2014 – 1st Quarter Report
Support for Conducting Systems & Performance Audits of CASTNET Sites and NADP Monitoring Stations

EPA Contract No. EPW12019

Prepared for:

U. S. Environmental Protection Agency

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May 2016

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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 May 2016, the network is comprised of 94 active rural sampling sites across the Untied States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), the Bureau of Land Management (BLM), 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 and BLM sponsored sites.

1.2 Project Objectives

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

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

and PAL190. Five sites sponsored by EPA and operated by the BLM in WY also operate meteorological sensors and are BAS601, NEC602, BUF603, SHE604, and FOR605.

Some or all of the additional monitored variables, NOy, CO, and SO_2 have been added to the EPA sponsored sites BVL130, HWF187, PND165, PNF126, and BEL116. No sites that measure these variables were audited in first quarter 2014.

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-	0.9000 ≤ m ≤ 1.1000

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Ozone	Intercept	point test gas concentration as measured with a certified transfer standard	-5.0 ppb ≤ b ≤ 5.0 ppb
Ozone	Correlation Coefficient		0.9950 ≤ r
DAS	Accuracy	Comparison with certified standard	≤ ± 0.003 VDC

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

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

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

1.3 CASTNET Sites Visited First Quarter 2014

This report consists of the systems and performance and other audit results from the CASTNET sites visited during the first quarter (January through March) of 2014. The locations and dates of the audits are presented in Table 2.

Table 2. Site Audit Visits

Site ID	Audit Type	Sponsor Agency	Site Location	Visit dates
IRL141	Without met	EPA	Indian River Lagoon	2/13/2014
SUM156	Without met	EPA	Sumatra	2/11/2014
GAS153	Without met	EPA	Georgia Station	3/4/2014
SND152	Without met	EPA	Sand Mountain	3/5/2014
SPD111	Without met	EPA	Speedwell	3/31/2014
COW137	Without met	EPA	Coweeta	3/26/2014
ESP127	Without met	EPA	Edgar Evins	3/27/2014

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
ALC188	EPA	Alabama-Coushatta	3/12/2014
BBE401	NPS	Big Bend NP	3/20/2014
CAD150	EPA	Caddo Valley	2/25/2014
CDZ171	EPA	Cadiz	3/28/2014
CHE185	EPA	Cherokee Nation	2/26/2014
CKT136	EPA	Crockett	3/31/2014
CVL151	EPA	Coffeeville	2/28/2014
MAC426	NPS	Mammoth Cave NP	3/28/2014
MCK131	EPA	Mackville	3/30/2014
MCK231	EPA	Mackville (precision site)	3/30/2014
PAL190	EPA	Palo Duro	3/25/2014

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.

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 250 sites. The Atmospheric Integrated Research Monitoring Network (AIRMoN) began operation in 1992 and currently measures event based precipitation events at 6 sites. The Mercury Deposition Network (MDN) measures total mercury in precipitation samples from more than 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 Eurofins, and the network equipment depot (NED).

2.2 Project Objectives

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

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

2.3 NADP Sites Visited First Quarter 2014

This report covers the results from the NADP sites surveyed during the first quarter (January through March) of 2014. The station names and dates of the surveys are presented in Table 4.

Table 4. Sites Surveyed

Side ID	Network	Survey Date	Station Name
AL03	MDN/NTN	2/24/2014	Centreville
AL10	NTN	2/24/2014	Black Belt Research & Extension Center
AR02	NTN	2/25/2014	Warren 2WSW
AR03	NTN/AMoN	2/25/2014	Caddo Valley
AR16	NTN	2/27/2014	Buffalo National River-Buffalo Point
AR27	NTN	2/26/2014	Fayetteville
LA30	NTN	2/18/2014	Southeast Research Station
MS22	MDN	2/20/2014	Oak Grove
MS30	NTN/AMoN	2/28/2014	Coffeeville
OK99	MDN	2/27/2014	Cherokee Nation
AL99	AMoN/NTN	3/5/2014	Sand Mountain Research & Extension Center
GA41	AMoN/NTN	3/4/2014	Georgia Station
MS10	NTN	3/8/2014	Clinton
MS19	NTN	3/6/2014	Newton
TX02	NTN	3/24/2014	Muleshoe National Wildlife Refuge
TX03	NTN	3/17/2014	Beeville
TX04	NTN	3/20/2014	Big Bend National Park
TX10	NTN	3/13/2014	Attwater Prairie Chicken
TX16	NTN	3/18/2014	Sonora
TX21	MDN	3/11/2014	Longview
TX21	NTN	3/11/2014	Longview
TX43	AMoN/NTN	3/25/2014	Canonceta
TX56	NTN	3/10/2014	LBJ Grassland

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 NADP site survey results are included in this report.

APPENDIX A

CASTNET Audit Report Forms

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SUM156-Eric Hebert-02/11/2014						
1	2/11/2014	Computer	Dell	000323	D520	unknown
2	2/11/2014	DAS	Campbell	000335	CR3000	2114
3	2/11/2014	Elevation	Elevation	None	1	None
4	2/11/2014	Filter pack flow pump	Thomas	00235	107CA18	00688001783
5	2/11/2014	Flow Rate	Apex	000665	AXMC105LPMDPCV	54762
6	2/11/2014	Infrastructure	Infrastructure	none	none	none
7	2/11/2014	Ozone	ThermoElectron Inc	000724	49i A1NAA	1105347328
8	2/11/2014	Ozone Standard	ThermoElectron Inc	000447	49i A3NAA	CM08200023
9	2/11/2014	Sample Tower	Aluma Tower	03542	A	none
10	2/11/2014	Shelter Temperature	Campbell	none	107-L	none
11	2/11/2014	Siting Criteria	Siting Criteria	None	1	None
12	2/11/2014	Temperature	RM Young	05043	41342VO	9639
13	2/11/2014	UPS	APC	06792	RS900	unknown
14	2/11/2014	Zero air pump	Werther International	06876	C 70/4	000814286

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2114	SUM156	Eric Hebert	02/11/2014	DAS	Primary

Das Date: 2 /11/2014 **Audit Date** 2 /11/2014
Das Time: 11:25:54 **Audit Time** 11:25:53
Das Day: 42 **Audit Day** 42

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

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

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

Slope 1.00000 **Intercept** 0.00000
Cert Date 12/28/2013 **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	0.5001	0.5000	V	V	-0.0001
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	1.0002	1.0000	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	54762	SUM156	Eric Hebert	02/11/2014	Flow Rate	000665

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.003
2.34%	2.37%			**Cal Factor Full Scale**	0.996
				Rotometer Reading:	1.3

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	0.00	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.00	l/m	l/m	
primary	test pt 1	0.000	1.535	0.00	0.000	1.50	l/m	l/m	-2.31%
primary	test pt 2	0.000	1.536	0.00	0.000	1.50	l/m	l/m	-2.33%
primary	test pt 3	0.000	1.536	0.00	0.000	1.50	l/m	l/m	-2.37%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 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**	See comments	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347328	SUM156	Eric Hebert	02/11/2014	Ozone	000724

Slope:	0.98734	**Slope:**	0.00000
Intercept	-0.66673	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00561	**Intercept**	0.21973
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.7%	4.0%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.27	0.04	-0.56	ppb	
primary	2	25.88	25.51	24.48	ppb	-4.04%
primary	3	52.47	51.95	50.60	ppb	-2.60%
primary	4	84.83	84.13	82.30	ppb	-2.18%
primary	5	110.60	109.76	107.80	ppb	-1.79%

Sensor Component	Condition	Status
Cell B Noise	0.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.30	pass
Span	0.999	pass
Cell B Freq.	110.0 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.71 lpm	pass
Cell A Tmp.	34.4 C	pass
Cell A Pressure	736 mmHg	pass
Cell A Noise	0.9 ppb	pass
Cell A Freq.	101.9 kHz	pass
Cell A Flow	0.71 lpm	pass
Battery Backup	Functioning	pass
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	9639	SUM156	Eric Hebert	02/11/2014	Temperature	05043

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00496	**Intercept**	-0.23009
Cert Date	1/8/2014	**CorrCoff**	1.00000

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

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	-0.10	0.13	0.000	0.3	C	0.13
primary	Temp Mid Range	20.58	20.71	0.000	20.7	C	-0.02
primary	Temp High Range	47.86	47.85	0.000	47.8	C	-0.07

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	SUM156	Eric Hebert	02/11/2014	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.43	0.67		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00496	Intercept	-0.23009
Cert Date	1/8/2014	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	24.60	24.71	0.000	25.3	C	0.59
primary	Temp Mid Range	25.62	25.72	0.000	25.7	C	-0.03
primary	Temp Mid Range	26.77	26.87	0.000	26.2	C	-0.67

Infrastructure Data For

Site ID	SUM156	Technician	Eric Hebert	Site Visit Date	02/11/2014

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Shelter Roof	Condition	Fair	Status	pass
Sensor Component	Sample Tower Type	Condition	Type A	Status	pass
Sensor Component	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	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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	SUM156	Eric Hebert	02/11/2014	Moisture Present	Apex	3534	☐	☐

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

Field Systems Comments

1 **Parameter:** DasComments

The meteorological tower has been removed. The temperature sensor is mounted in a naturally aspirated shield on the sample tower.

2 **Parameter:** SitingCriteriaCom

The site is surrounded by pine trees on land managed by the forest service. A few trees are now 17 meters tall and within 17 meters of the sample tower. Most trees are 30 meters from the sample tower.

3 **Parameter:** ShelterCleanNotes

The shelter is clean and well organized.. The site operator does an excellent job of organizing and maintaining the site.

4 **Parameter:** PollAnalyzerCom

There is water in the flow tubing outside the shelter. Trees to the north are less than 20 meters from the sample inlets.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	SUM156	**Technician**	Eric Hebert	**Site Visit Date**	02/11/2014

Site Sponsor (agency)	EPA/USFS	**USGS Map**	Sumatra
Operating Group	USFS/private	**Map Scale**	
AQS #	12-077-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	wetlands, woodland - evergreen	**QAPP Elevation Meters**	
Terrain	flat	**QAPP Declination**	
Conforms to MLM	Yes	**QAPP Declination Date**	
Site Telephone	(850) 670-8376	**Audit Latitude**	30.110226
Site Address 1	Rt 65	**Audit Longitude**	-84.99038
Site Address 2	Apalachicola National Forest	**Audit Elevation**	16
County	Liberty	**Audit Declination**	-3
City, State	Bristol, FL		**Present**
Zip Code	32321	**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	none	**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 **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter is clean and well organized.. The site operator does an excellent job of organizing and maintaining the site.

Site OK ☑ **Notes**

Driving Directions From Tallahassee take Hwy 20 west about 25 miles to Hosford. Turn left (south) on Hwy 65 at the intersection in Hosford. Continue about 22 miles on Hwy 65 past Wilma. Turn right on a dirt road and bear left continuing south parallel to Hwy 65. The site will be visible on the right.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID SUM156 **Technician** Eric Hebert **Site Visit Date** 02/11/2014

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	17 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

The site is surrounded by pine trees on land managed by the forest service. A few trees are now 17 meters tall and within 17 meters of the sample tower. Most trees are 30 meters from the sample tower.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID	SUM156	Technician	Eric Hebert	Site Visit Date	02/11/2014

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 SUM156 **Technician** Eric Hebert **Site Visit Date** 02/11/2014

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	
2	Are all the meteorological sensors operational online, and reporting data?	☑	
3	Are the shields for the temperature and RH sensors clean?	☑	Moderately clean
4	Are the aspirated motors working?	☑	N/A
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	N/A
6	Is the surface wetness sensor grid clean and undamaged?	☑	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	☑	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
Temperature	RM Young	41342VO	9639	05043

Provide any additional explanation (photograph or sketch if necessary) regarding 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 SUM156 **Technician** Eric Hebert **Site Visit Date** 02/11/2014

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 17 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 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?	☐	Moisture in tubing only
7	Is the zero air supply desiccant unsaturated?	☐	70 % saturated
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	03542
Ozone	ThermoElectron Inc	49i A1NAA	1105347328	000724
Filter pack flow pump	Thomas	107CA18	00688001783	00235
Zero air pump	Werther International	C 70/4	000814286	06876

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

There is water in the flow tubing outside the shelter. Trees to the north are less than 20 meters from the sample inlets.

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID SUM156 **Technician** Eric Hebert **Site Visit Date** 02/11/2014

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	000323
DAS	Campbell	CR3000	2114	000335
UPS	APC	RS900	unknown	06792

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

The meteorological tower has been removed. The temperature sensor is mounted in a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID	SUM156	Technician	Eric Hebert	Site Visit Date	02/11/2014

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 2010	☐
Field Ops Manual	☐		☐
Calibration Reports	☐	2/5/2014	☑
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 SUM156 **Technician** Eric Hebert **Site Visit Date** 02/11/2014

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained on-site in 1989
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

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

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

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

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

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	SSRF, 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	SUM156	Technician	Eric Hebert	Site Visit Date	02/11/2014

Site operation procedures

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

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

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

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
IRL141-Eric Hebert-02/13/2014						
1	2/13/2014	Computer	Dell	000295	D520	HF974A02
2	2/13/2014	DAS	Campbell	000340	CR3000	2119
3	2/13/2014	Elevation	Elevation	None	1	None
4	2/13/2014	Filter pack flow pump	Thomas	00085	107CA110	71488
5	2/13/2014	Flow Rate	Apex	000598	AXMC105LPMDPCV	unknown
6	2/13/2014	Infrastructure	Infrastructure	none	none	none
7	2/13/2014	Modem	Raven	06384	H4222-C	0802310499
8	2/13/2014	Ozone	ThermoElectron Inc	000729	49i A1NAA	1105347323
9	2/13/2014	Ozone Standard	ThermoElectron Inc	000446	49i A3NAA	CM08200022
10	2/13/2014	Sample Tower	Aluma Tower	000020	B	AT-61152-A-H8-F
11	2/13/2014	Shelter Temperature	Campbell	none	107-L	none
12	2/13/2014	Siting Criteria	Siting Criteria	None	1	None
13	2/13/2014	Temperature	RM Young	illegible	41342VC	14804
14	2/13/2014	UPS	APC	06790	RS900	unknown
15	2/13/2014	Zero air pump	Werther International	06898	C 70/4	000821905

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2119	IRL141	Eric Hebert	02/13/2014	DAS	Primary

Das Date: 2 /13/2014
Das Time: 12:13:58
Das Day: 44

Audit Date 2 /13/2014
Audit Time 12:13:57
Audit Day 44

Low Channel:

Avg Diff:	Max Diff:
0.0000	0.0002

High Channel:

Avg Diff:	Max Diff:
0.0000	0.0002

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/28/2013	**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	0.5000	V	V	0.0000
7	0.7000	0.7000	0.7000	V	V	0.0000
7	0.9000	0.9001	0.8999	V	V	-0.0002
7	1.0000	1.0001	1.0000	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	unknown	IRL141	Eric Hebert	02/13/2014	Flow Rate	000598

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.017
0.92%	1.06%			**Cal Factor Full Scale**	0.99
				Rotometer Reading:	1.4

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	-0.01	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.05	l/m	l/m	
primary	test pt 1	0.000	1.516	1.51	0.000	1.50	l/m	l/m	-1.06%
primary	test pt 2	0.000	1.516	1.51	0.000	1.50	l/m	l/m	-1.03%
primary	test pt 3	0.000	1.520	1.51	0.000	1.51	l/m	l/m	-0.68%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.000	**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**	6.0 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347323	IRL141	Eric Hebert	02/13/2014	Ozone	000729

Slope:	0.99726	**Slope:**	0.00000
Intercept	0.41844	**Intercept**	0.00000
CorrCoff	0.99988	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00561	**Intercept**	0.21973
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.3%	3.6%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.24	0.02	-0.25	ppb	
primary	2	33.09	32.68	33.87	ppb	3.64%
primary	3	62.41	61.84	62.40	ppb	0.91%
primary	4	85.15	84.45	84.60	ppb	0.18%
primary	5	99.78	99.00	98.70	ppb	-0.30%

Sensor Component	Condition	Status
Cell B Noise	0.8 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.000	pass
Span	1.025	pass
Cell B Freq.	100.4 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.72 lpm	pass
Cell A Tmp.	35.6 C	pass
Cell A Pressure	732 mmHg	pass
Cell A Noise	1.4 ppb	pass
Cell A Freq.	109.1 kHz	pass
Cell A Flow	0.78 lpm	pass
Battery Backup	Functioning	pass
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14804	IRL141	Eric Hebert	02/13/2014	Temperature	illegible

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00496	**Intercept**	-0.23009
Cert Date	1/8/2014	**CorrCoff**	1.00000

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

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	-0.03	0.20	0.000	0.2	C	-0.05
primary	Temp Mid Range	25.19	25.29	0.000	25.2	C	-0.06
primary	Temp High Range	48.10	48.09	0.000	48.0	C	-0.06

Sensor Component	Shield	**Condition**	Moderately 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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	IRL141	Eric Hebert	02/13/2014	Shelter Temperature	none

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

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00496	Intercept	-0.23009
Cert Date	1/8/2014	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	26.85	26.95	0.000	26.3	C	-0.64
primary	Temp Mid Range	28.08	28.17	0.000	27.2	C	-1.01
primary	Temp Mid Range	20.39	20.52	0.000	21.4	C	0.83

Infrastructure Data For

Site ID	IRL141	Technician	Eric Hebert	Site Visit Date	02/13/2014

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	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	Fair	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	Good	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator is doing an excellent job of handling and changing the filter pack.

2 **Parameter:** SitingCriteriaCom

The expanded roadway and parking lots were observed to have several vehicles traveling and parking including motor homes, during the audit visit. Sebastian has an estimated population of 18,000. The park operates a boat ramp with vehicle parking near the site. The site is surrounded on three sides by boat traffic using the ramp.

3 **Parameter:** ShelterCleanNotes

The shelter is clean and well organized.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	IRL141	**Technician**	Eric Hebert	**Site Visit Date**	02/13/2014

Site Sponsor (agency)	EPA/SJRWMD	**USGS Map**	Sebastian
Operating Group	IRC Health Dept	**Map Scale**	
AQS #	12-061-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry	**QAPP Longitude**	
Land Use	coastal	**QAPP Elevation Meters**	
Terrain	flat	**QAPP Declination**	
Conforms to MLM	Yes	**QAPP Declination Date**	
Site Telephone	(772) 538-2365	**Audit Latitude**	27.849215
Site Address 1	Sebastian Inlet State Park	**Audit Longitude**	-80.455595
Site Address 2	9700 South A1A	**Audit Elevation**	2
County	Indian River	**Audit Declination**	-5.8
City, State	Melbourne Beach, FL		
Zip Code	32951	**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		**Security Fence** ☑	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

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

Driving Directions From I-95 take exit 180, east on 192 to AIA. Turn right (south) and proceed approximately 18 miles over the Sebastian Inlet bridge. Once over the bridge, turn right at the entrance to the park and check in at the guard station. The site is at the west end of the road past the boat launch ramp.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID IRL141 **Technician** Eric Hebert **Site Visit Date** 02/13/2014

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	5 to 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	100 m	☐
Small parking lot	100 m	10 - 20 m	☐
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☐

Siting Criteria Comment

The expanded roadway and parking lots were observed to have several vehicles traveling and parking including motor homes, during the audit visit. Sebastian has an estimated population of 18,000. The park operates a boat ramp with vehicle parking near the site. The site is surrounded on three sides by boat traffic using the ramp.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID	IRL141	Technician	Eric Hebert	Site Visit Date	02/13/2014

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	IRL141	Technician	Eric Hebert	Site Visit Date	02/13/2014

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

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342VC	14804	illegible

Provide any additional explanation (photograph or sketch if necessary) regarding 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 IRL141 **Technician** Eric Hebert **Site Visit Date** 02/13/2014

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	AT-61152-A-H8-F	000020
Ozone	ThermoElectron Inc	49i A1NAA	1105347323	000729
Filter pack flow pump	Thomas	107CA110	71488	00085
Zero air pump	Werther International	C 70/4	000821905	06898

Provide any additional explanation (photograph or sketch if necessary) regarding 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 IRL141 **Technician** Eric Hebert **Site Visit Date** 02/13/2014

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	HF974A02	000295
DAS	Campbell	CR3000	2119	000340
Modem	Raven	H4222-C	0802310499	06384
UPS	APC	RS900	unknown	06790

Provide any additional explanation (photograph or sketch if necessary) regarding 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	IRL141	Technician	Eric Hebert	Site Visit Date	02/13/2014

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 2011	☑
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?	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding 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	IRL141	Technician	Eric Hebert	Site Visit Date	02/13/2014

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	on-site 7/9/2001 by MACTEC employee EOH
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID	IRL141	Technician	Eric Hebert	Site Visit Date	02/13/2014

Site operation procedures

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

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

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

The site operator is doing an excellent job of handling and changing the filter pack.

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GAS153-Eric Hebert-03/04/2014						
1	3/4/2014	Computer	Dell	000295	D520	HF974A02
2	3/4/2014	DAS	Campbell	000635	CR3000	4934
3	3/4/2014	Elevation	Elevation	None	1	None
4	3/4/2014	Filter pack flow pump	Thomas	04858	107CAB18	608102A
5	3/4/2014	Flow Rate	Apex	000643	AXMC105LPMDPCV	unknown
6	3/4/2014	Infrastructure	Infrastructure	none	none	none
7	3/4/2014	Modem	Raven	06805	H4222-C	0934411884
8	3/4/2014	Ozone	ThermoElectron Inc	000705	49i A1NAA	1030244807
9	3/4/2014	Ozone Standard	ThermoElectron Inc	000697	49i A3NAA	1030244814
10	3/4/2014	Sample Tower	Aluma Tower	000138	B	none
11	3/4/2014	Shelter Temperature	Campbell	none	107-L	none
12	3/4/2014	Siting Criteria	Siting Criteria	None	1	None
13	3/4/2014	Temperature	RM Young	04319	41342	4038
14	3/4/2014	UPS	APC	missing	BP6505	NB0009260535
15	3/4/2014	Zero air pump	Werther International	06865	C 70/4	000814277

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	4934	GAS153	Eric Hebert	03/04/2014	DAS	Primary

Das Date: 3 /4 /2014
Das Time: 10:17:00
Das Day: 63

Audit Date 3 /4 /2014
Audit Time 10:17:01
Audit Day 63

Low Channel:

Avg Diff:	Max Diff:
0.0001	0.0001

High Channel:

Avg Diff:	Max Diff:
0.0001	0.0001

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

Mfg Fluke **Parameter** DAS
Serial Number 95740243 **Tfer Desc.** DVM
Tfer ID 01312

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0000	V	V	0.0001
7	0.1000	0.0999	0.1000	V	V	0.0001
7	0.3000	0.3000	0.3000	V	V	0.0000
7	0.5000	0.5000	0.5001	V	V	0.0001
7	0.7000	0.7001	0.7001	V	V	0.0000
7	0.9000	0.9001	0.9002	V	V	0.0001
7	1.0000	1.0001	1.0002	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	unknown	GAS153	Eric Hebert	03/04/2014	Flow Rate	000643

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.036
2.62%	2.86%			**Cal Factor Full Scale**	0.97
				Rotometer Reading:	1.5

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	0.00	0.000	-0.04	l/m	l/m	
primary	leak check	0.000	0.000	0.19	0.000	0.17	l/m	l/m	
primary	test pt 1	0.000	1.544	1.53	0.000	1.50	l/m	l/m	-2.86%
primary	test pt 2	0.000	1.544	1.53	0.000	1.51	l/m	l/m	-2.17%
primary	test pt 3	0.000	1.544	1.53	0.000	1.50	l/m	l/m	-2.83%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.0 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	3.0 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244807	GAS153	Eric Hebert	03/04/2014	Ozone	000705

Slope:	1.02217	**Slope:**	0.00000
Intercept	-0.44253	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00707	**Intercept**	-0.21032
Cert Date	1/8/2014	**CorrCoff**	1.00000

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

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.56	0.76	0.37	ppb	
primary	2	28.45	28.45	28.63	ppb	0.63%
primary	3	50.05	49.90	50.55	ppb	1.30%
primary	4	77.27	76.93	78.12	ppb	1.55%
primary	5	110.32	109.75	111.80	ppb	1.87%

Sensor Component	Condition	Status
Cell B Noise	0.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.10	pass
Span	1.004	pass
Cell B Freq.	96.4 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.73 lpm	pass
Cell A Tmp.	28.6 C	pass
Cell A Pressure	727 mmHg	pass
Cell A Noise	0.8 ppb	pass
Cell A Freq.	94.3 kHz	pass
Cell A Flow	0.72 lpm	pass
Battery Backup	Not functioning	pass
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4038	GAS153	Eric Hebert	03/04/2014	Temperature	04319

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.12	0.25		

Mfg	Eutechnics	Parameter	Temperature
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000

Mfg	Eutechnics	Parameter	Temperature
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.05	0.11	0.000	0.0	C	-0.11
primary	Temp Mid Range	15.83	15.87	0.000	15.6	C	-0.25
primary	Temp High Range	48.56	48.55	0.000	48.5	C	-0.01

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	GAS153	Eric Hebert	03/04/2014	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.09	0.10		

Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000
Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	18.26	18.29	0.000	18.4	C	0.08
primary	Temp Mid Range	17.07	17.10	0.000	17.0	C	-0.1

Infrastructure Data For

Site ID	GAS153	Technician	Eric Hebert	Site Visit Date	03/04/2014

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	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	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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	GAS153	Eric Hebert	03/04/2014	Moisture Present	Apex	3978	☐	☐

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone sample train is tested for leaks every two weeks.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	GAS153	**Technician**	Eric Hebert	**Site Visit Date**	03/04/2014

Site Sponsor (agency)	EPA	**USGS Map**	Hollonville
Operating Group	UGA	**Map Scale**	
AQS #	13-231-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	
Terrain	gently rolling	**QAPP Declination**	
Conforms to MLM	Yes	**QAPP Declination Date**	
Site Telephone	(770) 229-8542	**Audit Latitude**	33.181173
Site Address 1	Bledsoe Farm, GA Experiment Station	**Audit Longitude**	-84.410054
Site Address 2	1913 Jackson road	**Audit Elevation**	265
County	Pike	**Audit Declination**	-4
City, State	Williamson, GA		
Zip Code	30292	**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		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

(**Present**)

Shelter Working Room ☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean ☑	**Notes**					
Site OK ☑	**Notes**					

Driving Directions

From I-75 take exit 205 (Rt 16) west to Griffin. Continue west through Griffin to 19/41 south. Turn south on 19/41 and take the next exit (Rt 362) west toward Williamson. Continue 7.2 miles on 362 through Williamson. Bear right on the dirt road marked Blanton Mill Road, approximately 0.9 miles to the gated Bledsoe Farm on the right. The site is past the farm office and sheds on the north side of the farm.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID GAS153 **Technician** Eric Hebert **Site Visit Date** 03/04/2014

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	GAS153	Technician	Eric Hebert	Site Visit Date	03/04/2014

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	Technician	Site Visit Date
GAS153	Eric Hebert	03/04/2014

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?	☑	N/A

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342	4038	04319

Provide any additional explanation (photograph or sketch if necessary) regarding 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 GAS153 **Technician** Eric Hebert **Site Visit Date** 03/04/2014

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	000138
Ozone	ThermoElectron Inc	49i A1NAA	1030244807	000705
Filter pack flow pump	Thomas	107CAB18	608102A	04858
Zero air pump	Werther International	C 70/4	000814277	06865

Provide any additional explanation (photograph or sketch if necessary) regarding 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 GAS153 **Technician** Eric Hebert **Site Visit Date** 03/04/2014

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	HF974A02	000295
DAS	Campbell	CR3000	4934	000635
Modem	Raven	H4222-C	0934411884	06805
UPS	APC	BP6505	NB0009260535	missing

Provide any additional explanation (photograph or sketch if necessary) regarding 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	GAS153	Technician	Eric Hebert	Site Visit Date	03/04/2014

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☐		☐
HASP	☑	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?	☑	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	GAS153	Technician	Eric Hebert	Site Visit Date	03/04/2014

Site operation procedures

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

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

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

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

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

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

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

The ozone sample train is tested for leaks every two weeks.

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID	GAS153	Technician	Eric Hebert	Site Visit Date	03/04/2014

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

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

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

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SND152-Eric Hebert-03/05/2014						
1	3/5/2014	Computer	Dell	000255	D520	unknown
2	3/5/2014	DAS	Campbell	000357	CR3000	2135
3	3/5/2014	Elevation	Elevation	None	1	None
4	3/5/2014	Filter pack flow pump	Thomas	04855	107CAB18	060300020200
5	3/5/2014	Flow Rate	Apex	000555	AXMC105LPMDPCV	illegible
6	3/5/2014	Infrastructure	Infrastructure	none	none	none
7	3/5/2014	Modem	Raven	06458	V4221-V	0808337422
8	3/5/2014	Ozone	ThermoElectron Inc	000725	49i A1NAA	1106347326
9	3/5/2014	Ozone Standard	ThermoElectron Inc	000215	49i A3NAA	0622717856
10	3/5/2014	Sample Tower	Aluma Tower	000148	B	none
11	3/5/2014	Shelter Temperature	Campbell	none	107-L	none
12	3/5/2014	Siting Criteria	Siting Criteria	None	1	None
13	3/5/2014	Temperature	RM Young	06405	41342	14038
14	3/5/2014	Zero air pump	Werther International	06867	C 70/4	000814279

DAS Data Form

DAS Time Max Error: 0.03

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2135	SND152	Eric Hebert	03/05/2014	DAS	Primary

Das Date: 3 /5 /2014
Das Time: 10:48:32
Das Day: 64

Audit Date 3 /5 /2014
Audit Time 10:48:30
Audit Day 64

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

Mfg Fluke **Parameter** DAS
Serial Number 95740243 **Tfer Desc.** DVM
Tfer ID 01312

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0000	V	V	0.0001
7	0.1000	0.0999	0.0996	V	V	-0.0003
7	0.3000	0.3000	0.3000	V	V	0.0000
7	0.5000	0.5000	0.5001	V	V	0.0001
7	0.7000	0.7000	0.7001	V	V	0.0001
7	0.9000	0.9001	0.9002	V	V	0.0001
7	1.0000	1.0001	1.0002	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	SND152	Eric Hebert	03/05/2014	Flow Rate	000555

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.02
0.26%	0.47%			**Cal Factor Full Scale**	1
				Rotometer Reading:	1.45

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	0.00	0.000	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.00	l/m	l/m	
primary	test pt 1	0.000	1.511	1.50	0.000	1.51	l/m	l/m	-0.05%
primary	test pt 2	0.000	1.517	1.50	0.000	1.51	l/m	l/m	-0.47%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 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**	4.5 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1106347326	SND152	Eric Hebert	03/05/2014	Ozone	000725

Slope:	1.00529	**Slope:**	0.00000
Intercept	-0.52037	**Intercept**	0.00000
CorrCoff	0.99982	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00707	**Intercept**	-0.21032
Cert Date	1/8/2014	**CorrCoff**	1.00000

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

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.47	0.67	0.00	ppb	
primary	2	28.51	28.51	27.97	ppb	-1.89%
primary	3	49.64	49.50	49.04	ppb	-0.93%
primary	4	76.80	76.46	77.67	ppb	1.58%
primary	5	108.51	107.95	107.20	ppb	-0.69%

Sensor Component	Condition	Status
Cell B Noise	1.0 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.20	pass
Span	0.994	pass
Cell B Freq.	92.6 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.70 lpm	pass
Cell A Tmp.	31.1 C	pass
Cell A Pressure	701 mmHg	pass
Cell A Noise	1.1 ppb	pass
Cell A Freq.	96.4 kHz	pass
Cell A Flow	0.71 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14038	SND152	Eric Hebert	03/05/2014	Temperature	06405

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.24	0.34		

Mfg	Eutechnics	Parameter	Temperature
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000

Mfg	Eutechnics	Parameter	Temperature
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.05	0.11	0.000	0.3	C	0.16
primary	Temp Mid Range	24.42	24.44	0.000	24.2	C	-0.23
primary	Temp High Range	44.95	44.95	0.000	44.6	C	-0.34

Sensor Component	Shield	Condition	Moderately 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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	SND152	Eric Hebert	03/05/2014	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.38	0.70		

Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000
Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	17.29	17.32	0.000	17.3	C	-0.06
primary	Temp Mid Range	23.69	23.72	0.000	23.0	C	-0.7

Infrastructure Data For

Site ID	SND152	Technician	Eric Hebert	Site Visit Date	03/05/2014

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Shelter Roof	Condition	Fair	Status	pass
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	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	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

Field Systems Comments

1 **Parameter:** DasComments

The sample tower is leaning approximately 10 degrees from vertical.

2 **Parameter:** SitingCriteriaCom

The site is located on an active research farm with cattle and poultry. Cattle are fed within 100 meters of the site. A Climate Reference Network site is located on the farm on the south side of Hwy 68 which is a better location for the CASTNET site.

3 **Parameter:** ShelterCleanNotes

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

4 **Parameter:** MetOpMaintCom

The temperature sensor signal cable is beginning to show signs of wear.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	SND152	**Technician**	Eric Hebert	**Site Visit Date**	03/05/2014

Site Sponsor (agency)	EPA	**USGS Map**	Crossville
Operating Group	Auburn Univ./private	**Map Scale**	
AQS #	01-049-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, PM10	**QAPP Latitude**	
Deposition Measurement	dry, wet,	**QAPP Longitude**	
Land Use	Agriculture, Dairy	**QAPP Elevation Meters**	
Terrain	plateau, gently rolling	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone	(256) 528-7175	**Audit Latitude**	34.289001
Site Address 1	Sand Mountain Research & Extension	**Audit Longitude**	-85.970065
Site Address 2	13112 Hwy 68	**Audit Elevation**	349
County	DeKalb	**Audit Declination**	-3
City, State	Crossville, AL		
Zip Code	35962	**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		**Security Fence** ☑	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

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

Driving Directions From I-59 take exit 205, Highway 68, west toward Crossville. The site is on the right at the Sand Mountain Research and Extension Station just at the east edge of Crossville. The combination to the gate lock is 22-32-10.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID SND152 **Technician** Eric Hebert **Site Visit Date** 03/05/2014

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	100 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 on an active research farm with cattle and poultry. Cattle are fed within 100 meters of the site. A Climate Reference Network site is located on the farm on the south side of Hwy 68 which is a better location for the CASTNET site.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID	SND152	Technician	Eric Hebert	Site Visit Date	03/05/2014

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	Technician	Site Visit Date
SND152	Eric Hebert	03/05/2014

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

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342	14038	06405

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

The temperature sensor signal cable is beginning to show signs of wear.

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID SND152 **Technician** Eric Hebert **Site Visit Date** 03/05/2014

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	000148
Ozone	ThermoElectron Inc	49i A1NAA	1106347326	000725
Zero air pump	Werther International	C 70/4	000814279	06867
Filter pack flow pump	Thomas	107CAB18	060300020200	04855

Provide any additional explanation (photograph or sketch if necessary) regarding 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 SND152 **Technician** Eric Hebert **Site Visit Date** 03/05/2014

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	000255
DAS	Campbell	CR3000	2135	000357
Modem	Raven	V4221-V	0808337422	06458

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

The sample tower is leaning approximately 10 degrees from vertical.

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID	SND152	Technician	Eric Hebert	Site Visit Date	03/05/2014

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 2011	☑
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: SND152 | Technician: Eric Hebert | Site Visit Date: 03/05/2014

Site operation procedures

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

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

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

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

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

1	Do multi-point calibration gases go through the complete sample train including all filters?	☑	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
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 SND152 **Technician** Eric Hebert **Site Visit Date** 03/05/2014

Site operation procedures

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

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

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

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
COW137-Sandy Grenville-03/26/2014						
1	3/26/2014	Computer	Dell	000261	D520	23FNHB1
2	3/26/2014	DAS	Campbell	000401	CR3000	2529
3	3/26/2014	Elevation	Elevation	None	1	None
4	3/26/2014	Filter pack flow pump	Thomas	02758	107CAB18	001871
5	3/26/2014	Flow Rate	Apex	000652	AXMC105LPMDPCV	54771
6	3/26/2014	Infrastructure	Infrastructure	none	none	none
7	3/26/2014	Modem	Raven	06806	V4221-V	0936444095
8	3/26/2014	Ozone	ThermoElectron Inc	000726	49i A1NAA	1105347314
9	3/26/2014	Ozone Standard	ThermoElectron Inc	000441	49i A3NAA	CM08200017
10	3/26/2014	Sample Tower	Aluma Tower	03499	A	none
11	3/26/2014	Shelter Temperature	Campbell	none	107-L	none
12	3/26/2014	Siting Criteria	Siting Criteria	None	1	None
13	3/26/2014	Temperature	Climatronics	06693	100093	missing
14	3/26/2014	UPS	APC	none	650	unknown
15	3/26/2014	Zero air pump	Werther International	06878	C 70/4	000815254

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2529	COW137	Sandy Grenville	03/26/2014	DAS	Primary

Das Date: 3 /26/2014
Das Time: 15:11:56
Das Day: 85

Audit Date 3 /26/2014
Audit Time 15:11:57
Audit Day 85

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

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2998	0.2998	V	V	0.0000
7	0.5000	0.4997	0.4996	V	V	-0.0001
7	0.7000	0.6996	0.6995	V	V	-0.0001
7	0.9000	0.8995	0.8994	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
Apex	54771	COW137	Sandy Grenville	03/26/2014	Flow Rate	000652

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	1.00846	**Intercept**	0.01358
Cert Date	1/8/2014	**CorrCoff**	0.99997

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0
2.04%	2.04%			**Cal Factor Full Scale**	1.01
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.00	l/m	l/m	
primary	test pt 1	1.495	1.470	1.49	0.000	1.50	l/m	l/m	2.04%
primary	test pt 2	1.492	1.470	1.49	0.000	1.50	l/m	l/m	2.04%
primary	test pt 3	1.493	1.470	1.49	0.000	1.50	l/m	l/m	2.04%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	170 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347314	COW137	Sandy Grenville	03/26/2014	Ozone	000726

Slope:	1.01997	**Slope:**	0.00000
Intercept	0.24297	**Intercept**	0.00000
CorrCoff	0.99994	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00458	**Intercept**	-0.11484
Cert Date	12/10/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.1%	2.8%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.05	0.16	0.85	ppb	
primary	2	31.27	31.24	31.86	ppb	1.98%
primary	3	50.15	50.03	50.87	ppb	1.68%
primary	4	79.55	79.30	80.80	ppb	1.89%
primary	5	101.26	100.91	103.70	ppb	2.76%

Sensor Component	Condition	Status
Cell B Noise	0.6 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.20	pass
Span	1.020	pass
Cell B Freq.	99 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.72 lpm	pass
Cell A Tmp.	29.9 C	pass
Cell A Pressure	683.1 mmHg	pass
Cell A Noise	0.9 ppb	pass
Cell A Freq.	108 kHz	pass
Cell A Flow	0.77 lpm	pass
Battery Backup	Not functioning	Fail
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	missing	COW137	Sandy Grenville	03/26/2014	Temperature	06693

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00288	**Intercept**	-0.15155
Cert Date	1/8/2014	**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	0.58	0.73	0.000	0.6	C	-0.11
primary	Temp Mid Range	24.89	24.97	0.000	24.9	C	-0.04
primary	Temp High Range	49.14	49.15	0.000	49.1	C	-0.09

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	COW137	Sandy Grenville	03/26/2014	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.46	0.65		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00288	Intercept	-0.15155
Cert Date	1/8/2014	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	21.19	21.28	0.000	21.0	C	-0.27
primary	Temp Mid Range	21.44	21.53	0.000	21.1	C	-0.47
primary	Temp Mid Range	23.37	23.45	0.000	22.8	C	-0.65

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	COW137	Technician	Sandy Grenville	Site Visit Date	03/26/2014

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

Field Systems Comments

1 **Parameter:** DasComments

One leg of the meteorological tower has two holes.

2 **Parameter:** SitingCriteriaCom

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

3 **Parameter:** ShelterCleanNotes

The shelter is in fair condition with some rot near the air conditioner and in the corners. It has degraded since the previous audit. It was reported that the roof leaks. The shelter is kept very clean, neat, and well organized.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	COW137	**Technician**	Sandy Grenville	**Site Visit Date**	03/26/2014

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

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in fair condition with some rot near the air conditioner and in the corners. It has degraded since the previous audit. It was reported that the roof leaks. The shelter is kept very clean, neat, and well organized.				
Site OK	☑	**Notes**					
Driving Directions							

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 03/26/2014

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

Siting Distances OK ☑

Siting Criteria Comment

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

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 03/26/2014

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 03/26/2014

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 03/26/2014

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 03/26/2014

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

One leg of the meteorological tower has two holes.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 03/26/2014

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☐		☐
HASP	☑	Feb 2014	☑
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	COW137	Technician	Sandy Grenville	Site Visit Date	03/26/2014

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	In Gainesville in 1987
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

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

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	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 3 weeks	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 03/26/2014

Site operation procedures

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

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

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

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

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 03/26/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	23FNHB1	000261
DAS	Campbell	CR3000	2529	000401
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	001871	02758
Flow Rate	Apex	AXMC105LPMDPC	54771	000652
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0936444095	06806
Ozone	ThermoElectron Inc	49i A1NAA	1105347314	000726
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200017	000441
Sample Tower	Aluma Tower	A	none	03499
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	Climatronics	100093	missing	06693
UPS	APC	650	unknown	none
Zero air pump	Werther International	C 70/4	000815254	06878

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ESP127-Sandy Grenville-03/27/2014						
1	3/27/2014	Computer	Dell	000322	D520	unknown
2	3/27/2014	DAS	Campbell	illegible	CR3000	3817
3	3/27/2014	Elevation	Elevation	None	1	None
4	3/27/2014	Filter pack flow pump	Thomas	02975	107CAB18	0493002476
5	3/27/2014	Flow Rate	Apex	000642	AXMC105LPMDPCV	54755
6	3/27/2014	Infrastructure	Infrastructure	none	none	none
7	3/27/2014	Modem	Raven	06606	H4223-C	0844355622
8	3/27/2014	Ozone	ThermoElectron Inc	000622	49i A1NAA	1009241785
9	3/27/2014	Ozone Standard	ThermoElectron Inc	000687	49i A3NAA	1030244809
10	3/27/2014	Sample Tower	Aluma Tower	03550	A	none
11	3/27/2014	Shelter Temperature	Campbell	none	107-L	none
12	3/27/2014	Siting Criteria	Siting Criteria	None	1	None
13	3/27/2014	Temperature	Climatronics	06692	100093	none
14	3/27/2014	Zero air pump	Werther International	06909	C 70/4	000829161

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	3817	ESP127	Sandy Grenville	03/27/2014	DAS	Primary

Das Date: 3 /27/2014
Das Time: 15:04:01
Das Day: 86

Audit Date 3 /27/2014
Audit Time 15:04:01
Audit Day 86

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

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2997	0.2998	V	V	0.0001
7	0.5000	0.4996	0.4997	V	V	0.0001
7	0.7000	0.6996	0.6996	V	V	0.0000
7	0.9000	0.8995	0.8994	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
Apex	54755	ESP127	Sandy Grenville	03/27/2014	Flow Rate	000642

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	1.00846	**Intercept**	0.01358
Cert Date	1/8/2014	**CorrCoff**	0.99997

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.04
0.45%	0.67%			**Cal Factor Full Scale**	1.02
				Rotometer Reading:	1.4

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.03	0.000	0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.06	l/m	l/m	
primary	test pt 1	1.529	1.500	1.50	0.000	1.51	l/m	l/m	0.67%
primary	test pt 2	1.534	1.510	1.50	0.000	1.51	l/m	l/m	0.00%
primary	test pt 3	1.530	1.500	1.50	0.000	1.51	l/m	l/m	0.67%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.25 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.75 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	350 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241785	ESP127	Sandy Grenville	03/27/2014	Ozone	000622

Slope:	0.99644	**Slope:**	0.00000
Intercept	0.52675	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00458	**Intercept**	-0.11484
Cert Date	12/10/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.4%	0.8%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.03	0.14	0.88	ppb	
primary	2	30.68	30.65	30.90	ppb	0.82%
primary	3	50.19	50.07	50.15	ppb	0.16%
primary	4	80.03	79.77	80.20	ppb	0.54%
primary	5	102.36	102.00	102.20	ppb	0.20%

Sensor Component	Condition	Status
Cell B Noise	0.7 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-0.1	pass
Span	1.007	pass
Cell B Freq.	102.2 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.71 lpm	pass
Cell A Tmp.	33.4 C	pass
Cell A Pressure	704 mmHg	pass
Cell A Noise	0.7 ppb	pass
Cell A Freq.	88.8 kHz	pass
Cell A Flow	0.70 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	none	ESP127	Sandy Grenville	03/27/2014	Temperature	06692

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00288	**Intercept**	-0.15155
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.09	0.15		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	1.03	1.18	0.000	1.0	C	-0.15
primary	Temp Mid Range	25.30	25.38	0.000	25.3	C	-0.13
primary	Temp High Range	47.95	47.96	0.000	48.0	C	0

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ESP127	Sandy Grenville	03/27/2014	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.21	0.31		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00288	Intercept	-0.15155
Cert Date	1/8/2014	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.40	22.49	0.000	22.3	C	-0.21
primary	Temp Mid Range	21.90	21.99	0.000	22.3	C	0.31
primary	Temp Mid Range	23.40	23.48	0.000	23.6	C	0.12

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	ESP127	Technician	Sandy Grenville	Site Visit Date	03/27/2014

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

Field Systems Comments

1 **Parameter:** DasComments

The site operator must use a chair to stand on when accessing the sample tower filter pack enclosure due to obstructions when lowering the sample tower.

2 **Parameter:** ShelterCleanNotes

The shelter is in poor condition with rot at the bottom of walls and floor. Some paneling is loose.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	ESP127	**Technician**	Sandy Grenville	**Site Visit Date**	03/27/2014

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

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☐	**Notes**	The shelter is in poor condition with rot at the bottom of walls and floor. Some paneling is loose.				
Site OK	☑	**Notes**					

Driving Directions

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

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 03/27/2014

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 03/27/2014

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	ESP127	Technician	Sandy Grenville	Site Visit Date	03/27/2014

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	ESP127	Technician	Sandy Grenville	Site Visit Date	03/27/2014

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 03/27/2014

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

The site operator must use a chair to stand on when accessing the sample tower filter pack enclosure due to obstructions when lowering the sample tower.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 03/27/2014

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☐		☐
HASP	☑	Feb 2014	☑
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 03/27/2014

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 03/27/2014

Site operation procedures

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

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

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

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

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 03/27/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000322
DAS	Campbell	CR3000	3817	illegible
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	0493002476	02975
Flow Rate	Apex	AXMC105LPMDPC	54755	000642
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4223-C	0844355622	06606
Ozone	ThermoElectron Inc	49i A1NAA	1009241785	000622
Ozone Standard	ThermoElectron Inc	49i A3NAA	1030244809	000687
Sample Tower	Aluma Tower	A	none	03550
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	Climatronics	100093	none	06692
Zero air pump	Werther International	C 70/4	000829161	06909

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SPD111-Sandy Grenville-03/31/2014						
1	3/31/2014	Computer	Dell	000265	D520	unknown
2	3/31/2014	DAS	Campbell	000342	CR3000	2121
3	3/31/2014	Elevation	Elevation	None	1	None
4	3/31/2014	Filter pack flow pump	Thomas	04861	107CAB18	00019997
5	3/31/2014	Flow Rate	Apex	000459	AXMC105LPMDPCV	40577
6	3/31/2014	Infrastructure	Infrastructure	none	none	none
7	3/31/2014	Modem	Raven	06463	V4221-V	0808337428
8	3/31/2014	Ozone	ThermoElectron Inc	000676	49i A1NAA	1030244794
9	3/31/2014	Ozone Standard	ThermoElectron Inc	000515	49i A3NAA	0922236891
10	3/31/2014	Sample Tower	Aluma Tower	03548	A	none
11	3/31/2014	Shelter Temperature	Campbell	none	107-L	none
12	3/31/2014	Siting Criteria	Siting Criteria	None	1	None
13	3/31/2014	Temperature	RM Young	04314	41342	4011
14	3/31/2014	UPS	APC	06096	RS800	080331133278
15	3/31/2014	Zero air pump	Werther International	06918	C 70/4	000829138

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2121	SPD111	Sandy Grenville	03/31/2014	DAS	Primary

Das Date: 3 /31/2014
Das Time: 17:22:09
Das Day: 90

Audit Date 3 /31/2014
Audit Time 17:22:09
Audit Day 90

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 95740135 **Tfer Desc.** DVM
Tfer ID 01311

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	0.2998	0.2997	V	V	-0.0001
7	0.5000	0.4997	0.4996	V	V	-0.0001
7	0.7000	0.6996	0.6993	V	V	-0.0003
7	0.9000	0.8994	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
Apex	40577	SPD111	Sandy Grenville	03/31/2014	Flow Rate	000459

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	1.00846	**Intercept**	0.01358
Cert Date	1/8/2014	**CorrCoff**	0.99997

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.04
0.44%	0.66%			**Cal Factor Full Scale**	0.97
				Rotometer Reading:	1.6

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	-0.03	l/m	l/m	
primary	test pt 1	1.524	1.500	1.53	0.000	1.50	l/m	l/m	0.00%
primary	test pt 2	1.533	1.510	1.53	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 3	1.539	1.510	1.53	0.000	1.50	l/m	l/m	-0.66%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244794	SPD111	Sandy Grenville	03/31/2014	Ozone	000676

Slope:	1.00976	**Slope:**	0.00000
Intercept	0.27889	**Intercept**	0.00000
CorrCoff	0.99982	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00458	**Intercept**	-0.11484
Cert Date	12/10/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.7%	2.5%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.04	0.15	0.02	ppb	
primary	2	30.54	30.51	30.99	ppb	1.57%
primary	3	52.03	51.90	53.22	ppb	2.54%
primary	4	81.12	80.86	82.90	ppb	2.52%
primary	5	103.77	103.41	103.70	ppb	0.28%

Sensor Component	Condition	Status
Cell B Noise	0.8 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.20	pass
Span	1.021	pass
Cell B Freq.	101.3 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.69 lpm	pass
Cell A Tmp.	32.7 C	pass
Cell A Pressure	701.8 mmHg	pass
Cell A Noise	1.1 ppb	pass
Cell A Freq.	101.8 kHz	pass
Cell A Flow	0.60 lpm	pass
Battery Backup	Functioning	pass
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4011	SPD111	Sandy Grenville	03/31/2014	Temperature	04314

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00288	**Intercept**	-0.15155
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.14	0.26		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.71	0.86	0.000	0.6	C	-0.26
primary	Temp Mid Range	25.94	26.02	0.000	25.9	C	-0.08
primary	Temp High Range	49.41	49.42	0.000	49.4	C	-0.07

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	SPD111	Sandy Grenville	03/31/2014	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.23	0.26		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00288	Intercept	-0.15155
Cert Date	1/8/2014	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	21.91	22.00	0.000	21.7	C	-0.26
primary	Temp Mid Range	22.02	22.11	0.000	21.9	C	-0.21
primary	Temp Mid Range	22.19	22.28	0.000	22.1	C	-0.23

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	SPD111	Technician	Sandy Grenville	Site Visit Date	03/31/2014

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

Field Systems Comments

1 **Parameter:** DasComments

One leg of the meteorological tower is split.

2 **Parameter:** SitingCriteriaCom

The site is in a pasture with as many as 75 cattle. The cattle are fed within 100 meters of the site. When the site is visited the cattle approach to within 10 meters of the site.

3 **Parameter:** ShelterCleanNotes

The shelter is in good condition. The shelter is clean, neat, well organized and well maintained, however the floor is beginning to buckle.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	SPD111	**Technician**	Sandy Grenville	**Site Visit Date**	03/31/2014

Site Sponsor (agency)	EPA	**USGS Map**	Ausmus
Operating Group	private	**Map Scale**	
AQS #	47-025-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	Agriculture, dairy, woodland - mixed	**QAPP Elevation Meters**	
Terrain	rolling / complex	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone	4238698159	**Audit Latitude**	36.46983
Site Address 1	718 Russell Hill Road	**Audit Longitude**	-83.826511
Site Address 2		**Audit Elevation**	361
County	Claiborne	**Audit Declination**	-5.1
City, State	, TN		
Zip Code	37870	**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		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

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

Driving Directions

From I-75 take exit 134, 25W to 63 and LaFollette. Continue through LaFollette on 63 into Claiborne county. Just past mile marker 6 and the B&B gas and tire station in Claiborne county, turn right on an unmarked road. This road will end at a Tee after about 150 yds. Turn left at the Tee and then an immediate right at the next intersection onto Russell Hill Rd. The site will be on the right in the pasture behind the silo.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID SPD111 **Technician** Sandy Grenville **Site Visit Date** 03/31/2014

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	100 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 in a pasture with as many as 75 cattle. The cattle are fed within 100 meters of the site. When the site is visited the cattle approach to within 10 meters of the site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	SPD111	Technician	Sandy Grenville	Site Visit Date	03/31/2014

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	SPD111	Technician	Sandy Grenville	Site Visit Date	03/31/2014

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	SPD111	Technician	Sandy Grenville	Site Visit Date	03/31/2014

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID SPD111 **Technician** Sandy Grenville **Site Visit Date** 03/31/2014

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?	one leg of met tower split	

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

One leg of the meteorological tower is split.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID SPD111 **Technician** Sandy Grenville **Site Visit Date** 03/31/2014

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2001	☐
HASP	☑	Feb 2014	☐
Field Ops Manual	☑	July 1990	☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID SPD111 **Technician** Sandy Grenville **Site Visit Date** 03/31/2014

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID SPD111 **Technician** Sandy Grenville **Site Visit Date** 03/31/2014

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

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

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

Site ID SPD111 **Technician** Sandy Grenville **Site Visit Date** 03/31/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000265
DAS	Campbell	CR3000	2121	000342
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	00019997	04861
Flow Rate	Apex	AXMC105LPMDPC	40577	000459
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0808337428	06463
Ozone	ThermoElectron Inc	49i A1NAA	1030244794	000676
Ozone Standard	ThermoElectron Inc	49i A3NAA	0922236891	000515
Sample Tower	Aluma Tower	A	none	03548
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	4011	04314
UPS	APC	RS800	080331133278	06096
Zero air pump	Werther International	C 70/4	000829138	06918

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: 4/3/2014 11:37:13 PM

SiteVisitDate	Site	Technician
03/12/2014	ALC188	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00006	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.63109	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.7	%	**P**
5	Ozone % difference max	P	7	10	4	4.3	%	**P**

EEMS Spot Report

Data Compiled: 4/11/2014 5:07:30 PM

SiteVisitDate	Site	Technician
03/20/2014	BBE401	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.02051	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.35549	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.5	%	**P**
5	Ozone % difference max	P	7	10	4	2.0	%	**P**

EEMS Spot Report

Data Compiled: 4/11/2014 4:56:01 PM

SiteVisitDate	Site	Technician
02/25/2014	CAD150	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.02516	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.20051	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.1	%	**P**
5	Ozone % difference max	P	7	10	4	2.4	%	**P**

EEMS Spot Report

Data Compiled: 4/5/2014 1:48:46 PM

SiteVisitDate	Site	Technician
03/28/2014	CDZ171	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99413	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.51849	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.9	%	**P**
5	Ozone % difference max	P	7	10	4	3.5	%	**P**

EEMS Spot Report

Data Compiled: 4/11/2014 4:36:31 PM

SiteVisitDate	Site	Technician
02/26/2014	CHE185	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.02487	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.19321	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99982	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.4	%	**P**
5	Ozone % difference max	P	7	10	4	4.2	%	**P**

EEMS Spot Report

Data Compiled: 4/5/2014 2:29:24 PM

SiteVisitDate	Site	Technician
03/31/2014	CKT136	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99303	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.34168	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.5	%	**P**
5	Ozone % difference max	P	7	10	4	2.2	%	**P**

EEMS Spot Report

Data Compiled: 5/2/2016 6:01:41 PM

SiteVisitDate	Site	Technician
03/26/2014	COW137	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	3	0.08	c	**P**
2	Temperature max error	P	4	0.5	3	0.11	c	**P**
3	Ozone Slope	P	0	1.1	4	1.01997	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.24297	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99994	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.1	%	**P**
7	Ozone % difference max	P	7	10	4	2.8	%	**P**
8	Flow Rate average % difference	P	10	5	3	2.04	%	**P**
9	Flow Rate max % difference	P	10	5	3	2.04	%	**P**
10	DAS Time maximum error	P	0	5	1	0.02	min	**P**
11	DAS Voltage average error	P	7	0.003	49	0.0001	V	**P**

Field Systems Comments

1 **Parameter:** DasComments

One leg of the meteorological tower has two holes.

2 **Parameter:** SitingCriteriaCom

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

3 **Parameter:** ShelterCleanNotes

The shelter is in fair condition with some rot near the air conditioner and in the corners. It has degraded since the previous audit. It was reported that the roof leaks. The shelter is kept very clean, neat, and well organized.

EEMS Spot Report

Data Compiled: 4/11/2014 4:46:24 PM

SiteVisitDate	Site	Technician
02/28/2014	CVL151	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00749	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.67428	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.7	%	**P**
5	Ozone % difference max	P	7	10	4	2.0	%	**P**

EEMS Spot Report

Data Compiled: 5/2/2016 6:59:11 PM

SiteVisitDate	Site	Technician
03/27/2014	ESP127	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.09	c	**P**
2	Temperature max error	P	4	0.5	6	0.15	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99644	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.52675	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.4	%	**P**
7	Ozone % difference max	P	7	10	4	0.8	%	**P**
8	Flow Rate average % difference	P	10	5	4	0.44	%	**P**
9	Flow Rate max % difference	P	10	5	4	0.67	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	49	0.0001	V	**P**

Field Systems Comments

1 **Parameter:** DasComments

The site operator must use a chair to stand on when accessing the sample tower filter pack enclosure due to obstructions when lowering the sample tower.

2 **Parameter:** ShelterCleanNotes

The shelter is in poor condition with rot at the bottom of walls and floor. Some paneling is loose.

EEMS Spot Report

Data Compiled: 8/9/2014 4:05:00 PM

SiteVisitDate	Site	Technician
03/04/2014	GAS153	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	12	0.12	c	**P**
2	Temperature max error	P	4	0.5	12	0.25	c	**P**
3	Ozone Slope	P	0	1.1	4	1.02217	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.44253	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.3	%	**P**
7	Ozone % difference max	P	7	10	4	1.9	%	**P**
8	Flow Rate average % difference	P	10	5	2	2.62	%	**P**
9	Flow Rate max % difference	P	10	5	2	2.86	%	**P**
10	DAS Time maximum error	P	0	5	1	0.02	min	**P**
11	DAS Voltage average error	P	7	0.003	21	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	6	0.09	c	**P**
13	Shelter Temperature max error	P	5	1	6	0.10	c	**P**

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone sample train is tested for leaks every two weeks.

EEMS Spot Report

Data Compiled: 8/9/2014 3:04:58 PM

SiteVisitDate	Site	Technician
02/13/2014	IRL141	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	3	0.06	c	**P**
2	Temperature max error	P	4	0.5	3	0.06	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99726	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.41844	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99988	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.3	%	**P**
7	Ozone % difference max	P	7	10	4	3.6	%	**P**
8	Flow Rate average % difference	P	10	5	4	0.92	%	**P**
9	Flow Rate max % difference	P	10	5	4	1.06	%	**P**
10	DAS Time maximum error	P	0	5	1	0.02	min	**P**
11	DAS Voltage average error	P	7	0.003	35	0.0000	V	**P**
12	Shelter Temperature average error	P	5	1	9	0.83	c	**P**
13	Shelter Temperature max error	P	5	1	9	1.01	c	**Fail**

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator is doing an excellent job of handling and changing the filter pack.

2 **Parameter:** SitingCriteriaCom

The expanded roadway and parking lots were observed to have several vehicles traveling and parking including motor homes, during the audit visit. Sebastian has an estimated population of 18,000. The park operates a boat ramp with vehicle parking near the site. The site is surrounded on three sides by boat traffic using the ramp.

3 **Parameter:** ShelterCleanNotes

The shelter is clean and well organized.

EEMS Spot Report

Data Compiled: 4/5/2014 1:38:22 PM

SiteVisitDate	Site	Technician
03/28/2014	MAC426	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01804	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.31284	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.1	%	**P**
5	Ozone % difference max	P	7	10	4	1.7	%	**P**

EEMS Spot Report

Data Compiled: 4/5/2014 2:11:58 PM

SiteVisitDate	Site	Technician
03/30/2014	MCK131	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00752	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.11721	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.2	%	**P**
5	Ozone % difference max	P	7	10	4	2.6	%	**P**

EEMS Spot Report

Data Compiled: 4/5/2014 2:20:56 PM

SiteVisitDate	Site	Technician
03/30/2014	MCK231	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01159	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.35351	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.8	%	**P**
5	Ozone % difference max	P	7	10	4	1.2	%	**P**

EEMS Spot Report

Data Compiled: 4/11/2014 5:17:48 PM

SiteVisitDate	Site	Technician
03/25/2014	PAL190	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99016	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.24018	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.6	%	**P**
5	Ozone % difference max	P	7	10	4	2.3	%	**P**

EEMS Spot Report

Data Compiled: 8/10/2014 10:54:16 AM

SiteVisitDate	Site	Technician
03/05/2014	SND152	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	3	0.24	c	**P**
2	Temperature max error	P	4	0.5	3	0.34	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00529	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.52037	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99982	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.3	%	**P**
7	Ozone % difference max	P	7	10	4	1.9	%	**P**
8	Flow Rate average % difference	P	10	5	1	0.26	%	**P**
9	Flow Rate max % difference	P	10	5	1	0.47	%	**P**
10	DAS Time maximum error	P	0	5	1	0.03	min	**P**
11	DAS Voltage average error	P	7	0.003	35	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	6	0.38	c	**P**
13	Shelter Temperature max error	P	5	1	6	0.70	c	**P**

Field Systems Comments

1 **Parameter:** DasComments

The sample tower is leaning approximately 10 degrees from vertical.

2 **Parameter:** SitingCriteriaCom

The site is located on an active research farm with cattle and poultry. Cattle are fed within 100 meters of the site. A Climate Reference Network site is located on the farm on the south side of Hwy 68 which is a better location for the CASTNET site.

3 **Parameter:** ShelterCleanNotes

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

4 **Parameter:** MetOpMaintCom

The temperature sensor signal cable is beginning to show signs of wear.

EEMS Spot Report

Data Compiled: 5/2/2016 7:30:07 PM

SiteVisitDate	Site	Technician
03/31/2014	SPD111	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	12	0.14	c	**P**
2	Temperature max error	P	4	0.5	12	0.26	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00976	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.27889	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99982	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.7	%	**P**
7	Ozone % difference max	P	7	10	4	2.5	%	**P**
8	Flow Rate average % difference	P	10	5	8	0.44	%	**P**
9	Flow Rate max % difference	P	10	5	8	0.66	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	49	0.0001	V	**P**

Field Systems Comments

1 **Parameter:** DasComments

One leg of the meteorological tower is split.

2 **Parameter:** SitingCriteriaCom

The site is in a pasture with as many as 75 cattle. The cattle are fed within 100 meters of the site. When the site is visited the cattle approach to within 10 meters of the site.

3 **Parameter:** ShelterCleanNotes

The shelter is in good condition. The shelter is clean, neat, well organized and well maintained, however the floor is beginning to buckle.

EEMS Spot Report

Data Compiled: 8/9/2014 2:03:24 PM

SiteVisitDate	Site	Technician
02/11/2014	SUM156	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.07	c	**P**
2	Temperature max error	P	4	0.5	6	0.13	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98734	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.66673	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.6	%	**P**
7	Ozone % difference max	P	7	10	4	4.0	%	**P**
8	Flow Rate average % difference	P	10	5	3	2.34	%	**P**
9	Flow Rate max % difference	P	10	5	3	2.37	%	**P**
10	DAS Time maximum error	P	0	5	1	0.02	min	**P**
11	DAS Voltage average error	P	7	0.003	35	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	9	0.43	c	**P**
13	Shelter Temperature max error	P	5	1	9	0.67	c	**P**

SiteVisitDate	Site	Technician
02/11/2014	SUM156	Eric Hebert

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** DasComments

The meteorological tower has been removed. The temperature sensor is mounted in a naturally aspirated shield on the sample tower.

2 **Parameter:** SitingCriteriaCom

The site is surrounded by pine trees on land managed by the forest service. A few trees are now 17 meters tall and within 17 meters of the sample tower. Most trees are 30 meters from the sample tower.

3 **Parameter:** ShelterCleanNotes

The shelter is clean and well organized.. The site operator does an excellent job of organizing and maintaining the site.

4 **Parameter:** PollAnalyzerCom

There is water in the flow tubing outside the shelter. Trees to the north are less than 20 meters from the sample inlets.

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

EEMS Spot Report

Data Compiled: 4/11/2014 4:56:01 PM

SiteVisitDate	Site	Technician
02/25/2014	CAD150	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.02516	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.20051	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.1	%	**P**
5	Ozone % difference max	P	7	10	4	2.4	%	**P**

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241792	CAD150	Sandy Grenville	02/25/2014	Ozone	000624

Slope:	1.02516	**Slope:**	0.00000
Intercept	-0.20051	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00458	**Intercept**	-0.11484
Cert Date	12/10/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.1%	2.4%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.53	0.64	0.46	ppb	
primary	2	31.55	31.52	32.08	ppb	1.78%
primary	3	50.86	50.74	51.91	ppb	2.31%
primary	4	80.88	80.62	82.30	ppb	2.08%
primary	5	100.06	99.71	102.10	ppb	2.40%

Sensor Component	Condition	Status
Cell B Noise	1.6 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.20	pass
Span	1.037	pass
Cell B Freq.	100.3 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.71 lpm	pass
Cell A Tmp.	31.8 C	pass
Cell A Pressure	737.5 mmHg	pass
Cell A Noise	0.9 ppb	pass
Cell A Freq.	103.6 kHz	pass
Cell A Flow	0.72 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CAD150-Sandy Grenville-02/25/2014					
1 2/25/2014	DAS	Campbell	000421	CR3000	2530
2 2/25/2014	Ozone	ThermoElectron Inc	000624	49i A1NAA	1009241792
3 2/25/2014	Ozone Standard	ThermoElectron Inc	000495	49i A3NAA	0622717849
4 2/25/2014	Zero air pump	Werther International	06885	C 70/4	000814270

EEMS Spot Report

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SiteVisitDate	Site	Technician
02/26/2014	CHE185	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.02487	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.19321	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99982	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.4	%	**P**
5	Ozone % difference max	P	7	10	4	4.2	%	**P**

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Monitor Labs, Inc.	191	CHE185	Sandy Grenville	02/26/2014	Ozone	54901

Slope:	1.02487	**Slope:**	0.00000
Intercept	-0.19321	**Intercept**	0.00000
CorrCoff	0.99982	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00458	**Intercept**	-0.11484
Cert Date	12/10/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.4%	4.2%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.05	0.16	0.01	ppb	
primary	2	30.04	30.01	29.67	ppb	-1.13%
primary	3	50.78	50.66	52.78	ppb	4.18%
primary	4	82.49	82.22	84.45	ppb	2.71%
primary	5	100.14	99.79	101.50	ppb	1.71%

Sensor Component	Condition	Status
Cell B Noise	0.22 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-0.06	pass
Span	1.079	pass
Cell B Freq.		pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.5 lpm	pass
Cell A Tmp.	37.6 C	pass
Cell A Pressure	712 mmHg	pass
Cell A Noise	0.22 ppb	pass
Cell A Freq.		pass
Cell A Flow	0.5 lpm	pass
Battery Backup	Functioning	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CHE185-Sandy Grenville-02/26/2014						
1	2/26/2014	DAS	Environmental Sys Corp	73955	8832	A0656-b
2	2/26/2014	Ozone	Monitor Labs, Inc.	54901	ML9811	191
3	2/26/2014	UPS	Tripplite	none	LRC2400	9743AYOLC615000
4	2/26/2014	Zero air pump	Ecotech	none	8301LC	01-0658

EEMS Spot Report

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SiteVisitDate	Site	Technician
02/28/2014	CVL151	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00749	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.67428	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.7	%	**P**
5	Ozone % difference max	P	7	10	4	2.0	%	**P**

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244797	CVL151	Sandy Grenville	02/28/2014	Ozone	000698

Slope:	1.00749	**Slope:**	0.00000
Intercept	-0.67428	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00458	**Intercept**	-0.11484
Cert Date	12/10/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.7%	2.0%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.03	0.14	-0.44	ppb	
primary	2	31.60	31.57	30.95	ppb	-1.96%
primary	3	49.97	49.85	49.56	ppb	-0.58%
primary	4	81.09	80.83	80.90	ppb	0.09%
primary	5	99.74	99.39	99.40	ppb	0.01%

Sensor Component	Condition	Status
Cell B Noise	1.0 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.30	pass
Span	1.02	pass
Cell B Freq.	100.8 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.70 lpm	pass
Cell A Tmp.	33.5 C	pass
Cell A Pressure	726 mmHg	pass
Cell A Noise	0.8 ppb	pass
Cell A Freq.	95.9 kHz	pass
Cell A Flow	0.70 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CVL151-Sandy Grenville-02/28/2014						
1	2/28/2014	DAS	Campbell	000410	CR3000	2508
2	2/28/2014	Ozone	ThermoElectron Inc	000698	49i A1NAA	1030244797
3	2/28/2014	Ozone Standard	ThermoElectron Inc	000464	49i A3NAA	0622717858
4	2/28/2014	Zero air pump	Werther International	06884	PC70/4	000815263

EEMS Spot Report

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SiteVisitDate	Site	Technician
03/12/2014	ALC188	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00006	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.63109	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.7	%	**P**
5	Ozone % difference max	P	7	10	4	4.3	%	**P**

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244802	ALC188	Eric Hebert	03/12/2014	Ozone	000689

Slope:	1.00006	**Slope:**	0.00000
Intercept	-0.63109	**Intercept**	0.00000
CorrCoff	0.99996	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00707	**Intercept**	-0.21032
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.7%	4.3%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.58	0.78	0.51	ppb	
primary	2	26.99	27.00	25.85	ppb	-4.26%
primary	3	47.52	47.39	46.69	ppb	-1.48%
primary	4	75.22	74.90	74.51	ppb	-0.52%
primary	5	103.96	103.43	102.80	ppb	-0.61%

Sensor Component	Condition	Status
Cell B Noise	0.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.000	pass
Span	1.015	pass
Cell B Freq.	93.0 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.69 lpm	pass
Cell A Tmp.	28.0 C	pass
Cell A Pressure	731 mmHg	pass
Cell A Noise	0.8 ppb	pass
Cell A Freq.	94.5 kHz	pass
Cell A Flow	0.72 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ALC188-Eric Hebert-03/12/2014						
1	3/12/2014	DAS	Campbell	000422	CR3000	2523
2	3/12/2014	Ozone	ThermoElectron Inc	000689	49i A1NAA	1030244802
3	3/12/2014	Ozone Standard	ThermoElectron Inc	000363	49i A3NAA	0726124691
4	3/12/2014	Zero air pump	Werther International	06940	C 70/4	000821897

EEMS Spot Report

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SiteVisitDate	Site	Technician
03/20/2014	BBE401	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.02051	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.35549	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.5	%	**P**
5	Ozone % difference max	P	7	10	4	2.0	%	**P**

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-58468-318	BBE401	Alison Ray	03/20/2014	Ozone	90517

Slope:	1.02051	**Slope:**	0.00000
Intercept	-0.35549	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00707	**Intercept**	-0.21032
Cert Date	1/8/2014	**CorrCoff**	1.00000

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

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.45	0.65	0.21	ppb	
primary	2	33.13	33.10	33.58	ppb	1.45%
primary	3	45.07	44.96	45.45	ppb	1.09%
primary	4	82.65	82.27	83.88	ppb	1.96%
primary	5	94.83	94.37	95.69	ppb	1.40%

Sensor Component	Condition	Status
Cell B Noise	0.6 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.000	pass
Span	1.018	pass
Cell B Freq.	87 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.70 lpm	pass
Cell A Tmp.	38.0 C	pass
Cell A Pressure	659.6 mmHg	pass
Cell A Noise	0.8 ppb	pass
Cell A Freq.	91 kHz	pass
Cell A Flow	0.67 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
BBE401-Alison Ray-03/20/2014						
1	3/20/2014	DAS	Environmental Sys Corp	90665	8816	2689
2	3/20/2014	Ozone	ThermoElectron Inc	90517	49C	49C-58468-318
3	3/20/2014	Ozone Standard	ThermoElectron Inc	90832	49C	520012326
4	3/20/2014	Zero air pump	Werther International	none	C 70/4	606499

EEMS Spot Report

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SiteVisitDate	Site	Technician
03/25/2014	PAL190	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99016	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.24018	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.6	%	**P**
5	Ozone % difference max	P	7	10	4	2.3	%	**P**

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347322	PAL190	Alison Ray	03/25/2014	Ozone	000733

Slope:	0.99016	**Slope:**	0.00000
Intercept	-0.24018	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00707	**Intercept**	-0.21032
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.6%	2.3%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.03	0.23	0.13	ppb	
primary	2	33.45	33.42	32.64	ppb	-2.33%
primary	3	51.67	51.51	50.72	ppb	-1.53%
primary	4	79.81	79.45	78.52	ppb	-1.17%
primary	5	98.06	97.58	96.40	ppb	-1.21%

Sensor Component	Condition	Status
Cell B Noise	0.8 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.1	pass
Span	1.005	pass
Cell B Freq.	97.6 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.67 lpm	pass
Cell A Tmp.	27.4 C	pass
Cell A Pressure	657.6 mmHg	pass
Cell A Noise	0.8 ppb	pass
Cell A Freq.	90.5 kHz	pass
Cell A Flow	0.67 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PAL190-Alison Ray-03/25/2014						
1	3/25/2014	DAS	Campbell	000347	CR3000	2126
2	3/25/2014	Ozone	ThermoElectron Inc	000733	49i A1NAA	1105347322
3	3/25/2014	Ozone Standard	ThermoElectron Inc	000214	49i A3NAA	0622717855
4	3/25/2014	Zero air pump	Werther International	06929	C 70/4	000829173

EEMS Spot Report

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SiteVisitDate	Site	Technician
03/28/2014	CDZ171	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99413	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.51849	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.9	%	**P**
5	Ozone % difference max	P	7	10	4	3.5	%	**P**

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347320	CDZ171	Sandy Grenville	03/28/2014	Ozone	000727

Slope:	0.99413	**Slope:**	0.00000
Intercept	-0.51849	**Intercept**	0.00000
CorrCoff	0.99995	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00458	**Intercept**	-0.11484
Cert Date	12/10/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.9%	3.5%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.31	0.42	0.26	ppb	
primary	2	32.20	32.16	31.03	ppb	-3.51%
primary	3	50.81	50.69	49.57	ppb	-2.21%
primary	4	80.50	80.24	79.64	ppb	-0.75%
primary	5	100.28	99.93	98.80	ppb	-1.13%

Sensor Component	Condition	Status
Cell B Noise	0.7 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.000	pass
Span	1.007	pass
Cell B Freq.	89.1 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.72 lpm	pass
Cell A Tmp.	35.6 C	pass
Cell A Pressure	714.3 mmHg	pass
Cell A Noise	0.8 ppb	pass
Cell A Freq.	91.8 kHz	pass
Cell A Flow	0.72 lpm	pass
Battery Backup	Functioning	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CDZ171-Sandy Grenville-03/28/2014					
1 3/28/2014	DAS	Campbell	000352	CR3000	2130
2 3/28/2014	Ozone	ThermoElectron Inc	000727	49i A1NAA	1105347320
3 3/28/2014	Ozone Standard	ThermoElectron Inc	000544	49i A3NAA	0929938242
4 3/28/2014	UPS	APC	06793	RS900	unknown
5 3/28/2014	Zero air pump	Werther International	06899	PC70/4	000821902

EEMS Spot Report

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SiteVisitDate	Site	Technician
03/28/2014	MAC426	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01804	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.31284	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.1	%	**P**
5	Ozone % difference max	P	7	10	4	1.7	%	**P**

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460049	MAC426	Sandy Grenville	03/28/2014	Ozone	none

Slope:	1.01804	**Slope:**	0.00000
Intercept	-0.31284	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00458	**Intercept**	-0.11484
Cert Date	12/10/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.1%	1.7%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.03	0.14	-0.03	ppb	
primary	2	29.81	29.78	30.11	ppb	1.11%
primary	3	50.79	50.67	50.82	ppb	0.30%
primary	4	80.34	80.08	81.25	ppb	1.46%
primary	5	99.87	99.52	101.17	ppb	1.66%

Sensor Component	Condition	Status
Cell B Noise	0.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.2	pass
Span	1.016	pass
Cell B Freq.	106.1 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.72 lpm	pass
Cell A Tmp.	34.7 C	pass
Cell A Pressure	729.4 mmHg	pass
Cell A Noise	0.8 ppb	pass
Cell A Freq.	88.1 kHz	pass
Cell A Flow	0.72 lpm	pass
Battery Backup	Functioning	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MAC426-Sandy Grenville-03/28/2014					
1 3/28/2014	DAS	Environmental Sys Corp	3027	8832	A3027
2 3/28/2014	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460049
3 3/28/2014	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1030745084
4 3/28/2014	UPS	APC	none	XS1500	unkown
5 3/28/2014	Zero air pump	Werther International	none	PC70/4	000665778

EEMS Spot Report

Data Compiled: 4/5/2014 2:11:58 PM

SiteVisitDate	Site	Technician
03/30/2014	MCK131	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00752	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.11721	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.2	%	**P**
5	Ozone % difference max	P	7	10	4	2.6	%	**P**

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347327	MCK131	Sandy Grenville	03/30/2014	Ozone	000723

Slope:	1.00752	**Slope:**	0.00000
Intercept	0.11721	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00458	**Intercept**	-0.11484
Cert Date	12/10/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.2%	2.6%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.03	0.14	0.14	ppb	
primary	2	31.04	31.01	31.81	ppb	2.58%
primary	3	51.03	50.91	51.00	ppb	0.18%
primary	4	80.79	80.53	81.30	ppb	0.96%
primary	5	100.25	99.90	100.80	ppb	0.90%

Sensor Component	Condition	Status
Cell B Noise	1.7 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.3	pass
Span	1.031	pass
Cell B Freq.	110.1 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.73 lpm	pass
Cell A Tmp.	31.3 C	pass
Cell A Pressure	726.2 mmHg	pass
Cell A Noise	1.4 ppb	pass
Cell A Freq.	102.8 kHz	pass
Cell A Flow	0.71 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MCK131-Sandy Grenville-03/30/2014						
1	3/30/2014	DAS	Campbell	000429	CR3000	2535
2	3/30/2014	Ozone	ThermoElectron Inc	000723	49i A1NAA	1105347327
3	3/30/2014	Ozone Standard	ThermoElectron Inc	000366	49i A3NAA	0726124895
4	3/30/2014	Zero air pump	Werther International	06912	PC70/4	000829177

EEMS Spot Report

Data Compiled: 4/5/2014 2:20:56 PM

SiteVisitDate	Site	Technician
03/30/2014	MCK231	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01159	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.35351	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.8	%	**P**
5	Ozone % difference max	P	7	10	4	1.2	%	**P**

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347318	MCK231	Sandy Grenville	03/30/2014	Ozone	000739

Slope:	1.01159	**Slope:**	0.00000
Intercept	-0.35351	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00458	**Intercept**	-0.11484
Cert Date	12/10/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.8%	1.2%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.13	0.24	0.10	ppb	
primary	2	31.04	31.01	30.65	ppb	-1.16%
primary	3	51.54	51.41	51.64	ppb	0.45%
primary	4	81.03	80.77	81.60	ppb	1.03%
primary	5	100.82	100.47	101.20	ppb	0.73%

Sensor Component	Condition	Status
Cell B Noise	0.8 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.20	pass
Span	1.015	pass
Cell B Freq.	89.2 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.74 lpm	pass
Cell A Tmp.	35.2 C	pass
Cell A Pressure	705.8 mmHg	pass
Cell A Noise	1.1 ppb	pass
Cell A Freq.	93.4 kHz	pass
Cell A Flow	0.69 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MCK231-Sandy Grenville-03/30/2014						
1	3/30/2014	DAS	Campbell	000359	CR3000	2137
2	3/30/2014	Ozone	ThermoElectron Inc	000739	49i A1NAA	1105347318
3	3/30/2014	Ozone Standard	ThermoElectron Inc	000369	49i A3NAA	0726124890
4	3/30/2014	Zero air pump	Werther International	06924	C 70/4	000836205

EEMS Spot Report

Data Compiled: 4/5/2014 2:29:24 PM

SiteVisitDate	Site	Technician
03/31/2014	CKT136	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99303	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.34168	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.5	%	**P**
5	Ozone % difference max	P	7	10	4	2.2	%	**P**

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241780	CKT136	Sandy Grenville	03/31/2014	Ozone	000617

Slope:	0.99303	**Slope:**	0.00000
Intercept	-0.34168	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00458	**Intercept**	-0.11484
Cert Date	12/10/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.5%	2.2%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.02	0.13	-0.05	ppb	
primary	2	31.31	31.28	30.58	ppb	-2.24%
primary	3	52.54	52.41	51.51	ppb	-1.72%
primary	4	82.03	81.77	81.00	ppb	-0.94%
primary	5	100.36	100.01	99.00	ppb	-1.01%

Sensor Component	Condition	Status
Cell B Noise	1.0 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.20	pass
Span	1.008	pass
Cell B Freq.	113.7 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.64 lpm	pass
Cell A Tmp.	34.0 C	pass
Cell A Pressure	711.5 mmHg	pass
Cell A Noise	0.9 ppb	pass
Cell A Freq.	98.2 kHz	pass
Cell A Flow	0.66 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CKT136-Sandy Grenville-03/31/2014						
1	3/31/2014	DAS	Campbell	000354	CR3000	2132
2	3/31/2014	Ozone	ThermoElectron Inc	000617	49i A1NAA	1009241780
3	3/31/2014	Ozone Standard	ThermoElectron Inc	000433	49i A3NAA	CM08200009
4	3/31/2014	Zero air pump	Werther International	06902	PC70/4	000829157