2013 – 1st Quarter Report
Support for Conducting Systems & Performance Audits of CASTNET Sites and NADP Monitoring Stations

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U. S. Environmental Protection Agency

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Table of Contents

1.0 CASTNET Quarterly Report..... 1-1

1.1 Introduction..... 1-1
1.2 Project Objectives..... 1-1
1.3 Sites Visited First Quarter 2013..... 1-3
1.4 Audit Results..... 1-4

2.0 NADP Quarterly Report..... 2-1

2.1 Introduction..... 2-1
2.2 Project Objectives..... 2-1
2.3 Sites Visited First Quarter 2013..... 2-2
2.4 Survey Results..... 2-3

List of Appendices

Appendix A CASNTET Audit Report Forms
Appendix B CASTNET Site Spot Report Forms
Appendix C CASTNET Ozone Performance Evaluation Forms

List of Tables

Table 1. Performance Audit Challenge and Acceptance Criteria ……. 1-2
Table 2. Site Audit Visits …….. 1-3
Table 3. Site Ozone PE Visits ……... 1-4
Table 4. Sites Surveyed – First Quarter 2013 …….. 2-2

List of Acronyms and Abbreviations

% diff	percent difference
A/D	analog to digital converter
ARS	Air Resource Specialist, Inc.
ASTM	American Society for Testing and Materials
CASTNET	Clean Air Status and Trends Network
DAS	data acquisition system
DC	direct current
deg	degree
DVM	digital voltmeter
EEMS	Environmental, Engineering & Measurement Services, Inc.
EPA	U.S. Environmental Protection Agency
ESC	Environmental Systems Corporation
FSAD	Field Site Audit Database
GPS	geographical positioning system
lpm	liters per minute
MLM	Multilayer Model
m/s	meters per second
mv	milivolt
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
QAPP	Quality Assurance Project Plan
SOP	standard operating procedure
TEI	Thermo Environmental Instruments
USNO	United States Naval Observatory
V	volts
WRR	World Radiation Reference

1.0 CASTNET Quarterly Report

1.1 Introduction

The Clean Air Status and Trends Network (CASTNET) is a national air monitoring program developed under mandate of the 1990 Clean Air Act Amendments. Each site in the network measures acidic gases and particles and other forms of atmospheric pollution using a continuous collection filter aggregated over a one week period. Hourly averages of surface ozone concentrations and selected meteorological variables are also measured.

Site measurements are used to estimate deposition rates of the various pollutants with the objective of determining relationships between emissions, air quality, deposition, and ecological effects. In conjunction with other national monitoring networks, CASTNET data are used to determine the effectiveness of national emissions control programs and to assess temporal trends and spatial deposition patterns in atmospheric pollutants. CASTNET data are also used for long-range transport model evaluations and effects research.

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

As of January 2012, the network is comprised of 82 active rural sampling sites across the Untied States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Environment Canada, and several independent partners. AMEC is responsible for operating the EPA and Environment Canada sponsored sites, and Air Resource Specialist, Inc. (ARS) is responsible for operating the NPS sponsored sites.

1.2 Project Objectives

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

Performance audits verify that all evaluated variables are consistent with the accuracy goals as defined in the CASTNET Quality Assurance Project Plan (QAPP). The parameter specific

accuracy goals are presented in Table 1. Only four EPA sponsored sites continue to operate meteorological sensors. Those sites are BEL116, BVL30, CHE185, and PAL190.

Table 1. Performance Audit Challenge and Acceptance Criteria

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

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

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

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

1.3 Sites Visited First Quarter 2013

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

Table 2. Site Audit Visits

Site ID	Audit Type	Sponsor	Site Location	Visit dates
CVL151	Audit w/o met	EPA	Coffeeville	2/13/2013
CAD150	Audit w/o met	EPA	Caddo Valley	2/14/2013
ALC188	Audit w/o met	EPA	Alabama-Coushatta	2/15/2013

Site ID	Audit Type	Sponsor	Site Location	Visit dates
MAC426	Audit with met	NPS	Mammoth Cave NP	3/1/2013
CHE185	Audit with met	EPA	Cherokee Nation	3/3/2013
CDZ171	Audit w/o met	EPA	Cadiz	3/5/2013
MCK131	Audit w/o met	EPA	Mackville	3/6/2013
MCK231	Audit w/o met	EPA	Mackville (precision site)	3/6/2013
BBE401	Audit with met	NPS	Big Bend NP	3/6/2013
PAL190	Audit with met	EPA	Palo Duro	3/7/2013
CKT136	Audit w/o met	EPA	Crockett	3/9/2013

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
SUM156	EPA	Sumatra	2/17/2013
IRL141	EPA	Indian River Lagoon	2/20/2013
GAS153	EPA	Georgia Station	2/28/2013
SND152	EPA	Sand Mountain	2/28/2013
COW137	EPA	Coweeta	3/29/2013
ESP127	EPA	Edgar Evins St. Park	3/30/2013
SPD111	EPA	Speedwell	3/30/2013

1.4 Audit Results

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

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

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

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

2.0 NADP Quarterly Report

2.1 Introduction

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

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

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

2.2 Project Objectives

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

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

2.3 Sites Visited First Quarter 2013

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

Table 4. Sites Surveyed – First Quarter 2013

Side ID	Network	Survey Date	Station Name
FL03	NTN	2/4/2013	Bradford Forest
FL05	MDN/NTN	2/5/2013	Chassahowitzka National Wildlife Refuge
FL11	MDN/NTN/AMoN	2/20/2013	Everglades National Park-Research Center
FL14	NTN	2/12/2013	Quincy
FL23	NTN	2/17/2013	Sumatra
FL34	MDN	2/19/2013	Everglades Nutrient Removal Project
FL41	NTN	2/18/2013	Verna Well Field
FL97	MDN	2/19/2013	Everglades-Western Broward County
FL99	NTN	3/21/2013	Kennedy Space Center
GA20	NTN	3/19/2013	Claxton
KY03	NTN/AMoN	3/7/2013	Mackville
KY10	MDN/NTN	3/1/2013	Mammoth Cave National Park-Houchin Meadow
KY19	NTN	3/6/2013	Seneca Park
KY22	NTN	3/8/2013	Lilley Cornett Woods
KY99	NTN	3/5/2013	Mulberry Flat
MS12	MDN/NTN	2/12/2013	Grand Bay NERR
OK22	MDN	3/4/2013	Miami
PR20	NTN	2/12/2013	El Verde
TN04	NTN	3/30/2013	Speedwell
TN14	NTN	3/29/2013	Hatchie National Wildlife Refuge
VI01	NTN	2/13/2013	Virgin Islands National Park-Lind Point

2.4 Survey Results

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

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

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

APPENDIX A

CASTNET Audit Report Forms

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CVL151-Sandy Grenville-02/13/2013						
1	2/13/2013	Computer	Dell	000477	D630	unknown
2	2/13/2013	DAS	Campbell	000410	CR3000	2508
3	2/13/2013	Elevation	Elevation	None	1	None
4	2/13/2013	Filter pack flow pump	Thomas	04282	107CAB18B	129800010140
5	2/13/2013	flow rate	Tylan	03867	FC280SAV	AW9508046
6	2/13/2013	Infrastructure	Infrastructure	none	none	none
7	2/13/2013	MFC power supply	Tylan	03410	RO-32	FP9403012
8	2/13/2013	Modem	Raven	06462	V42221	0808338333
9	2/13/2013	Ozone	ThermoElectron Inc	000698	49i A1NAA	1030244797
10	2/13/2013	Ozone Standard	ThermoElectron Inc	000440	49i A3NAA	CM08200016
11	2/13/2013	Sample Tower	Aluma Tower	03540	A	none
12	2/13/2013	Shelter Temperature	Campbell	none	107-L	none
13	2/13/2013	Siting Criteria	Siting Criteria	None	1	None
14	2/13/2013	Temperature	Climatronics	06668	100093	none
15	2/13/2013	Zero air pump	Werther International	06884	PC70/4	000815263

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2508	CVL151	Sandy Grenville	02/13/2013	DAS	Primary

Das Date: 2 /13/2013
Das Time: 13:30:00
Das Day: 44

Audit Date 2 /13/2013
Audit Time 13:30:00
Audit Day 44

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

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

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2998	0.2998	V	V	0.0000
7	0.5000	0.4997	0.4997	V	V	0.0000
7	0.7000	0.6997	0.6995	V	V	-0.0002
7	0.9000	0.8995	0.8994	V	V	-0.0001
7	1.0000	0.9995	0.9993	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9508046	CVL151	Sandy Grenville	02/13/2013	flow rate	03867

Mfg	Tylan	
SN/Owner ID	FP9403012	03410
Parameter	MFC power supply	

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

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

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
1.53%	1.70%			

Cal Factor Zero	0.13
Cal Factor Full Scale	1.23
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	-0.17	-0.145	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	-0.17	-0.141	-0.02	l/m	l/m	
primary	test pt 1	1.492	1.520	1.24	1.248	1.50	l/m	l/m	-1.32%
primary	test pt 2	1.494	1.524	1.24	1.248	1.50	l/m	l/m	-1.57%
primary	test pt 3	1.496	1.526	1.24	1.247	1.50	l/m	l/m	-1.70%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	360	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 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**	See comments	**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	6.5 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244797	CVL151	Sandy Grenville	02/13/2013	Ozone	000698

Slope:	1.00458	**Slope:**	0.00000
Intercept	-0.04842	**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	1.00121	**Intercept**	-0.18383
Cert Date	1/2/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.5%	0.6%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.01	0.19	0.02	ppb	
primary	2	44.91	45.03	45.25	ppb	0.49%
primary	3	66.32	66.42	66.81	ppb	0.59%
primary	4	84.44	84.52	85.00	ppb	0.57%
primary	5	109.81	109.86	110.10	ppb	0.22%

Sensor Component	Condition	Status
Cell B Noise	1.1 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	1.020	pass
Cell B Freq.	98.1 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.71 lpm	pass
Cell A Tmp.	26.2 C	pass
Cell A Pressure	727 mmHg	pass
Cell A Noise	1.0 ppb	pass
Cell A Freq.	93.6 kHz	pass
Cell A Flow	0.72 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	CVL151	Sandy Grenville	02/13/2013	Temperature	06668

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

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.16	0.38		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	-0.02	0.06	0.000	0.0	C	-0.07
primary	Temp Mid Range	25.39	25.36	0.000	25.4	C	0.03
primary	Temp High Range	48.08	47.96	0.000	47.6	C	-0.38

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

Infrastructure Data For

Site ID	CVL151	Technician	Sandy Grenville	Site Visit Date	02/13/2013

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CVL151	Sandy Grenville	02/13/2013	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.06	0.10		

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

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	16.14	16.15	0.000	16.3	C	0.1
primary	Temp Mid Range	16.04	16.05	0.000	16.0	C	-0.04
primary	Temp Mid Range	15.88	15.90	0.000	16.0	C	0.05

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	CVL151	Sandy Grenville	02/13/2013	Moisture Present	Tylan	1204	☐	☐

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

Field Systems Comments

1 **Parameter:** DocumentationCo

The site operations manual does not apply to the currently installed instrumentation.

2 **Parameter:** SitingCriteriaCom

The site is located in a Pine forest on USFS managed land. The tree line has been cut back to at least 17 meters from the site.

3 **Parameter:** ShelterCleanNotes

The shelter is somewhat cluttered. The floor and lower walls are beginning to rot.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	CVL151	**Technician**	Sandy Grenville	**Site Visit Date**	02/13/2013

Site Sponsor (agency)	EPA	**USGS Map**	Coker Lake
Operating Group	Private - USFS	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	34.0028
Deposition Measurement	dry, wet	**QAPP Longitude**	-89.7989
Land Use	woodland - evergreen	**QAPP Elevation Meters**	134
Terrain	rolling	**QAPP Declination**	0.2
Conforms to MLM	Marginally	**QAPP Declination Date**	2/22/2006
Site Telephone	(662) 623-7334	**Audit Latitude**	34.002747
Site Address 1	Forest Road 809	**Audit Longitude**	-89.799183
Site Address 2	Tombigbee National Forest	**Audit Elevation**	138
County	Yalobusha	**Audit Declination**	-0.95
City, State	Tillatoba, MS		**Present**
Zip Code	38961	**Fire Extinguisher**	☑ No inspection date
Time Zone	Central	**First Aid Kit**	☑
Primary Operator	Gail Thompson	**Safety Glasses**	☑
Primary Op. Phone #	(662) 675-8187	**Safety Hard Hat**	☑
Primary Op. E-mail	gtpworksite@yahoo.com	**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 somewhat cluttered. The floor and lower walls are beginning to rot.				
Site OK	☑	**Notes**					

Driving Directions

From interstate 55 take exit 220 east on highway 330. Continue approximately 5 miles and turn left (north) at the Forest Service sign for the Yalobusha County Work Center and Jamie L. Whitter Plant Materials Center. Immediately after the facility turn left on forest service road 802. Continue approximately 1.5 miles to the stop sign and turn left on road 809. Continue approximately 0.3 miles to the first road on the left.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID CVL151 **Technician** Sandy Grenville **Site Visit Date** 02/13/2013

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m	17 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☐

Siting Criteria Comment

The site is located in a Pine forest on USFS managed land. The tree line has been cut back to at least 17 meters from the site.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID	CVL151	Technician	Sandy Grenville	Site Visit Date	02/13/2013

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

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

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID	CVL151	Technician	Sandy Grenville	Site Visit Date	02/13/2013

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?	☑	

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	Climatronics	100093	none	06668

Provide any additional 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 CVL151 **Technician** Sandy Grenville **Site Visit Date** 02/13/2013

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

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☐	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 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☐	Moisture in tubing only
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	
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	03540
Ozone	ThermoElectron Inc	49i A1NAA	1030244797	000698
Filter pack flow pump	Thomas	107CAB18B	129800010140	04282
MFC power supply	Tylan	RO-32	FP9403012	03410
Zero air pump	Werther International	PC70/4	000815263	06884

Provide any additional 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 CVL151 **Technician** Sandy Grenville **Site Visit Date** 02/13/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D630	unknown	000477
DAS	Campbell	CR3000	2508	000410
Modem	Raven	V42221	0808338333	06462

Provide any additional 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	CVL151	Technician	Sandy Grenville	Site Visit Date	02/13/2013

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	June 2007	☐
HASP	☑	Nov 2001	☐
Field Ops Manual	☑	July 1990	☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

The site operations manual does not apply to the currently installed instrumentation.

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID	CVL151	Technician	Sandy Grenville	Site Visit Date	02/13/2013

Site operation procedures

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

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

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☐		☑
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, 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	CVL151	Technician	Sandy Grenville	Site Visit Date	02/13/2013

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed afternoons
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, 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*
CAD150-Sandy Grenville-02/14/2013					
1 2/14/2013	Computer	Dell	000306	D520	unknown
2 2/14/2013	DAS	Campbell	000421	CR3000	2530
3 2/14/2013	Elevation	Elevation	None	1	None
4 2/14/2013	Filter pack flow pump	Thomas	00462	107CA110	09883403-01-4
5 2/14/2013	flow rate	Tylan	000090	FC280SAV	AW99013048
6 2/14/2013	Infrastructure	Infrastructure	none	none	none
7 2/14/2013	MFC power supply	Teledyne	01517	CPR-1A	149
8 2/14/2013	Modem	Raven	06515	NL115	3875
9 2/14/2013	Ozone	ThermoElectron Inc	000624	49i A1NAA	1009241792
10 2/14/2013	Ozone Standard	ThermoElectron Inc	000364	49i A3NAA	0726124687
11 2/14/2013	Sample Tower	Aluma Tower	03538	A	none
12 2/14/2013	Shelter Temperature	Campbell	none	107-L	none
13 2/14/2013	Siting Criteria	Siting Criteria	None	1	None
14 2/14/2013	Temperature	Climatronics	06648	100093	none
15 2/14/2013	Zero air pump	Werther International	06885	C 70/4	000814270

DAS Data Form

DAS Time Max Error: 0.05

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2530	CAD150	Sandy Grenville	02/14/2013	DAS	Primary

Das Date: 2 /14/2013
Das Time: 12:26:14
Das Day: 45

Audit Date 2 /14/2013
Audit Time 12:26:11
Audit Day 45

Low Channel:

Avg Diff:	Max Diff:
0.0002	0.0004

High Channel:

Avg Diff:	Max Diff:
0.0002	0.0004

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

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0000	V	V	0.0001
7	0.1000	0.0998	0.1000	V	V	0.0002
7	0.3000	0.2997	0.2993	V	V	-0.0004
7	0.5000	0.4996	0.4998	V	V	0.0002
7	0.7000	0.6995	0.6997	V	V	0.0002
7	0.9000	0.8994	0.8996	V	V	0.0002
7	1.0000	0.9993	0.9996	V	V	0.0003

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW99013048	CAD150	Sandy Grenville	02/14/2013	flow rate	000090

Mfg	Teledyne	
SN/Owner ID	149	01517
Parameter	MFC power supply	

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

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

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
2.02%	2.15%			

Cal Factor Zero	0.12
Cal Factor Full Scale	1.21
Rotometer Reading:	1.35

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	-0.26	0.127	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	-0.25	0.121	-0.01	l/m	l/m	
primary	test pt 1	1.506	1.530	2.54	1.270	1.50	l/m	l/m	-1.96%
primary	test pt 2	1.509	1.533	2.54	1.268	1.50	l/m	l/m	-2.15%
primary	test pt 3	1.509	1.530	2.54	1.268	1.50	l/m	l/m	-1.96%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	290 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241792	CAD150	Sandy Grenville	02/14/2013	Ozone	000624

Slope:	0.98806	**Slope:**	0.00000
Intercept	0.40998	**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	1.00121	**Intercept**	-0.18383
Cert Date	1/2/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.8%	1.1%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.02	0.20	0.94	ppb	
primary	2	46.73	46.85	46.36	ppb	-1.05%
primary	3	66.60	66.70	66.05	ppb	-0.97%
primary	4	85.16	85.24	84.50	ppb	-0.87%
primary	5	110.77	110.81	110.30	ppb	-0.46%

Sensor Component	Condition	Status
Cell B Noise	1.3 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.02	pass
Span	1.021	pass
Cell B Freq.	82.8 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.75 lpm	pass
Cell A Tmp.	32.7 C	pass
Cell A Pressure	737 mmHg	pass
Cell A Noise	0.9 ppb	pass
Cell A Freq.	84.9 kHz	pass
Cell A Flow	0.75 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	CAD150	Sandy Grenville	02/14/2013	Temperature	06648

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

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.08	0.13		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.23	0.31	0.000	0.2	C	-0.13
primary	Temp Mid Range	25.24	25.22	0.000	25.3	C	0.1
primary	Temp High Range	46.33	46.21	0.000	46.2	C	-0.02

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

Infrastructure Data For

Site ID	CAD150	Technician	Sandy Grenville	Site Visit Date	02/14/2013

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CAD150	Sandy Grenville	02/14/2013	Shelter Temperature	none

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

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

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	21.81	21.80	0.000	21.9	C	0.06
primary	Temp Mid Range	21.89	21.88	0.000	21.9	C	0
primary	Temp Mid Range	22.68	22.67	0.000	22.5	C	-0.14

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone analyzer sample train is leak checked by capping the inlet every two weeks.

2 **Parameter:** ShelterCleanNotes

The bottom of the shelter walls are very badly deteriorated. The floor and ceiling have been repaired.

3 **Parameter:** PollAnalyzerCom

Both the filter pack flow tubing and ozone sample line fold tightly against the tower hinge when the tower is lowered. This could eventually cause damage to the tubing.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	CAD150	**Technician**	Sandy Grenville	**Site Visit Date**	02/14/2013

Site Sponsor (agency)	EPA	**USGS Map**	Caddo Valley
Operating Group	Ouachita Baptist University	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	34.1792
Deposition Measurement	dry, wet	**QAPP Longitude**	-93.0989
Land Use	woodland - mixed	**QAPP Elevation Meters**	71
Terrain	gently rolling	**QAPP Declination**	2.3
Conforms to MLM	Marginally	**QAPP Declination Date**	12/28/2004
Site Telephone	(870) 246-0030	**Audit Latitude**	34.179278
Site Address 1	DeGray Regulating Dam	**Audit Longitude**	-93.098755
Site Address 2	Route 390	**Audit Elevation**	78
County	Clark	**Audit Declination**	1.3
City, State	Arkadelphia, AR		**Present**
Zip Code	71923	**Fire Extinguisher**	☑ No inspection date
Time Zone	Central	**First Aid Kit**	☑
Primary Operator	Harell Beckwith	**Safety Glasses**	☑
Primary Op. Phone #	(870) 245-5239	**Safety Hard Hat**	☑
Primary Op. E-mail	beckwithh@obu.edu	**Climbing Belt**	☑
Backup Operator	Clark Kuyper	**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 bottom of the shelter walls are very badly deteriorated. The floor and ceiling have been repaired.

Site OK ☑ **Notes**

Driving Directions From Interstate 30 in Arkadelphia take exit 78 and turn west on route 7. Go south on Lower Dam Pike, route 390, immediately west of the interstate. This road runs parallel to the interstate for approximately 1/2 mile and then turns west. Continue for approximately 1 mile, the site will be on the left just before the dam.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID CAD150 **Technician** Sandy Grenville **Site Visit Date** 02/14/2013

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID	CAD150	Technician	Sandy Grenville	Site Visit Date	02/14/2013

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

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

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID	Technician	Site Visit Date
CAD150	Sandy Grenville	02/14/2013

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?	☑	N/A
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	☑	N/A

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	Climatronics	100093	none	06648

Provide any additional 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 CAD150 **Technician** Sandy Grenville **Site Visit Date** 02/14/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	A	none	03538
MFC power supply	Teledyne	CPR-1A	149	01517
Ozone	ThermoElectron Inc	49i A1NAA	1009241792	000624
Filter pack flow pump	Thomas	107CA110	09883403-01-4	00462
Zero air pump	Werther International	C 70/4	000814270	06885

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

Both the filter pack flow tubing and ozone sample line fold tightly against the tower hinge when the tower is lowered. This could eventually cause damage to the tubing.

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID CAD150 **Technician** Sandy Grenville **Site Visit Date** 02/14/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000306
DAS	Campbell	CR3000	2530	000421
Modem	Raven	NL115	3875	06515

Provide any additional 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	CAD150	Technician	Sandy Grenville	Site Visit Date	02/14/2013

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

1	Is the station log properly completed during every site visit?	☑	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 CAD150 **Technician** Sandy Grenville **Site Visit Date** 02/14/2013

Site operation procedures

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

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☐		☑
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 analyzer sample train is leak checked by capping the inlet every two weeks.

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID	CAD150	Technician	Sandy Grenville	Site Visit Date	02/14/2013

Site operation procedures

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

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

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

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ALC188-Sandy Grenville-02/15/2013					
1 2/15/2013	DAS	Campbell	000422	CR3000	2523
2 2/15/2013	Elevation	Elevation	None	1	None
3 2/15/2013	Filter pack flow pump	Thomas	01040	107CA110	000010887
4 2/15/2013	Flow Rate	Apex	000684	AXMC105LPMDPCV	54761
5 2/15/2013	Infrastructure	Infrastructure	none	none	none
6 2/15/2013	Modem	Raven	06583	H4223-C	08443555843
7 2/15/2013	Ozone	ThermoElectron Inc	000689	49i A1NAA	1030244802
8 2/15/2013	Ozone Standard	ThermoElectron Inc	000363	49i A3NAA	0726124691
9 2/15/2013	Sample Tower	Aluma Tower	000136	B	none
10 2/15/2013	Shelter Temperature	Campbell	none	107-L	none
11 2/15/2013	Siting Criteria	Siting Criteria	None	1	None
12 2/15/2013	Temperature	RM Young	02997	41342VC	missing
13 2/15/2013	UPS	APC	06794	RS900	unknown
14 2/15/2013	Zero air pump	Werther International	06940	C 70/4	000821897

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2523	ALC188	Sandy Grenville	02/15/2013	DAS	Primary

Das Date: 2 /15/2013
Das Time: 11:05:17
Das Day: 46

Audit Date 2 /15/2013
Audit Time 11:05:17
Audit Day 46

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

Mfg	Datel	**Parameter**	DAS
Serial Number	15510194	**Tfer Desc.**	Source generator (D
Tfer ID	01320		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000
Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/26/2013	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0002	V	V	0.0003
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	0.4997	0.4997	V	V	0.0000
7	0.7000	0.6996	0.6996	V	V	0.0000
7	0.9000	0.8995	0.8995	V	V	0.0000
7	1.0000	0.9994	0.9994	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	54761	ALC188	Sandy Grenville	02/15/2013	Flow Rate	000684

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

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

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
3.75%	3.87%			

Cal Factor Zero	0
Cal Factor Full Scale	0.98
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	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.002	0.01	l/m	l/m	
primary	test pt 1	1.533	1.546	1.53	1.521	1.49	l/m	l/m	-3.62%
primary	test pt 2	1.535	1.548	1.53	1.524	1.49	l/m	l/m	-3.75%
primary	test pt 3	1.536	1.550	1.53	1.523	1.49	l/m	l/m	-3.87%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	190 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244802	ALC188	Sandy Grenville	02/15/2013	Ozone	000689

Slope:	1.01151	**Slope:**	0.00000
Intercept	-0.34553	**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	1.00121	**Intercept**	-0.18383
Cert Date	1/2/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.8%	1.1%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	-0.01	0.17	-0.43	ppb	
primary	2	31.04	31.18	31.51	ppb	1.06%
primary	3	50.60	50.72	51.10	ppb	0.75%
primary	4	81.60	81.68	82.10	ppb	0.51%
primary	5	100.95	101.01	101.80	ppb	0.78%

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	< 1 %	pass
Offset	-0.20	pass
Span	1.029	pass
Cell B Freq.	85.8 kHz	pass
System Memo	See comments	pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.72 lpm	pass
Cell A Tmp.	32.1 C	pass
Cell A Pressure	731 mmHg	pass
Cell A Noise	0.6 ppb	pass
Cell A Freq.	85.5 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	missing	ALC188	Sandy Grenville	02/15/2013	Temperature	02997

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

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.31	0.36		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.05	0.13	0.000	0.4	C	0.23
primary	Temp Mid Range	25.44	25.41	0.000	25.7	C	0.33
primary	Temp High Range	47.54	47.42	0.000	47.8	C	0.36

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

Infrastructure Data For

Site ID	Technician	Site Visit Date
ALC188	Sandy Grenville	02/15/2013

Shelter Make	Shelter Model	Shelter Size
Shelter One	8128-2311	1024 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ALC188	Sandy Grenville	02/15/2013	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.43	0.93		

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

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	22.94	22.93	0.000	23.9	C	0.93
primary	Temp Mid Range	23.25	23.23	0.000	23.5	C	0.28
primary	Temp Mid Range	23.58	23.56	0.000	23.6	C	0.07

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator uses the same gloves to remove and install the filter pack.

2 **Parameter:** SitingCriteriaCom

The site is well located with respect to CASTNET siting criteria, however there is a small campground 0.5 km to the northwest which may be a source of smoke.

3 **Parameter:** ShelterCleanNotes

The site is clean and neat.

4 **Parameter:** PollAnalyzerCom

The site was revisited on 3/3/2013 to complete the ozone performance evaluation. The level 2 ozone standard malfunctioned during the audit visit performed on 2/15/213.

5 **Parameter:** MetSensorComme

The temperature shield is pointing south and not north as stated in the QAPP. This condition was observed and reported during the previous site audit visits in February 2009 and 2011.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	ALC188	**Technician**	Sandy Grenville	**Site Visit Date**	02/15/2013

Site Sponsor (agency)	EPA	**USGS Map**	Dallardsville
Operating Group	Alabama-Coushatta Environmental Gr	**Map Scale**	
AQS #	48-373-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	30.4210
Deposition Measurement	dry	**QAPP Longitude**	-94.4045
Land Use	woodland - mixed	**QAPP Elevation Meters**	101
Terrain	gently rolling	**QAPP Declination**	3.8
Conforms to MLM	Yes	**QAPP Declination Date**	9/16/2005
Site Telephone	(936) 563-2973	**Audit Latitude**	30.701577
Site Address 1	Poncho Rd.	**Audit Longitude**	-94.674011
Site Address 2	571 Park Rd. 56	**Audit Elevation**	105
County	Polk	**Audit Declination**	2.5
City, State	Livingston, TX		
Zip Code	77351	**Fire Extinguisher** ☑	Inspected Feb 2002
Time Zone	Central	**First Aid Kit** ☑	
Primary Operator	Michelle Battise	**Safety Glasses** ☑	
Primary Op. Phone #	(936) 563-1146	**Safety Hard Hat** ☑	
Primary Op. E-mail	battise_michelle@hotmail.com	**Climbing Belt** ☑	
Backup Operator	Carlene Bullock	**Security Fence** ☑	
Backup Op. Phone #	(936) 563-4009	**Secure Shelter** ☑	
Backup Op. E-mail	carlenebullock@eastex.net	**Stable Entry Step** ☑	

Present

Shelter Working Room ☑	**Make**	Shelter One	**Model**	8128-2311	**Shelter Size**	1024 cuft
Shelter Clean ☑	**Notes**	The site is clean and neat.				
Site OK ☑	**Notes**					

Driving Directions

From Livingston proceed east on route 190 approximately 16 miles. Turn right (south) onto Park Road 56 at the sign for Alabama-Coushatta Tribe and the Indain Village. Continue past the facility and campground by the small lake on the left. Just past the campground entrance, turn left onto a dirt road. Continue approximately 0.6 miles bearing right at the first fork and left at the second. You will see the site in the clearing.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID ALC188 **Technician** Sandy Grenville **Site Visit Date** 02/15/2013

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

Siting Distances OK ☑

Siting Criteria Comment

The site is well located with respect to CASTNET siting criteria, however there is a small campground 0.5 km to the northwest which may be a source of smoke.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID	ALC188	Technician	Sandy Grenville	Site Visit Date	02/15/2013

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

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

The temperature shield is pointing south and not north as stated in the QAPP. This condition was observed and reported during the previous site audit visits in February 2009 and 2011.

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID	Technician	Site Visit Date
ALC188	Sandy Grenville	02/15/2013

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?	☑	

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342VC	missing	02997

Provide any additional 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 ALC188 **Technician** Sandy Grenville **Site Visit Date** 02/15/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet
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	000136
Ozone	ThermoElectron Inc	49i A1NAA	1030244802	000689
Filter pack flow pump	Thomas	107CA110	000010887	01040
Zero air pump	Werther International	C 70/4	000821897	06940

Provide any additional 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 was revisited on 3/3/2013 to complete the ozone performance evaluation. The level 2 ozone standard malfunctioned during the audit visit performed on 2/15/213.

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID ALC188 **Technician** Sandy Grenville **Site Visit Date** 02/15/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR3000	2523	000422
Modem	Raven	H4223-C	08443555843	06583
UPS	APC	RS900	unknown	06794

Provide any additional 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	ALC188	Technician	Sandy Grenville	Site Visit Date	02/15/2013

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2001	☐
HASP	☑	Nov 2010	☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☑		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID: ALC188 | Technician: Sandy Grenville | Site Visit Date: 02/15/2013

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID ALC188 **Technician** Sandy Grenville **Site Visit Date** 02/15/2013

Site operation procedures

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

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

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

The site operator uses the same gloves to remove and install the filter pack.

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MAC426-Eric Hebert-03/01/2013						
1	3/1/2013	Computer	Toshiba	90934	Terca	87074381H
2	3/1/2013	DAS	Environmental Sys Corp	3027	8832	A3027
3	3/1/2013	Elevation	Elevation	None	1	None
4	3/1/2013	Filter pack flow pump	Thomas	none	107CAB11A	109500000033
5	3/1/2013	Flow Rate	Tylan	02023	FC280SAV	AW710253
6	3/1/2013	Infrastructure	Infrastructure	none	none	none
7	3/1/2013	Met tower	Climatronics	none	illegible	illegible
8	3/1/2013	MFC power supply	Tylan	03645	RO-32	FP9605011
9	3/1/2013	Modem	US Robotics	none	28.8 fax modem	1275
10	3/1/2013	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460049
11	3/1/2013	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	0733726104
12	3/1/2013	Precipitation	Climatronics	01324	100508-2	illegible
13	3/1/2013	Printer	Hewlett Packard	none	842C	unknown
14	3/1/2013	Relative Humidity	Rotronic	none	MP 601A	52064
15	3/1/2013	Sample Tower	Aluma Tower	none	B	none
16	3/1/2013	Shelter Temperature	ARS	60	none	none
17	3/1/2013	Siting Criteria	Siting Criteria	None	1	None
18	3/1/2013	Solar Radiation	Licor	none	LI-200	PY98205
19	3/1/2013	Temperature	RM Young	none	41342	15105
20	3/1/2013	Temperature2meter	RM Young	none	41342	15104
21	3/1/2013	Wind Direction	Climatronics	none	100076	1484
22	3/1/2013	Wind Speed	Climatronics	90924	100075	1515
23	3/1/2013	Zero air pump	Werther International	none	PC70/4	000665778

DAS Data Form

DAS Time Max Error: 0.45

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	A3027	MAC426	Eric Hebert	03/01/2013	DAS	Primary

Das Date: 3 /1 /2013
Das Time: 9:18:35
Das Day: 60

Audit Date 3 /1 /2013
Audit Time 9:19:02
Audit Day 60

Low Channel:

Avg Diff:	Max Diff:
0.0002	0.0004

High Channel:

Avg Diff:	Max Diff:
0.0001	0.0002

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

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
8	0.0000	0.0000	-0.0001	V	V	-0.0001
8	0.1000	0.1000	0.0998	V	V	-0.0002
8	0.3000	0.3000	0.2997	V	V	-0.0003
8	0.5000	0.5000	0.4999	V	V	-0.0001
8	0.7000	0.7000	0.6996	V	V	-0.0004
8	0.9000	0.9001	0.8998	V	V	-0.0003
8	1.0000	1.0001	0.9998	V	V	-0.0003
13	0.0000	0.0000	0.0000	V	V	0.0000
13	0.1000	0.1000	0.0999	V	V	-0.0001
13	0.3000	0.3000	0.2999	V	V	-0.0001
13	0.5000	0.5000	0.4999	V	V	-0.0001
13	0.7000	0.7000	0.6999	V	V	-0.0001
13	0.9000	0.9001	0.8999	V	V	-0.0002
13	1.0000	1.0001	0.9999	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW710253	MAC426	Eric Hebert	03/01/2013	Flow Rate	02023

Mfg	Tylan	
SN/Owner ID	FP9605011	03645
Parameter	MFC power supply	

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

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0
0.85%	0.94%			**Cal Factor Full Scale**	5.51
				Rotometer Reading:	1.55

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	-0.04	-0.0140	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	-0.01	0.0170	0.01	l/m	l/m	
primary	test pt 1	0.000	1.486	1.36	1.3610	1.50	l/m	l/m	0.94%
primary	test pt 2	0.000	1.488	1.36	1.3610	1.50	l/m	l/m	0.82%
primary	test pt 3	0.000	1.488	1.36	1.3610	1.50	l/m	l/m	0.78%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	- 3.5 cm	**Status**	Fail
Sensor Component	Filter Position	**Condition**	Poor	**Status**	Fail
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	7.0 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460049	MAC426	Eric Hebert	03/01/2013	Ozone	none

Slope:	1.03139	**Slope:**	0.00000
Intercept	1.44173	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

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

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
5.4%	6.7%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	-0.14	-0.32	1.26	ppb	
primary	2	37.17	37.08	39.57	ppb	6.72%
primary	3	53.20	53.16	56.25	ppb	5.81%
primary	4	82.02	82.06	85.84	ppb	4.61%
primary	5	110.54	110.66	115.80	ppb	4.64%

Sensor Component	Condition	Status
Cell B Noise	0.9 kHz	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-1.2	pass
Span	1.016	pass
Cell B Freq.	97.9 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.72 lpm	pass
Cell A Tmp.	36.7 C	pass
Cell A Pressure	731 mmHg	pass
Cell A Noise	0.8 ppb	pass
Cell A Freq.	83.4 kHz	pass
Cell A Flow	0.72 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	1515	MAC426	Eric Hebert	03/01/2013	Wind Speed	90924

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

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

Prop or Cups SN	2341		
Prop or Cups Torque	0.2	**to**	0.2
Prop Correction Fact	N/A		

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

UseDescription:	InputDevice:	Input RPM:	Input m/s:	Output V:	DAS m/s:	Diff/ %Diff:	Difference:
primary	00000	0	0.20	0.0000	0.2		0.00
primary	00000	50	1.40	0.0000	1.4		0.00
primary	00000	100	2.57	0.0000	2.6		0.03
primary	00000	170	4.22	0.0000	4.2		-0.02
primary	00000	250	6.10	0.0000	6.1	0.00%	
primary	00000	500	11.97	0.0000	12.0	0.25%	
primary	00000	800	19.02	0.0000	19.0	-0.11%	
primary	00000	2000	47.22	0.0000	47.2	-0.04%	

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

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	1484	MAC426	Eric Hebert	03/01/2013	Wind Direction	none

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

Vane SN: 3945 **C. A. Align. deg. true:**

VaneTorque 5 **to** 7 358

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

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	1.4	1.5		
Abs Max Er	2	5		

UseDescription:	TferID:	Input Raw:	Linearity	Output V:	Output Deg.:	Difference:	Change:	Error:
primary	01265	88	☐	0.0000	86	2		2
primary	01265	168	☐	0.0000	168	0		0
primary	01265	178	☐	0.0000	177	1		1
primary	01265	268	☐	0.0000	266	2		2
primary	01265	358	☐	0.0000	360	2		2
primary	01266	0	☑	0.0000	0	0	48	3
primary	01266	45	☑	0.0000	40	5	40	-5
primary	01266	90	☑	0.0000	86	4	46	1
primary	01266	135	☑	0.0000	132	3	46	1
primary	01266	180	☑	0.0000	177	3	45	0
primary	01266	225	☑	0.0000	221	4	44	-1
primary	01266	270	☑	0.0000	266	4	45	0
primary	01266	315	☑	0.0000	312	3	46	1

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

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	15105	MAC426	Eric Hebert	03/01/2013	Temperature	none

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

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.31	0.34		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	-0.18	-0.06	0.0000	0.20	C	0.26
primary	Temp Mid Range	24.45	24.40	0.0000	24.73	C	0.33
primary	Temp High Range	43.30	43.11	0.0000	43.45	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

2 Meter Temperature Data For

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	15104	MAC426	Eric Hebert	03/01/2013	Temperature2meter	none

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

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.33	0.43		

UseDescription:	Test type:	InputTmpRaw	InputTmpCorrected:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Rang	-0.18	-0.06	0.0000	0.17	C	0.23
primary	Temp Mid Range	24.45	24.40	0.0000	24.74	C	0.34
primary	Temp High Rang	43.30	43.11	0.0000	43.54	C	0.43

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Rotronic	52064	MAC426	Eric Hebert	03/01/2013	Relative Humidity	none

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

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	14.9	2.2		
Abs Max Er	27.4	2.2		

UseDesc.:	Test type:	Device:	Input RH:	GTL Raw:	RH Corr.:	DAS Volts:	DAS %RH:	Difference:
primary	RH Low Range	Hygroclip	32.8	34.8	32.8	0.0000	60.2	27.4
primary	RH Low Range	Hygroclip	52.9	60.0	52.9	0.0000	55.3	2.4
primary	RH High Range	Hygroclip	93.6	91.1	93.6	0.0000	95.8	2.2

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY98205	MAC426	Eric Hebert	03/01/2013	Solar Radiation	none

Mfg	Eppley	Parameter	solar radiation
Serial Number	10765	Tfer Desc.	SR transfer translat
Tfer ID	01246		
Slope	1.00000	Intercept	0.00000
Cert Date	1/6/2010	CorrCoff	1.00000

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

DAS 1:		DAS 2:	
% Diff of Avg	%Diff of Max	%Diff of Avg	%Diff of Max
6.8%	9.2%	0.0%	0.0%

UseDescription:	Measure Date	MeasureTime	Tfer Corr:	DAS w/m2:	PctDifference:
primary	3/1/2013	10:00	223	239	7.2%
primary	3/1/2013	11:00	251	274	9.2%
primary	3/1/2013	12:00	234	257	9.8%
primary	3/1/2013	13:00	201	204	1.5%
primary	3/1/2013	14:00	191	212	11.0%
primary	3/1/2013	15:00	92	87	-5.4%

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

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	MAC426	Eric Hebert	03/01/2013	Precipitation	01324

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
6.0%	8.0%		

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

UseDesc.	Test type:	TferVolume:	Iteration:	TimePerTip:	Eq.Ht:	DAS eng:	Eq.HtUnit:	OSE Unit:	TferUnits:	PctDifference
primary	tip check	10 manual	1	2 sec	1.00	1.00	mm	mm	ml	
primary	test 1	231.5	1	10 sec	5.00	4.80	mm	mm	ml	-4.0%
primary	test 2	231.5	2	10 sec	5.00	4.60	mm	mm	ml	-8.0%

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

Infrastructure Data For

Site ID	MAC426	Technician	Eric Hebert	Site Visit Date	03/01/2013

Shelter Make	Shelter Model	Shelter Size
custom	N/A	1536 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	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	Fair	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	MAC426	Eric Hebert	03/01/2013	Shelter Temperature	60

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.98	1.40		

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

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	23.71	23.66	0.000	24.5	C	0.79
primary	Temp Mid Range	23.51	23.46	0.000	24.9	C	1.4
primary	Temp Mid Range	23.67	23.62	0.000	24.4	C	0.75

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	MAC426	Eric Hebert	03/01/2013	Filter Position	Tylan	3705	☐	☑
The filter attachment plate is mounted too high in the enclosure resulting in the filter being recessed in the enclosure and not exposed in the standard geometric orientation.								
Precipitation	MAC426	Eric Hebert	03/01/2013	Properly Sited	Climatronics	3701	☐	☑
Objects violate the 45 degree rule for the tipping bucket rain gage.								

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operators are very knowledgeable with air quality monitoring. They are doing a very good job with site activities and filter handling.

2 **Parameter:** SitingCriteriaCom

Bowling Green is within 40 km of the site. The site is in a hay field which is harvested twice per year. The area to the west and south is comprised of livestock farms including cattle and poultry. The coordinates provided in the QAPP are incorrect.

3 **Parameter:** ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	MAC426	**Technician**	Eric Hebert	**Site Visit Date**	03/01/2013

Site Sponsor (agency)	NPS	**USGS Map**	Rhoda
Operating Group	NPS	**Map Scale**	
AQS #	21-061-0501	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, SO2, NOy, Hg, IMPROVE, PM	**QAPP Latitude**	37.2806
Deposition Measurement	dry, wet, Hg	**QAPP Longitude**	-86.2639
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	236
Terrain	rolling	**QAPP Declination**	3
Conforms to MLM	Marginally	**QAPP Declination Date**	12/27/2004
Site Telephone	(270) 758-2136	**Audit Latitude**	37.131794
Site Address 1	Alfred Cook Road	**Audit Longitude**	-86.142953
Site Address 2		**Audit Elevation**	230
County	Edmonson	**Audit Declination**	-4.0
City, State	Smiths Grove, KY		**Present**
Zip Code	42171	**Fire Extinguisher**	☑ inspected August 2010
Time Zone	Eastern	**First Aid Kit**	☑
Primary Operator	Jonathan Jernigan	**Safety Glasses**	☐
Primary Op. Phone #	(270) 758-2146	**Safety Hard Hat**	☐
Primary Op. E-mail	jonathan_jernigan@nps.gov	**Climbing Belt**	☑
Backup Operator	Bob Carson	**Security Fence**	☑
Backup Op. Phone #	(270) 758-2136	**Secure Shelter**	☑
Backup Op. E-mail	bob_carson@nps.gov	**Stable Entry Step**	☑

Shelter Working Room ☑ **Make** custom **Model** N/A **Shelter Size** 1536 cuft

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

Site OK ☑ **Notes**

Driving Directions From Bowling Green go east on 31W. Turn left (north) on 442 toward Pig. At the stop sign in Pig, turn right on route 259, or Brownsville Road. Continue approximately 1 mile, just past two churches (one on each side of the road). Take the 2nd left past the church on the left onto Chaumount Road. Then take the first left onto Doyle Road. Continue straight onto Alfred Cook Road. The site will be on the left approximately 0.6 miles.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID MAC426 **Technician** Eric Hebert **Site Visit Date** 03/01/2013

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km	35 km	☐
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m	10 m	☐
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Bowling Green is within 40 km of the site. The site is in a hay field which is harvested twice per year. The area to the west and south is comprised of livestock farms including cattle and poultry. The coordinates provided in the QAPP are incorrect.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID MAC426 **Technician** Eric Hebert **Site Visit Date** 03/01/2013

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

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

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID MAC426 **Technician** Eric Hebert **Site Visit Date** 03/01/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Met tower	Climatronics	illegible	illegible	none
Wind Direction	Climatronics	100076	1484	none
Solar Radiation	Licor	LI-200	PY98205	none
Relative Humidity	Rotronic	MP 601A	52064	none
Precipitation	Climatronics	100508-2	illegible	01324
Temperature	RM Young	41342	15105	none
Temperature2meter	RM Young	41342	15104	none
Wind Speed	Climatronics	100075	1515	90924

Provide any additional 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 MAC426 **Technician** Eric Hebert **Site Visit Date** 03/01/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 10 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	
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	none
Ozone	ThermoElectron Inc	49i A3NAA	CM08460049	none
Filter pack flow pump	Thomas	107CAB11A	109500000033	none
MFC power supply	Tylan	RO-32	FP9605011	03645
Zero air pump	Werther International	PC70/4	000665778	none

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

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID MAC426 **Technician** Eric Hebert **Site Visit Date** 03/01/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Toshiba	Terca	87074381H	90934
DAS	Environmental Sys Corp	8832	A3027	3027
Modem	US Robotics	28.8 fax modem	1275	none
Printer	Hewlett Packard	842C	unknown	none

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

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID	MAC426	Technician	Eric Hebert	Site Visit Date	03/01/2013

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	DataView2	☑
SSRF	☑		☑
Site Ops Manual	☑		☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID	MAC426	Technician	Eric Hebert	Site Visit Date	03/01/2013

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Receives training every 6 months during calibration visits
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Receives training every 6 months during calibration visits
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID MAC426 **Technician** Eric Hebert **Site Visit Date** 03/01/2013

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings (90%)
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

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

The site operators are very knowledgeable with air quality monitoring. They are doing a very good job with site activities and filter handling.

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CHE185-Eric Hebert-03/03/2013					
1 3/3/2013	DAS	Environmental Sys Corp	73955	8832	A0656-b
2 3/3/2013	Elevation	Elevation	None	1	None
3 3/3/2013	Filter pack flow pump	Thomas	00498	107CAB18	0000110
4 3/3/2013	Flow Rate	Apex	000641	AXMC105LPMDPCV	116
5 3/3/2013	Infrastructure	Infrastructure	none	none	none
6 3/3/2013	Met tower	Universal Tower	03662	unknown	none
7 3/3/2013	Modem	Raven	06459	V4221-V	0808452827
8 3/3/2013	Ozone	Monitor Labs, Inc.	54901	ML9811	191
9 3/3/2013	Precipitation	Texas Electronics	04714	TR-525i-HT	30094-202
10 3/3/2013	Printer	Hewlett Packard	none	6500A	unknown
11 3/3/2013	Relative Humidity	Rotronic	06385	MP 101A-C5	31161
12 3/3/2013	Sample Tower	Aluma Tower	000054	B	AT-81213-T12
13 3/3/2013	Shelter Temperature	unknown	none	none	015
14 3/3/2013	Shield (10 meter)	RM Young	04620	Aspirated 43408	none
15 3/3/2013	Shield (2 meter)	RM Young	04680	Aspirated 43408	none
16 3/3/2013	Siting Criteria	Siting Criteria	None	1	None
17 3/3/2013	Solar Radiation	Licor	04009	LI-200	illegible
18 3/3/2013	Solar Radiation Translator	RM Young	06630	70101-X	none
19 3/3/2013	Solar Radiation Translator	RM Young	02533	70101-X	none
20 3/3/2013	Surface Wetness	RM Young	06313	58101	none
21 3/3/2013	Temperature	RM Young	04945	41342VC	8897
22 3/3/2013	Temperature2meter	RM Young	06244	41342VC	12791
23 3/3/2013	Wind Direction	RM Young	04865	AQ05305	58321wdr
24 3/3/2013	Wind Direction	RM Young	04335	AQ05305V	34948wdr
25 3/3/2013	Wind Speed	RM Young	04335	AQ05305V	34948wsp
26 3/3/2013	Zero air pump	Ecotech	none	8301LC	01-0658

DAS Data Form

DAS Time Max Error: 0.03

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	A0656-b	CHE185	Eric Hebert	03/03/2013	DAS	Primary

Das Date: 3 /3 /2013
Das Time: 10:00:02
Das Day: 62

Audit Date 3 /3 /2013
Audit Time 10:00:00
Audit Day 62

Low Channel:

Avg Diff:	Max Diff:
0.0010	0.0011

High Channel:

Avg Diff:	Max Diff:
0.0010	0.0011

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

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
6	0.0000	0.0000	-0.0009	V	V	-0.0009
6	0.1000	0.1000	0.0991	V	V	-0.0009
6	0.3000	0.3000	0.2991	V	V	-0.0009
6	0.5000	0.5000	0.4990	V	V	-0.0010
6	0.7000	0.7001	0.6990	V	V	-0.0011
6	0.9000	0.9001	0.8990	V	V	-0.0011
6	1.0000	1.0001	0.9991	V	V	-0.0010

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	116	CHE185	Eric Hebert	03/03/2013	Flow Rate	000641

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

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.017
1.38%	1.65%			**Cal Factor Full Scale**	5.177
				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	0.0000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.0010	-0.01	l/m	l/m	
primary	test pt 1	0.000	1.525	1.48	1.4650	1.50	l/m	l/m	-1.65%
primary	test pt 2	0.000	1.518	1.48	1.4650	1.50	l/m	l/m	-1.17%
primary	test pt 3	0.000	1.520	1.48	1.4650	1.50	l/m	l/m	-1.31%

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

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Monitor Labs, Inc.	191	CHE185	Eric Hebert	03/03/2013	Ozone	54901

Slope:	0.99014	**Slope:**	0.00000
Intercept	2.27140	**Intercept**	0.00000
CorrCoff	0.99990	**CorrCoff**	0.00000

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

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.4%	6.5%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.08	-0.10	1.98	ppb	
primary	2	28.46	28.35	30.20	ppb	6.53%
primary	3	55.31	55.28	57.33	ppb	3.71%
primary	4	82.86	82.90	85.14	ppb	2.70%
primary	5	101.81	101.91	102.40	ppb	0.48%

Sensor Component	Condition	Status
Cell B Noise		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	1.024	pass
Cell B Freq.		pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow		pass
Cell A Tmp.	37.9 C	pass
Cell A Pressure	701 mmHg	pass
Cell A Noise	N/A	pass
Cell A Freq.	42 kHz	pass
Cell A Flow	0.5 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	34948wsp	CHE185	Eric Hebert	03/03/2013	Wind Speed	04335

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

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

Prop or Cups SN	N/A
Prop or Cups Torque	0.9 **to** 1.1
Prop Correction Fact	0.0049

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.12	0.48%		
Abs Max Er	0.30	0.74%		

UseDescription:	InputDevice:	Input RPM:	Input m/s:	Output V:	DAS m/s:	Diff/ %Diff:	Difference:
primary	none	0	0.20	0.0000	-0.1		-0.30
primary	01262	200	0.98	0.0000	0.9		-0.08
primary	01262	400	1.96	0.0000	1.9		-0.06
primary	01262	800	3.92	0.0000	3.9		-0.02
primary	01262	1200	5.88	0.0000	5.9	0.34%	
primary	01262	2400	11.76	0.0000	11.8	0.34%	
primary	01262	4000	19.60	0.0000	19.7	0.51%	
primary	01262	9400	46.06	0.0000	46.4	0.74%	

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

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	34948wdr	CHE185	Eric Hebert	03/03/2013	Wind Direction	04335

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

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

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

VaneTorque 15 **to** 30 360

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	0.5	1.0		
Abs Max Er	2	3		

UseDescription:	TferID:	Input Raw:	Linearity	Output V:	Output Deg.:	Difference:	Change:	Error:
primary	01266	0	☑	0.0000	2	2	48	3
primary	01266	45	☑	0.0000	44	1	42	-3
primary	01266	90	☑	0.0000	90	0	46	1
primary	01266	135	☑	0.0000	135	0	45	0
primary	01266	180	☑	0.0000	180	0	45	0
primary	01266	225	☑	0.0000	225	0	45	0
primary	01266	270	☑	0.0000	270	0	45	0
primary	01266	315	☑	0.0000	314	1	44	-1
primary	01265	90	☐	0.0000	90	0		0
primary	01265	180	☐	0.0000	180	0		0
primary	01265	270	☐	0.0000	270	0		0
primary	01265	360	☐	0.0000	2	2		2

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

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	8897	CHE185	Eric Hebert	03/03/2013	Temperature	04945

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

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.13	0.24		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	-0.08	0.04	0.0000	-0.09	C	-0.13
primary	Temp Mid Range	17.02	17.02	0.0000	16.99	C	-0.03
primary	Temp High Range	42.36	42.18	0.0000	42.42	C	0.24

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

2 Meter Temperature Data For

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	12791	CHE185	Eric Hebert	03/03/2013	Temperature2meter	06244

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

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.15	0.17		

UseDescription:	Test type:	InputTmpRaw	InputTmpCorrected:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Rang	-0.08	0.04	0.0000	-0.09	C	-0.13
primary	Temp Mid Rang	17.02	17.02	0.0000	16.87	C	-0.15
primary	Temp High Ran	42.36	42.18	0.0000	42.35	C	0.17

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Rotronic	31161	CHE185	Eric Hebert	03/03/2013	Relative Humidity	06385

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

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	7.2	1.5		
Abs Max Er	8.1	1.5		

UseDesc.:	Test type:	Device:	Input RH:	GTL Raw:	RH Corr.:	DAS Volts:	DAS %RH:	Difference:
primary	RH Low Range	Hygroclip	32.8	35.5	32.8	0.0000	24.7	-8.1
primary	RH Low Range	Hygroclip	52.9	54.8	52.9	0.0000	46.6	-6.3
primary	RH High Range	Hygroclip	93.6	89.9	93.6	0.0000	95.1	1.5

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	illegible	CHE185	Eric Hebert	03/03/2013	Solar Radiation	04009

Mfg	RM Young	
SN/Owner ID	none	02533
Parameter	Solar Radiation Translator	
Mfg	RM Young	
SN/Owner ID	none	06630
Parameter	Solar Radiation Translator	

Mfg	Eppley	**Parameter**	solar radiation
Serial Number	10765	**Tfer Desc.**	SR transfer translat
Tfer ID	01246		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/6/2010	**CorrCoff**	1.00000
Mfg	Eppley	**Parameter**	solar radiation
Serial Number	34341F3	**Tfer Desc.**	SR transfer sensor
Tfer ID	01245		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/16/2010	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
1.4%	1.7%	0.0%	0.0%

UseDescription:	Measure Date	MeasureTime	Tfer Corr:	DAS w/m2:	PctDifference:
primary	3/3/2013	12:00	781	794	1.7%
primary	3/3/2013	13:00	750	761	1.5%
primary	3/3/2013	14:00	633	645	1.9%
primary	3/3/2013	15:00	488	498	2.0%
primary	3/3/2013	16:00	194	188	-3.1%

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

Surface Wetness Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	none	CHE185	Eric Hebert	03/03/2013	Surface Wetness	06313

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

☑ **Manual Test Pass**

UseDescription:	Test Type:	Tfer kOhms:	OutputSignal:	DAS eng:	OutputSignalEngUni	TferUnits:	OutputSignalUnit
primary	wet	N/A	1.2220	1.05	V	N/A	V
primary	dry	N/A	0.0200	0.02	V	N/A	V
primary	Decade box on	230	1.2220	1.05	V	kOhm	V
primary	Decade box off	240	0.0200	0.02	V	kOhm	V

Sensor Component	Grid Orientation	**Condition**	North	**Status**	pass
Sensor Component	Grid Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Grid Angle	**Condition**	About 30 deg	**Status**	pass
Sensor Component	Grid Condition	**Condition**	Fair	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Grid Type	**Condition**	Grid without holes	**Status**	pass

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Texas Electronics	30094-202	CHE185	Eric Hebert	03/03/2013	Precipitation	04714

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
2.0%	4.0%		

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

UseDesc.	Test type:	TferVolume:	Iteration:	TimePerTip:	Eq.Ht:	DAS eng:	Eq.HtUnit:	OSE Unit:	TferUnits:	PctDifference
primary	tip check	10 manual	1	2 sec	0.10	0.10	in	in	ml	
primary	test 1	231.5	1	8 sec	0.50	0.50	in	in	ml	0.0%
primary	test 2	231.5	2	10 sec	0.50	0.48	in	in	ml	-4.0%

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

Infrastructure Data For

Site ID	CHE185	Technician	Eric Hebert	Site Visit Date	03/03/2013

Shelter Make	Shelter Model	Shelter Size
Shelter One	8128	768 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
unknown	015	CHE185	Eric Hebert	03/03/2013	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.58	0.82		

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

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	22.29	22.25	0.000	23.1	C	0.82
primary	Temp Mid Range	23.87	23.82	0.000	24.3	C	0.49
primary	Temp Mid Range	25.02	24.96	0.000	25.4	C	0.44

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	CHE185	Eric Hebert	03/03/2013	Filter Position	Apex	3709	☐	☑

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site is well maintained and operated. Very good sample change out procedures are being used by the site operator.

2 **Parameter:** SitingCriteriaCom

The site is located in a pasture with grazing cattle sometimes as close as 5 meters.

3 **Parameter:** ShelterCleanNotes

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

4 **Parameter:** PollAnalyzerCom

The ozone analyzer response to audit gas was observed to be very slow. This was discussed with the site operator, and it was recommended that the monitor averaging interval be changed to a shorter period. It was also suggested that the sample line be changed from 3/8 inch tubing to 1/4 inch tubing.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	CHE185	**Technician**	Eric Hebert	**Site Visit Date**	03/03/2013

Site Sponsor (agency)	EPA	**USGS Map**	Stilwell West
Operating Group	Cherokee Nation OES	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, NOy, ammonia	**QAPP Latitude**	35.7507
Deposition Measurement	dry, Hg, passive ammonia	**QAPP Longitude**	-94.6700
Land Use	agriculture, pasture	**QAPP Elevation Meters**	299
Terrain	rolling	**QAPP Declination**	3.25
Conforms to MLM	Marginally	**QAPP Declination Date**	9/16/2005
Site Telephone	(918) 696-5604	**Audit Latitude**	35.750786
Site Address 1	Cherry Tree	**Audit Longitude**	-94.669789
Site Address 2	Dahlonegah School	**Audit Elevation**	305
County	Adair	**Audit Declination**	3
City, State	Stilwell, OK		
		Present	
Zip Code	74960	**Fire Extinguisher** ☑	No inspection date
Time Zone	Central	**First Aid Kit** ☑	
Primary Operator	Jacque Adam	**Safety Glasses** ☑	
Primary Op. Phone #	(918) 822-2770	**Safety Hard Hat** ☑	
Primary Op. E-mail	jacque-adam@cherokee.org	**Climbing Belt** ☑	
Backup Operator	Dani Keese	**Security Fence** ☑	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail	danielle-keese@cherokee.org	**Stable Entry Step** ☑	

Shelter Working Room ☑ **Make** Shelter One **Model** 8128 **Shelter Size** 768 cuft

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

Site OK ☑ **Notes**

Driving Directions From interstate 40 take exit 311 and go north on route 59 toward Stilwell. Continue approximately 18 miles. About 5 miles south of Stilwell turn left (west) on an unmarked road. There is a sign for Cherry Tree Baptist Church and Dahlonegah school. Continue to the end of the road at the school. The site is on the right behind the ball fields.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID CHE185 **Technician** Eric Hebert **Site Visit Date** 03/03/2013

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

Siting Distances OK ☑

Siting Criteria Comment

The site is located in a pasture with grazing cattle sometimes as close as 5 meters.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID	CHE185	Technician	Eric Hebert	Site Visit Date	03/03/2013

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

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

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID CHE185 **Technician** Eric Hebert **Site Visit Date** 03/03/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Solar Radiation	Licor	LI-200	illegible	04009
Shield (10 meter)	RM Young	Aspirated 43408	none	04620
Shield (2 meter)	RM Young	Aspirated 43408	none	04680
Surface Wetness	RM Young	58101	none	06313
Wind Speed	RM Young	AQ05305V	34948wsp	04335
Wind Direction	RM Young	AQ05305V	34948wdr	04335
Precipitation	Texas Electronics	TR-525i-HT	30094-202	04714
Met tower	Universal Tower	unknown	none	03662
Temperature	RM Young	41342VC	8897	04945
Temperature2meter	RM Young	41342VC	12791	06244
Relative Humidity	Rotronic	MP 101A-C5	31161	06385

Provide any additional 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 CHE185 **Technician** Eric Hebert **Site Visit Date** 03/03/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		3/8 teflon by 15meters
4	Describe dry dep sample tube.		3/8 teflon by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	AT-81213-T12	000054
Zero air pump	Ecotech	8301LC	01-0658	none
Ozone	Monitor Labs, Inc.	ML9811	191	54901
Filter pack flow pump	Thomas	107CAB18	0000110	00498

Provide any additional 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 analyzer response to audit gas was observed to be very slow. This was discussed with the site operator, and it was recommended that the monitor averaging interval be changed to a shorter period. It was also suggested that the sample line be changed from 3/8 inch tubing to 1/4 inch tubing.

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID CHE185 **Technician** Eric Hebert **Site Visit Date** 03/03/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Environmental Sys Corp	8832	A0656-b	73955
Modem	Raven	V4221-V	0808452827	06459
Printer	Hewlett Packard	6500A	unknown	none
Solar Radiation Translator	RM Young	70101-X	none	02533
Solar Radiation Translator	RM Young	70101-X	none	06630

Provide any additional 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	CHE185	Technician	Eric Hebert	Site Visit Date	03/03/2013

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2001	☐
HASP	☐	Nov 2009	☑
Field Ops Manual	☐		☐
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: CHE185 | Technician: Eric Hebert | Site Visit Date: 03/03/2013

Site operation procedures

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

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Quarterly	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	Every 2 weeks	☑
Automatic Precision Level Tests	☐		☑
Manual Precision Level Test	☑	Every 2 weeks	☑
Analyzer Diagnostics Tests	☑	Every 2 weeks	☑
In-line Filter Replacement (at inlet)	☑	Monthly	☑
In-line Filter Replacement (at analyze	☑	Monthly	☑
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, Cherokee Nation CNEP data system

Provide any additional 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 CHE185 **Technician** Eric Hebert **Site Visit Date** 03/03/2013

Site operation procedures

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

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

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

The site is well maintained and operated. Very good sample change out procedures are being used by the site operator.

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CDZ171-Sandy Grenville-03/05/2013						
1	3/5/2013	Computer	Dell	000281	D520	unknown
2	3/5/2013	DAS	Campbell	000352	CR3000	2130
3	3/5/2013	Elevation	Elevation	None	1	None
4	3/5/2013	Filter pack flow pump	Thomas	06020	107CAB18D	060400022646
5	3/5/2013	Flow Rate	Apex	000548	AXMC105LPMDPCV	50742
6	3/5/2013	Infrastructure	Infrastructure	none	none	none
7	3/5/2013	Modem	Raven	06457	V42221	0808338189
8	3/5/2013	Ozone	ThermoElectron Inc	000615	49i A1NAA	1009241787
9	3/5/2013	Ozone Standard	ThermoElectron Inc	000367	49i A3NAA	0726124683
10	3/5/2013	Sample Tower	Aluma Tower	000125	B	none
11	3/5/2013	Shelter Temperature	Campbell	none	107-L	none
12	3/5/2013	Siting Criteria	Siting Criteria	None	1	None
13	3/5/2013	Temperature	RM Young	06403	41342VC	14036
14	3/5/2013	UPS	APC	06793	RS900	unknown
15	3/5/2013	Zero air pump	Werther International	06899	PC70/4	000821902

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2130	CDZ171	Sandy Grenville	03/05/2013	DAS	Primary

Das Date: 3 /5 /2013
Das Time: 15:25:30
Das Day: 64

Audit Date 3 /5 /2013
Audit Time 15:25:30
Audit Day 64

Low Channel:

Avg Diff:	Max Diff:
0.0001	0.0002

High Channel:

Avg Diff:	Max Diff:
0.0001	0.0002

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

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0000	V	V	0.0001
7	0.1000	0.0998	0.0999	V	V	0.0001
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	0.6995	0.6997	V	V	0.0002
7	0.9000	0.8995	0.8995	V	V	0.0000
7	1.0000	0.9994	0.9994	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	50742	CDZ171	Sandy Grenville	03/05/2013	Flow Rate	000548

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

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

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.01
2.95%	3.18%			**Cal Factor Full Scale**	0.99
				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	0.0019	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.0038	0.00	l/m	l/m	
primary	test pt 1	1.532	1.535	1.52	1.5135	1.49	l/m	l/m	-2.93%
primary	test pt 2	1.530	1.532	1.52	1.5097	1.49	l/m	l/m	-2.74%
primary	test pt 3	1.536	1.539	1.52	1.5119	1.49	l/m	l/m	-3.18%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	225 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.5 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	2.5 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241787	CDZ171	Sandy Grenville	03/05/2013	Ozone	000615

Slope:	1.01314	**Slope:**	0.00000
Intercept	-1.30738	**Intercept**	0.00000
CorrCoff	0.99996	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00121	**Intercept**	-0.18383
Cert Date	1/2/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.7%	1.3%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.09	0.27	-1.37	ppb	
primary	2	35.26	35.40	35.06	ppb	-0.96%
primary	3	50.62	50.74	50.07	ppb	-1.32%
primary	4	80.34	80.42	80.29	ppb	-0.16%
primary	5	100.68	100.74	100.50	ppb	-0.24%

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	< 1 %	pass
Offset	0.000	pass
Span	1.014	pass
Cell B Freq.	84.3 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.70 lpm	pass
Cell A Tmp.	31.9 C	pass
Cell A Pressure	726 mmHg	pass
Cell A Noise	0.6 ppb	pass
Cell A Freq.	105.2 kHz	pass
Cell A Flow	0.70 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	14036	CDZ171	Sandy Grenville	03/05/2013	Temperature	06403

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

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

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.39	0.47	0.0000	0.4	C	-0.1
primary	Temp Mid Range	24.43	24.41	0.0000	24.6	C	0.21
primary	Temp High Range	47.54	47.42	0.0000	47.5	C	0.08

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

Infrastructure Data For

Site ID	CDZ171	Technician	Sandy Grenville	Site Visit Date	03/05/2013

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CDZ171	Sandy Grenville	03/05/2013	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
1.10	1.23		

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

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	21.60	21.59	0.000	20.6	C	-1
primary	Temp Mid Range	22.98	22.96	0.000	21.9	C	-1.06
primary	Temp Mid Range	23.86	23.84	0.000	22.6	C	-1.23

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Tower is lowered and filter changed without downing ozone channel.

2 **Parameter:** ShelterCleanNotes

The shelter floor and door have been repaired since the previous audit visit. The shelter is still cluttered and dirty.

3 **Parameter:** SitingCriteriaCom

The site is in a corn field with limited agricultural operations within 15 meters.

4 **Parameter:** MetSensorComme

The temperature sensor has been installed in a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	CDZ171	**Technician**	Sandy Grenville	**Site Visit Date**	03/05/2013

Site Sponsor (agency)	EPA	**USGS Map**	Cadiz
Operating Group	private, TVA	**Map Scale**	
AQS #	21-221-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, SO2, NOy, PM2.5, IMPROVE	**QAPP Latitude**	36.7841
Deposition Measurement	dry	**QAPP Longitude**	-87.8500
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	189
Terrain	gently rolling	**QAPP Declination**	-2.01
Conforms to MLM	Yes	**QAPP Declination Date**	2/23/2006
Site Telephone	(270) 522-9373	**Audit Latitude**	36.784053
Site Address 1	4560 Old Dover Road	**Audit Longitude**	-87.85015
Site Address 2	route 1175	**Audit Elevation**	190
County	Trigg	**Audit Declination**	-2.7
City, State	Cadiz, KY		
Zip Code	42211	**Fire Extinguisher** ☑	No inspection date
Time Zone	Central	**First Aid Kit** ☑	
Primary Operator	David Chesnut	**Safety Glasses** ☐	
Primary Op. Phone #	(270) 522-6819	**Safety Hard Hat** ☑	
Primary Op. E-mail	dchesnut@bellsouth.net	**Climbing Belt** ☑	
Backup Operator	Lawrence Barnes	**Security Fence** ☐	
Backup Op. Phone #	(270) 855-2500	**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room ☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean ☑	**Notes**	The shelter floor and door have been repaired since the previous audit visit. The shelter is still cluttered and dirty.				
Site OK ☑	**Notes**					

Driving Directions From route 68 in Cadiz turn south on 1175 and continue approximately 4.7 miles. The site will be visible in the field on the right. Turn onto the gravel road just past the site operator's house at 4560 Old Dover Road, which is on the left.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID CDZ171 **Technician** Sandy Grenville **Site Visit Date** 03/05/2013

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m	15 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 corn field with limited agricultural operations within 15 meters.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID	CDZ171	Technician	Sandy Grenville	Site Visit Date	03/05/2013

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

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

The temperature sensor has been installed in a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID	CDZ171	Technician	Sandy Grenville	Site Visit Date	03/05/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342VC	14036	06403

Provide any additional 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	CDZ171	Technician	Sandy Grenville	Site Visit Date	03/05/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 18 meters
4	Describe dry dep sample tube.		3/8 teflon by 15 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	none	000125
Ozone	ThermoElectron Inc	49i A1NAA	1009241787	000615
Filter pack flow pump	Thomas	107CAB18D	060400022646	06020
Zero air pump	Werther International	PC70/4	000821902	06899

Provide any additional 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 CDZ171 **Technician** Sandy Grenville **Site Visit Date** 03/05/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000281
DAS	Campbell	CR3000	2130	000352
Modem	Raven	V42221	0808338189	06457
UPS	APC	RS900	unknown	06793

Provide any additional 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	CDZ171	Technician	Sandy Grenville	Site Visit Date	03/05/2013

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2001	☐
HASP	☑	Nov 2009	☐
Field Ops Manual	☐		☐
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	CDZ171	Technician	Sandy Grenville	Site Visit Date	03/05/2013

Site operation procedures

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

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

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

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

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

1	Do multi-point calibration gases go through the complete sample train including all filters?	☑	
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 CDZ171 **Technician** Sandy Grenville **Site Visit Date** 03/05/2013

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed afternoons (90% of the time)
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	One set of gloves only
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

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

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

Tower is lowered and filter changed without downing ozone channel.

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MCK131-Sandy Grenville-03/06/2013						
1	3/6/2013	Computer	Dell	000457	D520	unknown
2	3/6/2013	DAS	Campbell	000429	CR3000	2535
3	3/6/2013	Elevation	Elevation	None	1	None
4	3/6/2013	Filter pack flow pump	Thomas	00497	107CA18	118700000596
5	3/6/2013	Flow Rate	Apex	000528	AXMC105LPMDPCV	48097
6	3/6/2013	Infrastructure	Infrastructure	none	none	none
7	3/6/2013	Modem	Raven	06477	H4222-C	0808311292
8	3/6/2013	Ozone	ThermoElectron Inc	000683	49i A1NAA	1030244798
9	3/6/2013	Ozone Standard	ThermoElectron Inc	000441	49i A3NAA	CM08200017
10	3/6/2013	Sample Tower	Aluma Tower	03514	A	none
11	3/6/2013	Shelter Temperature	Campbell	none	107-L	none
12	3/6/2013	Siting Criteria	Siting Criteria	None	1	None
13	3/6/2013	Temperature	RM Young	06543	41342VC	14804
14	3/6/2013	Zero air pump	Werther International	06912	PC70/4	000829177

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2535	MCK131	Sandy Grenville	03/06/2013	DAS	Primary

Das Date: 3 /6 /2013
Das Time: 17:57:49
Das Day: 65

Audit Date 3 /6 /2013
Audit Time 17:57:50
Audit Day 65

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

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

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0000	V	V	0.0001
7	0.1000	0.0998	0.0996	V	V	-0.0002
7	0.3000	0.2997	0.2998	V	V	0.0001
7	0.5000	0.4996	0.4997	V	V	0.0001
7	0.7000	0.6995	0.6997	V	V	0.0002
7	0.9000	0.8994	0.8996	V	V	0.0002
7	1.0000	0.9994	0.9995	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	48097	MCK131	Sandy Grenville	03/06/2013	Flow Rate	000528

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

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

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.01
0.24%	0.40%			**Cal Factor Full Scale**	1
				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	0.002	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.002	0.00	l/m	l/m	
primary	test pt 1	1.496	1.502	1.50	1.489	1.50	l/m	l/m	-0.13%
primary	test pt 2	1.497	1.503	1.50	1.490	1.50	l/m	l/m	-0.20%
primary	test pt 3	1.500	1.506	1.50	1.491	1.50	l/m	l/m	-0.40%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	Not tested	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244798	MCK131	Sandy Grenville	03/06/2013	Ozone	000683

Slope:	1.01600	**Slope:**	0.00000
Intercept	-0.62386	**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	1.00121	**Intercept**	-0.18383
Cert Date	1/2/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.5%	1.2%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.20	0.38	-0.17	ppb	
primary	2	35.77	35.91	35.92	ppb	0.03%
primary	3	51.51	51.63	51.69	ppb	0.12%
primary	4	80.03	80.11	80.60	ppb	0.61%
primary	5	101.95	102.01	103.20	ppb	1.17%

Sensor Component	Condition	Status
Cell B Noise	1.4 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	< 1 %	pass
Offset	-0.2	pass
Span	1.039	pass
Cell B Freq.	81.4 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.72 lpm	pass
Cell A Tmp.	30.9 C	pass
Cell A Pressure	739 mmHg	pass
Cell A Noise	2.0 ppb	pass
Cell A Freq.	111.7 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	14804	MCK131	Sandy Grenville	03/06/2013	Temperature	06543

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

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.08	0.12		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	-0.11	-0.03	0.000	-0.2	C	-0.12
primary	Temp Mid Range	25.70	25.67	0.000	25.6	C	-0.12
primary	Temp High Range	49.00	48.87	0.000	48.9	C	-0.01

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

Infrastructure Data For

Site ID	MCK131	Technician	Sandy Grenville	Site Visit Date	03/06/2013

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	MCK131	Sandy Grenville	03/06/2013	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
1.53	1.70		

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

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	18.80	18.80	0.000	17.1	C	-1.7
primary	Temp Mid Range	19.00	19.00	0.000	17.5	C	-1.5
primary	Temp Mid Range	19.30	19.30	0.000	17.9	C	-1.4

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The shelter is neat, clean, and well organized.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	MCK131	**Technician**	Sandy Grenville	**Site Visit Date**	03/06/2013

Site Sponsor (agency)	EPA	**USGS Map**	Mackville
Operating Group	Private	**Map Scale**	
AQS #	21-229-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	37.7044
Deposition Measurement	dry, wet	**QAPP Longitude**	-85.0483
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	353
Terrain	rolling	**QAPP Declination**	4.25
Conforms to MLM	Marginally	**QAPP Declination Date**	12/28/2004
Site Telephone	(859) 262-5181	**Audit Latitude**	37.704678
Site Address 1	Westley Miller Road	**Audit Longitude**	-85.048706
Site Address 2		**Audit Elevation**	293
County	Washington	**Audit Declination**	-4.5
City, State	Harrodsburg, KY		
Zip Code	40330	**Fire Extinguisher** (Present) ☑	Inspected Nov 1992
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator	Belinda Warden	**Safety Glasses** ☑	
Primary Op. Phone #	(859) 262-0386	**Safety Hard Hat** ☑	
Primary Op. E-mail	bawarden@bellsouth.net	**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 neat, clean, and well organized.

Site OK ☑ **Notes**

Driving Directions From Danville go west on 150 toward Perryville. In Perryville turn right (north) on 1920 or Battlefield Road. Continue approximately 7.3 miles to Wesley Miller Road. Turn left onto Wesley Miller Road and continue approximately 1 mile. The site is on the left through a farm gate.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID MCK131 **Technician** Sandy Grenville **Site Visit Date** 03/06/2013

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID	MCK131	Technician	Sandy Grenville	Site Visit Date	03/06/2013

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

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

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID	MCK131	Technician	Sandy Grenville	Site Visit Date	03/06/2013

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?	☑	

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342VC	14804	06543

Provide any additional 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	MCK131	Technician	Sandy Grenville	Site Visit Date	03/06/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	A	none	03514
Ozone	ThermoElectron Inc	49i A1NAA	1030244798	000683
Filter pack flow pump	Thomas	107CA18	118700000596	00497
Zero air pump	Werther International	PC70/4	000829177	06912

Provide any additional 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 MCK131 **Technician** Sandy Grenville **Site Visit Date** 03/06/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000457
DAS	Campbell	CR3000	2535	000429
Modem	Raven	H4222-C	0808311292	06477

Provide any additional 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 MCK131 **Technician** Sandy Grenville **Site Visit Date** 03/06/2013

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2001	☐
HASP	☑	Nov 2009	☐
Field Ops Manual	☐		☐
Calibration Reports	☑	Electronic copy	☑
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 MCK131 **Technician** Sandy Grenville **Site Visit Date** 03/06/2013

Site operation procedures

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

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

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

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

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

1	Do multi-point calibration gases go through the complete sample train including all filters?	☑	
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	SSRF, 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 MCK131 **Technician** Sandy Grenville **Site Visit Date** 03/06/2013

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	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	☑	As needed	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

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

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MCK231-Sandy Grenville-03/06/2013						
1	3/6/2013	Computer	Dell	000458	D530	unknown
2	3/6/2013	DAS	Campbell	000359	CR3000	2137
3	3/6/2013	Elevation	Elevation	None	1	None
4	3/6/2013	Filter pack flow pump	Thomas	04513	107CAB18B	110000014171
5	3/6/2013	Flow Rate	Mykrolis	000236	FC280SAV	AW06273002
6	3/6/2013	Infrastructure	Infrastructure	none	none	none
7	3/6/2013	MFC power supply	MACTEC	04998	none	none
8	3/6/2013	Modem	Raven	06476	H4222-C	0808311140
9	3/6/2013	Ozone	ThermoElectron Inc	000680	49i A1NAA	1030244792
10	3/6/2013	Ozone Standard	ThermoElectron Inc	000439	49i A3NAA	CM08200015
11	3/6/2013	Shelter Temperature	Campbell	none	107-L	none
12	3/6/2013	Siting Criteria	Siting Criteria	None	1	None
13	3/6/2013	Temperature	RM Young	06542	41342VC	14803
14	3/6/2013	Zero air pump	Werther International	06924	C 70/4	000836205

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2137	MCK231	Sandy Grenville	03/06/2013	DAS	Primary

Das Date: 3 /6 /2013
Das Time: 17:55:20
Das Day: 65

Audit Date 3 /6 /2013
Audit Time 17:55:20
Audit Day 65

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

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

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0998	0.0999	V	V	0.0001
7	0.3000	0.2997	0.2998	V	V	0.0001
7	0.5000	0.4996	0.4998	V	V	0.0002
7	0.7000	0.6995	0.6997	V	V	0.0002
7	0.9000	0.8995	0.8996	V	V	0.0001
7	1.0000	0.9993	0.9995	V	V	0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Mykrolis	AW06273002	MCK231	Sandy Grenville	03/06/2013	Flow Rate	000236

Mfg	MACTEC
SN/Owner ID	none 04998
Parameter	MFC power supply

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

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

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
2.81%	2.98%			

Cal Factor Zero	0
Cal Factor Full Scale	1
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	-0.15	-0.142	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	-0.15	-0.146	-0.04	l/m	l/m	
primary	test pt 1	1.539	1.542	1.28	1.283	1.50	l/m	l/m	-2.72%
primary	test pt 2	1.539	1.542	1.28	1.283	1.50	l/m	l/m	-2.72%
primary	test pt 3	1.542	1.546	1.28	1.283	1.50	l/m	l/m	-2.98%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	135 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	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	1030244792	MCK231	Sandy Grenville	03/06/2013	Ozone	000680

Slope:	0.86335	**Slope:**	0.00000
Intercept	-1.19057	**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	1.00121	**Intercept**	-0.18383
Cert Date	1/2/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
15.7%	17.1%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.12	0.30	-0.94	ppb	
primary	2	38.00	38.13	31.61	ppb	-17.10%
primary	3	49.85	49.97	42.26	ppb	-15.43%
primary	4	80.51	80.59	68.03	ppb	-15.59%
primary	5	101.77	101.83	86.90	ppb	-14.66%

Sensor Component	Condition	Status
Cell B Noise	1.1 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	< 1 %	pass
Offset	-0.01	pass
Span	1.02	pass
Cell B Freq.	94.0 kHz	pass
System Memo	See comments	pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.71 lpm	pass
Cell A Tmp.	29.3 C	pass
Cell A Pressure	723 mmHg	pass
Cell A Noise	0.9 ppb	pass
Cell A Freq.	95.2 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
RM Young	14803	MCK231	Sandy Grenville	03/06/2013	Temperature	06542

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

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.15	0.30		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	-0.11	-0.03	0.000	0.0	C	0.02
primary	Temp Mid Range	25.70	25.67	0.000	25.6	C	-0.12
primary	Temp High Range	49.00	48.87	0.000	48.6	C	-0.3

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

Infrastructure Data For

Site ID	MCK231	Technician	Sandy Grenville	Site Visit Date	03/06/2013

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	MCK231	Sandy Grenville	03/06/2013	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
1.11	1.25		

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

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	21.30	21.29	0.000	20.0	C	-1.25
primary	Temp Mid Range	22.61	22.60	0.000	21.5	C	-1.07
primary	Temp Mid Range	20.40	20.40	0.000	19.4	C	-1

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The site instruments are located in the MCK131 shelter. The same site operator is servicing both sites.

2 **Parameter:** PollAnalyzerCom

The ozone analyzer failed the performance evaluation. The field operations staff at AMEC were aware of the problem and had sent a replacement ozone monitor to the site operator for installation. The site operator had not been informed of the problem and had not replaced the site monitor prior to the audit visit. The site will be revisited for an ozone PE following the replacement of the site ozone analyzer.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	MCK231	**Technician**	Sandy Grenville	**Site Visit Date**	03/06/2013

Site Sponsor (agency)	EPA	**USGS Map**	Mackville
Operating Group	Private	**Map Scale**	
AQS #	21-229-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	37.7044
Deposition Measurement	dry, wet	**QAPP Longitude**	-85.0483
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	353
Terrain	rolling	**QAPP Declination**	4.25
Conforms to MLM	Marginally	**QAPP Declination Date**	12/28/2004
Site Telephone	(859) 262-5181	**Audit Latitude**	37.704678
Site Address 1	Wesley Miller Road	**Audit Longitude**	-85.048706
Site Address 2		**Audit Elevation**	293
County	Washington	**Audit Declination**	-4.5
City, State	Harrodsburg, KY		
Zip Code	40330	**Fire Extinguisher** ☑	Inspected Nov 1992
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator	Belinda Warden	**Safety Glasses** ☑	
Primary Op. Phone #	(859) 262-0386	**Safety Hard Hat** ☑	
Primary Op. E-mail	bawarden@bellsouth.net	**Climbing Belt** ☑	
Backup Operator	none	**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The site instruments are located in the MCK131 shelter. The same site operator is servicing both sites.				
Site OK	☑	**Notes**					

Driving Directions From Danville go west on 150 toward Perryville. In Perryville turn right (north) on 1920 or Battlefield Road. Continue approximately 7.3 miles to Wesley Miller Road. Turn left onto Wesley Miller Road and continue approximately 1 mile. The site is on the left through a farm gate.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID MCK231 **Technician** Sandy Grenville **Site Visit Date** 03/06/2013

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID	MCK231	Technician	Sandy Grenville	Site Visit Date	03/06/2013

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

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

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID MCK231 **Technician** Sandy Grenville **Site Visit Date** 03/06/2013

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?	☑	

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342VC	14803	06542

Provide any additional 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	MCK231	Technician	Sandy Grenville	Site Visit Date	03/06/2013

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

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

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

Parameter	Manufacturer	Model	S/N	Client ID
MFC power supply	MACTEC	none	none	04998
Ozone	ThermoElectron Inc	49i A1NAA	1030244792	000680
Filter pack flow pump	Thomas	107CAB18B	110000014171	04513
Zero air pump	Werther International	C 70/4	000836205	06924

Provide any additional 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 analyzer failed the performance evaluation. The field operations staff at AMEC were aware of the problem and had sent a replacement ozone monitor to the site operator for installation. The site operator had not been informed of the problem and had not replaced the site monitor prior to the audit visit. The site will be revisited for an ozone PE following the replacement of the site ozone analyzer.

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID MCK231 **Technician** Sandy Grenville **Site Visit Date** 03/06/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D530	unknown	000458
DAS	Campbell	CR3000	2137	000359
Modem	Raven	H4222-C	0808311140	06476

Provide any additional 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	MCK231	Technician	Sandy Grenville	Site Visit Date	03/06/2013

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☐		☐
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑	Electronic copy	☑
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: MCK231 | Technician: Sandy Grenville | Site Visit Date: 03/06/2013

Site operation procedures

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

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

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

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

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

1	Do multi-point calibration gases go through the complete sample train including all filters?	☑	
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	SSRF, 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	MCK231	Technician	Sandy Grenville	Site Visit Date	03/06/2013

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	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	☑	As needed	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

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

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
BBE401-Eric Hebert-03/06/2013						
1	3/6/2013	Computer	Gateway	90699	Solo	0018986902
2	3/6/2013	DAS	Environmental Sys Corp	90665	8816	2689
3	3/6/2013	Elevation	Elevation	None	1	None
4	3/6/2013	F460 translator	Climatronics	none	100163	688
5	3/6/2013	Filter pack flow pump	Thomas	none	107CAB18B	070000012920
6	3/6/2013	flow rate	Tylan	03392	FC280AV	AW9403018
7	3/6/2013	Infrastructure	Infrastructure	none	none	none
8	3/6/2013	Mainframe	Climatronics	01847	100081	1426
9	3/6/2013	Mainframe power supply	Climatronics	none	101074	unknown
10	3/6/2013	Met tower	Universal Tower	none	unknown	none
11	3/6/2013	MFC power supply	Tylan	03680	RO-32	FP9403013
12	3/6/2013	Modem	US Robotics	none	V.92	unknown
13	3/6/2013	Ozone	ThermoElectron Inc	90517	49C	49C-58468-318
14	3/6/2013	Ozone Standard	ThermoElectron Inc	90832	49C	520012326
15	3/6/2013	Precipitation	Climatronics	01474	100508-2	illegible
16	3/6/2013	Printer	Hewlett Packard	none	842C	unknown
17	3/6/2013	Relative Humidity	Rotronic	none	MP 601A	59221
18	3/6/2013	Sample Tower	Aluma Tower	none	B	AT-5381-F9-1
19	3/6/2013	Shelter Temperature	ARS	none	none	none
20	3/6/2013	Shield (10 meter)	Climatronics	00390	100325	1275
21	3/6/2013	Shield (2 meter)	Climatronics	01497	100325	illegible
22	3/6/2013	Siting Criteria	Siting Criteria	None	1	None
23	3/6/2013	Solar Radiation	Licor	none	LI-200	PY35732
24	3/6/2013	Solar Radiation Translator	Climatronics	none	100144	385
25	3/6/2013	Temperature	Climatronics	01049	100093	missing
26	3/6/2013	Temperature Translator	Climatronics	none	100088-2	482
27	3/6/2013	Wind Direction	Climatronics	90885	100076	1813
28	3/6/2013	Wind Speed	Climatronics	90921	100075	1725

Site	*Visit Date*	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
29	3/6/2013	Zero air pump	Werther International	none	PC70/4	606489

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2689	BBE401	Eric Hebert	03/06/2013	DAS	Primary

Das Date: 3 /6 /2013
Das Time: 9:09:33
Das Day: 65

Audit Date 3 /6 /2013
Audit Time 9:09:32
Audit Day 65

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

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

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
2	0.0000	0.0000	0.0000	V	V	0.0000
2	0.1000	0.1000	0.1000	V	V	0.0000
2	0.3000	0.3000	0.3000	V	V	0.0000
2	0.5000	0.5000	0.5000	V	V	0.0000
2	0.7000	0.7000	0.7000	V	V	0.0000
2	0.9000	0.9000	0.9000	V	V	0.0000
2	1.0000	1.0001	1.0001	V	V	0.0000
10	0.0000	0.0000	0.0000	V	V	0.0000
10	0.1000	0.1000	0.1000	V	V	0.0000
10	0.3000	0.3000	0.3000	V	V	0.0000
10	0.5000	0.5000	0.5000	V	V	0.0000
10	0.7000	0.7000	0.7000	V	V	0.0000
10	0.9000	0.9000	0.9000	V	V	0.0000
10	1.0000	1.0001	1.0000	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9403018	BBE401	Eric Hebert	03/06/2013	flow rate	03392

Mfg	Tylan	
SN/Owner ID	FP9403013	03680
Parameter	MFC power supply	

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

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.07
0.43%	0.70%			**Cal Factor Full Scale**	5.37
				Rotometer Reading:	3.05

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	-0.02	0.011	0.08	l/m	l/m	
primary	leak check	0.000	0.000	-0.03	0.003	0.07	l/m	l/m	
primary	test pt 1	0.000	2.969	3.04	2.755	2.99	l/m	l/m	0.70%
primary	test pt 2	0.000	2.978	3.04	2.755	2.99	l/m	l/m	0.41%
primary	test pt 3	0.000	2.985	3.04	2.755	2.99	l/m	l/m	0.17%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	Not tested	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.5 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-58468-318	BBE401	Eric Hebert	03/06/2013	Ozone	90517

Slope:	0.98260	**Slope:**	0.00000
Intercept	2.09900	**Intercept**	0.00000
CorrCoff	0.99991	**CorrCoff**	0.00000

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

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.0%	3.5%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.26	0.07	2.31	ppb	
primary	2	29.17	29.06	30.07	ppb	3.48%
primary	3	52.05	52.01	53.55	ppb	2.96%
primary	4	79.97	80.00	81.29	ppb	1.61%
primary	5	97.66	97.74	97.65	ppb	-0.09%

Sensor Component	Condition	Status
Cell B Noise	2.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	1.0005	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-2.3	pass
Span	1.018	pass
Cell B Freq.	80.8 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.69 lpm	pass
Cell A Tmp.	37.7 C	pass
Cell A Pressure	657 mmHg	pass
Cell A Noise	3.0 ppb	pass
Cell A Freq.	86.4 kHz	pass
Cell A Flow	0.66 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	0.0006	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	1725	BBE401	Eric Hebert	03/06/2013	Wind Speed	90921

Mfg	Climatronics
SN/Owner ID	688 none
Parameter	F460 translator

Prop or Cups SN	1967
Prop or Cups Torque	0.2 to 0.3
Prop Correction Fact	N/A

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

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.01	0.21%		
Abs Max Er	0.03	0.42%		

UseDescription:	InputDevice:	Input RPM:	Input m/s:	Output V:	DAS m/s:	Diff/ %Diff:	Difference:
primary	none	0	0.20	0.000	0.2		0.00
primary	01261	50	1.40	0.000	1.4		0.00
primary	01261	100	2.57	0.000	2.6		0.03
primary	01261	170	4.22	0.000	4.2		-0.02
primary	01261	250	6.10	0.000	6.1	0.00%	
primary	01262	500	11.97	0.000	12.0	0.25%	
primary	01262	800	19.02	0.000	19.1	0.42%	
primary	01262	2000	47.22	0.000	47.3	0.17%	

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

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	1813	BBE401	Eric Hebert	03/06/2013	Wind Direction	90885

Mfg	Climatronics	
SN/Owner ID	688	none
Parameter	F460 translator	

Vane SN: 36 C. A. Align. deg. true: 360

VaneTorque 10 to 10

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

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	1.8	0.8		
Abs Max Er	3	2		

UseDescription:	TferID:	Input Raw:	Linearity	Output V:	Output Deg.:	Difference:	Change:	Error:
primary	01266	0	☑	0.000	359	1	44	-1
primary	01266	45	☑	0.000	42	3	43	-2
primary	01266	90	☑	0.000	87	3	45	0
primary	01266	135	☑	0.000	132	3	45	0
primary	01266	180	☑	0.000	178	2	46	1
primary	01266	225	☑	0.000	224	1	46	1
primary	01266	270	☑	0.000	269	1	45	0
primary	01266	315	☑	0.000	315	0	46	1
primary	01265	90	☐	0.000	87	3		3
primary	01265	180	☐	0.000	178	2		2
primary	01265	270	☐	0.000	269	1		1
primary	01265	360	☐	0.000	359	1		1

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

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	missing	BBE401	Eric Hebert	03/06/2013	Temperature	01049

Mfg	Climatronics	
SN/Owner ID	482	none
Parameter	Temperature Translator	

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

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.16	0.22		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	-0.10	0.02	0.000	0.2	C	0.14
primary	Temp Mid Range	29.23	29.14	0.000	29.3	C	0.12
primary	Temp High Range	46.44	46.23	0.000	46.5	C	0.22

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Rotronic	59221	BBE401	Eric Hebert	03/06/2013	Relative Humidity	none

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

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	1.9	2.0		
Abs Max Er	2.5	2.0		

UseDesc.:	Test type:	Device:	Input RH:	GTL Raw:	RH Corr.:	DAS Volts:	DAS %RH:	Difference:
primary	RH Low Range	Hygroclip	32.8	34.1	32.8	0.340	34.0	1.2
primary	RH Low Range	Hygroclip	52.9	52.0	52.9	0.554	55.4	2.5
primary	RH High Range	Hygroclip	93.6	90.3	93.6	0.916	91.6	-2.0

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY35732	BBE401	Eric Hebert	03/06/2013	Solar Radiation	none

Mfg	Climatronics	
SN/Owner ID	385	none
Parameter	Solar Radiation Translator	

Mfg	Eppley	**Parameter**	solar radiation	
Serial Number	10765	**Tfer Desc.**	SR transfer translat	
Tfer ID	01246			
Slope	1.00000	**Intercept**	0.00000	
Cert Date	1/6/2010	**CorrCoff**	1.00000	
Mfg	Eppley	**Parameter**	solar radiation	
Serial Number	34341F3	**Tfer Desc.**	SR transfer sensor	
Tfer ID	01245			
Slope	1.00000	**Intercept**	0.00000	
Cert Date	12/16/2010	**CorrCoff**	1.00000	

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
9.0%	8.7%	0.0%	0.0%

UseDescription:	Measure Date	MeasureTime	Tfer Corr:	DAS w/m2:	PctDifference:
primary	3/6/2013	10:00	510	549	7.6%
primary	3/6/2013	11:00	517	567	9.7%
primary	3/6/2013	12:00	690	750	8.7%
primary	3/6/2013	13:00	755	821	8.7%
primary	3/6/2013	14:00	589	648	10.0%

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

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	BBE401	Eric Hebert	03/06/2013	Precipitation	01474

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

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

UseDesc.	Test type:	TferVolume:	Iteration:	TimePerTip:	Eq.Ht:	DAS eng:	Eq.HtUnit:	OSE Unit:	TferUnits:	PctDifference
primary	tip check	10 manual	1	2 sec	1.00	1.00	mm	mm	ml	
primary	test 1	231.5	1	12 sec	5.00	5.20	mm	mm	ml	4.0%
primary	test 2	231.5	2	8 sec	5.00	5.10	mm	mm	ml	2.0%

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

Infrastructure Data For

Site ID	BBE401	Technician	Eric Hebert	Site Visit Date	03/06/2013

Shelter Make	Shelter Model	Shelter Size
Ekto	8814	896 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	Fair	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Signal Cable	Condition	Fair	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	BBE401	Eric Hebert	03/06/2013	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.44	0.61		

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

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	21.63	21.60	0.000	22.2	C	0.61
primary	Temp Mid Range	24.32	24.27	0.000	23.9	C	-0.39
primary	Temp Mid Range	25.19	25.13	0.000	24.8	C	-0.32

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone sample line is leak tested every month when the inlet filter is replaced.

2 **Parameter:** ShelterCleanNotes

The shelter is clean, neat, and well organized.

3 **Parameter:** MetOpMaintCom

The signal cables are showing signs of wear. The precipitation gage signal cable is in poor condition.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	BBE401	**Technician**	Eric Hebert	**Site Visit Date**	03/06/2013

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Panther Junction
Operating Group	NPS	**Map Scale**	
AQS #	48-043-0101	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMPROVE, PM2.5	**QAPP Latitude**	29.3022
Deposition Measurement	dry, wet	**QAPP Longitude**	-103.1772
Land Use	desert	**QAPP Elevation Meters**	1052
Terrain	complex	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone	(432) 477-2258	**Audit Latitude**	29.302651
Site Address 1	K-Bar Ranch	**Audit Longitude**	-103.177813
Site Address 2	Big Bend National Park	**Audit Elevation**	1057
County	Brewster	**Audit Declination**	7.0
City, State	Big Bend National Park, TX		**Present**
Zip Code	79834	**Fire Extinguisher**	☑ Inspected Nov 2009
Time Zone	Central	**First Aid Kit**	☑
Primary Operator	Keith Sauter	**Safety Glasses**	☐
Primary Op. Phone #	(432) 477-1150	**Safety Hard Hat**	☐
Primary Op. E-mail	Keith_Sauter@nps.gov	**Climbing Belt**	☐
Backup Operator	Jeff Bennett	**Security Fence**	☐
Backup Op. Phone #	(432) 477-1141	**Secure Shelter**	☑
Backup Op. E-mail	jeff_bennett@nps.gov	**Stable Entry Step**	☑

Shelter Working Room ☑ **Make** Ekto **Model** 8814 **Shelter Size** 896 cuft

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

Site OK ☑ **Notes**

Driving Directions From interstate 10 in Fort Stockton, turn south on highway 385 and drive approximately 120 miles to Big Bend National Park. Continue on the park road past the entrance station 26 miles to the stop sign at Panther Junction near the visitor center. Turn left (east) and continue approximately 2.5 miles. Turn left on the dirt road marked K-Bar and continue approximately 0.5 miles. Turn right on the service road just past the Chihuahuan Desert Research Station (old house) on the right. The site is 400 meters at the end of the road.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID BBE401 **Technician** Eric Hebert **Site Visit Date** 03/06/2013

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID	BBE401	Technician	Eric Hebert	Site Visit Date	03/06/2013

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	
3	Are the tower and sensors plumb?	☑	
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	
8	Is the rain gauge plumb?	☑	
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	
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 BBE401 **Technician** Eric Hebert **Site Visit Date** 03/06/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Precipitation	Climatronics	100508-2	illegible	01474
Shield (10 meter)	Climatronics	100325	1275	00390
Shield (2 meter)	Climatronics	100325	illegible	01497
Temperature	Climatronics	100093	missing	01049
Wind Direction	Climatronics	100076	1813	90885
Solar Radiation	Licor	LI-200	PY35732	none
Relative Humidity	Rotronic	MP 601A	59221	none
Met tower	Universal Tower	unknown	none	none
Wind Speed	Climatronics	100075	1725	90921

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

The signal cables are showing signs of wear. The precipitation gage signal cable is in poor condition.

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID BBE401 **Technician** Eric Hebert **Site Visit Date** 03/06/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		1/2 teflon by 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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	AT-5381-F9-1	none
Ozone	ThermoElectron Inc	49C	49C-58468-318	90517
Filter pack flow pump	Thomas	107CAB18B	070000012920	none
MFC power supply	Tylan	RO-32	FP9403013	03680
Zero air pump	Werther International	PC70/4	606489	none

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

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID BBE401 **Technician** Eric Hebert **Site Visit Date** 03/06/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Gateway	Solo	0018986902	90699
DAS	Environmental Sys Corp	8816	2689	90665
F460 translator	Climatronics	100163	688	none
Mainframe	Climatronics	100081	1426	01847
Mainframe power supply	Climatronics	101074	unknown	none
Modem	US Robotics	V.92	unknown	none
Printer	Hewlett Packard	842C	unknown	none
Solar Radiation Translator	Climatronics	100144	385	none
Temperature Translator	Climatronics	100088-2	482	none

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

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID	BBE401	Technician	Eric Hebert	Site Visit Date	03/06/2013

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID	BBE401	Technician	Eric Hebert	Site Visit Date	03/06/2013

Site operation procedures

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

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

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

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

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

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

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

The ozone sample line is leak tested every month when the inlet filter is replaced.

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID	BBE401	Technician	Eric Hebert	Site Visit Date	03/06/2013

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings (90%)
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☐	
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

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

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PAL190-Eric Hebert-03/07/2013						
1	3/7/2013	Computer	Dell	000262	D520	unknown
2	3/7/2013	DAS	Campbell	000347	CR3000	2126
3	3/7/2013	Elevation	Elevation	None	1	None
4	3/7/2013	Filter pack flow pump	Thomas	04286	107CA18B	12980000141
5	3/7/2013	Flow Rate	Apex	000604	AXMC105LPMDPCV	unknown
6	3/7/2013	Infrastructure	Infrastructure	none	none	none
7	3/7/2013	Met tower	Universal Tower	06322	unknown	none
8	3/7/2013	Modem	Raven	06808	H4223-C	0934411667
9	3/7/2013	Ozone	ThermoElectron Inc	000613	49i A1NAA	1009241783
10	3/7/2013	Ozone Standard	ThermoElectron Inc	000214	49i A3NAA	0622717855
11	3/7/2013	Precipitation	Texas Electronics	06307	TR-525i-HT	41276-107
12	3/7/2013	Relative Humidity	Vaisala	06223	HMP50	B3220003
13	3/7/2013	Sample Tower	Aluma Tower	missing	B	AT-7200-582
14	3/7/2013	Shelter Temperature	Campbell	none	107-L	10755-148
15	3/7/2013	Shield (10 meter)	RM Young	06167	Aspirated 43408	none
16	3/7/2013	Shield (2 meter)	RM Young	06166	Aspirated 43408	none
17	3/7/2013	Siting Criteria	Siting Criteria	None	1	None
18	3/7/2013	Solar Radiation	Licor	06311	LI-200	PY55110
19	3/7/2013	Solar Radiation Translator	RM Young	06310	70101-X	none
20	3/7/2013	Surface Wetness	RM Young	06288	58101	none
21	3/7/2013	Temperature	RM Young	06303	41342VO	12542
22	3/7/2013	Temperature2meter	RM Young	06302	41342VO	12541
23	3/7/2013	Wind Direction	RM Young	03421	AQ05305	17101wdr
24	3/7/2013	Wind Speed	RM Young	03421	AQ05305	17101wsp
25	3/7/2013	Zero air pump	Werther International	06929	C 70/4	000829173

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2126	PAL190	Eric Hebert	03/07/2013	DAS	Primary

Das Date: 3 /7 /2013
Das Time: 13:32:20
Das Day: 66

Audit Date 3 /7 /2013
Audit Time 13:32:20
Audit Day 66

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

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

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

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

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	unknown	PAL190	Eric Hebert	03/07/2013	Flow Rate	000604

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

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.04
1.33%	1.43%			**Cal Factor Full Scale**	0.97
				Rotometer Reading:	3.25

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	0.024	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.02	0.038	0.00	l/m	l/m	
primary	test pt 1	0.000	2.958	3.00	3.007	3.00	l/m	l/m	1.43%
primary	test pt 2	0.000	2.960	3.00	3.007	3.00	l/m	l/m	1.36%
primary	test pt 3	0.000	2.965	3.00	3.007	3.00	l/m	l/m	1.19%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	135 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241783	PAL190	Eric Hebert	03/07/2013	Ozone	000613

Slope:	0.98874	**Slope:**	0.00000
Intercept	0.63510	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

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

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.5%	0.7%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	-0.13	-0.31	0.32	ppb	
primary	2	35.07	34.98	35.24	ppb	0.74%
primary	3	51.97	51.93	52.04	ppb	0.21%
primary	4	77.86	77.89	77.51	ppb	-0.49%
primary	5	102.35	102.45	102.00	ppb	-0.44%

Sensor Component	Condition	Status
Cell B Noise	1.3 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.10	pass
Span	1.001	pass
Cell B Freq.	92.5 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.65 lpm	pass
Cell A Tmp.	32.1 C	pass
Cell A Pressure	648 mmHg	pass
Cell A Noise	0.6 ppb	pass
Cell A Freq.	99.8 kHz	pass
Cell A Flow	0.64 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	17101wsp	PAL190	Eric Hebert	03/07/2013	Wind Speed	03421

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

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

Prop or Cups SN	68264			
Prop or Cups Torque	0.3	**to**	0.4	
Prop Correction Fact	0.0512			

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

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

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

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	17101wdr	PAL190	Eric Hebert	03/07/2013	Wind Direction	03421

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

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

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

VaneTorque 12 **to** 18 360

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	1.3	1.0		
Abs Max Er	3	2		

UseDescription:	TferID:	Input Raw:	Linearity	Output V:	Output Deg.:	Difference:	Change:	Error:
primary	01266	0	☑	0.000	2	2	45	0
primary	01266	45	☑	0.000	48	3	46	1
primary	01266	90	☑	0.000	93	3	45	0
primary	01266	135	☑	0.000	136	1	43	-2
primary	01266	180	☑	0.000	180	0	44	-1
primary	01266	225	☑	0.000	224	1	44	-1
primary	01266	270	☑	0.000	270	0	46	1
primary	01266	315	☑	0.000	317	2	47	2
primary	01265	90	☐	0.000	93	3		3
primary	01265	180	☐	0.000	180	0		0
primary	01265	270	☐	0.000	270	0		0
primary	01265	360	☐	0.000	2	2		2

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

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	12542	PAL190	Eric Hebert	03/07/2013	Temperature	06303

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

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.04	0.07		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	-0.03	0.09	0.000	0.05	C	-0.04
primary	Temp Mid Range	26.20	26.13	0.000	26.11	C	-0.02
primary	Temp High Range	46.29	46.08	0.000	46.15	C	0.07

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

2 Meter Temperature Data For

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	12541	PAL190	Eric Hebert	03/07/2013	Temperature2meter	06302

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

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.04	0.07		

UseDescription:	Test type:	InputTmpRaw	InputTmpCorrected:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Rang	-0.03	0.09	0.000	0.04	C	-0.05
primary	Temp Mid Rang	26.20	26.13	0.000	26.14	C	0.01
primary	Temp High Ran	46.29	46.08	0.000	46.15	C	0.07

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	B3220003	PAL190	Eric Hebert	03/07/2013	Relative Humidity	06223

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

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	3.3	9.1		
Abs Max Er	4.9	9.1		

UseDesc.:	Test type:	Device:	Input RH:	GTL Raw:	RH Corr.:	DAS Volts:	DAS %RH:	Difference:
primary	RH Low Range	Hygroclip	32.8	35.0	32.8	0.000	34.4	1.6
primary	RH Low Range	Hygroclip	52.9	51.2	52.9	0.000	48.0	-4.9
primary	RH High Range	Hygroclip	93.6	90.8	93.6	0.000	84.5	-9.1

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY55110	PAL190	Eric Hebert	03/07/2013	Solar Radiation	06311

Mfg	RM Young	
SN/Owner ID	none	06310
Parameter	Solar Radiation Translator	

Mfg	Eppley	**Parameter**	solar radiation	
Serial Number	10765	**Tfer Desc.**	SR transfer translat	
Tfer ID	01246			
Slope	1.00000	**Intercept**	0.00000	
Cert Date	1/6/2010	**CorrCoff**	1.00000	
Mfg	Eppley	**Parameter**	solar radiation	
Serial Number	34341F3	**Tfer Desc.**	SR transfer sensor	
Tfer ID	01245			
Slope	1.00000	**Intercept**	0.00000	
Cert Date	12/16/2010	**CorrCoff**	1.00000	

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
1.5%	0.9%	0.0%	0.0%

UseDescription:	Measure Date	MeasureTime	Tfer Corr:	DAS w/m2:	PctDifference:
primary	3/7/2013	14:00	742	749	0.9%
primary	3/7/2013	15:00	616	624	1.3%
primary	3/7/2013	16:00	383	388	1.3%
primary	3/7/2013	17:00	227	237	4.4%

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

Surface Wetness Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	none	PAL190	Eric Hebert	03/07/2013	Surface Wetness	06288

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

☑ **Manual Test Pass**

UseDescription:	Test Type:	Tfer kOhms:	OutputSignal:	DAS eng:	OutputSignalEngUni	TferUnits:	OutputSignalUnit
primary	wet	N/A	1.023	1.02	V	N/A	V
primary	dry	N/A	0.009	0.01	V	N/A	V
primary	Decade box on	210	1.022	1.02	V	kOhm	V
primary	Decade box off	220	0.009	0.01	V	kOhm	V

Sensor Component	Grid Orientation	**Condition**	northwest	**Status**	pass
Sensor Component	Grid Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Grid Angle	**Condition**	about 45 deg	**Status**	pass
Sensor Component	Grid Condition	**Condition**	Fair	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Grid Type	**Condition**	Grid with holes	**Status**	pass

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Texas Electronics	41276-107	PAL190	Eric Hebert	03/07/2013	Precipitation	06307

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
1.0%	2.0%		

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

UseDesc.	Test type:	TferVolume:	Iteration:	TimePerTip:	Eq.Ht:	DAS eng:	Eq.HtUnit:	OSE Unit:	TferUnits:	PctDifference
primary	tip check	10 manual	1	2 sec	0.10	0.10	in	in	ml	
primary	test 1	231.5	1	8 sec	0.50	0.50	in	in	ml	0.0%
primary	test 2	231.5	2	8 sec	0.50	0.49	in	in	ml	-2.0%

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

Infrastructure Data For

Site ID	PAL190	Technician	Eric Hebert	Site Visit Date	03/07/2013

Shelter Make	Shelter Model	Shelter Size
Met One	E-8109-26012-2	720 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	Fair	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	10755-148	PAL190	Eric Hebert	03/07/2013	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.73	0.77		

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

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	24.70	24.64	0.000	24.0	C	-0.68
primary	Temp Mid Range	19.78	19.76	0.000	20.5	C	0.75
primary	Temp Mid Range	23.38	23.33	0.000	22.6	C	-0.77

Field Systems Comments

1 **Parameter:** DasComments

The lower temperature sensor is mounted 1.75 meters above the ground and not 2 meters as stated in the QAPP. This condition was observed and reported during the two previous audit visits.

2 **Parameter:** SiteOpsProcedures

The ozone sample train is leak tested every two weeks.

3 **Parameter:** DocumentationCo

The site logbook is not used for routine weekly site visits.

4 **Parameter:** SitingCriteriaCom

The site is located 40 km southeast of Amarillo TX which has a population of approximately 178,000.

5 **Parameter:** ShelterCleanNotes

New shelter, in very good condition.

6 **Parameter:** MetSensorComme

The surface wetness sensor grid is inclined approximately 45 degrees and is oriented to the northwest.

7 **Parameter:** MetOpMaintCom

Temperature and 2 meter temperature blowers are functioning. The blower status can be observed on the computer screen when testing the blowers, however the data status cannot be verified in the DAS.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	PAL190	**Technician**	Eric Hebert	**Site Visit Date**	03/07/2013

Site Sponsor (agency)	EPA	**USGS Map**	Fortress Cliff
Operating Group	TX A&M University	**Map Scale**	
AQS #	48-381-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	agriculture	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	34.88061
Site Address 1		**Audit Longitude**	-101.664703
Site Address 2		**Audit Elevation**	1053
County	Randall	**Audit Declination**	6.6
City, State	Canyon, TX		**Present**
Zip Code	79015	**Fire Extinguisher**	☑ No inspection date
Time Zone	Central	**First Aid Kit**	☑
Primary Operator	Brent Auvermann	**Safety Glasses**	☐
Primary Op. Phone #	(806) 677-5663	**Safety Hard Hat**	☑
Primary Op. E-mail	b-auvermann@tamu.edu	**Climbing Belt**	☐
Backup Operator	Jack Bush	**Security Fence**	☐
Backup Op. Phone #	(806) 677-5657	**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Step**	☐

Shelter Working Room	☑	**Make**	Met One	**Model**	E-8109-26012-2	**Shelter Size**	720 cuft
Shelter Clean	☑	**Notes**	New shelter, in very good condition.				
Site OK	☑	**Notes**					

Driving Directions

From I27 take exit 99 and go east on Hungate road to the first stop sign. Turn right (south) onto Eastern which is a dirt road. At the next intersection turn left (east) on Lawrence (also dirt). Continue and follow sharp left turn onto Pullman. Continue and follow sharp right turn onto game lands. Continue through two gates and past storage building. Site will be visible on the left.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID PAL190 **Technician** Eric Hebert **Site Visit Date** 03/07/2013

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

Siting Distances OK ☑

Siting Criteria Comment

The site is located 40 km southeast of Amarillo TX which has a population of approximately 178,000.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID	PAL190	Technician	Eric Hebert	Site Visit Date	03/07/2013

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

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

The surface wetness sensor grid is inclined approximately 45 degrees and is oriented to the northwest.

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID PAL190 **Technician** Eric Hebert **Site Visit Date** 03/07/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Solar Radiation	Licor	LI-200	PY55110	06311
Surface Wetness	RM Young	58101	none	06288
Temperature	RM Young	41342VO	12542	06303
Temperature2meter	RM Young	41342VO	12541	06302
Shield (10 meter)	RM Young	Aspirated 43408	none	06167
Shield (2 meter)	RM Young	Aspirated 43408	none	06166
Wind Speed	RM Young	AQ05305	17101wsp	03421
Wind Direction	RM Young	AQ05305	17101wdr	03421
Precipitation	Texas Electronics	TR-525i-HT	41276-107	06307
Met tower	Universal Tower	unknown	none	06322
Relative Humidity	Vaisala	HMP50	B3220003	06223

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

Temperature and 2 meter temperature blowers are functioning. The blower status can be observed on the computer screen when testing the blowers, however the data status cannot be verified in the DAS.

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID	PAL190	Technician	Eric Hebert	Site Visit Date	03/07/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	AT-7200-582	missing
Ozone	ThermoElectron Inc	49i A1NAA	1009241783	000613
Filter pack flow pump	Thomas	107CA18B	12980000141	04286
Zero air pump	Werther International	C 70/4	000829173	06929

Provide any additional 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 PAL190 **Technician** Eric Hebert **Site Visit Date** 03/07/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000262
DAS	Campbell	CR3000	2126	000347
Modem	Raven	H4223-C	0934411667	06808
Solar Radiation Translator	RM Young	70101-X	none	06310

Provide any additional 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 lower temperature sensor is mounted 1.75 meters above the ground and not 2 meters as stated in the QAPP. This condition was observed and reported during the two previous audit visits.

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID	PAL190	Technician	Eric Hebert	Site Visit Date	03/07/2013

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Feb 2005	☐
HASP	☑	Nov 2009	☑
Field Ops Manual	☐		☐
Calibration Reports	☑	Electronic copy	☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

The site logbook is not used for routine weekly site visits.

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID	PAL190	Technician	Eric Hebert	Site Visit Date	03/07/2013

Site operation procedures

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

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	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

Provide any additional 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 leak tested every two weeks.

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID	PAL190	Technician	Eric Hebert	Site Visit Date	03/07/2013

Site operation procedures

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

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

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

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CKT136-Sandy Grenville-03/09/2013						
1	3/9/2013	Computer	Dell	000247	D520	unknown
2	3/9/2013	DAS	Campbell	000354	CR3000	2132
3	3/9/2013	Elevation	Elevation	None	1	None
4	3/9/2013	Filter pack flow pump	Thomas	02361	107CA18	0290006116
5	3/9/2013	Flow Rate	Apex	000468	AXMC105LPMDPCV	illegible
6	3/9/2013	Infrastructure	Infrastructure	none	none	none
7	3/9/2013	Modem	Raven	06585	H4223-C	0844381259
8	3/9/2013	Ozone	ThermoElectron Inc	000617	49i A1NAA	1009241780
9	3/9/2013	Ozone Standard	ThermoElectron Inc	000433	49i A3NAA	CM08200009
10	3/9/2013	Sample Tower	Aluma Tower	03512	A	none
11	3/9/2013	Shelter Temperature	Campbell	none	107-L	none
12	3/9/2013	Siting Criteria	Siting Criteria	None	1	None
13	3/9/2013	Temperature	RM Young	06500	41342VC	14605
14	3/9/2013	Zero air pump	Werther International	06902	PC70/4	000829157

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2132	CKT136	Sandy Grenville	03/09/2013	DAS	Primary

Das Date: 3 /9 /2013
Das Time: 13:32:00
Das Day: 68

Audit Date 3 /9 /2013
Audit Time 13:32:00
Audit Day 68

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0003	0.0002	0.0003

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

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0000	V	V	0.0001
7	0.1000	0.0998	0.1000	V	V	0.0002
7	0.3000	0.2997	0.2999	V	V	0.0002
7	0.5000	0.4996	0.4998	V	V	0.0002
7	0.7000	0.6996	0.6999	V	V	0.0003
7	0.9000	0.8995	0.8997	V	V	0.0002
7	1.0000	0.9994	0.9997	V	V	0.0003

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	CKT136	Sandy Grenville	03/09/2013	Flow Rate	000468

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

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

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
1.27%	1.32%			

Cal Factor Zero	-0.04
Cal Factor Full Scale	0.97
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	0.005	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.005	-0.03	l/m	l/m	
primary	test pt 1	1.545	1.520	1.53	1.528	1.50	l/m	l/m	-1.32%
primary	test pt 2	1.545	1.519	1.54	1.530	1.50	l/m	l/m	-1.25%
primary	test pt 3	1.545	1.519	1.54	1.528	1.50	l/m	l/m	-1.25%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	330 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.4 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.7 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241780	CKT136	Sandy Grenville	03/09/2013	Ozone	000617

Slope:	0.99158	**Slope:**	0.00000
Intercept	-0.26696	**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	1.00121	**Intercept**	-0.18383
Cert Date	1/2/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.5%	2.4%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.10	0.28	0.18	ppb	
primary	2	36.89	37.02	36.14	ppb	-2.38%
primary	3	51.32	51.44	50.70	ppb	-1.44%
primary	4	80.11	80.19	79.45	ppb	-0.92%
primary	5	101.29	101.35	100.20	ppb	-1.13%

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	< 1 %	pass
Offset	0.2	pass
Span	1.008	pass
Cell B Freq.	85.2 kHz	pass
System Memo	See comments	pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.63 lpm	pass
Cell A Tmp.	31.3 C	pass
Cell A Pressure	709 mmHg	pass
Cell A Noise	1.2 ppb	pass
Cell A Freq.	78.9 kHz	Fail
Cell A Flow	0.67 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	14605	CKT136	Sandy Grenville	03/09/2013	Temperature	06500

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

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.20	0.27		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.10	0.18	0.000	0.4	C	0.23
primary	Temp Mid Range	24.93	24.91	0.000	25.0	C	0.09
primary	Temp High Range	49.10	48.97	0.000	48.7	C	-0.27

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

Infrastructure Data For

Site ID	CKT136	Technician	Sandy Grenville	Site Visit Date	03/09/2013

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2116-2)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Shelter Roof	Condition	Good	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	Poor	Status	Fail
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CKT136	Sandy Grenville	03/09/2013	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.42	0.42		

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

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	23.40	23.38	0.000	23.8	C	0.42
primary	Temp Mid Range	23.20	23.18	0.000	23.6	C	0.42
primary	Temp Mid Range	23.20	23.18	0.000	23.6	C	0.42

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	CKT136	Sandy Grenville	03/09/2013	Moisture Present	Apex	3721	☐	☐
The filter sample tubing has drops of moisture in low sections outside the shelter.								
Ozone	CKT136	Sandy Grenville	03/09/2013	Cell A Freq.	ThermoElectron	3464	☐	☑
This analyzer diagnostic check is outside the manufacturer's recommended value.								

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The filter is changed with the sample pump running while the tower is in the down position. This may be due to a mislabeled switch for the sample pump. This condition was also reported following the previous audit visit.

2 **Parameter:** ShelterCleanNotes

The shelter is very clean and well organized.

3 **Parameter:** PollAnalyzerCom

The meteorological tower has been removed. The sample tower is in poor condition. The upper section is bent, and the lower section will not align and lock in place. Wire ties are used to secure the tower in the upright position.

4 **Parameter:** MetOpMaintCom

The temperature sensor has been installed at approximately 8 meters from the ground on the sample tower in a naturally aspirated shield.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	CKT136	**Technician**	Sandy Grenville	**Site Visit Date**	03/09/2013

Site Sponsor (agency)	EPA	**USGS Map**	Dingus
Operating Group	private	**Map Scale**	
AQS #	21-175-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	37.9211
Deposition Measurement	dry	**QAPP Longitude**	-83.0658
Land Use	woodland - mixed	**QAPP Elevation Meters**	455
Terrain	rolling	**QAPP Declination**	5.9
Conforms to MLM	Yes	**QAPP Declination Date**	2/22/2006
Site Telephone	(606) 522-3560	**Audit Latitude**	37.92146
Site Address 1	7687 Highway 437	**Audit Longitude**	-83.066295
Site Address 2		**Audit Elevation**	376
County	Morgan	**Audit Declination**	-6.1
City, State	West Liberty, KY		
Zip Code	41472	**Fire Extinguisher** ☑	Inspected May 1993
Time Zone	Eastern	**First Aid Kit** ☐	
Primary Operator	Carolyn Montgomery	**Safety Glasses** ☑	
Primary Op. Phone #	(606) 522-4318	**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator	Mason Montgomery	**Security Fence** ☑	
Backup Op. Phone #	(606) 522-4318	**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room ☑ **Make** Ekto **Model** 8810 (s/n 2116-2) **Shelter Size** 640 cuft

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

Site OK ☑ **Notes**

Driving Directions From I-64 in Morehead go south on route 519 to West Liberty. At the first traffic light in West Liberty, turn left (east) onto route 460. Continue approximately 1 mile and turn left onto route 172. continue approximately 8 miles and then turn right onto route 437. Continue approximately 8 miles staying on 437. The road will climb a hill, turn left onto a dirt road at the top of the hill before the closed gas station). There is a sign for "KY Ridgerunners". The site is approximately 1/2 mile on the left.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID CKT136 **Technician** Sandy Grenville **Site Visit Date** 03/09/2013

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID CKT136 **Technician** Sandy Grenville **Site Visit Date** 03/09/2013

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

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

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID	CKT136	Technician	Sandy Grenville	Site Visit Date	03/09/2013

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

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342VC	14605	06500

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

The temperature sensor has been installed at approximately 8 meters from the ground on the sample tower in a naturally aspirated shield.

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID CKT136 **Technician** Sandy Grenville **Site Visit Date** 03/09/2013

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	A	none	03512
Ozone	ThermoElectron Inc	49i A1NAA	1009241780	000617
Filter pack flow pump	Thomas	107CA18	0290006116	02361
Zero air pump	Werther International	PC70/4	000829157	06902

Provide any additional 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 sample tower is in poor condition. The upper section is bent, and the lower section will not align and lock in place. Wire ties are used to secure the tower in the upright position.

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID CKT136 **Technician** Sandy Grenville **Site Visit Date** 03/09/2013

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000247
DAS	Campbell	CR3000	2132	000354
Modem	Raven	H4223-C	0844381259	06585

Provide any additional 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 CKT136 **Technician** Sandy Grenville **Site Visit Date** 03/09/2013

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☐		☐
HASP	☑	Nov 2001	☑
Field Ops Manual	☑	Oct 2001	☐
Calibration Reports	☑	Electronic copy	☑
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 CKT136 **Technician** Sandy Grenville **Site Visit Date** 03/09/2013

Site operation procedures

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

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

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

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

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

1	Do multi-point calibration gases go through the complete sample train including all filters?	☑	
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	SSRF, 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 CKT136 **Technician** Sandy Grenville **Site Visit Date** 03/09/2013

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed various times
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, 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 filter is changed with the sample pump running while the tower is in the down position. This may be due to a mislabeled switch for the sample pump. This condition was also reported following the previous audit visit.

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: 5/25/2013 3:48:13 PM

SiteVisitDate	Site	Technician
02/13/2013	CVL151	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.16	c	**P**
2	Temperature max error	P	4	0.5	6	0.38	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00458	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.04842	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.5	%	**P**
7	Ozone % difference max	P	7	10	4	0.6	%	**P**
8	Flow Rate average % difference	P	10	5	6	1.53	%	**P**
9	Flow Rate max % difference	P	10	5	6	1.7	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	28	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	3	0.06	c	**P**
13	Shelter Temperature max error	P	5	1	3	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:** DocumentationCo

The site operations manual does not apply to the currently installed instrumentation.

2 **Parameter:** SitingCriteriaCom

The site is located in a Pine forest on USFS managed land. The tree line has been cut back to at least 17 meters from the site.

3 **Parameter:** ShelterCleanNotes

The shelter is somewhat cluttered. The floor and lower walls are beginning to rot.

EEMS Spot Report

Data Compiled: 5/25/2013 4:35:44 PM

SiteVisitDate	Site	Technician
02/14/2013	CAD150	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.08	c	**P**
2	Temperature max error	P	4	0.5	6	0.13	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98806	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.40998	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.8	%	**P**
7	Ozone % difference max	P	7	10	4	1.0	%	**P**
8	Flow Rate average % difference	P	10	5	6	2.02	%	**P**
9	Flow Rate max % difference	P	10	5	6	2.15	%	**P**
10	DAS Time maximum error	P	0	5	1	0.05	min	**P**
11	DAS Voltage average error	P	7	0.003	28	0.0002	V	**P**
12	Shelter Temperature average error	P	5	1	3	0.07	c	**P**
13	Shelter Temperature max error	P	5	1	3	0.14	c	**P**

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone analyzer sample train is leak checked by capping the inlet every two weeks.

2 **Parameter:** ShelterCleanNotes

The bottom of the shelter walls are very badly deteriorated. The floor and ceiling have been repaired.

3 **Parameter:** PollAnalyzerCom

Both the filter pack flow tubing and ozone sample line fold tightly against the tower hinge when the tower is lowered. This could eventually cause damage to the tubing.

EEMS Spot Report

Data Compiled: 5/27/2013 3:04:11 PM

SiteVisitDate	Site	Technician
02/15/2013	ALC188	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	3	0.31	c	**P**
2	Temperature max error	P	4	0.5	3	0.36	c	**P**
3	Ozone Slope	P	0	1.1	4	1.01151	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.34553	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.8	%	**P**
7	Ozone % difference max	P	7	10	4	1.1	%	**P**
8	Flow Rate average % difference	P	10	5	2	3.75	%	**P**
9	Flow Rate max % difference	P	10	5	2	3.87	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	28	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	3	0.43	c	**P**
13	Shelter Temperature max error	P	5	1	3	0.93	c	**P**

SiteVisitDate	Site	Technician
02/15/2013	ALC188	Sandy Grenville

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator uses the same gloves to remove and install the filter pack.

2 **Parameter:** SitingCriteriaCom

The site is well located with respect to CASTNET siting criteria, however there is a small campground 0.5 km to the northwest which may be a source of smoke.

3 **Parameter:** ShelterCleanNotes

The site is clean and neat.

4 **Parameter:** PollAnalyzerCom

The site was revisited on 3/3/2013 to complete the ozone performance evaluation. The level 2 ozone standard malfunctioned during the audit visit performed on 2/15/213.

5 **Parameter:** MetSensorComme

The temperature shield is pointing south and not north as stated in the QAPP. This condition was observed and reported during the previous site audit visits in February 2009 and 2011.

EEMS Spot Report

Data Compiled: 5/27/2013 2:50:58 PM

SiteVisitDate	Site	Technician
02/17/2013	SUM156	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.98315	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.12501	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.7	%	**P**
5	Ozone % difference max	P	7	10	4	2.4	%	**P**

EEMS Spot Report

Data Compiled: 5/27/2013 1:59:56 PM

SiteVisitDate	Site	Technician
02/28/2013	SND152	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00643	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.28276	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.2	%	**P**
5	Ozone % difference max	P	7	10	4	0.4	%	**P**

EEMS Spot Report

Data Compiled: 5/27/2013 1:47:10 PM

SiteVisitDate	Site	Technician
02/28/2013	GAS153	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01205	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.25812	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.0	%	**P**
5	Ozone % difference max	P	7	10	4	1.8	%	**P**

Field Performance Comments

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

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

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

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

EEMS Spot Report

Data Compiled: 5/27/2013 1:33:00 PM

SiteVisitDate	Site	Technician
02/20/2013	IRL141	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00192	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.84313	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.8	%	**P**
5	Ozone % difference max	P	7	10	4	1.1	%	**P**

EEMS Spot Report

Data Compiled: 5/27/2013 3:35:21 PM

SiteVisitDate	Site	Technician
03/01/2013	MAC426	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.33	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.43	c	**P**
3	Wind Speed average error below 5m/s in m/s	P	3	0.5	4	0.01	m/s	**P**
4	Wind Speed max error below 5m/s in m/s	P	3	0.5	4	0.03	m/s	**P**
5	Wind Speed average % difference above 5 m/s	P	3	5	4	0.1	%	**P**
6	Wind Speed max % difference above 5 m/s	P	3	5	4	0.3	%	**P**
7	Wind Speed Torque average error	P	3	0.5	1	0.20	g-cm	**P**
8	Wind Speed Torque max error	P	3	0.5	1	0.2	g-cm	**P**
9	Wind Direction Input Deg True average error (de	P	2	5	10	1.4	degrees	**P**
10	Wind Direction Input Deg True max error (deg)	P	2	5	10	2	degrees	**P**
11	Wind Direction Linearity average error (deg)	P	2	5	16	1.5	degrees	**P**
12	Wind Direction Linearity max error (deg)	P	2	5	16	5	degrees	**P**
13	Wind Direction Torque average error	P	2	20	1	6	g-cm	**P**
14	Wind Direction Torque max error	P	2	20	1	7	g-cm	**P**
15	Temperature average error	P	4	0.5	3	0.31	c	**P**
16	Temperature max error	P	4	0.5	3	0.34	c	**P**
17	Relative Humidity average above 85%	P	6	10	2	2.2	%	**P**
18	Relative Humidity max above 85%	P	6	10	2	2.2	%	**P**
19	Relative Humidity average below 85%	P	6	10	4	14.9	%	**Fail**
20	Relative Humidity max below 85%	P	6	10	4	27.4	%	**Fail**
21	Solar Radiation % diff of avg	P	3	10	18	6.8	%	**P**
22	Solar Radiation % diff of max STD value	P	3	10	18	9.2	%	**P**
23	Precipitation average % difference	P	1	10	2	6.0	%	**P**
24	Precipitation max % difference	P	1	10	2	8.0	%	**P**
25	Ozone Slope	P	0	1.1	4	1.03139	unitless	**P**
26	Ozone Intercept	P	0	5	4	1.44173	ppb	**P**
27	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
28	Ozone % difference avg	P	7	10	4	5.4	%	**P**
29	Ozone % difference max	P	7	10	4	6.7	%	**P**
30	Flow Rate average % difference	P	10	5	2	0.84	%	**P**
31	Flow Rate max % difference	P	10	5	2	0.94	%	**P**
32	DAS Time maximum error	P	0	5	1	0.45	min	**P**
33	DAS Voltage average error	P	13	0.003	21	0.0001	V	**P**
34	DAS Voltage average error	P	8	0.003	21	0.0002	V	**P**

SiteVisitDate	Site	Technician
03/01/2013	MAC426	Eric Hebert

35	Shelter Temperature average error	P	5	1	6	0.98	c	**P**
36	Shelter Temperature max error	P	5	1	6	1.4	c	**Fail**

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** Filter Position **CommentCode** 202

The filter attachment plate is mounted too high in the enclosure resulting in the filter being recessed in the enclosure and not exposed in the standard geometric orientation.

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operators are very knowledgeable with air quality monitoring. They are doing a very good job with site activities and filter handling.

2 **Parameter:** SitingCriteriaCom

Bowling Green is within 40 km of the site. The site is in a hay field which is harvested twice per year. The area to the west and south is comprised of livestock farms including cattle and poultry. The coordinates provided in the QAPP are incorrect.

3 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 5/26/2013 4:28:14 PM

SiteVisitDate	Site	Technician
03/03/2013	CHE185	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.15	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.17	c	**P**
3	Wind Speed average error below 5m/s in m/s	P	3	0.5	8	0.12	m/s	**P**
4	Wind Speed max error below 5m/s in m/s	P	3	0.5	8	0.30	m/s	**P**
5	Wind Speed average % difference above 5 m/s	P	3	5	8	0.5	%	**P**
6	Wind Speed max % difference above 5 m/s	P	3	5	8	0.7	%	**P**
7	Wind Speed Torque average error	P	3	0.5	1	1.00	g-cm	**Fail**
8	Wind Speed Torque max error	P	3	0.5	1	1.1	g-cm	**Fail**
9	Wind Direction Input Deg True average error (de	P	2	5	8	0.5	degrees	**P**
10	Wind Direction Input Deg True max error (deg)	P	2	5	8	2	degrees	**P**
11	Wind Direction Linearity average error (deg)	P	2	5	16	1.0	degrees	**P**
12	Wind Direction Linearity max error (deg)	P	2	5	16	3	degrees	**P**
13	Wind Direction Torque average error	P	2	20	1	22	g-cm	**Fail**
14	Wind Direction Torque max error	P	2	20	1	30	g-cm	**Fail**
15	Temperature average error	P	4	0.5	3	0.13	c	**P**
16	Temperature max error	P	4	0.5	3	0.24	c	**P**
17	Relative Humidity average above 85%	P	6	10	1	1.5	%	**P**
18	Relative Humidity max above 85%	P	6	10	1	1.5	%	**P**
19	Relative Humidity average below 85%	P	6	10	2	7.2	%	**P**
20	Relative Humidity max below 85%	P	6	10	2	8.1	%	**P**
21	Solar Radiation % diff of avg	P	9	10	10	1.41	%	**P**
22	Solar Radiation % diff of max STD value	P	9	10	10	1.7	%	**P**
23	Precipitation average % difference	P	1	10	2	2.0	%	**P**
24	Precipitation max % difference	P	1	10	2	4.0	%	**P**
25	Ozone Slope	P	0	1.1	4	0.99014	unitless	**P**
26	Ozone Intercept	P	0	5	4	2.2714	ppb	**P**
27	Ozone correlation	P	0	0.995	4	0.99990	unitless	**P**
28	Ozone % difference avg	P	7	10	4	3.4	%	**P**
29	Ozone % difference max	P	7	10	4	6.5	%	**P**
30	Flow Rate average % difference	P	10	5	2	1.38	%	**P**
31	Flow Rate max % difference	P	10	5	2	1.65	%	**P**
32	DAS Time maximum error	P	0	5	1	0.03	min	**P**
33	DAS Voltage average error	P	6	0.003	7	0.0010	V	**P**
34	Surface Wetness Sensitivity test on	P	9	10000	1	230	k ohms	**P**

SiteVisitDate	Site	Technician
03/03/2013	CHE185	Eric Hebert

35	Surface Wetness Sensitivity test off	P	9	10000	1	240	k ohms	**P**
36	Surface Wetness Response	P	9	0.5	1	1.05		**P**
37	Shelter Temperature average error	P	5	1	9	0.58	c	**P**
38	Shelter Temperature max error	P	5	1	9	0.82	c	**P**

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site is well maintained and operated. Very good sample change out procedures are being used by the site operator.

2 **Parameter:** SitingCriteriaCom

The site is located in a pasture with grazing cattle sometimes as close as 5 meters.

3 **Parameter:** ShelterCleanNotes

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

4 **Parameter:** PollAnalyzerCom

The ozone analyzer response to audit gas was observed to be very slow. This was discussed with the site operator, and it was recommended that the monitor averaging interval be changed to a shorter period. It was also suggested that the sample line be changed from 3/8 inch tubing to 1/4 inch tubing.

EEMS Spot Report

Data Compiled: 5/26/2013 5:11:24 PM

SiteVisitDate	Site	Technician
03/05/2013	CDZ171	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.13	c	**P**
2	Temperature max error	P	4	0.5	6	0.21	c	**P**
3	Ozone Slope	P	0	1.1	4	1.01314	unitless	**P**
4	Ozone Intercept	P	0	5	4	-1.30738	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.7	%	**P**
7	Ozone % difference max	P	7	10	4	1.3	%	**P**
8	Flow Rate average % difference	P	10	5	3	2.95	%	**P**
9	Flow Rate max % difference	P	10	5	3	3.18	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	35	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	3	1.1	c	**Fail**
13	Shelter Temperature max error	P	5	1	3	1.23	c	**Fail**

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Tower is lowered and filter changed without downing ozone channel.

2 **Parameter:** SitingCriteriaCom

The site is in a corn field with limited agricultural operations within 15 meters.

3 **Parameter:** ShelterCleanNotes

The shelter floor and door have been repaired since the previous audit visit. The shelter is still cluttered and dirty.

4 **Parameter:** MetSensorComme

The temperature sensor has been installed in a naturally aspirated shield on the sample tower.

EEMS Spot Report

Data Compiled: 5/26/2013 10:36:19 PM

SiteVisitDate	Site	Technician
03/06/2013	BBE401	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	P	3	0.5	4	0.01	m/s	**P**
2	Wind Speed max error below 5m/s in m/s	P	3	0.5	4	0.03	m/s	**P**
3	Wind Speed average % difference above 5 m/s	P	3	5	4	0.2	%	**P**
4	Wind Speed max % difference above 5 m/s	P	3	5	4	0.4	%	**P**
5	Wind Speed Torque average error	P	3	0.5	1	0.25	g-cm	**P**
6	Wind Speed Torque max error	P	3	0.5	1	0.3	g-cm	**P**
7	Wind Direction Input Deg True average error (de	P	2	5	12	1.8	degrees	**P**
8	Wind Direction Input Deg True max error (deg)	P	2	5	12	3	degrees	**P**
9	Wind Direction Linearity average error (deg)	P	2	5	24	0.8	degrees	**P**
10	Wind Direction Linearity max error (deg)	P	2	5	24	2	degrees	**P**
11	Wind Direction Torque average error	P	2	20	1	10	g-cm	**P**
12	Wind Direction Torque max error	P	2	20	1	10	g-cm	**P**
13	Temperature average error	P	4	0.5	9	0.16	c	**P**
14	Temperature max error	P	4	0.5	9	0.22	c	**P**
15	Relative Humidity average above 85%	P	6	10	2	2.0	%	**P**
16	Relative Humidity max above 85%	P	6	10	2	2.0	%	**P**
17	Relative Humidity average below 85%	P	6	10	4	1.8	%	**P**
18	Relative Humidity max below 85%	P	6	10	4	2.5	%	**P**
19	Solar Radiation % diff of avg	P	9	10	15	8.95	%	**P**
20	Solar Radiation % diff of max STD value	P	9	10	15	8.7	%	**P**
21	Precipitation average % difference	P	1	10	2	3.0	%	**P**
22	Precipitation max % difference	P	1	10	2	4.0	%	**P**
23	Ozone Slope	P	0	1.1	4	0.98260	unitless	**P**
24	Ozone Intercept	P	0	5	4	2.099	ppb	**P**
25	Ozone correlation	P	0	0.995	4	0.99991	unitless	**P**
26	Ozone % difference avg	P	7	10	4	2.0	%	**P**
27	Ozone % difference max	P	7	10	4	3.5	%	**P**
28	Flow Rate average % difference	P	10	5	6	0.43	%	**P**
29	Flow Rate max % difference	P	10	5	6	0.70	%	**P**
30	DAS Time maximum error	P	0	5	1	0.02	min	**P**
31	DAS Voltage average error	P	10	0.003	35	0.0000	V	**P**
32	DAS Voltage average error	P	2	0.003	35	0.0000	V	**P**
33	Shelter Temperature average error	P	5	1	6	0.44	c	**P**
34	Shelter Temperature max error	P	5	1	6	0.61	c	**P**

SiteVisitDate	Site	Technician
03/06/2013	BBE401	Eric Hebert

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone sample line is leak tested every month when the inlet filter is replaced.

2 **Parameter:** ShelterCleanNotes

The shelter is clean, neat, and well organized.

3 **Parameter:** MetOpMaintCom

The signal cables are showing signs of wear. The precipitation gage signal cable is in poor condition.

EEMS Spot Report

Data Compiled: 5/27/2013 9:39:16 AM

SiteVisitDate	Site	Technician
03/06/2013	MCK131	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.08	c	**P**
2	Temperature max error	P	4	0.5	6	0.12	c	**P**
3	Ozone Slope	P	0	1.1	4	1.016	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.62386	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.5	%	**P**
7	Ozone % difference max	P	7	10	4	1.2	%	**P**
8	Flow Rate average % difference	P	10	5	3	0.24	%	**P**
9	Flow Rate max % difference	P	10	5	3	0.40	%	**P**
10	DAS Time maximum error	P	0	5	1	0.02	min	**P**
11	DAS Voltage average error	P	7	0.003	7	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	3	1.53	c	**Fail**
13	Shelter Temperature max error	P	5	1	3	1.7	c	**Fail**

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The shelter is neat, clean, and well organized.

EEMS Spot Report

Data Compiled: 5/27/2013 10:48:55 AM

SiteVisitDate	Site	Technician
03/06/2013	MCK231	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.15	c	**P**
2	Temperature max error	P	4	0.5	6	0.30	c	**P**
3	Ozone Slope	P	0	1.1	4	0.86335	unitless	**Fail**
4	Ozone Intercept	P	0	5	4	-1.19057	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
6	Ozone % difference avg	P	7	10	4	15.7	%	**Fail**
7	Ozone % difference max	P	7	10	4	17.1	%	**Fail**
8	Flow Rate average % difference	P	10	5	4	2.81	%	**P**
9	Flow Rate max % difference	P	10	5	4	2.98	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	28	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	3	1.11	c	**Fail**
13	Shelter Temperature max error	P	5	1	3	1.25	c	**Fail**

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The site instruments are located in the MCK131 shelter. The same site operator is servicing both sites.

2 **Parameter:** PollAnalyzerCom

The ozone analyzer failed the performance evaluation. The field operations staff at AMEC were aware of the problem and had sent a replacement ozone monitor to the site operator for installation. The site operator had not been informed of the problem and had not replaced the site monitor prior to the audit visit. The site will be revisited for an ozone PE following the replacement of the site ozone analyzer.

EEMS Spot Report

Data Compiled: 5/27/2013 8:55:27 AM

SiteVisitDate	Site	Technician
03/07/2013	PAL190	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.04	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.07	c	**P**
3	Wind Speed average error below 5m/s in m/s	P	3	0.5	8	0.05	m/s	**P**
4	Wind Speed max error below 5m/s in m/s	P	3	0.5	8	0.20	m/s	**P**
5	Wind Speed average % difference above 5 m/s	P	3	5	8	0.0	%	**P**
6	Wind Speed max % difference above 5 m/s	P	3	5	8	0.0	%	**P**
7	Wind Speed Torque average error	P	3	0.5	1	0.35	g-cm	**P**
8	Wind Speed Torque max error	P	3	0.5	1	0.4	g-cm	**P**
9	Wind Direction Input Deg True average error (de	P	2	5	8	1.2	degrees	**P**
10	Wind Direction Input Deg True max error (deg)	P	2	5	8	3	degrees	**P**
11	Wind Direction Linearity average error (deg)	P	2	5	16	1.0	degrees	**P**
12	Wind Direction Linearity max error (deg)	P	2	5	16	2	degrees	**P**
13	Wind Direction Torque average error	P	2	20	1	15	g-cm	**P**
14	Wind Direction Torque max error	P	2	20	1	18	g-cm	**P**
15	Temperature average error	P	4	0.5	9	0.04	c	**P**
16	Temperature max error	P	4	0.5	9	0.07	c	**P**
17	Relative Humidity average above 85%	P	6	10	2	9.1	%	**P**
18	Relative Humidity max above 85%	P	6	10	2	9.1	%	**P**
19	Relative Humidity average below 85%	P	6	10	4	3.3	%	**P**
20	Relative Humidity max below 85%	P	6	10	4	4.9	%	**P**
21	Solar Radiation % diff of avg	P	9	10	12	1.52	%	**P**
22	Solar Radiation % diff of max STD value	P	9	10	12	0.90	%	**P**
23	Precipitation average % difference	P	1	10	2	1.0	%	**P**
24	Precipitation max % difference	P	1	10	2	2.0	%	**P**
25	Ozone Slope	P	0	1.1	4	0.98874	unitless	**P**
26	Ozone Intercept	P	0	5	4	0.63510	ppb	**P**
27	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
28	Ozone % difference avg	P	7	10	4	0.5	%	**P**
29	Ozone % difference max	P	7	10	4	0.7	%	**P**
30	Flow Rate average % difference	P	10	5	3	1.33	%	**P**
31	Flow Rate max % difference	P	10	5	3	1.43	%	**P**
32	DAS Time maximum error	P	0	5	1	0.00	min	**P**
33	DAS Voltage average error	P	7	0.003	35	0.0000	V	**P**
34	Surface Wetness Sensitivity test on	P	12	10000	1	210	k ohms	**P**

SiteVisitDate	Site	Technician
03/07/2013	PAL190	Eric Hebert

35	Surface Wetness Sensitivity test off	P	12	10000	1	220	k ohms	**P**
36	Surface Wetness Response	P	12	0.5	1	1.02		**P**
37	Shelter Temperature average error	P	5	1	9	0.73	c	**P**
38	Shelter Temperature max error	P	5	1	9	0.77	c	**P**

Field Systems Comments

1 **Parameter:** DasComments

The lower temperature sensor is mounted 1.75 meters above the ground and not 2 meters as stated in the QAPP. This condition was observed and reported during the two previous audit visits.

2 **Parameter:** SiteOpsProcedures

The ozone sample train is leak tested every two weeks.

3 **Parameter:** DocumentationCo

The site logbook is not used for routine weekly site visits.

4 **Parameter:** SitingCriteriaCom

The site is located 40 km southeast of Amarillo TX which has a population of approximately 178,000.

5 **Parameter:** ShelterCleanNotes

New shelter, in very good condition.

6 **Parameter:** MetSensorComme

The surface wetness sensor grid is inclined approximately 45 degrees and is oriented to the northwest.

7 **Parameter:** MetOpMaintCom

Temperature and 2 meter temperature blowers are functioning. The blower status can be observed on the computer screen when testing the blowers, however the data status cannot be verified in the DAS.

EEMS Spot Report

Data Compiled: 5/27/2013 1:12:17 PM

SiteVisitDate	Site	Technician
03/09/2013	CKT136	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	3	0.20	c	**P**
2	Temperature max error	P	4	0.5	3	0.27	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99158	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.26696	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.5	%	**P**
7	Ozone % difference max	P	7	10	4	2.4	%	**P**
8	Flow Rate average % difference	P	10	5	2	1.27	%	**P**
9	Flow Rate max % difference	P	10	5	2	1.32	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	14	0.0002	V	**P**
12	Shelter Temperature average error	P	5	1	9	0.42	c	**P**
13	Shelter Temperature max error	P	5	1	9	0.42	c	**P**

SiteVisitDate	Site	Technician
03/09/2013	CKT136	Sandy Grenville

Field Performance Comments

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

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

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The filter is changed with the sample pump running while the tower is in the down position. This may be due to a mislabeled switch for the sample pump. This condition was also reported following the previous audit visit.

2 **Parameter:** ShelterCleanNotes

The shelter is very clean and well organized.

3 **Parameter:** PollAnalyzerCom

The meteorological tower has been removed. The sample tower is in poor condition. The upper section is bent, and the lower section will not align and lock in place. Wire ties are used to secure the tower in the upright position.

4 **Parameter:** MetOpMaintCom

The temperature sensor has been installed at approximately 8 meters from the ground on the sample tower in a naturally aspirated shield.

EEMS Spot Report

Data Compiled: 5/27/2013 7:51:17 PM

SiteVisitDate	Site	Technician
03/29/2013	COW137	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.02623	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.19778	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.5	%	**P**
5	Ozone % difference max	P	7	10	4	2.8	%	**P**

EEMS Spot Report

Data Compiled: 5/27/2013 8:04:59 PM

SiteVisitDate	Site	Technician
03/30/2013	ESP127	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00977	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.33906	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.6	%	**P**
5	Ozone % difference max	P	7	10	4	0.6	%	**P**

EEMS Spot Report

Data Compiled: 5/27/2013 8:19:25 PM

SiteVisitDate	Site	Technician
03/30/2013	SPD111	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.0111	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.20253	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.0	%	**P**
5	Ozone % difference max	P	7	10	4	2.1	%	**P**

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SUM156-Sandy Grenville-02/17/2013					
1 2/17/2013	DAS	Campbell	000335	CR3000	2114
2 2/17/2013	Ozone	ThermoElectron Inc	00823	49i A1NAA	1009241790
3 2/17/2013	Ozone Standard	ThermoElectron Inc	000453	49i A3NAA	CM08200027
4 2/17/2013	Zero air pump	Werther International	06876	C 70/4	000814286

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241790	SUM156	Sandy Grenville	02/17/2013	Ozone	00823

Slope:	0.98315	**Slope:**	0.00000
Intercept	-0.12501	**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	1.00121	**Intercept**	-0.18383
Cert Date	1/2/2013	**CorrCoff**	1.00000

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

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.25	0.43	0.14	ppb	
primary	2	46.96	47.08	46.79	ppb	-0.62%
primary	3	65.34	65.44	63.88	ppb	-2.38%
primary	4	85.70	85.78	83.90	ppb	-2.19%
primary	5	109.55	109.60	107.80	ppb	-1.64%

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	0.3	pass
Span	1.032	pass
Cell B Freq.	111.3 lHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.69 lpm	pass
Cell A Tmp.	39.2 C	pass
Cell A Pressure	745 mmHg	pass
Cell A Noise	0.9 ppb	pass
Cell A Freq.	105.8 kHz	pass
Cell A Flow	0.68 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
IRL141-Sandy Grenville-02/20/2013					
1 2/20/2013	Computer	Dell	000245	D520	unknown
2 2/20/2013	DAS	Campbell	000340	CR3000	2119
3 2/20/2013	Modem	Raven	06384	H4222-C	0802310499
4 2/20/2013	Ozone	ThermoElectron Inc	000724	49i A1NAA	1105347328
5 2/20/2013	Ozone Standard	ThermoElectron Inc	000694	49i A3NAA	1030244815
6 2/20/2013	Sample Tower	Aluma Tower	000020	B	AT-61152-A-H8-F
7 2/20/2013	UPS	APC	06790	RS900	unknown
8 2/20/2013	Zero air pump	Werther International	06898	C 70/4	000821905

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347328	IRL141	Sandy Grenville	02/20/2013	Ozone	000724

Slope:	1.00192	**Slope:**	0.00000
Intercept	-0.84313	**Intercept**	0.00000
CorrCoff	0.99996	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00121	**Intercept**	-0.18383
Cert Date	1/2/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.8%	1.1%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.14	0.32	-0.93	ppb	
primary	2	35.57	35.71	35.32	ppb	-1.09%
primary	3	66.02	66.12	65.72	ppb	-0.60%
primary	4	85.84	85.91	85.30	ppb	-0.71%
primary	5	111.65	111.69	110.70	ppb	-0.89%

Sensor Component	Condition	Status
Cell B Noise	1.4 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-0.10	pass
Span	1.011	pass
Cell B Freq.	91.7 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.73 lpm	pass
Cell A Tmp.	30.4 C	pass
Cell A Pressure	736 mmHg	pass
Cell A Noise	1.1 ppb	pass
Cell A Freq.	89.5 kHz	pass
Cell A Flow	0.74 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*
SND152-Sandy Grenville-02/28/2013					
1 2/28/2013	Computer	Dell	000260	D520	unknown
2 2/28/2013	DAS	Campbell	000357	CR3000	2135
3 2/28/2013	Modem	Raven	06458	V4221-V	0808337422
4 2/28/2013	Ozone	ThermoElectron Inc	000619	49i A1NAA	1009241791
5 2/28/2013	Ozone Standard	ThermoElectron Inc	000215	49i A3NAA	0622717856
6 2/28/2013	Sample Tower	Aluma Tower	000148	B	none
7 2/28/2013	Zero air pump	Werther International	06867	C 70/4	000814279

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241791	SND152	Sandy Grenville	02/28/2013	Ozone	000619

Slope:	1.00643	**Slope:**	0.00000
Intercept	-0.28276	**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	1.00121	**Intercept**	-0.18383
Cert Date	1/2/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.2%	0.4%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	-0.08	0.10	-0.29	ppb	
primary	2	30.69	30.83	30.86	ppb	0.10%
primary	3	50.66	50.78	50.97	ppb	0.37%
primary	4	79.72	79.80	79.82	ppb	0.03%
primary	5	102.01	102.07	102.50	ppb	0.42%

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	1.04	pass
Cell B Freq.	99.0 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.70 lpm	pass
Cell A Tmp.	34.8 C	pass
Cell A Pressure	711 mmHg	pass
Cell A Noise	0.9 ppb	pass
Cell A Freq.	108.9 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*
GAS153-Sandy Grenville-02/28/2013					
1 2/28/2013	DAS	Campbell	000635	CR3000	4934
2 2/28/2013	Modem	Raven	06805	H4222-C	0934411884
3 2/28/2013	Ozone	ThermoElectron Inc	000729	49i A1NAA	1105347323
4 2/28/2013	Ozone Standard	ThermoElectron Inc	000697	49i A3NAA	1030244814
5 2/28/2013	Sample Tower	Aluma Tower	000138	B	none
6 2/28/2013	UPS	APC	missing	BP6505	NB0009260535
7 2/28/2013	Zero air pump	Werther International	06865	C 70/4	000814277

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347323	GAS153	Sandy Grenville	02/28/2013	Ozone	000729

Slope:	1.01205	**Slope:**	0.00000
Intercept	-0.25812	**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	1.00121	**Intercept**	-0.18383
Cert Date	1/2/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.0%	1.8%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	-0.01	0.17	-0.39	ppb	
primary	2	30.70	30.84	31.39	ppb	1.78%
primary	3	49.84	49.96	50.32	ppb	0.72%
primary	4	80.64	80.72	81.40	ppb	0.84%
primary	5	99.81	99.87	100.70	ppb	0.83%

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	-0.60	pass
Span	1.016	pass
Cell B Freq.	78.6 khz	Fail
System Memo	See comments	pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.73 lpm	pass
Cell A Tmp.	30.9 C	pass
Cell A Pressure	716 mmHg	pass
Cell A Noise	0.8 ppb	pass
Cell A Freq.	79.8 kHz	Fail
Cell A Flow	0.74 lpm	pass
Battery Backup	Not functioning	Fail
Zero Voltage	N/A	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	GAS153	Sandy Grenville	02/28/2013	Cell B Freq.	ThermoElectron	3537	☐	☑
This analyzer diagnostic check is outside the manufacturer's recommended value.								
Ozone	GAS153	Sandy Grenville	02/28/2013	Cell A Freq.	ThermoElectron	3537	☐	☑
This analyzer diagnostic check is outside the manufacturer's recommended value.								

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
COW137-Sandy Grenville-03/29/2013					
1 3/29/2013	DAS	Campbell	000401	CR3000	2529
2 3/29/2013	Ozone	ThermoElectron Inc	000622	49i A1NAA	1009241785
3 3/29/2013	Ozone Standard	ThermoElectron Inc	000686	49i A3NAA	1030244818
4 3/29/2013	UPS	APC	06744	RS900	unknown
5 3/29/2013	Zero air pump	Werther International	06878	C 70/4	000815254

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241785	COW137	Sandy Grenville	03/29/2013	Ozone	000622

Slope:	1.02623	**Slope:**	0.00000
Intercept	-0.19778	**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	1.00121	**Intercept**	-0.18383
Cert Date	1/2/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.5%	2.8%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.09	0.27	-0.12	ppb	
primary	2	30.59	30.73	31.59	ppb	2.80%
primary	3	49.81	49.93	51.09	ppb	2.32%
primary	4	81.19	81.27	83.20	ppb	2.37%
primary	5	100.79	100.85	103.20	ppb	2.33%

Sensor Component	Condition	Status
Cell B Noise	0.6 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Moderately clean	pass
Line Loss	Not tested	pass
Offset	-0.10	pass
Span	1.044	pass
Cell B Freq.	93.1 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.65 lpm	pass
Cell A Tmp.	32.4 C	pass
Cell A Pressure	685 mmHg	pass
Cell A Noise	0.9 ppb	pass
Cell A Freq.	109.0 kHz	pass
Cell A Flow	0.67 lpm	pass
Battery Backup	Not functioning	Fail
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ESP127-Sandy Grenville-03/30/2013						
1	3/30/2013	DAS	Campbell	illegible	CR3000	3817
2	3/30/2013	Ozone	ThermoElectron Inc	000699	49i A1NAA	1030244804
3	3/30/2013	Ozone Standard	ThermoElectron Inc	000687	49i A3NAA	1030244809
4	3/30/2013	Zero air pump	Werther International	06909	C 70/4	000829161

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244804	ESP127	Sandy Grenville	03/30/2013	Ozone	000699

Slope:	1.00977	**Slope:**	0.00000
Intercept	-0.33906	**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	1.00121	**Intercept**	-0.18383
Cert Date	1/2/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.6%	0.7%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	-0.08	0.10	-0.47	ppb	
primary	2	30.02	30.16	30.33	ppb	0.56%
primary	3	50.31	50.43	50.72	ppb	0.58%
primary	4	80.10	80.18	80.70	ppb	0.65%
primary	5	99.60	99.66	100.10	ppb	0.44%

Sensor Component	Condition	Status
Cell B Noise	1.1 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	1.009	pass
Cell B Freq.	84.7 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.70 lpm	pass
Cell A Tmp.	30.1 C	pass
Cell A Pressure	715 mmHg	pass
Cell A Noise	1.3 ppb	pass
Cell A Freq.	91.8 kHz	pass
Cell A Flow	0.68 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SPD111-Sandy Grenville-03/30/2013						
1	3/30/2013	DAS	Campbell	000342	CR3000	2121
2	3/30/2013	Ozone	ThermoElectron Inc	000676	49i A1NAA	1030244794
3	3/30/2013	Ozone Standard	ThermoElectron Inc	000515	49i A3NAA	0922236891
4	3/30/2013	UPS	APC	06096	RS800	080331133278
5	3/30/2013	Zero air pump	Werther International	06916	C 70/4	000829158

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244794	SPD111	Sandy Grenville	03/30/2013	Ozone	000676

Slope:	1.01110	**Slope:**	0.00000
Intercept	-0.20253	**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	1.00121	**Intercept**	-0.18383
Cert Date	1/2/2013	**CorrCoff**	1.00000

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

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	-0.05	0.13	-0.39	ppb	
primary	2	30.63	30.77	30.91	ppb	0.45%
primary	3	49.80	49.92	50.95	ppb	2.06%
primary	4	79.84	79.92	80.50	ppb	0.73%
primary	5	99.69	99.75	100.40	ppb	0.65%

Sensor Component	Condition	Status
Cell B Noise	0.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.20	pass
Span	1.021	pass
Cell B Freq.	88.0 kHz	Pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.62 lpm	pass
Cell A Tmp.	30.1 C	pass
Cell A Pressure	704 mmHg	pass
Cell A Noise	1.4 ppb	pass
Cell A Freq.	89.9 kHz	pass
Cell A Flow	0.61 lpm	pass
Battery Backup	Functioning	pass
Zero Voltage	N/A	pass