factor Zero 0.02

Cal Factor Full Scale 0.66

Rotometer Reading: 1.5

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalI	PctDifference:
primary	pump off	0.000	0.000	-0.02	-0.001	0.01	l/m	l/m	
primary	leak check	0.000	0.000	-0.01	-0.002	0.02	l/m	l/m	
primary	test pt 1	1.585	1.538	2.32	2.320	1.50	l/m	l/m	-2.47%
primary	test pt 2	1.585	1.537	2.32	2.323	1.50	l/m	l/m	-2.41%
primary	test pt 3	1.585	1.537	2.32	2.322	1.50	l/m	l/m	-2.41%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	360 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	5.0 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.2 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347318	QAK172	Sandy Grenville	05/09/2013	Ozone	000739

Slope:	0.99551	**Slope:**	0.00000
Intercept	0.61213	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.8%	1.3%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00308	**Intercept**	-0.17961
Cert Date	4/2/2013	**CorrCoff**	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.00	0.17	0.78	ppb	
primary	2	29.94	30.02	30.40	ppb	1.27%
primary	3	50.24	50.26	50.59	ppb	0.66%
primary	4	80.13	80.06	80.80	ppb	0.92%
primary	5	100.20	100.07	99.90	ppb	-0.17%

Sensor Component	Cell B Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	< 1 %	**Status**	pass
Sensor Component	Offset	**Condition**	-0.80	**Status**	pass
Sensor Component	Span	**Condition**	1.026	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	99.2 kHz	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.71 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	32.4 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	701 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.6 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	113.7 kHz	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.68 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	Functioning	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass

Temperature Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
RM Young	14801	QAK172	Sandy Grenville	05/09/2013	Temperature	06540

Mfg Extech

Parameter Temperature

Serial Number H232734

Tfer Desc. RTD

Tfer ID 01227

Slope 1.00435

Intercept -0.08480

Cert Date 1/12/2013

CorrCoff 1.00000

DAS 1:		**DAS 2:**	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.17	0.22		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	-0.10	-0.02	0.000	0.2	C	0.22
primary	Temp Mid Range	24.90	24.88	0.000	24.8	C	-0.08
primary	Temp High Range	47.20	47.08	0.000	47.3	C	0.22

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

Infrastructure Data For

Site ID QAK172 **Technician** Sandy Grenville **Site Visit Date** 05/09/2013

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2625-2)	640 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	230826	QAK172	Sandy Grenville	05/09/2013	Shelter Temperature	60712

DAS 1:

Abs Avg Err	Abs Max Er
0.61	0.81

DAS 2:

Abs Avg Err	Abs Max Er

Mfg	Extech	**Parameter**	Shelter Temperatur
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00435	**Intercept**	-0.08480
Cert Date	1/12/2013	**CorrCoff**	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	20.10	20.10	0.000	20.9	C	0.8
primary	Temp Mid Range	21.30	21.29	0.000	22.1	C	0.81
primary	Temp Mid Range	21.20	21.19	0.000	21.4	C	0.21

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator is doing an excellent job maintaining the site.

2 **Parameter:** ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID QAK172 **Technician** Sandy Grenville **Site Visit Date** 05/09/2013

Site Sponsor (agency) EPA
Operating Group Private
AQS # 39-121-9991
Meteorological Type R.M. Young
Air Pollutant Analyzer Ozone, IMPROVE
Deposition Measurement dry
Land Use woodland - mixed, agriculture
Terrain rolling
Conforms to MLM Yes
Site Telephone (740) 679-3345
Site Address 1 58163 St. Johns Road
Site Address 2
County Noble
City, State Quaker City, OH
Zip Code 43773
Time Zone Eastern
Primary Operator
Primary Op. Phone #
Primary Op. E-mail
Backup Operator
Backup Op. Phone #
Backup Op. E-mail

USGS Map Quaker City
Map Scale
Map Date
QAPP Latitude 39.9431
QAPP Longitude -81.3378
QAPP Elevation Meters 372
QAPP Declination 7.9
QAPP Declination Date 2/22/2006
Audit Latitude 39.942714
Audit Longitude -81.337914
Audit Elevation 371
Audit Declination -8.2

	Present	
Fire Extinguisher	☑	Inspected May 1993
First Aid Kit	☑	
Safety Glasses	☑	
Safety Hard Hat	☑	
Climbing Belt	☑	
Security Fence	☐	
Secure Shelter	☑	
Stable Entry Step	☑	

Shelter Working Room ☑ **Make** Ekto **Model** 8810 (s/n 2625-2) **Shelter Size** 640 cuft

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

Site OK ☑ **Notes**

Driving Directions From I-70 take exit 193, route 513 south to Quaker City. At the 4-way stop turn right and continue approximately 0.8 miles and turn left onto CR943. Continue approximately 2 miles and turn right onto Noble County Rd 34 (also St. Johns Road). Continue approximately 1.5 miles and turn left onto a dirt road which is the driveway up a steep hill to the site.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID QAK172 **Technician** Sandy Grenville **Site Visit Date** 05/09/2013

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID QAK172 **Technician** Sandy Grenville **Site Visit Date** 05/09/2013

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

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

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID QAK172 **Technician** Sandy Grenville **Site Visit Date** 05/09/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342	14801	06540

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

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID QAK172 **Technician** Sandy Grenville **Site Visit Date** 05/09/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	AT-5107-E-4-8	666368
MFC power supply	MACTEC	none	none	05037
Ozone	ThermoElectron Inc	49i A1NAA	1105347318	000739
Filter pack flow pump	Thomas	107CAB18	1089005314	02357
Zero air pump	Werther International	PC70/4	000814278	06870

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

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID QAK172 **Technician** Sandy Grenville **Site Visit Date** 05/09/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

11 **Tower comments?**

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D530	unknown	000456
DAS	Campbell	CR3000	2518	000418
Modem	Raven	V4221-V	0808338316	06467
UPS	APC	RS900	unknown	06798

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

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID QAK172 **Technician** Sandy Grenville **Site Visit Date** 05/09/2013

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2001	☐
HASP	☑	Oct 2011	☑
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID QAK172 **Technician** Sandy Grenville **Site Visit Date** 05/09/2013

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Site operator refresher training July 2006
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Site operator refresher training July 2006
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

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

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	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?	☑	SSRF, logbook, call-in

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

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID QAK172 **Technician** Sandy Grenville **Site Visit Date** 05/09/2013

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?	☑	records MFC display as DAS flow value
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, logbook, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

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

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

The site operator is doing an excellent job maintaining the site.

Site Inventory by Site Visit

PND165-Eric Hebert-05/12/2013

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
1	5/12/2013	Computer	Dell	000258	D520	unknown
2	5/12/2013	DAS	Campbell	000403	CR3000	2516
3	5/12/2013	Elevation	Elevation	None	1	None
4	5/12/2013	Filter pack flow pump	Thomas	03631	107CAB18	049400004449
5	5/12/2013	flow rate	Tylan	02135	FC280V	AW901290
6	5/12/2013	Infrastructure	Infrastructure	none	none	none
7	5/12/2013	MFC power supply	Tylan	01695	RO-32	FP902019
8	5/12/2013	Modem	Raven	06474	H4222-C	0808311240
9	5/12/2013	Ozone	ThermoElectron Inc	000627	49i A1NAA	1009241772
10	5/12/2013	Ozone Standard	ThermoElectron Inc	000208	49i A3NAA	0611416461
11	5/12/2013	Sample Tower	Aluma Tower	000055	B	AT-81213-J12
12	5/12/2013	Shelter Temperature	Campbell	none	107-L	none
13	5/12/2013	Siting Criteria	Siting Criteria	None	1	None
14	5/12/2013	Temperature	RM Young	06539	41342	14800
15	5/12/2013	Zero air pump	Werther International	06926	PC70/4	000836218

DAS Data Form

DAS Time Max Error: 0.08

Mfg	**Serial Number**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Use Desc.**
Campbell	2516	PND165	Eric Hebert	05/12/2013	DAS	Primary

Das Date: 5 /13/2013

Das Time: 9:00:00

Das Day: 133

Audit Date 5 /13/2013

Audit Time 9:00:05

Audit Day 133

Low Channel:

High Channel:

Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0001	0.0003	0.0001	0.0003

Mfg Datel

Parameter DAS

Serial Number 4000392

Tfer Desc. Source generator (D

Tfer ID 01321

Slope 1.00000

Intercept 0.00000

Cert Date 2/13/2012

CorrCoff 1.00000

Mfg Fluke

Parameter DAS

Serial Number 86590148

Tfer Desc. DVM

Tfer ID 01310

Slope 1.00000

Intercept 0.00000

Cert Date 1/27/2013

CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.1000	0.0999	V	V	-0.0001
7	0.3000	0.3000	0.2999	V	V	-0.0001
7	0.5000	0.5000	0.4999	V	V	-0.0001
7	0.7000	0.7000	0.6999	V	V	-0.0001
7	0.9000	0.9001	0.8998	V	V	-0.0003
7	1.0000	1.0001	0.9998	V	V	-0.0003

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW901290	PND165	Eric Hebert	05/12/2013	flow rate	02135

Mfg Tylan

SN/Owner ID FP902019 01695

Parameter MFC power supply

Mfg BIOS

Parameter Flow Rate

Serial Number 122974

Tfer Desc. BIOS 220-H

Tfer ID 01416

Slope 1.00000

Intercept 0.00000

Cert Date 1/8/2013

CorrCoff 1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
1.02%	1.36%		

Cal Factor Zero -0.09

Cal Factor Full Scale 1

Rotometer Reading: 3.95

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalI	PctDifference:
primary	pump off	0.000	0.000	0.03	0.000	-0.04	l/m	l/m	
primary	leak check	0.000	0.000	0.03	0.000	-0.04	l/m	l/m	
primary	test pt 1	0.000	2.975	2.82	0.000	3.00	l/m	l/m	0.83%
primary	test pt 2	0.000	2.975	2.82	0.000	3.00	l/m	l/m	0.86%
primary	test pt 3	0.000	2.970	2.83	0.000	3.01	l/m	l/m	1.36%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241772	PND165	Eric Hebert	05/12/2013	Ozone	000627

Slope:	0.95790	**Slope:**	0.00000
Intercept	0.02026	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	0.99720	**Intercept**	0.18428
Cert Date	1/2/2013	**CorrCoff**	1.00000

DAS 1:

DAS 2:

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
4.1%	4.4%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.35	0.16	0.06	ppb	
primary	2	28.90	28.79	27.59	ppb	-4.17%
primary	3	49.75	49.70	47.73	ppb	-3.96%
primary	4	79.85	79.88	76.77	ppb	-3.89%
primary	5	109.80	109.92	105.10	ppb	-4.39%

Sensor Component	Cell B Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	Offset	**Condition**	-0.10	**Status**	pass
Sensor Component	Span	**Condition**	1.003	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	83.5 kHz	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.63 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	37.0 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	569 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.6 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	84.1 kHz	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.61 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass

Temperature Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
RM Young	14800	PND165	Eric Hebert	05/12/2013	Temperature	06539

Mfg Extech

Parameter Temperature

Serial Number H232679

Tfer Desc. RTD

Tfer ID 01228

Slope 1.00732

Intercept -0.12380

Cert Date 1/12/2013

CorrCoff 1.00000

DAS 1:		**DAS 2:**	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.05	0.14		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	-0.09	0.03	0.000	0.0	C	0
primary	Temp Mid Range	26.06	25.99	0.000	26.0	C	0.02
primary	Temp High Range	42.11	41.93	0.000	42.1	C	0.14

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

Infrastructure Data For

Site ID PND165 **Technician** Eric Hebert **Site Visit Date** 05/12/2013

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

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	PND165	Eric Hebert	05/12/2013	Shelter Temperature	none

DAS 1:

Abs Avg Err	Abs Max Er
1.43	2.26

DAS 2:

Abs Avg Err	Abs Max Er

Mfg Extech

Parameter Shelter Temperatur

Serial Number H232679

Tfer Desc. RTD

Tfer ID 01228

Slope 1.00732

Intercept -0.12380

Cert Date 1/12/2013

CorrCoff 1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	24.20	24.15	0.000	26.4	C	2.26
primary	Temp Mid Range	25.28	25.22	0.000	26.6	C	1.4
primary	Temp Mid Range	25.74	25.68	0.000	26.3	C	0.63

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator uses the filter bag received with the new filter to send the filter removed from the tower back to the lab. There is no bag for the sample filter on site for storing the filter when it is removed from the tower.

2 **Parameter:** DasComments

Both the heat and the air conditioner are running simultaneously.

3 **Parameter:** DocumentationCo

General site observations are not being recorded on the SSRF. The purpose for recording the general observations was discussed with the site operator.

4 **Parameter:** ShelterCleanNotes

The shelter is well maintained.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID PND165 **Technician** Eric Hebert **Site Visit Date** 05/12/2013

Site Sponsor (agency)	EPA	**USGS Map**		Fremont Lake South
Operating Group	Private / BLM	**Map Scale**		
AQS #	56-035-9991	**Map Date**		
Meteorological Type	R.M. Young			
Air Pollutant Analyzer	Ozone	**QAPP Latitude**		42.9214
Deposition Measurement	dry, wet	**QAPP Longitude**		-109.7900
Land Use	range	**QAPP Elevation Meters**		2388
Terrain	complex	**QAPP Declination**		12.75
Conforms to MLM	Marginally	**QAPP Declination Date**		2/22/2006
Site Telephone	(307) 367-6584	**Audit Latitude**		42.929031
Site Address 1	Skyline Drive	**Audit Longitude**		-109.787796
Site Address 2	Fremont Lake Rd.	**Audit Elevation**		2386
County	Sublette	**Audit Declination**		11.4
City, State	Pinedale, WY		**Present**	
Zip Code	82941	**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** 8810 (s/n 2149-22) **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter is well maintained.

Site OK ☑ **Notes**

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

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID PND165 **Technician** Eric Hebert **Site Visit Date** 05/12/2013

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID PND165 **Technician** Eric Hebert **Site Visit Date** 05/12/2013

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

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

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID PND165 **Technician** Eric Hebert **Site Visit Date** 05/12/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342	14800	06539

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

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID PND165 **Technician** Eric Hebert **Site Visit Date** 05/12/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	AT-81213-J12	000055
Ozone	ThermoElectron Inc	49i A1NAA	1009241772	000627
Filter pack flow pump	Thomas	107CAB18	049400004449	03631
MFC power supply	Tylan	RO-32	FP902019	01695
Zero air pump	Werther International	PC70/4	000836218	06926

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

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID PND165 **Technician** Eric Hebert **Site Visit Date** 05/12/2013

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?	☑	Heat and a/c running simultaneously

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

11 Tower comments?

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000258
DAS	Campbell	CR3000	2516	000403
Modem	Raven	H4222-C	0808311240	06474

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

Both the heat and the air conditioner are running simultaneously.

Field Systems Data Form F-02058-1500-S7-rev001

Site ID PND165 **Technician** Eric Hebert **Site Visit Date** 05/12/2013

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2001	☐
HASP	☑	Nov 2009	☑
Field Ops Manual	☑	July 1990	☐
Calibration Reports	☐		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☐	General observations not complete
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:

General site observations are not being recorded on the SSRF. The purpose for recording the general observations was discussed with the site operator.

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID PND165 **Technician** Eric Hebert **Site Visit Date** 05/12/2013

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID PND165 **Technician** Eric Hebert **Site Visit Date** 05/12/2013

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed afternoons approximately 80%
2	Are the Site Status Report Forms being completed and filed correctly?	☐	General observations are not recorded
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, 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:

The site operator uses the filter bag received with the new filter to send the filter removed from the tower back to the lab. There is no bag for the sample filter on site for storing the filter when it is removed from the tower.

Site Inventory by Site Visit

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number
CNT169-Eric Hebert-05/14/2013						
1	5/14/2013	Computer	Dell	000241	D520	unknown
2	5/14/2013	DAS	Campbell	000417	CR3000	2515
3	5/14/2013	Elevation	Elevation	None	1	None
4	5/14/2013	Filter pack flow pump	Thomas	02753	107CAB18	1192001900
5	5/14/2013	flow rate	Tylan	000086	FC280SAV	AW99013049
6	5/14/2013	Infrastructure	Infrastructure	none	none	none
7	5/14/2013	MFC power supply	MACTEC	05031	none	none
8	5/14/2013	Modem	Raven	06600	V4221-V	0844349098
9	5/14/2013	Ozone	ThermoElectron Inc	000682	49i A1NAA	1030244796
10	5/14/2013	Ozone Standard	ThermoElectron Inc	000369	49i A3NAA	0726124690
11	5/14/2013	Sample Tower	Aluma Tower	000179	B	unknown
12	5/14/2013	Shelter Temperature	Campbell	none	107-L	none
13	5/14/2013	Siting Criteria	Siting Criteria	None	1	None
14	5/14/2013	Temperature	RM Young	06559	41342	illegible
15	5/14/2013	Zero air pump	Werther International	06925	P 70/4	000836220

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2515	CNT169	Eric Hebert	05/14/2013	DAS	Primary

Das Date: 5 /14/2013
Das Time: 10:30:00
Das Day: 134

Audit Date 5 /14/2013
Audit Time 10:30:00
Audit Day 134

Low Channel:

Avg Diff: 0.0001
Max Diff: 0.0002

High Channel:

Avg Diff: 0.0001
Max Diff: 0.0002

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

Mfg Fluke
Parameter DAS
Serial Number 86590148
Tfer Desc. DVM
Tfer ID 01310
Slope 1.00000
Intercept 0.00000
Cert Date 1/27/2013
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.1000	0.1000	V	V	0.0000
7	0.3000	0.3000	0.3000	V	V	0.0000
7	0.5000	0.5000	0.4999	V	V	-0.0001
7	0.7000	0.7001	0.7000	V	V	-0.0001
7	0.9000	0.9001	0.9000	V	V	-0.0001
7	1.0000	1.0001	0.9999	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW99013049	CNT169	Eric Hebert	05/14/2013	flow rate	000086

Mfg MACTEC

SN/Owner ID none 05031

Parameter MFC power supply

Mfg BIOS

Parameter Flow Rate

Serial Number 122974

Tfer Desc. BIOS 220-H

Tfer ID 01416

Slope 1.00000

Intercept 0.00000

Cert Date 1/8/2013

CorrCoff 1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
5.76%	6.13%		

Cal Factor Zero 0

Cal Factor Full Scale 0

Rotometer Reading: 3.5

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalI	PctDifference:
primary	pump off	0.000	0.000	-0.02	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	-0.02	0.000	0.01	l/m	l/m	
primary	test pt 1	0.000	2.842	2.58	0.000	3.00	l/m	l/m	5.56%
primary	test pt 2	0.000	2.841	2.58	0.000	3.00	l/m	l/m	5.59%
primary	test pt 3	0.000	2.827	2.58	0.000	3.00	l/m	l/m	6.13%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	360 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244796	CNT169	Eric Hebert	05/14/2013	Ozone	000682

Slope: 0.95862
Intercept 0.26392
CorrCoff 0.99999

Slope: 0.00000
Intercept 0.00000
CorrCoff 0.00000

DAS 1:

A Avg % Diff: 3.5%
A Max % Di 4.1%

DAS 2:

A Avg %Dif
A Max % Di

Mfg ThermoElectron Inc
Parameter ozone
Serial Number 517112175
Tfer Desc. Ozone primary stan
Tfer ID 01111
Slope 0.99720
Intercept 0.18428
Cert Date 1/2/2013
CorrCoff 1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.41	0.22	0.32	ppb	
primary	2	29.72	29.61	28.66	ppb	-3.21%
primary	3	50.00	49.95	48.32	ppb	-3.26%
primary	4	80.25	80.29	77.42	ppb	-3.57%
primary	5	110.20	110.32	105.80	ppb	-4.10%

Sensor Component Cell B Noise **Condition** 0.9 ppb **Status** pass

Sensor Component Cell B Tmp. **Condition** **Status** pass

Sensor Component Fullscale Voltage **Condition** N/A **Status** pass

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

Sensor Component Line Loss **Condition** Not tested **Status** pass

Sensor Component Offset **Condition** 0.3 **Status** pass

Sensor Component Span **Condition** 1.012 **Status** pass

Sensor Component Cell B Freq. **Condition** 99.8 kHz **Status** pass

Sensor Component System Memo **Condition** See comments **Status** pass

Sensor Component Sample Train **Condition** Good **Status** pass

Sensor Component Cell B Pressure **Condition** **Status** pass

Sensor Component Cell B Flow **Condition** 0.51 lpm **Status** pass

Sensor Component Cell A Tmp. **Condition** 40.9 C **Status** Fail

Sensor Component Cell A Pressure **Condition** 502 mmHg **Status** pass

Sensor Component Cell A Noise **Condition** 1.1 ppb **Status** pass

Sensor Component Cell A Freq. **Condition** 98.9 kHz **Status** pass

Sensor Component Cell A Flow **Condition** 0.52 lpm **Status** pass

Sensor Component Battery Backup **Condition** N/A **Status** pass

Sensor Component Zero Voltage **Condition** N/A **Status** pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	illegible	CNT169	Eric Hebert	05/14/2013	Temperature	06559

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00732	**Intercept**	-0.12380
Cert Date	1/12/2013	**CorrCoff**	1.00000

DAS 1:		**DAS 2:**	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.10	0.17		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	-0.13	-0.01	0.000	-0.1	C	-0.05
primary	Temp Mid Range	28.44	28.36	0.000	28.4	C	0.07
primary	Temp High Range	44.20	44.00	0.000	44.2	C	0.17

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

Infrastructure Data For

Site ID CNT169 **Technician** Eric Hebert **Site Visit Date** 05/14/2013

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

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CNT169	Eric Hebert	05/14/2013	Shelter Temperature	none

DAS 1:

Abs Avg Err	Abs Max Er
0.69	0.99

DAS 2:

Abs Avg Err	Abs Max Er

Mfg Extech

Parameter Shelter Temperatur

Serial Number H232679

Tfer Desc. RTD

Tfer ID 01228

Slope 1.00732

Intercept -0.12380

Cert Date 1/12/2013

CorrCoff 1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	23.39	23.34	0.000	24.3	C	0.99
primary	Temp Mid Range	24.35	24.30	0.000	24.9	C	0.55
primary	Temp Mid Range	24.64	24.58	0.000	25.1	C	0.52

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	CNT169	Eric Hebert	05/14/2013	Cell A Tmp.	ThermoElectron	3483	☐	☑

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

Field Systems Comments

1 **Parameter:** DasComments

The sample tower has been replaced and the met tower removed since the previous site audit visit.

2 **Parameter:** SiteOpsProcedures

The ozone inlet filter is changed once each month and the ozone sample line is leak tested every two weeks.

3 **Parameter:** ShelterCleanNotes

The shelter is dirty. Some floor tiles have been repaired since the previous audit visit.

Field Systems Data Form F-02058-1500-S1-rev001

Site ID CNT169 **Technician** Eric Hebert **Site Visit Date** 05/14/2013

Site Sponsor (agency)	EPA	**USGS Map**	Centennial
Operating Group	Forest Service	**Map Scale**	
AQS #	56-001-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	41.3722
Deposition Measurement	dry, wet	**QAPP Longitude**	-106.2422
Land Use	woodland - evergreen	**QAPP Elevation Meters**	3178
Terrain	complex	**QAPP Declination**	10.9
Conforms to MLM	Marginally	**QAPP Declination Date**	12/28/2004
Site Telephone	(307) 742-7229	**Audit Latitude**	41.364531
Site Address 1	Brooklyn Lake Guard Station	**Audit Longitude**	-106.24002
Site Address 2	Medicine Bow National Forest	**Audit Elevation**	3175
County	Albany	**Audit Declination**	9.5
City, State	Centennial, WY	**Present**	
Zip Code	82055	**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** 8810 (s/n 2149-19) **Shelter Size** 640 cuft

Shelter Clean ☐ **Notes** The shelter is dirty. Some floor tiles have been repaired since the previous audit visit.

Site OK ☑ **Notes**

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

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID CNT169 **Technician** Eric Hebert **Site Visit Date** 05/14/2013

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID CNT169 **Technician** Eric Hebert **Site Visit Date** 05/14/2013

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

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

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID CNT169 **Technician** Eric Hebert **Site Visit Date** 05/14/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342	illegible	06559

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

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID CNT169 **Technician** Eric Hebert **Site Visit Date** 05/14/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

Parameter	Manufacturer	Model	S/N	Client ID
MFC power supply	MACTEC	none	none	05031
Ozone	ThermoElectron Inc	49i A1NAA	1030244796	000682
Filter pack flow pump	Thomas	107CAB18	1192001900	02753
Zero air pump	Werther International	P 70/4	000836220	06925
Sample Tower	Aluma Tower	B	unknown	000179

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

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID CNT169 **Technician** Eric Hebert **Site Visit Date** 05/14/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

11 Tower comments?

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000241
DAS	Campbell	CR3000	2515	000417
Modem	Raven	V4221-V	0844349098	06600

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

The sample tower has been replaced and the met tower removed since the previous site audit visit.

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID CNT169 **Technician** Eric Hebert **Site Visit Date** 05/14/2013

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A
Wind speed sensor	☐	☐	☑
Wind direction sensor	☐	☐	☑
Temperature sensor	☑	☐	☐
Relative humidity sensor	☐	☐	☑
Solar radiation sensor	☐	☐	☑
Surface wetness sensor	☐	☐	☑
Wind sensor translator	☐	☐	☑
Temperature translator	☐	☐	☑
Humidity sensor translator	☐	☐	☑
Solar radiation translator	☐	☐	☑
Tipping bucket rain gauge	☐	☐	☑
Ozone analyzer	☐	☑	☐
Filter pack flow controller	☐	☑	☐
Filter pack MFC power supply	☐	☑	☐

	Yes	No	N/A
Data logger	☐	☑	☐
Data logger	☐	☐	☑
Strip chart recorder	☐	☐	☑
Computer	☑	☐	☐
Modem	☐	☑	☐
Printer	☐	☐	☑
Zero air pump	☐	☑	☐
Filter flow pump	☐	☑	☐
Surge protector	☐	☐	☑
UPS	☐	☑	☐
Lightning protection device	☐	☐	☑
Shelter heater	☐	☑	☐
Shelter air conditioner	☐	☑	☐

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	☑	July 1990	☐
Calibration Reports	☐		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID CNT169 **Technician** Eric Hebert **Site Visit Date** 05/14/2013

Site operation procedures

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

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

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

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

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

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

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

The ozone inlet filter is changed once each month and the ozone sample line is leak tested every two weeks.

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID CNT169

Technician Eric Hebert

Site Visit Date 05/14/2013

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	filter changed afternoons, 80% of the time
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	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:

Site Inventory by Site Visit

YEL408-Eric Hebert-06/06/2013

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
1	6/6/2013	Computer	Gateway	none	Solo	2500251339
2	6/6/2013	DAS	Environmental Sys Corp	90647	8816	2560
3	6/6/2013	Elevation	Elevation	None	1	None
4	6/6/2013	F460 translator	Climatronics	none	100163	686
5	6/6/2013	Filter pack flow pump	Thomas	none	107CA18	099800009748
6	6/6/2013	flow rate	Tylan	none	FC280SAV	AW9710138
7	6/6/2013	Infrastructure	Infrastructure	none	none	none
8	6/6/2013	Mainframe	Climatronics	none	100081	1380
9	6/6/2013	Mainframe power supply	Climatronics	none	101074	688
10	6/6/2013	Met tower	Climatronics	01362	14 inch taper	illegible
11	6/6/2013	MFC power supply	Tylan	03687	RO-32	FP9403014
12	6/6/2013	Modem	US Robotics	none	56k fax modem	unknown
13	6/6/2013	Ozone	ThermoElectron Inc	90714	49C	49C-66828-354
14	6/6/2013	Ozone Standard	ThermoElectron Inc	none	49C	0425208056
15	6/6/2013	Precipitation	Climatronics	02531	100508-2	illegible
16	6/6/2013	Printer	Hewlett Packard	none	840C	unknown
17	6/6/2013	Relative Humidity	Rotronic	none	MP 601A	75277
18	6/6/2013	Sample Tower	Aluma Tower	illegible	B	none
19	6/6/2013	Shelter Temperature	ARS	none	none	none
20	6/6/2013	Shield (10 meter)	Climatronics	01050	100325	1235
21	6/6/2013	Siting Criteria	Siting Criteria	None	1	None
22	6/6/2013	Solar Radiation	Licor	none	LI-200	PY18097
23	6/6/2013	Solar Radiation Translator	Climatronics	none	100144	381
24	6/6/2013	Temperature	Climatronics	ARS100	100093	none
25	6/6/2013	Temperature Translator	Climatronics	03626	100088-2	396
26	6/6/2013	Wind Direction	Climatronics	90876	100076	222
27	6/6/2013	Wind Speed	Climatronics	90881	100075	1697
28	6/6/2013	Zero air pump	Werther International	none	PC70/4	531393

DAS Data Form

DAS Time Max Error: 0.52

Mfg	**Serial Number**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Use Desc.**
Environmental Sys	2560	YEL408	Eric Hebert	06/06/2013	DAS	Primary

Das Date: 6 /6 /2013
Das Time: 9:55:00
Das Day: 157

Audit Date 6 /6 /2013
Audit Time 9:55:31
Audit Day 157

Low Channel:		**High Channel:**	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0001	0.0002	0.0003	0.0005

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

Mfg Fluke
Parameter DAS
Serial Number 86590148
Tfer Desc. DVM
Tfer ID 01310
Slope 1.00000
Intercept 0.00000
Cert Date 1/27/2013
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
2	0.0000	0.0000	0.0000	V	V	0.0000
2	0.1000	0.1000	0.0999	V	V	-0.0001
2	0.3000	0.3000	0.2998	V	V	-0.0002
2	0.5000	0.5000	0.5000	V	V	0.0000
2	0.7000	0.7001	0.7001	V	V	0.0000
2	0.9000	0.9001	0.9001	V	V	0.0000
2	1.0000	1.0001	1.0000	V	V	-0.0001
16	0.0000	0.0000	0.0000	V	V	0.0000
16	0.1000	0.1000	0.1000	V	V	0.0000
16	0.3000	0.3000	0.3002	V	V	0.0002
16	0.5000	0.5000	0.5003	V	V	0.0003
16	0.7000	0.7000	0.7004	V	V	0.0004
16	0.9000	0.9001	0.9005	V	V	0.0004
16	1.0000	1.0001	1.0006	V	V	0.0005

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9710138	YEL408	Eric Hebert	06/06/2013	flow rate	none

Mfg Tylan

SN/Owner ID FP9403014 03687

Parameter MFC power supply

Mfg BIOS

Parameter Flow Rate

Serial Number 122974

Tfer Desc. BIOS 220-H

Tfer ID 01416

Slope 1.00000

Intercept 0.00000

Cert Date 1/8/2013

CorrCoff 1.00000

DAS 1: A Avg % Diff:	DAS 1: A Max % Di	DAS 2: A Avg %Dif	DAS 2: A Max % Di
0.49%	0.87%		

Cal Factor Zero 0.4

Cal Factor Full Scale 5.8

Rotometer Reading: 3.6

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalI	PctDifference:
primary	pump off	0.000	0.000	-0.35	-0.3250	0.05	l/m	l/m	
primary	leak check	0.000	0.000	-0.35	-0.3250	0.05	l/m	l/m	
primary	test pt 1	0.000	2.999	2.40	2.4130	3.00	l/m	l/m	0.05%
primary	test pt 2	0.000	3.016	2.40	2.4130	3.00	l/m	l/m	-0.54%
primary	test pt 3	0.000	3.036	2.40	2.4130	3.01	l/m	l/m	-0.87%

Sensor Component	Condition	Status
Leak Test		pass
Filter Azimuth	90 deg	pass
Filter Depth	- 1.0 cm	Fail
Filter Position	Poor	Fail
Moisture Present	No moisture present	pass
Rotometer Condition	Clean and dry	pass
System Memo	See comments	pass
Tubing Condition	Good	pass
Filter Distance	5.5 cm	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-66828-354	YEL408	Eric Hebert	06/06/2013	Ozone	90714

Slope:	1.02906	**Slope:**	0.00000
Intercept	-0.33928	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

DAS 1: **DAS 2:**

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
2.0%	2.8%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	0.99720	**Intercept**	0.18428
Cert Date	1/2/2013	**CorrCoff**	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.40	0.21	0.19	ppb	
primary	2	30.41	30.31	30.48	ppb	0.56%
primary	3	50.00	49.95	50.86	ppb	1.82%
primary	4	79.43	79.46	81.67	ppb	2.78%
primary	5	110.00	110.12	113.00	ppb	2.62%

Sensor Component	Cell B Noise	**Condition**	0.7 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	1.0003	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	Offset	**Condition**	1.6	**Status**	pass
Sensor Component	Span	**Condition**	1.045	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	83.0 kHz	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.67 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	34.7 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	561 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	107 kHz	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.66 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	0.0005	**Status**	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	1697	YEL408	Eric Hebert	06/06/2013	Wind Speed	90881

Mfg	Climatronics	
SN/Owner ID	686	none
Parameter	F460 translator	

Prop or Cups SN	1968		
Prop or Cups Torque	0.3	**to**	0.3
Prop Correction Fact	N/A		

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

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

	DAS 1:		DAS 2:	
	Low Range	High Range	Low Range	High Range
Abs Avg Err	0.09	1.09%		
Abs Max Er	0.13	1.64%		

UseDescription:	InputDevice:	Input RPM:	Input m/s:	Output V:	DAS m/s:	Diff/ %Diff:	Difference:
primary	none	0	0.20	0.0000	0.3		0.13
primary	01261	50	1.40	0.0000	1.5		0.06
primary	01261	100	2.57	0.0000	2.6		0.06
primary	01261	170	4.22	0.0000	4.3		0.09
primary	01261	250	6.10	0.0000	6.2	1.64%	
primary	01262	500	11.97	0.0000	12.1	1.17%	
primary	01262	800	19.02	0.0000	19.2	0.79%	
primary	01262	2000	47.22	0.0000	47.6	0.74%	

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

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	222	YEL408	Eric Hebert	06/06/2013	Wind Direction	90876

Mfg Climatronics

SN/Owner ID 686 none

Parameter F460 translator

Vane SN: 1149

C. A. Align. deg. true: 180

VaneTorque 8 **to** 8

Mfg Ushikata

Parameter wind direction

Serial Number 190037

Tfer Desc. transit

Tfer ID 01265

Slope 1.00000

Intercept 0.00000

Cert Date 1/4/2011

CorrCoff 1.00000

Mfg RM Young

Parameter wind direction

Serial Number

Tfer Desc. wind direction wheel

Tfer ID 01266

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	9.5	1.3		
Abs Max Er	13	5		

UseDescription:	TferID:	Input Raw:	Linearity	Output V:	Output Deg.:	Difference:	Change:	Error:
primary	01266	0	☑	0.0000	352	8	45	0
primary	01266	45	☑	0.0000	36	9	44	-1
primary	01266	90	☑	0.0000	80	10	44	-1
primary	01266	135	☑	0.0000	125	10	45	0
primary	01266	180	☑	0.0000	168	12	43	-2
primary	01266	225	☑	0.0000	218	7	50	5
primary	01266	270	☑	0.0000	263	7	45	0
primary	01266	315	☑	0.0000	307	8	44	-1
primary	01265	90	☐	0.0000	80	10		10
primary	01265	136	☐	0.0000	123	13		13
primary	01265	180	☐	0.0000	173	7		7
primary	01265	360	☐	0.0000	352	8		8

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

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	none	YEL408	Eric Hebert	06/06/2013	Temperature	ARS100

Mfg Climatronics

SN/Owner ID 396 03626

Parameter Temperature Translator

Mfg Extech

Parameter Temperature

Serial Number H232679

Tfer Desc. RTD

Tfer ID 01228

Slope 1.00732

Intercept -0.12380

Cert Date 1/12/2013

CorrCoff 1.00000

DAS 1: Abs Avg Err	DAS 1: Abs Max Er	DAS 2: Abs Avg Err	DAS 2: Abs Max Er
0.05	0.11		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.01	0.13	0.0000	0.2	C	0.11
primary	Temp Mid Range	24.00	23.95	0.0000	23.9	C	-0.04
primary	Temp High Range	49.56	49.32	0.0000	49.3	C	-0.01

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Rotronic	75277	YEL408	Eric Hebert	06/06/2013	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	124432	**Tfer Desc.**	Hygroclip
Tfer ID	01225		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/29/2013	**CorrCoff**	1.00000

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	2.2	0.9		
Abs Max Er	2.8	0.9		

UseDesc.:	Test type:	Device:	Input RH:	GTL Raw:	RH Corr.:	DAS Volts:	DAS %RH:	Difference:
primary	RH Low Range	Hygroclip	32.8	32.8	32.8	0.3561	35.6	2.8
primary	RH Low Range	Hygroclip	52.9	52.9	52.9	0.5450	54.5	1.6
primary	RH High Range	Hygroclip	93.6	93.6	93.6	0.9450	94.5	0.9

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY18097	YEL408	Eric Hebert	06/06/2013	Solar Radiation	none

Mfg Climatronics

SN/Owner ID 381 none

Parameter Solar Radiation Translator

Mfg Eppley **Parameter** solar radiation

Serial Number 10765 **Tfer Desc.** SR transfer translat

Tfer ID 01246

Slope 1.00000 **Intercept** 0.00000

Cert Date 1/6/2010 **CorrCoff** 1.00000

Mfg Eppley **Parameter** solar radiation

Serial Number 34341F3 **Tfer Desc.** SR transfer sensor

Tfer ID 01245

Slope 1.00000 **Intercept** 0.00000

Cert Date 12/16/2010 **CorrCoff** 1.00000

DAS 1:		DAS 2:	
% Diff of Avg	%Diff of Max	%Diff of Avg	%Diff of Max
1.4%	1.3%	0.0%	0.0%

UseDescription:	Measure Date	MeasureTime	Tfer Corr:	DAS w/m2:	PctDifference:
primary	6/6/2013	9:00	753	763	1.3%
primary	6/6/2013	10:00	680	676	-0.6%
primary	6/6/2013	11:00	688	689	0.1%
primary	6/6/2013	12:00	735	740	0.7%
primary	6/6/2013	13:00	338	369	9.2%

Sensor Component Sensor Level **Condition** Level **Status** pass

Sensor Component Sensor Clean **Condition** Clean **Status** pass

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

Sensor Component System Memo **Condition** **Status** pass

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	YEL408	Eric Hebert	06/06/2013	Precipitation	02531

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

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
3.0%	4.0%		

UseDesc.	Test type:	TferVolume:	Iteration:	TimePerTip:	Eq.Ht:	DAS eng:	Eq.HtUnit:	OSE Unit:	TferUnits:	PctDifference
primary	tip check	10 manual	1	2 sec	1.00	1.00	mm	mm	ml	
primary	test 1	231.5	1	10 sec	5.00	5.20	mm	mm	ml	4.0%
primary	test 2	231.5	2	10 sec	5.00	5.10	mm	mm	ml	2.0%

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

Infrastructure Data For

Site ID YEL408 **Technician** Eric Hebert **Site Visit Date** 06/06/2013

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

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	YEL408	Eric Hebert	06/06/2013	Shelter Temperature	none

DAS 1:

Abs Avg Err	Abs Max Er
1.68	2.06

DAS 2:

Abs Avg Err	Abs Max Er

Mfg Extech

Parameter Shelter Temperatur

Serial Number H232679

Tfer Desc. RTD

Tfer ID 01228

Slope 1.00732

Intercept -0.12380

Cert Date 1/12/2013

CorrCoff 1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	23.14	23.09	0.000	24.7	C	1.61
primary	Temp Mid Range	23.44	23.39	0.000	24.8	C	1.36
primary	Temp Mid Range	22.63	22.59	0.000	24.7	C	2.06

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	YEL408	Eric Hebert	06/06/2013	Filter Position	Tylan	1647	☐	☑

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.

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Precipitation	YEL408	Eric Hebert	06/06/2013	Properly Sited	Climatronics	3766	☐	☑

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

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Wind Speed	YEL408	Eric Hebert	06/06/2013	System Memo	Climatronics	2863	☐	☑

The external heater that wraps around the sensor was found to be impeding the rotation of the sensor shaft. This condition impacts data accuracy. The condition was corrected during the sensor audit.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Gloves are no longer used to handle the filter pack.

2 **Parameter:** SitingCriteriaCom

The site is located at the edge of a tree line. The trees close to the inlet are approximately 5 meters tall. Trees taller than 10 meters are 15 meters from the inlet.

3 **Parameter:** ShelterCleanNotes

The shelter is organized and well maintained.

4 **Parameter:** PollAnalyzerCom

The shelter and sample tower are located at the edge of the tree line and mountain slope. Small trees are encroaching on the sample tower. Taller trees are 10 to 15 meters from the sample tower.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID YEL408 **Technician** Eric Hebert **Site Visit Date** 06/06/2013

Site Sponsor (agency)	NPS	**USGS Map**		Lake
Operating Group	NPS	**Map Scale**		
AQS #	56-039-1011	**Map Date**		
Meteorological Type	Climatronics			
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**		44.5597
Deposition Measurement	dry	**QAPP Longitude**		-110.4006
Land Use	woodland - evergreen	**QAPP Elevation Meters**		2400
Terrain	complex	**QAPP Declination**		
Conforms to MLM	Marginally	**QAPP Declination Date**		
Site Telephone	(307) 242-2410	**Audit Latitude**		44.565356
Site Address 1	Lake Ranger Station	**Audit Longitude**		-110.400338
Site Address 2	route 14	**Audit Elevation**		2430
County	Teton	**Audit Declination**		11.9
City, State	Yellowstone National Park, WY		**Present**	
Zip Code	82190	**Fire Extinguisher**	☐	
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 (s/n 2880-1) **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter is organized and well maintained.

Site OK ☑ **Notes**

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

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID YEL408 **Technician** Eric Hebert **Site Visit Date** 06/06/2013

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

Siting Distances OK ☐

Siting Criteria Comment

The site is located at the edge of a tree line. The trees close to the inlet are approximately 5 meters tall. Trees taller than 10 meters are 15 meters from the inlet.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID YEL408 **Technician** Eric Hebert **Site Visit Date** 06/06/2013

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
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

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

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID YEL408 **Technician** Eric Hebert **Site Visit Date** 06/06/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Met tower	Climatronics	14 inch taper	illegible	01362
Temperature	Climatronics	100093	none	ARS100
Shield (10 meter)	Climatronics	100325	1235	01050
Wind Direction	Climatronics	100076	222	90876
Wind Speed	Climatronics	100075	1697	90881
Solar Radiation	Licor	LI-200	PY18097	none
Relative Humidity	Rotronic	MP 601A	75277	none
Precipitation	Climatronics	100508-2	illegible	02531

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

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID YEL408

Technician Eric Hebert

Site Visit Date 06/06/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	none	illegible
Ozone	ThermoElectron Inc	49C	49C-66828-354	90714
Filter pack flow pump	Thomas	107CA18	099800009748	none
MFC power supply	Tylan	RO-32	FP9403014	03687
Zero air pump	Werther International	PC70/4	531393	none

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

The shelter and sample tower are located at the edge of the tree line and mountain slope. Small trees are encroaching on the sample tower. Taller trees are 10 to 15 meters from the sample tower.

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID YEL408 **Technician** Eric Hebert **Site Visit Date** 06/06/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

11 Tower comments?

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Gateway	Solo	2500251339	none
DAS	Environmental Sys Corp	8816	2560	90647
F460 translator	Climatronics	100163	686	none
Mainframe	Climatronics	100081	1380	none
Mainframe power supply	Climatronics	101074	688	none
Modem	US Robotics	56k fax modem	unknown	none
Printer	Hewlett Packard	840C	unknown	none
Solar Radiation Translator	Climatronics	100144	381	none
Temperature Translator	Climatronics	100088-2	396	03626

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

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID YEL408 **Technician** Eric Hebert **Site Visit Date** 06/06/2013

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A
Wind speed sensor	☑	☐	☐
Wind direction sensor	☑	☐	☐
Temperature sensor	☑	☐	☐
Relative humidity sensor	☐	☑	☐
Solar radiation sensor	☑	☐	☐
Surface wetness sensor	☐	☐	☑
Wind sensor translator	☑	☐	☐
Temperature translator	☑	☐	☐
Humidity sensor translator	☐	☐	☑
Solar radiation translator	☐	☑	☐
Tipping bucket rain gauge	☐	☐	☐
Ozone analyzer	☐	☑	☐
Filter pack flow controller	☑	☐	☐
Filter pack MFC power supply	☑	☐	☐

	Yes	No	N/A
Data logger	☑	☐	☐
Data logger	☐	☐	☑
Strip chart recorder	☐	☐	☑
Computer	☐	☑	☐
Modem	☐	☑	☐
Printer	☐	☑	☐
Zero air pump	☐	☑	☐
Filter flow pump	☐	☑	☐
Surge protector	☐	☐	☑
UPS	☐	☐	☑
Lightning protection device	☐	☐	☑
Shelter heater	☐	☑	☐
Shelter air conditioner	☑	☐	☐

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

	Present		Current
Station Log	☑	DataView2	☑
SSRF	☑		☑
Site Ops Manual	☑	Jan 2006	☑
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?	☑	Dataview
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID YEL408 **Technician** Eric Hebert **Site Visit Date** 06/06/2013

Site operation procedures

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

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

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	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	☑	Weekly	☑

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID YEL408 **Technician** Eric Hebert **Site Visit Date** 06/06/2013

Site operation procedures

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

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

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

Gloves are no longer used to handle the filter pack.

Site Inventory by Site Visit

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number
ROM206-Eric Hebert-06/10/2013						
1	6/10/2013	Computer	Dell	000454	D530	unknown
2	6/10/2013	DAS	Campbell	000415	CR3000	2510
3	6/10/2013	Elevation	Elevation	None	1	None
4	6/10/2013	Filter pack flow pump	Thomas	04986	107CA18	040400022185
5	6/10/2013	Flow Rate	Apex	000598	AXMC105LPMDPCV	unknown
6	6/10/2013	Infrastructure	Infrastructure	none	none	none
7	6/10/2013	Modem	Raven	06473	V4221-V	0808311135
8	6/10/2013	Ozone	ThermoElectron Inc	000734	49i A1NAA	1105347317
9	6/10/2013	Ozone Standard	ThermoElectron Inc	000437	49i A3NAA	CM08200013
10	6/10/2013	Sample Tower	Aluma Tower	666369	B	illegible
11	6/10/2013	Shelter Temperature	Campbell	none	107-L	none
12	6/10/2013	Siting Criteria	Siting Criteria	None	1	None
13	6/10/2013	Temperature	RM Young	02679	41342	none
14	6/10/2013	Zero air pump	Werther International	06900	PC70/4	000821894

DAS Data Form

DAS Time Max Error: 0.02

Mfg	**Serial Number**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Use Desc.**
Campbell	2510	ROM206	Eric Hebert	06/10/2013	DAS	Primary

Das Date: 6 /10/2013
Das Time: 12:31:59
Das Day: 161

Audit Date 6 /10/2013
Audit Time 12:32:00
Audit Day 161

Low Channel:

Avg Diff:	**Max Diff:**
0.0001	0.0003

High Channel:

Avg Diff:	**Max Diff:**
0.0001	0.0003

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

Mfg Fluke
Parameter DAS
Serial Number 86590148
Tfer Desc. DVM
Tfer ID 01310
Slope 1.00000
Intercept 0.00000
Cert Date 1/27/2013
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.1000	0.1000	V	V	0.0000
7	0.3000	0.3000	0.2999	V	V	-0.0001
7	0.5000	0.5000	0.4999	V	V	-0.0001
7	0.7000	0.7001	0.6999	V	V	-0.0002
7	0.9000	0.9001	0.8998	V	V	-0.0003
7	1.0000	1.0001	0.9998	V	V	-0.0003

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	unknown	ROM206	Eric Hebert	06/10/2013	Flow Rate	000598

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/8/2013	**CorrCoff**	1.00000

DAS 1:

A Avg % Diff:	A Max % Di
0.78%	0.94%

DAS 2:

A Avg %Dif	A Max % Di

Cal Factor Zero -0.06

Cal Factor Full Scale 0.95

Rotometer Reading: 3.75

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalI	PctDifference:
primary	pump off	0.000	0.000	0.01	0.000	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	-0.03	l/m	l/m	
primary	test pt 1	0.000	2.976	3.00	0.000	3.00	l/m	l/m	0.81%
primary	test pt 2	0.000	2.982	3.00	0.000	3.00	l/m	l/m	0.60%
primary	test pt 3	0.000	2.972	3.00	0.000	3.00	l/m	l/m	0.94%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347317	ROM206	Eric Hebert	06/10/2013	Ozone	000734

Slope:	0.99603	**Slope:**	0.00000
Intercept	0.31352	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

DAS 1: **DAS 2:**

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
0.5%	0.8%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	0.99720	**Intercept**	0.18428
Cert Date	1/2/2013	**CorrCoff**	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.59	0.40	0.82	ppb	
primary	2	30.46	30.36	30.15	ppb	-0.69%
primary	3	50.29	50.24	50.64	ppb	0.80%
primary	4	79.97	80.00	80.10	ppb	0.12%
primary	5	110.40	110.52	110.30	ppb	-0.20%

Sensor Component	Cell B Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	Offset	**Condition**	-0.30	**Status**	pass
Sensor Component	Span	**Condition**	1.036	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	105.5 kHz	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.34 lpm	**Status**	Fail
Sensor Component	Cell A Tmp.	**Condition**	37.8 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	542 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	1.3 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	92.1 kHz	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.36 lpm	**Status**	Fail
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	none	ROM206	Eric Hebert	06/10/2013	Temperature	02679

Mfg Extech **Parameter** Temperature

Serial Number H232679 **Tfer Desc.** RTD

Tfer ID 01228

Slope 1.00732 **Intercept** -0.12380

Cert Date 1/12/2013 **CorrCoff** 1.00000

DAS 1: Abs Avg Err	DAS 1: Abs Max Er	DAS 2: Abs Avg Err	DAS 2: Abs Max Er
0.08	0.12		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	-0.08	0.04	0.000	-0.1	C	-0.1
primary	Temp Mid Range	24.80	24.74	0.000	24.7	C	-0.01
primary	Temp High Range	45.68	45.47	0.000	45.6	C	0.12

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

Infrastructure Data For

Site ID ROM206 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

Shelter Make	**Shelter Model**	**Shelter Size**
Ekto	8810 (s/n 2182-1)	640 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ROM206	Eric Hebert	06/10/2013	Shelter Temperature	none

DAS 1:

Abs Avg Err	Abs Max Er
0.52	0.54

DAS 2:

Abs Avg Err	Abs Max Er

Mfg	Extech	**Parameter**	Shelter Temperatur
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00732	**Intercept**	-0.12380
Cert Date	1/12/2013	**CorrCoff**	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	24.83	24.77	0.000	25.3	C	0.48
primary	Temp Mid Range	23.78	23.73	0.000	24.3	C	0.54
primary	Temp Mid Range	26.34	26.27	0.000	25.7	C	-0.54

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	ROM206	Eric Hebert	06/10/2013	Cell B Flow	ThermoElectron	3593	☐	☑
This analyzer diagnostic check is outside the manufacturer's recommended value.								
Ozone	ROM206	Eric Hebert	06/10/2013	Cell A Flow	ThermoElectron	3593	☐	☑
This analyzer diagnostic check is outside the manufacturer's recommended value.								

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The shelter is clean, neat, and well organized. There are signs of previous roof leaks, but they have been repaired. The floor and counter top have been replaced.

2 **Parameter:** MetSensorComme

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

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID ROM206 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

Site Sponsor (agency)	EPA	**USGS Map**	Longs Peak
Operating Group	private	**Map Scale**	
AQS #	08-069-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**	40.2778
Deposition Measurement	dry	**QAPP Longitude**	-105.5453
Land Use	woodland - mixed	**QAPP Elevation Meters**	2743
Terrain	complex	**QAPP Declination**	10.3
Conforms to MLM	Marginally	**QAPP Declination Date**	2/22/2006
Site Telephone	(970) 586-2598	**Audit Latitude**	40.278129
Site Address 1	High Peak Camp	**Audit Longitude**	-105.545635
Site Address 2	Route 7	**Audit Elevation**	2742
County	Larimer	**Audit Declination**	9.0

City, State	Estes Park, CO		**Present**	
Zip Code	80517	**Fire Extinguisher**	☑	Inspected April 2001
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 (s/n 2182-1) **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter is clean, neat, and well organized. There are signs of previous roof leaks, but they have been repaired. The floor and counter top have been replaced.

Site OK ☑ **Notes**

Driving Directions From Estes Park take route 7 south approximately 8.5 miles. Turn right onto Preservation Road (dirt road) at the sign for High Peak Camp operated by the Salvation Army. The site is approximately 100 meters on the left.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID ROM206 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID ROM206 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

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

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

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

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID ROM206 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342	none	02679

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

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID ROM206 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	illegible	666369
Ozone	ThermoElectron Inc	49i A1NAA	1105347317	000734
Zero air pump	Werther International	PC70/4	000821894	06900
Filter pack flow pump	Thomas	107CA18	040400022185	04986

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

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID ROM206 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D530	unknown	000454
DAS	Campbell	CR3000	2510	000415
Modem	Raven	V4221-V	0808311135	06473

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

Field Systems Data Form F-02058-1500-S7-rev001

Site ID ROM206 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2001	☐
HASP	☑	Oct 2011	☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☑		☑

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

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

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID ROM206 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID ROM206 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings 50% of the time
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	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	☑	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

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

Site Inventory by Site Visit

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number
ROM406-Eric Hebert-06/10/2013						
1	6/10/2013	Computer	Toshiba	none	Terca	unknown
2	6/10/2013	DAS	Environmental Sys Corp	90535	8816	2025
3	6/10/2013	Elevation	Elevation	None	1	None
4	6/10/2013	Filter pack flow pump	Thomas	02978	107CAB18	0493002494
5	6/10/2013	flow rate	Tylan	03393	FC280AV	AW9403024
6	6/10/2013	Infrastructure	Infrastructure	none	none	none
7	6/10/2013	Met tower	Rohn	none	unknown	none
8	6/10/2013	MFC power supply	Tylan	none	RO-32	illegible
9	6/10/2013	Modem	US Robotics	none	33.6 fax modem	unknown
10	6/10/2013	Ozone	ThermoElectron Inc	none	49i A3NAA	1030745086
11	6/10/2013	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450194
12	6/10/2013	Precipitation	Climatronics	01620	100508-2	illegible
13	6/10/2013	Printer	Hewlett Packard	none	842C	unknown
14	6/10/2013	Relative Humidity	Rotronic	none	MP 601A	56091
15	6/10/2013	Sample Tower	Aluma Tower	illegible	B	none
16	6/10/2013	Shelter Temperature	ARS	none	none	none
17	6/10/2013	Shield (10 meter)	RM Young	none	unknown	none
18	6/10/2013	Shield (2 meter)	RM Young	none	unknown	none
19	6/10/2013	Siting Criteria	Siting Criteria	None	1	None
20	6/10/2013	Solar Radiation	Licor	none	LI-200	PY19983
21	6/10/2013	Solar Radiation Translator	RM Young	none	70101-X	none
22	6/10/2013	Temperature	RM Young	none	41342	17079
23	6/10/2013	Temperature2meter	RM Young	none	41342	17078
24	6/10/2013	Wind Direction	RM Young	none	AQ05103-5	89123wdr
25	6/10/2013	Wind Speed	RM Young	none	AQ05103-5	89123wsp
26	6/10/2013	Zero air pump	Werther International	none	PC70/4	531391

DAS Data Form

DAS Time Max Error: 0.4

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2025	ROM406	Eric Hebert	06/10/2013	DAS	Primary

Das Date: 6 /10/2013
Das Time: 12:30:00
Das Day: 161

Audit Date 6 /10/2013
Audit Time 12:30:24
Audit Day 161

Low Channel:		**High Channel:**	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0000	0.0001	0.0001	0.0002

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

Mfg Fluke
Parameter DAS
Serial Number 86590148
Tfer Desc. DVM
Tfer ID 01310
Slope 1.00000
Intercept 0.00000
Cert Date 1/27/2013
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
2	0.0000	0.0000	0.0000	V	V	0.0000
2	0.1000	0.1000	0.1000	V	V	0.0000
2	0.3000	0.3000	0.3000	V	V	0.0000
2	0.5000	0.5000	0.4999	V	V	-0.0001
2	0.7000	0.7000	0.7000	V	V	0.0000
2	0.9000	0.9000	0.8999	V	V	-0.0001
2	1.0000	1.0001	1.0000	V	V	-0.0001
12	0.0000	0.0000	0.0000	V	V	0.0000
12	0.1000	0.1000	0.0998	V	V	-0.0002
12	0.3000	0.3000	0.3000	V	V	0.0000
12	0.5000	0.5000	0.5000	V	V	0.0000
12	0.7000	0.7000	0.6999	V	V	-0.0001
12	0.9000	0.9000	0.9000	V	V	0.0000
12	1.0000	1.0001	1.0000	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9403024	ROM406	Eric Hebert	06/10/2013	flow rate	03393

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 1.00000

Intercept 0.00000

Cert Date 1/8/2013

CorrCoff 1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
0.32%	0.35%		

Cal Factor Zero 0.04

Cal Factor Full Scale 5.46

Rotometer Reading: 3.95

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalI	PctDifference:
primary	pump off	0.000	0.000	-0.05	-0.0150	0.02	l/m	l/m	
primary	leak check	0.000	0.000	-0.05	-0.0150	0.02	l/m	l/m	
primary	test pt 1	0.000	2.998	3.05	2.7380	3.01	l/m	l/m	0.32%
primary	test pt 2	0.000	2.998	3.05	2.7380	3.01	l/m	l/m	0.35%
primary	test pt 3	0.000	3.000	3.05	2.7380	3.01	l/m	l/m	0.28%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	- 1.0 cm	**Status**	fail
Sensor Component	Filter Position	**Condition**	Poor	**Status**	fail
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030745086	ROM406	Eric Hebert	06/10/2013	Ozone	none

Slope:	0.99341	**Slope:**	0.00000
Intercept	0.32985	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.4%	0.6%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	0.99720	**Intercept**	0.18428
Cert Date	1/2/2013	**CorrCoff**	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.32	0.13	0.50	ppb	
primary	2	31.40	31.30	31.12	ppb	-0.58%
primary	3	49.81	49.76	50.02	ppb	0.52%
primary	4	80.17	80.21	80.14	ppb	-0.09%
primary	5	110.10	110.22	109.70	ppb	-0.47%

Sensor Component	Cell B Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	0.9995	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	Offset	**Condition**	0.000	**Status**	pass
Sensor Component	Span	**Condition**	1.008	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	73.6 kHz	**Status**	Fail
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.58 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	34.0 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	538 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	66.1 kHz	**Status**	Fail
Sensor Component	Cell A Flow	**Condition**	0.57 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	-0.0002	**Status**	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	89123wsp	ROM406	Eric Hebert	06/10/2013	Wind Speed	none

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

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

Prop or Cups SN 68464

Prop or Cups Torque 0.3 **to** 0.3

Prop Correction Fact 0.0512

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

UseDescription:	InputDevice:	Input RPM:	Input m/s:	Output V:	DAS m/s:	Diff/ %Diff:	Difference:
primary	none	0	0.20	0.0000	0.0		-0.20
primary	01262	200	1.02	0.0000	1.0		0.00
primary	01262	400	2.05	0.0000	2.1		0.00
primary	01262	800	4.10	0.0000	4.1		0.00
primary	01262	1200	6.14	0.0000	6.1	0.00%	
primary	01262	2400	12.29	0.0000	12.3	0.00%	
primary	01262	4000	20.48	0.0000	20.5	0.00%	
primary	01262	9400	48.13	0.0000	48.1	0.00%	

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

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	89123wdr	ROM406	Eric Hebert	06/10/2013	Wind Direction	none

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

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

VaneTorque 12 **to** 15 276

	DAS 1: Orientation	Linearity:	DAS 2: Orientation	Linearity:
Abs Avg Err	9.7	10.8		
Abs Max Er	13	43		

UseDescription:	TferID:	Input Raw:	Linearity	Output V:	Output Deg.:	Difference:	Change:	Error:
primary	01266	0	☑	0.0000	26	26	88	43
primary	01266	45	☑	0.0000	60	15	34	-11
primary	01266	90	☑	0.0000	101	11	41	-4
primary	01266	135	☑	0.0000	140	5	39	-6
primary	01266	180	☑	0.0000	180	0	40	-5
primary	01266	225	☑	0.0000	220	5	40	-5
primary	01266	270	☑	0.0000	258	12	38	-7
primary	01266	315	☑	0.0000	298	17	40	-5
primary	01265	96	☐	0.0000	104	8		8
primary	01265	236	☐	0.0000	228	8		8
primary	01265	276	☐	0.0000	263	13		13

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

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	17079	ROM406	Eric Hebert	06/10/2013	Temperature	none

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00732	**Intercept**	-0.12380
Cert Date	1/12/2013	**CorrCoff**	1.00000

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

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.13	0.25	0.0000	0.16	C	-0.09
primary	Temp Mid Range	25.40	25.34	0.0000	25.44	C	0.1
primary	Temp High Range	48.65	48.42	0.0000	48.52	C	0.1

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

2 Meter Temperature Data For

Calc. Difference

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
RM Young	17078	ROM406	Eric Hebert	06/10/2013	Temperature2meter	none

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00732	**Intercept**	-0.12380
Cert Date	1/12/2013	**CorrCoff**	1.00000

DAS 1:		**DAS 2:**	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.11	0.2		

UseDescription:	Test type:	InputTmpRaw	InputTmpCorrected:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Rang	0.13	0.25	0.0000	0.45	C	0.2
primary	Temp Mid Rang	25.40	25.34	0.0000	25.48	C	0.14
primary	Temp High Ran	48.65	48.42	0.0000	48.42	C	0

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Rotronic	56091	ROM406	Eric Hebert	06/10/2013	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	124432	**Tfer Desc.**	Hygroclip
Tfer ID	01225		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/29/2013	**CorrCoff**	1.00000

	DAS 1:		**DAS 2:**	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.8	4.2		
Abs Max Er	1.0	4.2		

UseDesc.:	Test type:	Device:	Input RH:	GTL Raw:	RH Corr.:	DAS Volts:	DAS %RH:	Difference:
primary	RH Low Range	Hygroclip	32.8	0.0	32.8	0.3375	33.8	1.0
primary	RH Low Range	Hygroclip	52.9	0.0	52.9	0.5232	52.3	-0.6
primary	RH High Range	Hygroclip	93.6	0.0	93.6	0.8935	89.4	-4.2

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY19983	ROM406	Eric Hebert	06/10/2013	Solar Radiation	none

Mfg RM Young

SN/Owner ID none none

Parameter Solar Radiation Translator

Mfg Eppley **Parameter** solar radiation

Serial Number 10765 **Tfer Desc.** SR transfer translat

Tfer ID 01246

Slope 1.00000 **Intercept** 0.00000

Cert Date 1/6/2010 **CorrCoff** 1.00000

Mfg Eppley **Parameter** solar radiation

Serial Number 34341F3 **Tfer Desc.** SR transfer sensor

Tfer ID 01245

Slope 1.00000 **Intercept** 0.00000

Cert Date 12/16/2010 **CorrCoff** 1.00000

DAS 1:		DAS 2:	
% Diff of Avg	%Diff of Max	%Diff of Avg	%Diff of Max
3.1%	7.1%	0.0%	0.0%

UseDescription:	Measure Date	MeasureTime	Tfer Corr:	DAS w/m2:	PctDifference:
primary	6/10/2013	12:00	871	869	-0.2%
primary	6/10/2013	13:00	483	478	-1.0%
primary	6/10/2013	14:00	628	621	-1.1%
primary	6/10/2013	16:00	399	405	1.5%
primary	6/11/2013	5:00	47	50	6.4%
primary	6/11/2013	6:00	290	285	-1.7%
primary	6/11/2013	7:00	513	503	-1.9%
primary	6/11/2013	8:00	707	683	-3.4%
primary	6/11/2013	10:00	1001	938	-6.3%
primary	6/11/2013	11:00	1070	994	-7.1%

Sensor Component Sensor Level **Condition** Level **Status** pass

Sensor Component Sensor Clean **Condition** Clean **Status** pass

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

Sensor Component System Memo **Condition** **Status** pass

Precipitation Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
Climatronics	illegible	ROM406	Eric Hebert	06/10/2013	Precipitation	01620

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

DAS 1:

A Avg % Diff:	**A Max % Di**
0.0%	0.0%

DAS 2:

A Avg %Dif	**A Max % Di**

UseDesc.	Test type:	TferVolume:	Iteration:	TimePerTip:	Eq.Ht:	DAS eng:	Eq.HtUnit:	OSE Unit:	TferUnits:	PctDifference
primary	tip check	10 manual	1	2 sec	1.00	1.00	mm	mm	ml	
primary	test 1	231.5	1	8 sec	5.00	5.00	mm	mm	ml	0.0%
primary	test 2	231.5	2	10 sec	5.00	5.00	mm	mm	ml	0.0%

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

Infrastructure Data For

Site ID ROM406 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

Shelter Make	**Shelter Model**	**Shelter Size**
Ekto	8814 (s/n 3062-1)	896 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	ROM406	Eric Hebert	06/10/2013	Shelter Temperature	none

DAS 1:

Abs Avg Err	Abs Max Er
2.58	4.47

DAS 2:

Abs Avg Err	Abs Max Er

Mfg Extech

Parameter Shelter Temperatur

Serial Number H232679

Tfer Desc. RTD

Tfer ID 01228

Slope 1.00732

Intercept -0.12380

Cert Date 1/12/2013

CorrCoff 1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	19.11	19.09	0.000	22.0	C	2.91
primary	Temp Mid Range	21.38	21.35	0.000	21.7	C	0.37
primary	Temp Mid Range	17.22	17.22	0.000	21.7	C	4.47

Site Visit Comments

<table>
<tr><th>Parameter</th><th>Site</th><th>Technician</th><th>S.V. Date</th><th>Component</th><th>Mfg</th><th>Serial No.</th><th>Hazard</th><th>Problem</th></tr>
<tr><td>Flow Rate</td><td>ROM406</td><td>Eric Hebert</td><td>06/10/2013</td><td>Filter Position</td><td>Tylan</td><td>1578</td><td>☐</td><td>☑</td></tr>
<tr><td colspan="9">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.</td></tr>
<tr><td>Ozone</td><td>ROM406</td><td>Eric Hebert</td><td>06/10/2013</td><td>Cell B Freq.</td><td>ThermoElectron</td><td>3779</td><td>☐</td><td>☑</td></tr>
<tr><td colspan="9">This analyzer diagnostic check is outside the manufacturer's recommended value.</td></tr>
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<tr><td>Precipitation</td><td>ROM406</td><td>Eric Hebert</td><td>06/10/2013</td><td>Properly Sited</td><td>Climatronics</td><td>3769</td><td>☐</td><td>☑</td></tr>
<tr><td colspan="9">Objects violate the 45 degree rule for the tipping bucket rain gage.</td></tr>
<tr><td>Shelter Temperature</td><td>ROM406</td><td>Eric Hebert</td><td>06/10/2013</td><td>Accuracy Mid Ra</td><td>ARS</td><td>2274</td><td>☐</td><td>☑</td></tr>
<tr><td colspan="9">The shelter temperature is going outside CFR requirements for pollutant monitor operation.</td></tr>
</table>

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator is doing a very good job performing the site duties and expressed an interest in trying to improve any deficiencies. The sample flow rate systems for both the dry deposition and ozone sample trains were explained during the audit at the request of the site operator.

2 **Parameter:** SiteOpsProcedures

Mercury thermometer was removed from the shelter during the site audit. The site operator has requested additional training from ARS.

3 **Parameter:** ShelterCleanNotes

The shelter is clean, neat, organized, and well maintained.

4 **Parameter:** MetSensorComme

The tipping bucket rain gage and solar radiation sensor have been moved to the roof of the shelter since the previous audit visit. Both temperature sensor shields have been replaced with new models.

5 **Parameter:** MetOpMaintCom

The wind direction sensor is exhibiting the symptoms of potentiometer failure. Wind direction data quality are being impacted by this condition.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID ROM406 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

Site Sponsor (agency)	NPS	**USGS Map**		Longs Peak
Operating Group	NPS	**Map Scale**		
AQS #	08-069-0007	**Map Date**		
Meteorological Type	R.M. Young			
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**		40.2778
Deposition Measurement	dry	**QAPP Longitude**		-105.5453
Land Use	woodland - mixed	**QAPP Elevation Meters**		2743
Terrain	complex	**QAPP Declination**		
Conforms to MLM	Marginally	**QAPP Declination Date**		
Site Telephone	(970) 586-8520	**Audit Latitude**		40.278129
Site Address 1	High Peak Camp	**Audit Longitude**		-105.545635
Site Address 2	Route 7	**Audit Elevation**		2742
County	Larimer	**Audit Declination**		9.0
City, State	Estes Park, CO		**Present**	
Zip Code	80517	**Fire Extinguisher**	☑	Inspected July 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** 8814 (s/n 3062-1) **Shelter Size** 896 cuft

Shelter Clean ☑ **Notes** The shelter is clean, neat, organized, and well maintained.

Site OK ☑ **Notes**

Driving Directions From Estes Park take route 7 south approximately 8.5 miles. Turn right onto Preservation Road (dirt road) at the sign for High Peak Camp operated by the Salvation Army. The site is approximately 100 meters on the left.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID ROM406 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID ROM406 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

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
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 tipping bucket rain gage and solar radiation sensor have been moved to the roof of the shelter since the previous audit visit. Both temperature sensor shields have been replaced with new models.

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID ROM406 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Met tower	Rohn	unknown	none	none
Relative Humidity	Rotronic	MP 601A	56091	none
Precipitation	Climatronics	100508-2	illegible	01620
Solar Radiation	Licor	LI-200	PY19983	none
Wind Direction	RM Young	AQ05103-5	89123wdr	none
Wind Speed	RM Young	AQ05103-5	89123wsp	none
Temperature	RM Young	41342	17079	none
Temperature2meter	RM Young	41342	17078	none
Shield (10 meter)	RM Young	unknown	none	none
Shield (2 meter)	RM Young	unknown	none	none

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

The wind direction sensor is exhibiting the symptoms of potentiometer failure. Wind direction data quality are being impacted by this condition.

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID ROM406 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	none	illegible
Filter pack flow pump	Thomas	107CAB18	0493002494	02978
Zero air pump	Werther International	PC70/4	531391	none
MFC power supply	Tylan	RO-32	illegible	none
Ozone	ThermoElectron Inc	49i A3NAA	1030745086	none

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

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID ROM406 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

11 Tower comments?

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Toshiba	Terca	unknown	none
DAS	Environmental Sys Corp	8816	2025	90535
Modem	US Robotics	33.6 fax modem	unknown	none
Printer	Hewlett Packard	842C	unknown	none
Solar Radiation Translator	RM Young	70101-X	none	none

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

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID ROM406 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A
Wind speed sensor	☐	☑	☐
Wind direction sensor	☐	☑	☐
Temperature sensor	☐	☑	☐
Relative humidity sensor	☐	☑	☐
Solar radiation sensor	☐	☑	☐
Surface wetness sensor	☐	☐	☑
Wind sensor translator	☐	☐	☑
Temperature translator	☐	☐	☑
Humidity sensor translator	☐	☐	☑
Solar radiation translator	☐	☑	☐
Tipping bucket rain gauge	☐	☑	☐
Ozone analyzer	☑	☐	☐
Filter pack flow controller	☑	☐	☐
Filter pack MFC power supply	☑	☐	☐

	Yes	No	N/A
Data logger	☑	☐	☐
Data logger	☐	☐	☑
Strip chart recorder	☐	☐	☑
Computer	☐	☑	☐
Modem	☐	☑	☐
Printer	☐	☑	☐
Zero air pump	☐	☑	☐
Filter flow pump	☐	☑	☐
Surge protector	☐	☐	☑
UPS	☐	☐	☑
Lightning protection device	☐	☐	☑
Shelter heater	☐	☑	☐
Shelter air conditioner	☑	☐	☐

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

	Present		Current
Station Log	☑	DataView2	☑
SSRF	☑		☑
Site Ops Manual	☑	June 2000	☐
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?	☑	Dataview
2	Are the Site Status Report Forms being completed and current?	☑	Flow and 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-rev001

Site ID ROM406 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained by ARS on site
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained by operator and by ARS on site
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	☑	Monthly and semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	Every 2 weeks	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☐
Analyzer Diagnostics Tests	☑	Alarm values only	☑
In-line Filter Replacement (at inlet)	☑	Every 2 weeks	☑
In-line Filter Replacement (at analyze	☐		☐
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:

Mercury thermometer was removed from the shelter during the site audit. The site operator has requested additional training from ARS.

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID ROM406 **Technician** Eric Hebert **Site Visit Date** 06/10/2013

Site operation procedures

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

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	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:

The site operator is doing a very good job performing the site duties and expressed an interest in trying to improve any deficiencies. The sample flow rate systems for both the dry deposition and ozone sample trains were explained during the audit at the request of the site operator.

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GTH161-Eric Hebert-06/12/2013						
1	6/12/2013	Computer	Dell	000251	D520	5HFNHB1
2	6/12/2013	DAS	Campbell	000416	CR3000	2513
3	6/12/2013	Elevation	Elevation	None	1	None
4	6/12/2013	Filter pack flow pump	Thomas	02751	107CAB18	1192001884
5	6/12/2013	flow rate	Tylan	000171	FC280SAV	AW04423004
6	6/12/2013	Infrastructure	Infrastructure	none	none	none
7	6/12/2013	MFC power supply	MACTEC	06044	none	none
8	6/12/2013	Modem	Raven	06589	H4223-C	0844321356
9	6/12/2013	Ozone	ThermoElectron Inc	000744	49i A1NAA	1105347324
10	6/12/2013	Ozone Standard	ThermoElectron Inc	000443	49i A3NAA	CM08200019
11	6/12/2013	Sample Tower	Aluma Tower	03564	A	none
12	6/12/2013	Shelter Temperature	Campbell	none	107-L	none
13	6/12/2013	Siting Criteria	Siting Criteria	None	1	None
14	6/12/2013	Temperature	RM Young	06120	41342VC	11742
15	6/12/2013	Zero air pump	Werther International	06927	P 70/4	000836211

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2513	GTH161	Eric Hebert	06/12/2013	DAS	Primary

Das Date: 6 /13/2013
Audit Date 6 /13/2013

Das Time: 8:56:10
Audit Time 8:56:10

Das Day: 164
Audit Day 164

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

Mfg Datel
Parameter DAS

Serial Number 4000392
Tfer Desc. Source generator (D

Tfer ID 01321

Slope 1.00000
Intercept 0.00000

Cert Date 2/13/2012
CorrCoff 1.00000

Mfg Fluke
Parameter DAS

Serial Number 86590148
Tfer Desc. DVM

Tfer ID 01310

Slope 1.00000
Intercept 0.00000

Cert Date 1/27/2013
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.1000	0.0999	V	V	-0.0001
7	0.3000	0.3000	0.3000	V	V	0.0000
7	0.5000	0.5000	0.5000	V	V	0.0000
7	0.7000	0.7001	0.6999	V	V	-0.0002
7	0.9000	0.9001	0.8999	V	V	-0.0002
7	1.0000	1.0001	0.9999	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW04423004	GTH161	Eric Hebert	06/12/2013	flow rate	000171

Mfg	MACTEC	
SN/Owner ID	none	06044
Parameter	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/8/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
2.16%	2.23%		

Cal Factor Zero	-0.09
Cal Factor Full Scale	1.01
Rotometer Reading:	3.6

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalI	PctDifference:
primary	pump off	0.000	0.000	0.05	0.046	-0.04	l/m	l/m	
primary	leak check	0.000	0.000	0.05	0.046	-0.04	l/m	l/m	
primary	test pt 1	0.000	2.936	2.81	2.808	3.00	l/m	l/m	2.17%
primary	test pt 2	0.000	2.935	2.81	2.808	3.00	l/m	l/m	2.23%
primary	test pt 3	0.000	2.939	2.81	2.808	3.00	l/m	l/m	2.07%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347324	GTH161	Eric Hebert	06/12/2013	Ozone	000744

Slope: 0.93953
Intercept 0.44137
CorrCoff 0.99997

Slope: 0.00000
Intercept 0.00000
CorrCoff 0.00000

DAS 1:

A Avg % Diff:	A Max % Di
5.4%	5.8%

DAS 2:

A Avg %Dif	A Max % Di

Mfg ThermoElectron Inc
Parameter ozone
Serial Number 517112175
Tfer Desc. Ozone primary stan
Tfer ID 01111
Slope 0.99720
Intercept 0.18428
Cert Date 1/2/2013
CorrCoff 1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.03	-0.15	0.43	ppb	
primary	2	29.75	29.64	27.94	ppb	-5.74%
primary	3	49.75	49.70	47.16	ppb	-5.11%
primary	4	79.85	79.88	75.90	ppb	-4.98%
primary	5	109.80	109.92	103.50	ppb	-5.84%

Sensor Component	Cell B Noise	**Condition**	1.5 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	3 %	**Status**	pass
Sensor Component	Offset	**Condition**	0.000	**Status**	pass
Sensor Component	Span	**Condition**	0.988	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	99.0 kHz	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.59 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	33.3 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	522 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	1.1 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	90.9 kHz	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.57 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	11742	GTH161	Eric Hebert	06/12/2013	Temperature	06120

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00732	**Intercept**	-0.12380
Cert Date	1/12/2013	**CorrCoff**	1.00000

DAS 1:		**DAS 2:**	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.13	0.21		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	-0.04	0.08	0.000	0.3	C	0.21
primary	Temp Mid Range	23.81	23.76	0.000	23.8	C	0.03
primary	Temp High Range	45.88	45.67	0.000	45.5	C	-0.14

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

Infrastructure Data For

Site ID GTH161 **Technician** Eric Hebert **Site Visit Date** 06/12/2013

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

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

Shelter Temperature Data For

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
Campbell	none	GTH161	Eric Hebert	06/12/2013	Shelter Temperature	none

DAS 1:		**DAS 2:**	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.47	1.11		

Mfg	Extech	**Parameter**	Shelter Temperatur
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00732	**Intercept**	-0.12380
Cert Date	1/12/2013	**CorrCoff**	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	19.94	19.92	0.000	21.0	C	1.11
primary	Temp Mid Range	21.94	21.90	0.000	21.8	C	-0.12
primary	Temp Mid Range	22.72	22.68	0.000	22.5	C	-0.19

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Due to the remote location of the site, it can take up to a week to return the filter sample to the lab after it is removed from the tower in the winter. The site operator is transferring the filter bag and caps from the new filter to the removed filter. There are no clean bags and spare caps on-site. It was discussed that the bags and caps are intended to stay with each filter and not be transferred from one to the next.

2 **Parameter:** DasComments

There is a new sample tower on-site to be installed in the near future.

3 **Parameter:** SiteOpsProcedures

The site operator is new and has not received formal training. He has been provided with written instructions prepared by the previous site operator. Site operation has improved since the previous site audit visit.

4 **Parameter:** ShelterCleanNotes

Some floor tiles are damaged.

5 **Parameter:** MetSensorComme

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

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID GTH161 **Technician** Eric Hebert **Site Visit Date** 06/12/2013

Site Sponsor (agency)	EPA	**USGS Map**	Gothic
Operating Group	RMBL	**Map Scale**	
AQS #	08-051-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	38.9573
Deposition Measurement	dry, wet	**QAPP Longitude**	-106.9854
Land Use	mountain meadow, woodland - mixed	**QAPP Elevation Meters**	2926
Terrain	complex	**QAPP Declination**	10.75
Conforms to MLM	No	**QAPP Declination Date**	2/23/2006
Site Telephone	(970) 349-5691	**Audit Latitude**	38.95627
Site Address 1	RMBL	**Audit Longitude**	-106.98587
Site Address 2	Gothic	**Audit Elevation**	2915
County	Gunnison	**Audit Declination**	9.6

City, State	Crested Butte, CO		**Present**	
Zip Code	81224	**Fire Extinguisher**	☑	Inspected Nov 1987
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 (s/n 2149-12) **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** Some floor tiles are damaged.

Site OK ☑ **Notes**

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

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID GTH161 **Technician** Eric Hebert **Site Visit Date** 06/12/2013

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID GTH161

Technician Eric Hebert

Site Visit Date 06/12/2013

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

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

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

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID GTH161 **Technician** Eric Hebert **Site Visit Date** 06/12/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342VC	11742	06120

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

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID GTH161 **Technician** Eric Hebert **Site Visit Date** 06/12/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	A	none	03564
MFC power supply	MACTEC	none	none	06044
Ozone	ThermoElectron Inc	49i A1NAA	1105347324	000744
Filter pack flow pump	Thomas	107CAB18	1192001884	02751
Zero air pump	Werther International	P 70/4	000836211	06927

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

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID GTH161 **Technician** Eric Hebert **Site Visit Date** 06/12/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	5HFNHB1	000251
DAS	Campbell	CR3000	2513	000416
Modem	Raven	H4223-C	0844321356	06589

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

There is a new sample tower on-site to be installed in the near future.

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID GTH161

Technician Eric Hebert

Site Visit Date 06/12/2013

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2001	☐
HASP	☐		☐
Field Ops Manual	☑	July 1990	☐
Calibration Reports	☐		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID GTH161 **Technician** Eric Hebert **Site Visit Date** 06/12/2013

Site operation procedures

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

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

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

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

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

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

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

The site operator is new and has not received formal training. He has been provided with written instructions prepared by the previous site operator. Site operation has improved since the previous site audit visit.

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID GTH161

Technician Eric Hebert

Site Visit Date 06/12/2013

Site operation procedures

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

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

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

Due to the remote location of the site, it can take up to a week to return the filter sample to the lab after it is removed from the tower in the winter. The site operator is transferring the filter bag and caps from the new filter to the removed filter. There are no clean bags and spare caps on-site. It was discussed that the bags and caps are intended to stay with each filter and not be transferred from one to the next.

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: 7/11/2013 3:02:18 PM

SiteVisitDate	Site	Technician
04/01/2013	CHA467	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99085	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.45247	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.3	%	**P**
5	Ozone % difference max	P	7	10	4	0.5	%	**P**

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** System Memo **CommentCode** 178

Stainless steel fittings are connected to Teflon fittings on the ozone analyzer. This can cause leaks and premature failure of the fittings.

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

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

EEMS Spot Report

Data Compiled: 7/11/2013 7:29:05 PM

SiteVisitDate	Site	Technician
04/02/2013	PET427	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99254	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.63847	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.5	%	**P**
5	Ozone % difference max	P	7	10	4	1.1	%	**P**

Field Performance Comments

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

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

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

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

EEMS Spot Report

Data Compiled: 7/11/2013 7:39:36 PM

SiteVisitDate	Site	Technician
04/04/2013	GRC474	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00765	unitless	**P**
2	Ozone Intercept	P	0	5	4	-1.00446	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.1	%	**P**
5	Ozone % difference max	P	7	10	4	2.7	%	**P**

Field Performance Comments

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

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

EEMS Spot Report

Data Compiled: 7/11/2013 7:49:36 PM

SiteVisitDate	Site	Technician
04/08/2013	JOT403	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.95679	unitless	**P**
2	Ozone Intercept	P	0	5	4	1.01348	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99982	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.1	%	**P**
5	Ozone % difference max	P	7	10	4	4.3	%	**P**

EEMS Spot Report

Data Compiled: 7/11/2013 9:19:49 PM

SiteVisitDate	Site	Technician
04/11/2013	PIN414	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	P	3	0.5	4	0.01	m/s	**P**
2	Wind Speed max error below 5m/s in m/s	P	3	0.5	4	0.03	m/s	**P**
3	Wind Speed average % difference above 5 m/s	P	3	5	4	0.3	%	**P**
4	Wind Speed max % difference above 5 m/s	P	3	5	4	0.3	%	**P**
5	Wind Speed Torque average error	P	3	0.5	1	0.45	g-cm	**P**
6	Wind Speed Torque max error	P	3	0.5	1	0.5	g-cm	**Fail**
7	Wind Direction Input Deg True average error (de	P	2	5	5	3.4	degrees	**P**
8	Wind Direction Input Deg True max error (deg)	P	2	5	5	6	degrees	**Fail**
9	Wind Direction Linearity average error (deg)	P	2	5	8	2.2	degrees	**P**
10	Wind Direction Linearity max error (deg)	P	2	5	8	6	degrees	**Fail**
11	Wind Direction Torque average error	P	2	20	1	8	g-cm	**P**
12	Wind Direction Torque max error	P	2	20	1	8	g-cm	**P**
13	Temperature average error	P	4	0.5	3	0.08	c	**P**
14	Temperature max error	P	4	0.5	3	0.11	c	**P**
15	Relative Humidity average above 85%	P	6	10	1	4.0	%	**P**
16	Relative Humidity max above 85%	P	6	10	1	4.0	%	**P**
17	Relative Humidity average below 85%	P	6	10	2	2.5	%	**P**
18	Relative Humidity max below 85%	P	6	10	2	4.2	%	**P**
19	Solar Radiation % diff of avg	P	9	10	27	9.42	%	**P**
20	Solar Radiation % diff of max STD value	P	9	10	27	9.00	%	**P**
21	Precipitation average % difference	P	1	10	2	2.0	%	**P**
22	Precipitation max % difference	P	1	10	2	4.0	%	**P**
23	Ozone Slope	P	0	1.1	4	0.98686	unitless	**P**
24	Ozone Intercept	P	0	5	4	0.13471	ppb	**P**
25	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
26	Ozone % difference avg	P	7	10	4	1.1	%	**P**
27	Ozone % difference max	P	7	10	4	1.7	%	**P**
28	Flow Rate average % difference	P	10	5	3	0.10	%	**P**
29	Flow Rate max % difference	P	10	5	3	0.14	%	**P**
30	DAS Time maximum error	P	0	5	1	0.67	min	**P**
31	DAS Voltage average error	P	9	0.003	28	0.0001	V	**P**
32	DAS Voltage average error	P	2	0.003	28	0.0003	V	**P**
33	Shelter Temperature average error	P	5	1	9	1.28	c	**Fail**
34	Shelter Temperature max error	P	5	1	9	2.09	c	**Fail**

SiteVisitDate	Site	Technician
04/11/2013	PIN414	Eric Hebert

Field Performance Comments

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

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

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

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

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

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

4 **Parameter:** Precipitation **SensorComponent:** Sensor Heater **CommentCode** 107

The tipping bucket rain gauge heater is not functioning.

5 **Parameter:** Wind Direction **SensorComponent:** Condition **CommentCode** 147

The upper and lower sections of the wind sensor body are loose. This condition will cause premature failure of the sensor and can affect data accuracy.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator reported that the flow pump is routinely turned on while the tower is down after the dry deposition filter is installed. She reported that she was instructed by ARS to operate the flow pump while the tower was in the down position to check for proper filter pack installation. It was discussed that this is not a proper check of filter installation since air flow could be going through the connector with the connector completely locked in place. The operator reported that the plastic bag is used to handle the filter and that gloves are not used. The site operator reported that the ozone inlet filter is changed while the dry deposition filter is still installed and exposed on the tower.

2 **Parameter:** SiteOpsProcedures

The site operator reviews data each week to ensure proper operation of sensors and instruments.

3 **Parameter:** ShelterCleanNotes

Shelter has some loose tiles and signs of a leak in the SW corner. It is somewhat cluttered with equipment that is unused and some that requires installation. The lighting is poor.

EEMS Spot Report

Data Compiled: 7/11/2013 9:31:58 PM

SiteVisitDate	Site	Technician
04/16/2013	GRB411	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.0428	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.30416	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.5	%	**P**
5	Ozone % difference max	P	7	10	4	4.1	%	**P**

Field Performance Comments

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

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

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

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

EEMS Spot Report

Data Compiled: 7/11/2013 9:48:03 PM

SiteVisitDate	Site	Technician
04/18/2013	MEV405	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00093	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.68617	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	3.2	%	**P**

Field Performance Comments

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

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

EEMS Spot Report

Data Compiled: 7/11/2013 10:01:49 PM

SiteVisitDate	Site	Technician
04/19/2013	CAN407	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.97307	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.93607	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.3	%	**P**
5	Ozone % difference max	P	7	10	4	1.9	%	**P**

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** Cell A Tmp. **CommentCode** 94

The cooling fan dust cover for the ozone analyzer is clogged with dust and restricting air flow. This is increasing the internal ozone analyzer temperature. This could lead to premature failure of components including the ozone sample pump.

2 **Parameter:** Ozone **SensorComponent:** Cell A Tmp. **CommentCode** 99

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

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

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

EEMS Spot Report

Data Compiled: 7/13/2013 12:19:30 PM

SiteVisitDate	Site	Technician
04/22/2013	DCP114	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	12	0.13	c	**P**
2	Temperature max error	P	4	0.5	12	0.15	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99126	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.91544	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.8	%	**P**
7	Ozone % difference max	P	7	10	4	2.4	%	**P**
8	Flow Rate average % difference	P	10	5	2	1.64	%	**P**
9	Flow Rate max % difference	P	10	5	2	1.7	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	28	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	9	0.11	c	**P**
13	Shelter Temperature max error	P	5	1	9	0.12	c	**P**

SiteVisitDate	Site	Technician
04/22/2013	DCP114	Sandy Grenville

Field Performance Comments

1 **Parameter:** Temperature **SensorComponent:** Blower **CommentCode** 26

The forced-air blower for the shield is not functioning.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator is following procedures and doing a very good job with filter handling.

2 **Parameter:** DasComments

One leg of the meteorological sensor tower is damaged and has a hole near the midpoint of the tower.

3 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced and the sample line is leak-tested every two weeks.

4 **Parameter:** SitingCriteriaCom

The site is located in a wooded thicket within a state park. The area surrounding the park is almost completely intensive agriculture. The site may not be regionally representative.

5 **Parameter:** ShelterCleanNotes

The shelter is currently in fair condition. There are loose floor tiles. There are signs of rodent infestation.

6 **Parameter:** MetOpMaintCom

The blower for the aspirated temperature sensor shield is not functioning. This will affect sensor accuracy and data quality.

EEMS Spot Report

Data Compiled: 7/27/2013 12:33:22 PM

SiteVisitDate	Site	Technician
04/25/2013	SAN189	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.11	c	**P**
2	Temperature max error	P	4	0.5	6	0.24	c	**P**
3	Ozone Slope	P	0	1.1	4	0.95175	unitless	**P**
4	Ozone Intercept	P	0	5	4	1.21042	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99993	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.0	%	**P**
7	Ozone % difference max	P	7	10	4	3.6	%	**P**
8	Flow Rate average % difference	P	10	5	6	1.12	%	**P**
9	Flow Rate max % difference	P	10	5	6	1.15	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	21	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	9	0.34	c	**P**
13	Shelter Temperature max error	P	5	1	9	0.65	c	**P**

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator was observed to be not completely familiar with all aspects of CASTNET site operation. Additional training is recommended. Flow rate leak checks are not performed although they are reported. The initial and final flow rates are not recorded correctly. These observations were reported following the previous audit.

2 **Parameter:** SiteOpsProcedures

CASTNET procedures including filter pack leak check and filter pack final flow rate are not being performed correctly. Additional training is recommended.

3 **Parameter:** ShelterCleanNotes

The shelter is in very good condition, however somewhat cluttered.

EEMS Spot Report

Data Compiled: 7/27/2013 1:05:28 PM

SiteVisitDate	Site	Technician
04/26/2013	KNZ184	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	3	0.17	c	**P**
2	Temperature max error	P	4	0.5	3	0.19	c	**P**
3	Flow Rate average % difference	P	10	5	2	0.08	%	**P**
4	Flow Rate max % difference	P	10	5	2	0.13	%	**P**
5	DAS Time maximum error	P	0	5	1	0.00	min	**P**
6	DAS Voltage average error	P	7	0.003	28	0.0000	V	**P**
7	Shelter Temperature average error	P	5	1	9	0.93	c	**P**
8	Shelter Temperature max error	P	5	1	9	1.17	c	**Fail**

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

One clean glove is used to handle the filter for removal and installation.

2 **Parameter:** SiteOpsProcedures

Ozone monitor not operating.

3 **Parameter:** SitingCriteriaCom

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

4 **Parameter:** ShelterCleanNotes

The shelter is very clean, neat, well organized and well maintained.

5 **Parameter:** PollAnalyzerCom

By request of the Kansas Department of Health and Environment, the site ozone monitor was not operating at the time of the site audit.

EEMS Spot Report

Data Compiled: 7/27/2013 3:32:43 PM

SiteVisitDate	Site	Technician
05/01/2013	YOS404	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	P	3	0.5	4	0.02	m/s	**P**
2	Wind Speed max error below 5m/s in m/s	P	3	0.5	4	0.03	m/s	**P**
3	Wind Speed average % difference above 5 m/s	P	3	5	4	0.7	%	**P**
4	Wind Speed max % difference above 5 m/s	P	3	5	4	0.8	%	**P**
5	Wind Speed Torque average error	P	3	0.5	1	0.30	g-cm	**P**
6	Wind Speed Torque max error	P	3	0.5	1	0.3	g-cm	**P**
7	Wind Direction Input Deg True average error (de	P	2	5	4	10.8	degrees	**Fail**
8	Wind Direction Input Deg True max error (deg)	P	2	5	4	13	degrees	**Fail**
9	Wind Direction Linearity average error (deg)	P	2	5	8	1.5	degrees	**P**
10	Wind Direction Linearity max error (deg)	P	2	5	8	4	degrees	**P**
11	Wind Direction Torque average error	P	2	20	1	8	g-cm	**P**
12	Wind Direction Torque max error	P	2	20	1	8	g-cm	**P**
13	Temperature average error	P	4	0.5	3	0.05	c	**P**
14	Temperature max error	P	4	0.5	3	0.12	c	**P**
15	Relative Humidity average above 85%	P	6	10	2	2.1	%	**P**
16	Relative Humidity max above 85%	P	6	10	2	2.1	%	**P**
17	Relative Humidity average below 85%	P	6	10	4	3.3	%	**P**
18	Relative Humidity max below 85%	P	6	10	4	4.3	%	**P**
19	Solar Radiation % diff of avg	P	9	10	8	3.82	%	**P**
20	Solar Radiation % diff of max STD value	P	9	10	8	4.8	%	**P**
21	Precipitation average % difference	P	1	10	2	3.0	%	**P**
22	Precipitation max % difference	P	1	10	2	4.0	%	**P**
23	Ozone Slope	P	0	1.1	4	1.00354	unitless	**P**
24	Ozone Intercept	P	0	5	4	-0.98519	ppb	**P**
25	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
26	Ozone % difference avg	P	7	10	4	1.3	%	**P**
27	Ozone % difference max	P	7	10	4	1.9	%	**P**
28	Flow Rate average % difference	P	10	5	6	3.14	%	**P**
29	Flow Rate max % difference	P	10	5	6	3.22	%	**P**
30	DAS Time maximum error	P	0	5	1	1.4	min	**P**
31	DAS Voltage average error	P	15	0.003	21	0.0001	V	**P**
32	DAS Voltage average error	P	6	0.003	21	0.0000	V	**P**
33	Shelter Temperature average error	P	5	1	9	2.83	c	**Fail**
34	Shelter Temperature max error	P	5	1	9	3.6	c	**Fail**

SiteVisitDate	Site	Technician
05/01/2013	YOS404	Eric Hebert

Field Performance Comments

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

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

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

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

3 **Parameter:** Wind Direction **SensorComponent:** Vane Condition **CommentCode** 211

The wind direction vane is slightly bent and could be causing additional bias in wind direction measurements.

4 **Parameter:** Wind Direction **SensorComponent:** Condition **CommentCode** 147

The upper and lower sections of the wind sensor body are loose. This condition will cause premature failure of the sensor and can affect data accuracy.

5 **Parameter:** Wind Speed **SensorComponent:** Condition **CommentCode** 147

The upper and lower sections of the wind sensor body are loose. This condition will cause premature failure of the sensor and can affect data accuracy.

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The site is neat, clean, and well organized.

2 **Parameter:** PollAnalyzerCom

The DAS full scale and zero factors for the ozone channel are set to 497 and -3 respectively. The usual settings are 500 and 0. This may not be a problem but it does contribute to the error observed during the ozone accuracy check. It is possible that polled data at the central polling station have different factors.

EEMS Spot Report

Data Compiled: 7/27/2013 4:51:57 PM

SiteVisitDate	Site	Technician
05/03/2013	SEK430	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	P	3	0.5	4	0.07	m/s	**P**
2	Wind Speed max error below 5m/s in m/s	P	3	0.5	4	0.19	m/s	**P**
3	Wind Speed average % difference above 5 m/s	P	3	5	4	0.2	%	**P**
4	Wind Speed max % difference above 5 m/s	P	3	5	4	0.5	%	**P**
5	Wind Speed Torque average error	P	3	0.5	1	0.40	g-cm	**P**
6	Wind Speed Torque max error	P	3	0.5	1	0.4	g-cm	**P**
7	Wind Direction Input Deg True average error (de	P	2	5	4	2.8	degrees	**P**
8	Wind Direction Input Deg True max error (deg)	P	2	5	4	5	degrees	**P**
9	Wind Direction Linearity average error (deg)	P	2	5	8	1.8	degrees	**P**
10	Wind Direction Linearity max error (deg)	P	2	5	8	3	degrees	**P**
11	Wind Direction Torque average error	P	2	20	1	14	g-cm	**P**
12	Wind Direction Torque max error	P	2	20	1	14	g-cm	**P**
13	Temperature average error	P	4	0.5	9	0.13	c	**P**
14	Temperature max error	P	4	0.5	9	0.21	c	**P**
15	Relative Humidity average above 85%	P	6	10	1	2.0	%	**P**
16	Relative Humidity max above 85%	P	6	10	1	2.0	%	**P**
17	Relative Humidity average below 85%	P	6	10	2	2.0	%	**P**
18	Relative Humidity max below 85%	P	6	10	2	2.9	%	**P**
19	Solar Radiation % diff of avg	P	9	10	6	1.73	%	**P**
20	Solar Radiation % diff of max STD value	P	9	10	6	2.2	%	**P**
21	Precipitation average % difference	P	1	10	2	4.7	%	**P**
22	Precipitation max % difference	P	1	10	2	5.5	%	**P**
23	Ozone Slope	P	0	1.1	4	0.98730	unitless	**P**
24	Ozone Intercept	P	0	5	4	0.82037	ppb	**P**
25	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
26	Ozone % difference avg	P	7	10	4	0.9	%	**P**
27	Ozone % difference max	P	7	10	4	2.4	%	**P**
28	Flow Rate average % difference	P	10	5	6	0.20	%	**P**
29	Flow Rate max % difference	P	10	5	6	0.31	%	**P**
30	DAS Time maximum error	P	0	5	1	0.33	min	**P**
31	DAS Voltage average error	P	9	0.003	28	0.0002	V	**P**
32	DAS Voltage average error	P	2	0.003	28	0.0002	V	**P**
33	Shelter Temperature average error	P	5	1	9	1.42	c	**Fail**
34	Shelter Temperature max error	P	5	1	9	1.5	c	**Fail**

SiteVisitDate	Site	Technician
05/03/2013	SEK430	Eric Hebert

Field Performance Comments

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

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

2 **Parameter:** Precipitation **SensorComponent:** Sensor Heater **CommentCode** 107

The tipping bucket rain gauge heater is not functioning.

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

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

4 **Parameter:** Temperature **SensorComponent:** Blower **CommentCode** 26

The forced-air blower for the shield is not functioning.

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is a wooded area with spaced trees on three sides and a steep drop in elevation on the west side. Although not strictly conforming to siting criteria it is elevated in a wide valley and representative of the area. Some trees have been trimmed since the previous site audit. Trees are still within 5 meters, however none are higher than the CASTNET sample inlets.

2 **Parameter:** ShelterCleanNotes

The shelter is aging but is in fair condition and kept clean, neat, and well organized.

3 **Parameter:** MetSensorComme

The rain gauge is mounted near the tower.

4 **Parameter:** MetOpMaintCom

The temperature sensor aspirated shield blower is not functioning which will impact temperature data accuracy.

EEMS Spot Report

Data Compiled: 7/27/2013 11:01:13 PM

SiteVisitDate	Site	Technician
05/07/2013	LAV410	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	P	3	0.5	8	0.01	m/s	**P**
2	Wind Speed max error below 5m/s in m/s	P	3	0.5	8	0.03	m/s	**P**
3	Wind Speed average % difference above 5 m/s	P	3	5	8	0.1	%	**P**
4	Wind Speed max % difference above 5 m/s	P	3	5	8	0.3	%	**P**
5	Wind Speed Torque average error	P	3	0.5	1	0.30	g-cm	**P**
6	Wind Speed Torque max error	P	3	0.5	1	0.3	g-cm	**P**
7	Wind Direction Input Deg True average error (de	P	2	5	8	3.2	degrees	**P**
8	Wind Direction Input Deg True max error (deg)	P	2	5	8	5	degrees	**P**
9	Wind Direction Linearity average error (deg)	P	2	5	16	2.0	degrees	**P**
10	Wind Direction Linearity max error (deg)	P	2	5	16	4	degrees	**P**
11	Wind Direction Torque average error	P	2	20	1	8	g-cm	**P**
12	Wind Direction Torque max error	P	2	20	1	10	g-cm	**P**
13	Temperature average error	P	4	0.5	3	0.15	c	**P**
14	Temperature max error	P	4	0.5	3	0.34	c	**P**
15	Relative Humidity average above 85%	P	6	10	2	1.0	%	**P**
16	Relative Humidity max above 85%	P	6	10	2	1.0	%	**P**
17	Relative Humidity average below 85%	P	6	10	4	8.0	%	**P**
18	Relative Humidity max below 85%	P	6	10	4	11.4	%	**Fail**
19	Solar Radiation % diff of avg	P	9	10	18	9.72	%	**P**
20	Solar Radiation % diff of max STD value	P	9	10	18	11.4	%	**Fail**
21	Precipitation average % difference	P	1	10	2	3.0	%	**P**
22	Precipitation max % difference	P	1	10	2	4.0	%	**P**
23	Ozone Slope	P	0	1.1	4	0.98219	unitless	**P**
24	Ozone Intercept	P	0	5	4	1.20291	ppb	**P**
25	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
26	Ozone % difference avg	P	7	10	4	1.0	%	**P**
27	Ozone % difference max	P	7	10	4	2.1	%	**P**
28	Flow Rate average % difference	P	10	5	6	1.13	%	**P**
29	Flow Rate max % difference	P	10	5	6	1.26	%	**P**
30	DAS Time maximum error	P	0	5	1	0.15	min	**P**
31	DAS Voltage average error	P	9	0.003	28	0.0001	V	**P**
32	DAS Voltage average error	P	2	0.003	28	0.0000	V	**P**
33	Shelter Temperature average error	P	5	1	9	1.27	c	**Fail**
34	Shelter Temperature max error	P	5	1	9	1.68	c	**Fail**

SiteVisitDate	Site	Technician
05/07/2013	LAV410	Eric Hebert

Field Performance Comments

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

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

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

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

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

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

4 **Parameter:** Precipitation **SensorComponent:** System Memo **CommentCode** 100

The edge of the tipping bucket funnel rests on the pipe that supports the rain gauge. This causes the funnel to be out of level.

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

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

6 **Parameter:** Wind Direction **SensorComponent:** Condition **CommentCode** 147

The upper and lower sections of the wind sensor body are loose. This condition will cause premature failure of the sensor and can affect data accuracy.

7 **Parameter:** Wind Speed **SensorComponent:** Prop or Cups Con **CommentCode** 145

Both set screws are stripped.

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

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

2 **Parameter:** DocumentationCo

The most recent calibration and verification results are not available on-site.

3 **Parameter:** ShelterCleanNotes

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

4 **Parameter:** SitingCriteriaCom

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

5 **Parameter:** MetSensorComme

The rain gauge funnel is contacting the tipping bucket mounting post causing it to be 1/2 bubble off level. Objects violate the 45 degree rule.

6 **Parameter:** MetOpMaintCom

The signal cables are showing signs of wear.

EEMS Spot Report

Data Compiled: 7/27/2013 11:52:39 PM

SiteVisitDate	Site	Technician
05/08/2013	OXF122	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.44	c	**P**
2	Temperature max error	P	4	0.5	6	0.97	c	**Fail**
3	Ozone Slope	P	0	1.1	4	0.99852	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.14735	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99992	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.7	%	**P**
7	Ozone % difference max	P	7	10	4	1.7	%	**P**
8	Flow Rate average % difference	P	10	5	2	0.12	%	**P**
9	Flow Rate max % difference	P	10	5	2	0.20	%	**P**
10	DAS Time maximum error	P	0	5	1	0.02	min	**P**
11	DAS Voltage average error	P	7	0.003	28	0.0000	V	**P**
12	Shelter Temperature average error	P	5	1	9	0.45	c	**P**
13	Shelter Temperature max error	P	5	1	9	0.52	c	**P**

SiteVisitDate	**Site**	**Technician**
05/08/2013	OXF122	Sandy Grenville

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Due to the high operator turn-over rate, the operators are unfamiliar with some minor aspects of site operation.

2 **Parameter:** DasComments

The met tower is operated by the university and the temperature sensor has been moved to the sample tower in a naturally aspirated shield.

3 **Parameter:** SitingCriteriaCom

The site is located in university agriculture research facility.

4 **Parameter:** ShelterCleanNotes

The shelter roof is in poor condition with several leaks.

EEMS Spot Report

Data Compiled: 7/28/2013 12:13:50 AM

SiteVisitDate	Site	Technician
05/09/2013	QAK172	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	3	0.17	c	**P**
2	Temperature max error	P	4	0.5	3	0.22	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99551	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.61213	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.8	%	**P**
7	Ozone % difference max	P	7	10	4	1.3	%	**P**
8	Flow Rate average % difference	P	10	5	6	2.43	%	**P**
9	Flow Rate max % difference	P	10	5	6	2.47	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	28	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	9	0.61	c	**P**
13	Shelter Temperature max error	P	5	1	9	0.81	c	**P**

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator is doing an excellent job maintaining the site.

2 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 7/28/2013 12:35:32 AM

SiteVisitDate	Site	Technician
05/12/2013	PND165	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.05	c	**P**
2	Temperature max error	P	4	0.5	6	0.14	c	**P**
3	Ozone Slope	P	0	1.1	4	0.95790	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.02026	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	4.1	%	**P**
7	Ozone % difference max	P	7	10	4	4.4	%	**P**
8	Flow Rate average % difference	P	10	5	6	1.02	%	**P**
9	Flow Rate max % difference	P	10	5	6	1.36	%	**P**
10	DAS Time maximum error	P	0	5	1	0.08	min	**P**
11	DAS Voltage average error	P	7	0.003	28	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	9	1.43	c	**Fail**
13	Shelter Temperature max error	P	5	1	9	2.26	c	**Fail**

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator uses the filter bag received with the new filter to send the filter removed from the tower back to the lab. There is no bag for the sample filter on site for storing the filter when it is removed from the tower.

2 **Parameter:** DasComments

Both the heat and the air conditioner are running simultaneously.

3 **Parameter:** DocumentationCo

General site observations are not being recorded on the SSRF. The purpose for recording the general observations was discussed with the site operator.

4 **Parameter:** ShelterCleanNotes

The shelter is well maintained.

EEMS Spot Report

Data Compiled: 7/28/2013 2:48:21 PM

SiteVisitDate	Site	Technician
05/12/2013	PNF126	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.06946	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.38181	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99993	unitless	**P**
4	Ozone % difference avg	P	7	10	4	6.6	%	**P**
5	Ozone % difference max	P	7	10	4	7.5	%	**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: 7/28/2013 12:57:44 AM

SiteVisitDate	Site	Technician
05/14/2013	CNT169	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	3	0.10	c	**P**
2	Temperature max error	P	4	0.5	3	0.17	c	**P**
3	Ozone Slope	P	0	1.1	4	0.95862	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.26392	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	4.1	%	**P**
8	Flow Rate average % difference	P	10	5	6	5.76	%	**Fail**
9	Flow Rate max % difference	P	10	5	6	6.13	%	**Fail**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	28	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	9	0.69	c	**P**
13	Shelter Temperature max error	P	5	1	9	0.99	c	**P**

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** DasComments

The sample tower has been replaced and the met tower removed since the previous site audit visit.

2 **Parameter:** SiteOpsProcedures

The ozone inlet filter is changed once each month and the ozone sample line is leak tested every two weeks.

3 **Parameter:** ShelterCleanNotes

The shelter is dirty. Some floor tiles have been repaired since the previous audit visit.

EEMS Spot Report

Data Compiled: 7/28/2013 2:45:14 PM

SiteVisitDate	Site	Technician
05/18/2013	MCK231	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.97219	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.30066	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99970	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.7	%	**P**
5	Ozone % difference max	P	7	10	4	5.4	%	**P**

EEMS Spot Report

Data Compiled: 7/28/2013 12:31:17 PM

SiteVisitDate	Site	Technician
06/06/2013	YEL408	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	P	3	0.5	8	0.08	m/s	**P**
2	Wind Speed max error below 5m/s in m/s	P	3	0.5	8	0.13	m/s	**P**
3	Wind Speed average % difference above 5 m/s	P	3	5	8	1.1	%	**P**
4	Wind Speed max % difference above 5 m/s	P	3	5	8	1.6	%	**P**
5	Wind Speed Torque average error	P	3	0.5	1	0.30	g-cm	**P**
6	Wind Speed Torque max error	P	3	0.5	1	0.3	g-cm	**P**
7	Wind Direction Input Deg True average error (de	P	2	5	8	9.5	degrees	**Fail**
8	Wind Direction Input Deg True max error (deg)	P	2	5	8	13	degrees	**Fail**
9	Wind Direction Linearity average error (deg)	P	2	5	16	1.2	degrees	**P**
10	Wind Direction Linearity max error (deg)	P	2	5	16	5	degrees	**P**
11	Wind Direction Torque average error	P	2	20	1	8	g-cm	**P**
12	Wind Direction Torque max error	P	2	20	1	8	g-cm	**P**
13	Temperature average error	P	4	0.5	9	0.05	c	**P**
14	Temperature max error	P	4	0.5	9	0.11	c	**P**
15	Relative Humidity average above 85%	P	6	10	2	0.9	%	**P**
16	Relative Humidity max above 85%	P	6	10	2	0.9	%	**P**
17	Relative Humidity average below 85%	P	6	10	4	2.2	%	**P**
18	Relative Humidity max below 85%	P	6	10	4	2.8	%	**P**
19	Solar Radiation % diff of avg	P	9	10	15	1.35	%	**P**
20	Solar Radiation % diff of max STD value	P	9	10	15	1.3	%	**P**
21	Precipitation average % difference	P	1	10	2	3.0	%	**P**
22	Precipitation max % difference	P	1	10	2	4.0	%	**P**
23	Ozone Slope	P	0	1.1	4	1.02906	unitless	**P**
24	Ozone Intercept	P	0	5	4	-0.33928	ppb	**P**
25	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
26	Ozone % difference avg	P	7	10	4	1.9	%	**P**
27	Ozone % difference max	P	7	10	4	2.8	%	**P**
28	Flow Rate average % difference	P	10	5	6	0.48	%	**P**
29	Flow Rate max % difference	P	10	5	6	0.87	%	**P**
30	DAS Time maximum error	P	0	5	1	0.52	min	**P**
31	DAS Voltage average error	P	16	0.003	35	0.0003	V	**P**
32	DAS Voltage average error	P	2	0.003	35	0.0001	V	**P**
33	Shelter Temperature average error	P	5	1	12	1.68	c	**Fail**
34	Shelter Temperature max error	P	5	1	12	2.06	c	**Fail**

SiteVisitDate	Site	Technician
06/06/2013	YEL408	Eric Hebert

Field Performance Comments

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

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

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

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

3 **Parameter:** Wind Speed **SensorComponent:** System Memo **CommentCode** 212

The external heater that wraps around the sensor was found to be impeding the rotation of the sensor shaft. This condition impacts data accuracy. The condition was corrected during the sensor audit.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Gloves are no longer used to handle the filter pack.

2 **Parameter:** SitingCriteriaCom

The site is located at the edge of a tree line. The trees close to the inlet are approximately 5 meters tall. Trees taller than 10 meters are 15 meters from the inlet.

3 **Parameter:** ShelterCleanNotes

The shelter is organized and well maintained.

4 **Parameter:** PollAnalyzerCom

The shelter and sample tower are located at the edge of the tree line and mountain slope. Small trees are encroaching on the sample tower. Taller trees are 10 to 15 meters from the sample tower.

EEMS Spot Report

Data Compiled: 7/28/2013 1:02:30 PM

SiteVisitDate	Site	Technician
06/10/2013	ROM206	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	9	0.08	c	**P**
2	Temperature max error	P	4	0.5	9	0.12	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99603	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.31352	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.5	%	**P**
7	Ozone % difference max	P	7	10	4	0.8	%	**P**
8	Flow Rate average % difference	P	10	5	3	0.78	%	**P**
9	Flow Rate max % difference	P	10	5	3	0.94	%	**P**
10	DAS Time maximum error	P	0	5	1	0.02	min	**P**
11	DAS Voltage average error	P	7	0.003	28	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	9	0.52	c	**P**
13	Shelter Temperature max error	P	5	1	9	0.54	c	**P**

SiteVisitDate	Site	Technician
06/10/2013	ROM206	Eric Hebert

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.

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The shelter is clean, neat, and well organized. There are signs of previous roof leaks, but they have been repaired. The floor and counter top have been replaced.

2 **Parameter:** MetSensorComme

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

EEMS Spot Report

Data Compiled: 7/28/2013 2:01:22 PM

SiteVisitDate	Site	Technician
06/10/2013	ROM406	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.11	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.20	c	**P**
3	Wind Speed average error below 5m/s in m/s	P	3	0.5	4	0.05	m/s	**P**
4	Wind Speed max error below 5m/s in m/s	P	3	0.5	4	0.20	m/s	**P**
5	Wind Speed average % difference above 5 m/s	P	3	5	4	0.0	%	**P**
6	Wind Speed max % difference above 5 m/s	P	3	5	4	0.0	%	**P**
7	Wind Speed Torque average error	P	3	0.5	1	0.30	g-cm	**P**
8	Wind Speed Torque max error	P	3	0.5	1	0.3	g-cm	**P**
9	Wind Direction Input Deg True average error (de	P	2	5	3	9.7	degrees	**Fail**
10	Wind Direction Input Deg True max error (deg)	P	2	5	3	13	degrees	**Fail**
11	Wind Direction Linearity average error (deg)	P	2	5	8	10.8	degrees	**Fail**
12	Wind Direction Linearity max error (deg)	P	2	5	8	43	degrees	**Fail**
13	Wind Direction Torque average error	P	2	20	1	14	g-cm	**P**
14	Wind Direction Torque max error	P	2	20	1	15	g-cm	**P**
15	Temperature average error	P	4	0.5	3	0.10	c	**P**
16	Temperature max error	P	4	0.5	3	0.10	c	**P**
17	Relative Humidity average above 85%	P	6	10	2	4.2	%	**P**
18	Relative Humidity max above 85%	P	6	10	2	4.2	%	**P**
19	Relative Humidity average below 85%	P	6	10	4	0.8	%	**P**
20	Relative Humidity max below 85%	P	6	10	4	1.0	%	**P**
21	Solar Radiation % diff of avg	P	9	10	10	3.05	%	**P**
22	Solar Radiation % diff of max STD value	P	9	10	10	7.1	%	**P**
23	Precipitation average % difference	P	1	10	2	0.0	%	**P**
24	Precipitation max % difference	P	1	10	2	0.0	%	**P**
25	Ozone Slope	P	0	1.1	4	0.99341	unitless	**P**
26	Ozone Intercept	P	0	5	4	0.32985	ppb	**P**
27	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
28	Ozone % difference avg	P	7	10	4	0.4	%	**P**
29	Ozone % difference max	P	7	10	4	0.6	%	**P**
30	Flow Rate average % difference	P	10	5	6	0.32	%	**P**
31	Flow Rate max % difference	P	10	5	6	0.35	%	**P**
32	DAS Time maximum error	P	0	5	1	0.40	min	**P**
33	DAS Voltage average error	P	12	0.003	35	0.0001	V	**P**
34	DAS Voltage average error	P	2	0.003	35	0.0000	V	**P**

SiteVisitDate	Site	Technician
06/10/2013	ROM406	Eric Hebert

35	Shelter Temperature average error	P	5	1	12	2.58	c	**Fail**
36	Shelter Temperature max error	P	5	1	12	4.47	c	**Fail**

SiteVisitDate	**Site**	**Technician**
06/10/2013	ROM406	Eric Hebert

Field Performance Comments

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

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

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

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

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

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

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

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

5 **Parameter:** Shelter Temperatur **SensorComponent:** Accuracy Mid Ran **CommentCode** 213

The shelter temperature is going outside CFR requirements for pollutant monitor operation.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator is doing a very good job performing the site duties and expressed an interest in trying to improve any deficiencies. The sample flow rate systems for both the dry deposition and ozone sample trains were explained during the audit at the request of the site operator.

2 **Parameter:** SiteOpsProcedures

Mercury thermometer was removed from the shelter during the site audit. The site operator has requested additional training from ARS.

3 **Parameter:** ShelterCleanNotes

The shelter is clean, neat, organized, and well maintained.

4 **Parameter:** MetSensorComme

The tipping bucket rain gage and solar radiation sensor have been moved to the roof of the shelter since the previous audit visit. Both temperature sensor shields have been replaced with new models.

5 **Parameter:** MetOpMaintCom

The wind direction sensor is exhibiting the symptoms of potentiometer failure. Wind direction data quality are being impacted by this condition.

EEMS Spot Report

Data Compiled: 7/28/2013 2:27:29 PM

SiteVisitDate	Site	Technician
06/12/2013	GTH161	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	9	0.13	c	**P**
2	Temperature max error	P	4	0.5	9	0.21	c	**P**
3	Ozone Slope	P	0	1.1	4	0.93953	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.44137	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
6	Ozone % difference avg	P	7	10	4	5.4	%	**P**
7	Ozone % difference max	P	7	10	4	5.8	%	**P**
8	Flow Rate average % difference	P	10	5	6	2.15	%	**P**
9	Flow Rate max % difference	P	10	5	6	2.23	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	28	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	9	0.47	c	**P**
13	Shelter Temperature max error	P	5	1	9	1.11	c	**Fail**

SiteVisitDate	Site	Technician
06/12/2013	GTH161	Eric Hebert

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Due to the remote location of the site, it can take up to a week to return the filter sample to the lab after it is removed from the tower in the winter. The site operator is transferring the filter bag and caps from the new filter to the removed filter. There are no clean bags and spare caps on-site. It was discussed that the bags and caps are intended to stay with each filter and not be transferred from one to the next.

2 **Parameter:** DasComments

There is a new sample tower on-site to be installed in the near future.

3 **Parameter:** SiteOpsProcedures

The site operator is new and has not received formal training. He has been provided with written instructions prepared by the previous site operator. Site operation has improved since the previous site audit visit.

4 **Parameter:** ShelterCleanNotes

Some floor tiles are damaged.

5 **Parameter:** MetSensorComme

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

EEMS Spot Report

Data Compiled: 7/28/2013 2:47:00 PM

SiteVisitDate	Site	Technician
06/15/2013	DEN417	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99826	unitless	**P**
2	Ozone Intercept	P	0	5	4	1.06287	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.9	%	**P**
5	Ozone % difference max	P	7	10	4	4.1	%	**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: 7/28/2013 2:49:22 PM

SiteVisitDate	Site	Technician
06/17/2013	MOR409	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.97890	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.66252	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99992	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.5	%	**P**
5	Ozone % difference max	P	7	10	4	5.3	%	**P**

Field Performance Comments

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

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

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

Site Inventory by Site Visit

CHA467-Eric Hebert-04/01/2013

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
1	4/1/2013	Computer	Gateway	none	Solo	B2509462726
2	4/1/2013	DAS	Environmental Sys Corp	90611	8816	2613
3	4/1/2013	Modem	US Robotics	09615	56k	unknown
4	4/1/2013	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460007
5	4/1/2013	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450193
6	4/1/2013	Printer	Hewlett Packard	none	5610	Unknown
7	4/1/2013	Sample Tower	Aluma Tower	03566	A	none
8	4/1/2013	Zero air pump	Werther International	none	PC70/4	000665785

Ozone Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
ThermoElectron Inc	CM08460007	CHA467	Eric Hebert	04/01/2013	Ozone	none

Slope:	0.99085	**Slope:**	0.00000
Intercept	0.45247	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.3%	0.6%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	0.99720	**Intercept**	0.18428
Cert Date	1/2/2013	**CorrCoff**	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.03	-0.15	0.38	ppb	
primary	2	25.72	25.60	25.62	ppb	0.08%
primary	3	56.23	56.20	56.35	ppb	0.27%
primary	4	86.17	86.22	85.75	ppb	-0.55%
primary	5	107.58	107.69	107.20	ppb	-0.46%

Sensor Component	Cell B Noise	**Condition**	1.1 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	0.9960	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	Offset	**Condition**	0.1	**Status**	pass
Sensor Component	Span	**Condition**	1.055	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	78.9 kHz	**Status**	Fail
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Sample Train	**Condition**	Poor	**Status**	Fail
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.67 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	39.2 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	627 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	81.3 kHz	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.71 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	0.0002	**Status**	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	CHA467	Eric Hebert	04/01/2013	System Memo	ThermoElectron	3564	☐	☑
Stainless steel fittings are connected to Teflon fittings on the ozone analyzer. This can cause leaks and premature failure of the fittings.								
Ozone	CHA467	Eric Hebert	04/01/2013	Cell B Freq.	ThermoElectron	3564	☐	☑
This analyzer diagnostic check is outside the manufacturer's recommended value.								

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PET427-Eric Hebert-04/02/2013						
1	4/2/2013	Computer	Gateway	none	Solo	B2500212709
2	4/2/2013	DAS	Environmental Sys Corp	90641	8816	2526
3	4/2/2013	Modem	US Robotics	none	56k	unknown
4	4/2/2013	Ozone	ThermoElectron Inc	none	49i A3NAA	1211052490
5	4/2/2013	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1015543061
6	4/2/2013	Sample Tower	Aluma Tower	none	B	none

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1211052490	PET427	Eric Hebert	04/02/2013	Ozone	none

Slope:	0.99254	**Slope:**	0.00000
Intercept	0.63847	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	0.99720	**Intercept**	0.18428
Cert Date	1/2/2013	**CorrCoff**	1.00000

DAS 1: **DAS 2:**

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
0.5%	1.1%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.06	-0.12	0.42	ppb	
primary	2	36.16	36.07	36.48	ppb	1.14%
primary	3	54.32	54.28	54.70	ppb	0.77%
primary	4	77.85	77.88	77.87	ppb	-0.01%
primary	5	105.70	105.81	105.60	ppb	-0.20%

Sensor Component	Cell B Noise	**Condition**	2.0 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	0.9998	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	Offset	**Condition**	0.000	**Status**	pass
Sensor Component	Span	**Condition**	1.033	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	78.9 kHz	**Status**	Fail
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.67 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	36.0 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	608 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	1.9 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	77.7 kHz	**Status**	Fail
Sensor Component	Cell A Flow	**Condition**	0.66 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	0.0001	**Status**	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	PET427	Eric Hebert	04/02/2013	Cell B Freq.	ThermoElectron	3729	☐	☑
This analyzer diagnostic check is outside the manufacturer's recommended value.								
Ozone	PET427	Eric Hebert	04/02/2013	Cell A Freq.	ThermoElectron	3729	☐	☑
This analyzer diagnostic check is outside the manufacturer's recommended value.								

Site Inventory by Site Visit

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number
GRC474-Eric Hebert-04/04/2013						
1	4/4/2013	Computer	Gateway	none	Solo	B2500251337
2	4/4/2013	DAS	Environmental Sys Corp	90602	8816	2270
3	4/4/2013	Modem	US Robotics	none	33.6 sportster	unknown
4	4/4/2013	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943902
5	4/4/2013	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450192
6	4/4/2013	Printer	Hewlett Packard	none	842C	unknown
7	4/4/2013	Sample Tower	Aluma Tower	03570	B	none
8	4/4/2013	Zero air pump	Werther International	none	PC70/4	531380

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1023943902	GRC474	Eric Hebert	04/04/2013	Ozone	none

Slope:	1.00765	**Slope:**	0.00000
Intercept	-1.00446	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.1%	2.7%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	0.99720	**Intercept**	0.18428
Cert Date	1/2/2013	**CorrCoff**	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.03	-0.15	-1.17	ppb	
primary	2	27.77	27.66	26.91	ppb	-2.71%
primary	3	56.06	56.03	55.39	ppb	-1.14%
primary	4	83.12	83.16	82.85	ppb	-0.37%
primary	5	107.99	108.10	107.90	ppb	-0.19%

Sensor Component	Cell B Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	0.9999	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	Offset	**Condition**	1.6	**Status**	pass
Sensor Component	Span	**Condition**	1.040	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	103.7 kHz	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.61 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	40.1 C	**Status**	Fail
Sensor Component	Cell A Pressure	**Condition**	594 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.6 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	114.3 kHz	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.61 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	0.0002	**Status**	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	GRC474	Eric Hebert	04/04/2013	Cell A Tmp.	ThermoElectron	3570	☐	☑

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

Site Inventory by Site Visit

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number
JOT403-Eric Hebert-04/08/2013						
1	4/8/2013	Computer	Hewlett Packard	none	8460p	CNU1360668
2	4/8/2013	DAS	Environmental Sys Corp	90599	8816	2271
3	4/8/2013	Modem	US Robotics	none	56k	unknown
4	4/8/2013	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460006
5	4/8/2013	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1211052489
6	4/8/2013	Printer	Hewlett Packard	none	842C	unknown
7	4/8/2013	Sample Tower	Aluma Tower	923310	B	none
8	4/8/2013	Zero air pump	Werther International	none	PC70/4	606491

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460006	JOT403	Eric Hebert	04/08/2013	Ozone	none

Slope: 0.95679
Intercept 1.01348
CorrCoff 0.99982

Slope: 0.00000
Intercept 0.00000
CorrCoff 0.00000

DAS 1:

A Avg % Diff:	A Max % Di
2.1%	4.3%

DAS 2:

A Avg %Dif	A Max % Di

Mfg ThermoElectron Inc
Parameter ozone
Serial Number 517112175
Tfer Desc. Ozone primary stan
Tfer ID 01111
Slope 0.99720
Intercept 0.18428
Cert Date 1/2/2013
CorrCoff 1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.16	-0.02	0.60	ppb	
primary	2	26.16	26.04	25.98	ppb	-0.23%
primary	3	55.43	55.40	54.35	ppb	-1.90%
primary	4	81.93	81.97	80.44	ppb	-1.87%
primary	5	102.85	102.95	98.53	ppb	-4.29%

Sensor Component		Condition		Status	
Sensor Component	Cell B Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	10.0018	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	Offset	**Condition**	-0.8	**Status**	pass
Sensor Component	Span	**Condition**	1.001	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	99.3 kHz	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.68 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	31.7 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	643 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	1.1 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	101.0 kHz	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.72 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	-0.0003	**Status**	pass

Site Inventory by Site Visit

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number
GRB411-Eric Hebert-04/16/2013						
1	4/16/2013	Computer	Gateway	none	Solo	B2500130064
2	4/16/2013	DAS	Environmental Sys Corp	90635	8816	2507
3	4/16/2013	Modem	US Robotics	none	V.92	unknown
4	4/16/2013	Ozone	ThermoElectron Inc	90565	49C	49C-59285-322
5	4/16/2013	Ozone Standard	ThermoElectron Inc	90570	49C	49C-59301-322
6	4/16/2013	Printer	Hewlett Packard	none	842C	unknown
7	4/16/2013	Sample Tower	Aluma Tower	none	B	AT-5381-F9-2
8	4/16/2013	Zero air pump	Werther International	90722	TT70/4E	507782

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-59285-322	GRB411	Eric Hebert	04/16/2013	Ozone	90565

Slope:	1.04280	**Slope:**	0.00000
Intercept	-0.30416	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.5%	4.1%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	0.99720	**Intercept**	0.18428
Cert Date	1/2/2013	**CorrCoff**	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.18	0.00	-0.09	ppb	
primary	2	28.42	28.31	28.98	ppb	2.37%
primary	3	54.04	54.00	55.94	ppb	3.59%
primary	4	81.75	81.79	84.95	ppb	3.86%
primary	5	104.98	105.08	109.40	ppb	4.11%

Sensor Component	Cell B Noise	**Condition**	1.8 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	0.9995	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	Offset	**Condition**	0.6	**Status**	pass
Sensor Component	Span	**Condition**	1.044	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	66.4 kHz	**Status**	Fail
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.63 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	33.3 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	573 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	1.6 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	69.3 kHz	**Status**	Fail
Sensor Component	Cell A Flow	**Condition**	0.68 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	0.0008	**Status**	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	GRB411	Eric Hebert	04/16/2013	Cell B Freq.	ThermoElectron	1577	☐	☑
This analyzer diagnostic check is outside the manufacturer's recommended value.								
Ozone	GRB411	Eric Hebert	04/16/2013	Cell A Freq.	ThermoElectron	1577	☐	☑
This analyzer diagnostic check is outside the manufacturer's recommended value.								

Site Inventory by Site Visit

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number
MEV405-Eric Hebert-04/18/2013						
1	4/18/2013	Computer	Gateway	none	450SX4	unknown
2	4/18/2013	DAS	Environmental Sys Corp	90613	8816	2616
3	4/18/2013	Modem	US Robotics	none	56k fax modem	unknown
4	4/18/2013	Ozone	ThermoElectron Inc	none	49C	0425208058
5	4/18/2013	Ozone Standard	ThermoElectron Inc	none	49C	0425208055
6	4/18/2013	Printer	Hewlett Packard	none	842C	unknown
7	4/18/2013	Sample Tower	Aluma Tower	illegible	B	none
8	4/18/2013	Zero air pump	Werther International	none	PC40/4	526289

Ozone Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
ThermoElectron Inc	0425208058	MEV405	Eric Hebert	04/18/2013	Ozone	none

Slope:	1.00093	**Slope:**	0.00000
Intercept	-0.68617	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.4%	3.2%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	0.99720	**Intercept**	0.18428
Cert Date	1/2/2013	**CorrCoff**	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.05	-0.13	-0.63	ppb	
primary	2	27.24	27.13	26.27	ppb	-3.17%
primary	3	52.32	52.28	51.73	ppb	-1.05%
primary	4	81.47	81.51	80.57	ppb	-1.15%
primary	5	108.61	108.73	108.40	ppb	-0.30%

Sensor Component	Cell B Noise	**Condition**	0.7 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	1.0003	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	Offset	**Condition**	1.0	**Status**	pass
Sensor Component	Span	**Condition**	1.030	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	86.4 kHz	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.60 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	36.7 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	572 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.5 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	62.2 kHz	**Status**	Fail
Sensor Component	Cell A Flow	**Condition**	0.70 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	0.0003	**Status**	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	MEV405	Eric Hebert	04/18/2013	Cell A Freq.	ThermoElectron	418	☐	☑

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

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CAN407-Eric Hebert-04/19/2013						
1	4/19/2013	Computer	Gateway	none	Solo	unknown
2	4/19/2013	DAS	Environmental Sys Corp	09638	8816	2523
3	4/19/2013	Modem	US Robotics	none	56k	unknown
4	4/19/2013	Ozone	ThermoElectron Inc	none	49C	0425208057
5	4/19/2013	Ozone Standard	ThermoElectron Inc	90567	49C	49C-59283-322
6	4/19/2013	Printer	Hewlett Packard	none	842C	unknown
7	4/19/2013	Sample Tower	Aluma Tower	illegible	B	none
8	4/19/2013	Zero air pump	Twin Tower Engineering	none	TT70/4E	526292

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	0425208057	CAN407	Eric Hebert	04/19/2013	Ozone	none

Slope:	0.97307	**Slope:**	0.00000
Intercept	0.93607	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.3%	1.9%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	0.99720	**Intercept**	0.18428
Cert Date	1/2/2013	**CorrCoff**	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	-0.02	-0.20	1.03	ppb	
primary	2	27.49	27.38	27.10	ppb	-1.02%
primary	3	55.52	55.49	54.92	ppb	-1.03%
primary	4	82.24	82.28	81.31	ppb	-1.18%
primary	5	108.28	108.39	106.30	ppb	-1.93%

Sensor Component	Cell B Noise	**Condition**	1.1 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	0.9996	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	Offset	**Condition**	0.000	**Status**	pass
Sensor Component	Span	**Condition**	1.040	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	57.3 kHz	**Status**	Fail
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.59 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	40.3 C	**Status**	Fail
Sensor Component	Cell A Pressure	**Condition**	615 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	1.0 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	92.2 kHz	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.57 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	-0.0005	**Status**	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	CAN407	Eric Hebert	04/19/2013	Cell A Tmp.	ThermoElectron	216	☐	☑
The cooling fan dust cover for the ozone analyzer is clogged with dust and restricting air flow. This is increasing the internal ozone analyzer temperature. This could lead to premature failure of components including the ozone sample pump.								
Ozone	CAN407	Eric Hebert	04/19/2013	Cell A Tmp.	ThermoElectron	216	☐	☑
This analyzer diagnostic check is outside the manufacturer's recommended value.								
Ozone	CAN407	Eric Hebert	04/19/2013	Cell B Freq.	ThermoElectron	216	☐	☑
This analyzer diagnostic check is outside the manufacturer's recommended value.								

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PNF126-Sandy Grenville-05/12/2013						
1	5/12/2013	Computer	Dell	000264	D520	unknown
2	5/12/2013	DAS	Campbell	000346	CR3000	2125
3	5/12/2013	Modem	Raven	06597	V4221-V	0844349884
4	5/12/2013	Ozone	ThermoElectron Inc	000618	49i A1NAA	1009241789
5	5/12/2013	Ozone Standard	ThermoElectron Inc	000512	49i A3NAA	0922236890
6	5/12/2013	Sample Tower	Aluma Tower	000178	B	none
7	5/12/2013	Zero air pump	Werther International	06886	C 70/4	000815259

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241789	PNF126	Sandy Grenville	05/12/2013	Ozone	000618

Slope: 1.06946
Intercept -0.38181
CorrCoff 0.99993

Slope: 0.00000
Intercept 0.00000
CorrCoff 0.00000

DAS 1:

A Avg % Diff:	A Max % Di
6.6%	7.5%

DAS 2:

A Avg %Dif	A Max % Di

Mfg ThermoElectron Inc
Parameter ozone
Serial Number 49C-73104-373
Tfer Desc. Ozone transfer
Tfer ID 01100
Slope 1.00308
Intercept -0.17961
Cert Date 4/2/2013
CorrCoff 1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.00	0.17	-0.54	ppb	
primary	2	29.80	29.88	32.13	ppb	7.53%
primary	3	50.50	50.52	53.34	ppb	5.58%
primary	4	81.00	80.93	86.70	ppb	7.13%
primary	5	100.20	100.07	106.20	ppb	6.13%

Sensor Component Cell B Noise **Condition** 0.9 ppb **Status** pass

Sensor Component Cell B Tmp. **Condition** **Status** pass

Sensor Component Fullscale Voltage **Condition** N/A **Status** pass

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

Sensor Component Line Loss **Condition** Not tested **Status** pass

Sensor Component Offset **Condition** 0.30 **Status** pass

Sensor Component Span **Condition** 1.017 **Status** pass

Sensor Component Cell B Freq. **Condition** 93.2 kHz **Status** pass

Sensor Component System Memo **Condition** See comments **Status** pass

Sensor Component Sample Train **Condition** Good **Status** pass

Sensor Component Cell B Pressure **Condition** **Status** pass

Sensor Component Cell B Flow **Condition** 0.000 **Status** fail

Sensor Component Cell A Tmp. **Condition** 31.9 C **Status** pass

Sensor Component Cell A Pressure **Condition** 642 mmHg **Status** pass

Sensor Component Cell A Noise **Condition** 0.8 ppb **Status** pass

Sensor Component Cell A Freq. **Condition** 82.8 kHz **Status** pass

Sensor Component Cell A Flow **Condition** 1.37 lpm **Status** fail

Sensor Component Battery Backup **Condition** N/A **Status** pass

Sensor Component Zero Voltage **Condition** N/A **Status** pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	PNF126	Sandy Grenville	05/12/2013	Cell B Flow	ThermoElectron	3364	☐	☑
This analyzer diagnostic check is outside the manufacturer's recommended value.								
Ozone	PNF126	Sandy Grenville	05/12/2013	Cell A Flow	ThermoElectron	3364	☐	☑
This analyzer diagnostic check is outside the manufacturer's recommended value.								

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MCK231-Eric Hebert-05/18/2013						
1	5/18/2013	Computer	Dell	000458	D530	unknown
2	5/18/2013	DAS	Campbell	000359	CR3000	2137
3	5/18/2013	Modem	Raven	06476	H4222-C	0808311140
4	5/18/2013	Ozone	ThermoElectron Inc	000723	49i A1NAA	1105347327
5	5/18/2013	Ozone Standard	ThermoElectron Inc	000439	49i A3NAA	CM08200015
6	5/18/2013	Zero air pump	Werther International	06924	C 70/4	000836205

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347327	MCK231	Eric Hebert	05/18/2013	Ozone	000723

Slope:	0.97219	**Slope:**	0.00000
Intercept	0.30066	**Intercept**	0.00000
CorrCoff	0.99970	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	0.99720	**Intercept**	0.18428
Cert Date	1/2/2013	**CorrCoff**	1.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.7%	5.4%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	-0.17	-0.35	-0.11	ppb	
primary	2	30.01	29.90	28.30	ppb	-5.35%
primary	3	54.88	54.84	55.07	ppb	0.42%
primary	4	83.75	83.80	82.30	ppb	-1.79%
primary	5	109.06	109.18	105.60	ppb	-3.28%

Sensor Component	Cell B Noise	**Condition**	1.4 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	Offset	**Condition**	0.3	**Status**	pass
Sensor Component	Span	**Condition**	1.005	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	95.1 kHz	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.72 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	31.8 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	703 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	94.8 kHz	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.71 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass

Site Inventory by Site Visit

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number
DEN417-Sandy Grenville-06/15/2013						
1	6/15/2013	Computer	Gateway	none	Solo	2500251309
2	6/15/2013	DAS	Environmental Sys Corp	90600	8816	2274
3	6/15/2013	Modem	US Robotics	none	33.6 fax modem	unknown
4	6/15/2013	Ozone	ThermoElectron Inc	90778	49C	49C-77033-384
5	6/15/2013	Ozone Standard	ThermoElectron Inc	90831	49C	0520012325
6	6/15/2013	Printer	Hewlett Packard	none	840C	unknown
7	6/15/2013	Sample Tower	Aluma Tower	none	B	AT-71102-7I-5
8	6/15/2013	Zero air pump	Werther International	none	PC 70/4	626281

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-77033-384	DEN417	Sandy Grenville	06/15/2013	Ozone	90778

Slope:	0.99826	**Slope:**	0.00000
Intercept	1.06287	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.9%	4.1%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00308	**Intercept**	-0.17961
Cert Date	4/2/2013	**CorrCoff**	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	-0.23	-0.05	1.00	ppb	
primary	2	30.47	30.55	31.79	ppb	4.06%
primary	3	49.66	49.68	50.50	ppb	1.65%
primary	4	80.50	80.43	81.00	ppb	0.71%
primary	5	99.95	99.82	101.00	ppb	1.18%

Sensor Component	Cell B Noise	**Condition**	0.6 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	Offset	**Condition**	-0.7	**Status**	pass
Sensor Component	Span	**Condition**	1.021	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	76.7 kHz	**Status**	Fail
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.67 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	36.8 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	695 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	92.4 kHz	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.67 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	DEN417	Sandy Grenville	06/15/2013	Cell B Freq.	ThermoElectron	623	☐	☑

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

Site Inventory by Site Visit

Site Visit	Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
MOR409-Sandy Grenville-06/17/2013						
1	6/17/2013	DAS	Environmental Sys Corp	90652	8816	2565
2	6/17/2013	Modem	US Robotics	none	14.4 fax modem	7643
3	6/17/2013	Ozone	ThermoElectron Inc	90608	49C	49C-61987-333
4	6/17/2013	Ozone Standard	ThermoElectron Inc	none	49C	49C-74537-376
5	6/17/2013	Sample Tower	Aluma Tower	none	B	none
6	6/17/2013	Zero air pump	Werther International	none	PC70/4	585572

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-61987-333	MOR409	Sandy Grenville	06/17/2013	Ozone	90608

Slope:	0.97890	**Slope:**	0.00000
Intercept	-0.66252	**Intercept**	0.00000
CorrCoff	0.99992	**CorrCoff**	0.00000

DAS 1: **DAS 2:**

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
3.5%	5.3%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00308	**Intercept**	-0.17961
Cert Date	4/2/2013	**CorrCoff**	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.14	0.31	-0.16	ppb	
primary	2	32.36	32.43	30.71	ppb	-5.30%
primary	3	52.52	52.53	51.14	ppb	-2.65%
primary	4	82.40	82.32	79.25	ppb	-3.73%
primary	5	102.04	101.90	99.55	ppb	-2.31%

Sensor Component	Cell B Noise	**Condition**	1.0 ppb	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	Offset	**Condition**	1.4	**Status**	pass
Sensor Component	Span	**Condition**	1.131	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	58.9 kHz	**Status**	Fail
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**		**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.78 lpm	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	34.7 C	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	705 mmHg	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	89.6 kHz	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.56 lpm	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	MOR409	Sandy Grenville	06/17/2013	Cell B Freq.	ThermoElectron	1389	☐	☑

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