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

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**Prepared for:** 

**U. S. Environmental Protection Agency** 

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#### List of Acronyms and Abbreviations

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

### **1.0 CASTNET Quarterly Report**

#### 1.1 Introduction

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

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

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

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

#### **1.2 Project Objectives**

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

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

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

Sensor	Parameter	Audit Challenge	Acceptance Criteria		
Precipitation	Response	10 manual tips	1 DAS count per tip		
Precipitation	Precipitation Accuracy 2 introducti amounts		$\leq \pm 10.0\%$ of input amount		
		Compared to reference instrument or standard solution	≤±10.0% RH		
Solar Radiation	Accuracy	Compared to WRR traceable standard	$\leq \pm 10.0\%$ 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			$\leq \pm 0.50^{\circ} \mathrm{C}$		
Direction Accuracy rod/cros		Parallel to alignment rod/crossarm, or sighted to distant point	$\leq \pm 5^{\circ}$ from degrees true		
Wind Direction	Linearity	Eight cardinal points on test fixture	$\leq \pm 5^{\circ}$ 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	$\leq \pm 0.5$ mps below 5.0 mps input; $\leq \pm 5.0\%$ 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	$\leq \pm 5.0\%$ of designated rate		
Ozone	Slope	Linear regression of multi-	$0.9000 \le m \le 1.1000$		
Ozone	Intercept	point test gas concentration as measured with a certified	-5.0 ppb ≤b ≤5.0 ppb		
Ozone	Correlation Coefficient	transfer standard	$0.9950 \le r$		
DAS Accuracy		Comparison with certified standard	$\leq \pm 0.003 \text{ VDC}$		

 Table 1. Performance Audit Challenge and Acceptance Criteria

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.

Site ID	Audit Type	Sponsor	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

 Table 2. Site Audit Visits

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).

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

Table 3. Site Ozone PE Visits

#### 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.

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		

Table 4. Sites Surveyed – First Quarter 2013

### 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				
CVI	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 Nu	mber Site	7	Fechnician	Site Visit Date	Parameter	Use Desc.
Campbell	2508	CVL	151	Sandy Grenville	02/13/2013	DAS	Primary
Das Date:	2 /13/2013	Audit Date	2 /13/2013	Mfg	Datel	Parameter	DAS
Das Time:	13:30:00	Audit Time	13:30:00		15510194		Source generator (D
Das Day:	44	Audit Day	44	Serial Number	15510194	Tier Desc.	Source generator (D
Low Channe	l:	High Channel	:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.000	0.0002	0.0001	0.0002	Cart Data	2/13/201		1.00000
				Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/26/201	3 CorrCoff	1.00000
Channel	Input D	VM 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	B V	V	0.0000	
7	0.5000	0.4997	0.4997	7 V	V	0.0000	
7	0.7000	0.6997	0.6995		V	-0.0002	
7	0.9000	0.8995	0.8994	4 V	V	-0.0001	
7	1.0000	0.9995	0.9993	3 V	V	-0.0002	

## Flow Data Form

Mfg	Serial Nun	ıber Ta	Site	Тес	chnician	Site Visit Date	e Param	eter	Owner ID
Tylan	AW950804	16	CVL151	Sa	ndy Grenville	02/13/2013	flow rat	e	03867
Mfg	Tylan				Mfg	BIOS	P	arameter	low Rate
SN/Owner ID	FP9403012	03410			Serial Number	103471	Т	fer Desc. n	exus
Parameter	MFC power su	oply			Tfer ID	01420			
					Slope	1.000	00 Inte	ercept	0.00000
					Cert Date	6/13/20	012 <b>Cor</b>	rCoff	1.00000
					Mfg	BIOS	P	arameter	low Rate
					Serial Number	103424	Т	fer Desc. E	BIOS cell
					Tfer ID	01410			
					Slope	1.000	00 Inte	ercept	0.00000
					Cert Date	1/27/20	12 <b>Cor</b>	rCoff	1.00000
<b>DAS 1:</b>		<b>DAS 2:</b>		L	Cal Factor Z	ero	0.1	3	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale	1.2	3	
1.53%	1.70%				<b>Rotometer R</b>	eading:	1.	4	
UseDescription:	Test type:	Input l/m	: Input STP:	MfcDisp.:	OutputSignal:	Output S E: Inj	outUnit:	OutputSign	allPctDifference:
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 Compo	onent Leak Tes	t		Conditio	n		Status	pass	
Sensor Compo	onent Filter Azi	muth		Conditio	<b>n</b> 360		Status	pass	
Sensor Compo	onent Filter Dep	oth		Conditio	n 1.0 cm		Status	pass	
Sensor Compo	onent Filter Pos	sition		Conditio	n Good		Status	pass	
Sensor Compo	onent Moisture	Present		Conditio	n See comments	3	Status	pass	
Sensor Compo	nent Rotomete	er Conditio	n	Conditio	n Clean and dry		Status	pass	
Sensor Compo	onent System N	lemo		Conditio	n See comments	3	Status	pass	
Sensor Compo	ment Tubing C	ondition		Conditio	n Good		Status	pass	
	onent Filter Dis			Conditio	n 6.5 cm		Status	pass	
					L			ц	

## **Ozone Data Form**

Mfg	S	erial Number Ta	Site	Te	chnician		Site Visi	t Date	Parame	eter	Owner I	D
ThermoElect	ron Inc	1030244797	CVL151	Sa	andy Gre	nville	02/13/20	013	Ozone		000698	
Slope: Intercept CorrCoff	-0.0	Slope:484269999CorrCoff	0.00000	00 Serial Number		I		arameter ozone				
DAS 1:		<b>DAS 2:</b>			Clana			1.0012	1 Tertor	<b>-</b>	-0.18	202
	iff: A Ma	x % Di A Avg %	6Dif A Max 9	% Di	Slope					cept		
0.59		0.6%			Cert Da	ate		1/2/201	3 Corr	Coff	1.00	0000
UseDesc	ription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	Unit:	PctDif	ference:	
prim	ary	1	0.01	0.1	19	0.0	02	ppb				
prim	ary	2	44.91	45.	.03	45.	.25	ppb			0.49%	
prim	ary	3	66.32	66.	.42	66.	.81	ppb			0.59%	
prim	ary	4	84.44	84.	.52	85.	.00	ppb			0.57%	
prim	ary	5	109.81	109	.86	110	.10	ppb			0.22%	
Sensor Co	mponent	Cell B Noise		Conditio	on 1.1 pp	b			Status	pass		
Sensor Co	mponent	Cell B Tmp.		Conditio	on				Status	pass		
Sensor Co	mponent	Fullscale Voltage		Conditio	n N/A				Status	pass		
Sensor Co	mponent	Inlet Filter Condition	on	Conditio	on Clear	1			Status	pass		
Sensor Co	mponent	Line Loss		Conditio	n Not te	ested			Status	pass		
Sensor Co	mponent	Offset		Conditio	on 0.3				Status	pass		
Sensor Co	-			Conditio					Status			
	-	Cell B Freq.		Condition 98.1 kHz				Status				
	•	System Memo		Condition				Status	[			
		Sample Train						Status				
	_			Condition Good								
		Cell B Pressure		Conditio					Status			
		Cell B Flow		Conditio					Status			
	•	Cell A Tmp.		Conditio					Status			
Sensor Co	mponent	Cell A Pressure		Conditio	on 727 m	nmHg			Status	pass		
Sensor Co	mponent	Cell A Noise		Conditio	on 1.0 pp	b			Status	pass		
Sensor Co	mponent	Cell A Freq.		Conditio	on 93.6 k	κHz			Status	pass		
Sensor Co	mponent	Cell A Flow		Conditio	on 0.72 I	pm			Status	pass		
Sensor Co	mponent	Battery Backup		Conditio	on N/A				Status	pass		
Sensor Component Zero Voltage			Conditio	ondition N/A				Status	pass			

## Temperature Data Form

Mfg		Serial Nun	ıber Ta	Site		Technician		Site Vis	visit Date Parame		eter	Owner ID	
Climatronics		none		CVL151	Sar		dy Grenville	02/13/2	02/13/2013 Tempera		ature	06668	
						N	/Ifg	Extech		Pa	rameter Te	mperature	
						S	erial Number	H23273	34	Tf	er Desc. RT	D	
						T	fer ID	01227		]			
DAS 1:			DAS 2:			S	lope		1.00435	5 Inte	rcept	-0.08480	
Abs Avg Err	Abs	Max Er	Abs Avg	g Err Abs	Max Er	Max Er Cert Date			1/12/2013 Cor		rCoff	1.00000	
0.16		0.38											
UseDesc.:		Test type:	Inp	outTmpRaw	InputTmp	oCorr	.: OutputTmpS	ignal: OutputSignalEng:		OSE Unit:	Difference:		
primary	Temp	Low Range	2	-0.02	0.06	5	0.000		0.0		С	-0.07	
primary	Temp	Mid Range	:	25.39	25.3	6	0.000		25.4		С	0.03	
primary	Temp	High Rang	e	48.08	47.9	6	0.000		47.6	5	С	-0.38	
Sensor Com	poner	t Shield			Cond	Condition Clean				Status	pass		
Sensor Component Blower Status Switch			Cond	ition	Functioning			Status	tus pass				
Sensor Com	ponen	t Blower			Cond	Condition Functioning				Status pass			
Sensor Com	poner	t System N	lemo		Cond	ition				Status	pass		

#### **Infrastructure Data For**

Site ID	CVL151	Technician Sandy C	Grenville Site Visit Date 02/13/2013
Shelter	·Make	Shelter Model	Shelter Size
Ekto		8810	640 cuft

Sensor Component	Shelter Roof	Condition	Fair	Status	pass
Sensor Component	Sample Tower Type	Condition	Туре А	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Sample Tower	Condition	Fair	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Floor	Condition	Poor	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	Fair	Status	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:	<b>DAS 2:</b>		Mfg	Extech	Parameter She	lter Temperatur
Abs Avg ErrAb0.06	os Max Er Abs Avg 0.10	Err Abs Max Er	Serial Number	H232734	Tfer Desc. RTD	)
			Tfer ID	01227		
			Slope	1.0043	5 Intercept	-0.08480
			Cert Date	1/12/201	3 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	С	0.1
primary	Temp Mid Range	16.04	16.05	0.000	16.0	С	-0.04
primary	Temp Mid Range	15.88	15.90	0.000	16.0	С	0.05

## **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazaro	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.

Site ID CVL151	Technician Sandy G	Grenville Site Visit Date 02/	13/2013	
Site Engineer (Source)	EPA	USGS Map	Coker Lake	
Site Sponsor (agency)	Private - USFS	Map Scale		
Operating Group		Map Date		
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	34.00274	
Site Address 1	Forest Road 809	Audit Longitude	-89.79918	
Site Address 2	Tombigbee National Forest	Audit Elevation	13	
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	<b>Model</b> 8810	Shelter Size 640 cuft	
Shelter Clean	Notes The shelter is somewhat	at cluttered. The floor and lower walls	s are beginning to rot.	
Site OK	Notes		antanaa taaba oo kahaya daga ka taasada dabaada ka saa ca saa tu t	
Fores	st Service sign for the Yalobusha C		ely 5 miles and turn left (north) at the itter Plant Materials Center. Immediately 1.5 miles to the stop sign and turn left on	

## **Field Systems Data Form**

CVL151

F-02058-1500-S2-rev001

Site ID

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.

Fi	eld 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?	Ν/Α				
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				
Dre	wide any additional evaluation (nhotograph or sketch if nece	 () regarding conditions listed above or any other features				

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

Fie	eld Systems Data	Form		F-02058-1500-S4-rev001				
Site	<b>ID</b> CVL151	Technician Sa	andy Grenville		Site Visit Date 02/13/2013			
	Do all the meterological s condition, and well maint		tact, in good		Temperature only			
2	Are all the meteorologica reporting data?		nline, and		Temperature only			
	<b>3</b> Are the shields for the temperature and RH sensors clean?							
4	Are the aspirated motors	working?						
	Is the solar radiation sens scratches?	sor's lens clean and fre	e of		N/A			
6	Is the surface wetness sen	sor grid clean and und	lamaged?		N/A			
	Are the sensor signal and condition, and well maint		ı good					
	Are the sensor signal and from the elements and we		ons protected					
Para	ameter	Manufacturer	Model		S/N	Client ID		
Tem	nperature	Climatronics	100093	10.73	none	06668		
	ral or man-made, that may			iry)	regarding conditions listed above,	or any other reatures,		
						E Land		

Fi	eld 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 ed	<u>juip</u> i	ment 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						
Par	ameter Manufacturer Model		S/N Client ID						

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:

Fie	eld Sy	stems Data Fo	orm			F-02058-1500-S6-rev001					
Site	ID	CVL151	Technician	Sandy Grenville		Site Visit Date	02/13/2013				
	DAS, se	nsor translators, and j	<u>peripheral equi</u>	pment operation	<u>is ar</u>	nd maintenance					
1	Do the I well ma	DAS instruments appe intained?	ar to be in good	l condition and							
2		he components of the backup, etc)	DAS operation	al? (printers,							
3		nalyzer and sensor sig g protection circuitry?	through		Met sensors only						
4		signal connections pro intained?	otected from the	e weather and							
5	Are the	signal leads connected	to the correct	DAS channel?							
6	Are the grounde	DAS, sensor translato ed?	rs, and shelter	properly							
7	Does the	e instrument shelter h	ave a stable pov	ver source?							
8	Is the in	strument shelter temp	erature control	lled?							
9	Is the m	et tower stable and gr	ounded?			Stable	G	rounded			
10	Is the sa	mple tower stable and	l grounded?								
11	Tower c	omments?									
							GATERSTEIN CONTEN	NO. 6 (1991) (1991) (1991)			

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 l	Forn	1			<b>F-02</b>	058-2	1500-S7-rev001
Site ID CVL151	Т	echnicia	n Sandy Grenvill	le Site Visit Date	2/13/2013		
Documentation							
Does the site have the require	d instru	ument ai	nd equipment m	annals?			
	SULLEY CO. 1995	1223 442334	N/A		Yes	No	N/A
Wind speed sensor				ta logger			
Wind direction sensor			✓ Da	ta logger			
Temperature sensor			Str	rip chart recorder			
Relative humidity sensor			✓ Co	mputer			
Solar radiation sensor			✓ Mo	odem			
Surface wetness sensor	STREET, STREET, ST		✓ Pri	inter			
Wind sensor translator			✓ Zei	ro air pump			
Temperature translator				ter flow pump			
funnanty sensor translator			✓ Su	rge protector			
			✓ UP	S			
11 0 0 0			✓ Lig	ghtning protection device			
		2	The second s	elter heater			
Filter pack flow controller				elter air conditioner			
Filter pack MFC power supply							
Does the site have the requir	ed and	most re	cent QC docume	ents and report forms?			
	Present	t			Curre	nt	
Station Log							
SSRF							
Site Ops Manual		June	2007				
HASP		Nov 2	2001				
Field Ops Manual		July '	1990				
Calibration Reports							
Ozone z/s/p Control Charts							Constant States
Preventive maintenance schedul							
		Carlos and					
1 Is the station log properly c	omplet	ed durin	g every site visit	? 🗸			
2 Are the Site Status Report I current?	Forms l	being co	mpleted and				
3 Are the chain-of-custody for sample transfer to and from		operly u	sed to document				
4 Are ozone z/s/p control char current?	rts prop	perly cor	npleted and	Control charts not use	ed		
Provide any additional explanati natural or man-made, that may a					ons listed a	bove, o	r any other features,
The site operations manual does not	ot apply	to the cu	urrently installed in	nstrumentation.			
	ALC: NOT THE	And the set			States and		A STATE OF A

Fie	eld Sy	stems Data Fo	rm		F-02058-1500-S8-rev001					
Site	ite ID         CVL151         Technician         Sandy Grenville					Site Visit Date	02/13/2013		]	
1	Has the	eration procedures e site operator attended ? If yes, when and who i		TNET training		Trained by J.B. And	erson during si	te upgra	ade	
2		e backup operator atter g course? If yes, when a								
3	Is the si schedul	te visited regularly on t e?	he required T	uesday						
4		standard CASTNET op d by the site operator?	perational pro	cedures being						
5		te operator(s) knowleds iired site activities? (inc								
	Are reg	ular operational QA/Q	C checks perfo	ormed on meteor	<u>olog</u>	ical 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 Che	ck Performed
--------	--------------

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

Frequency	Compliant
Semiannually	
Daily	
Daily	
Weekly	
Every 2 weeks	
N/A	
Weekly	
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?

Unknown

 $\checkmark$ 

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:

Fie	eld Sy	stems Data Fo	rm				F-02058-1500-S9-rev001				
Site	e ID	CVL151	Technic	cian [	Sandy Grenville	394 F	Site Visit Date	02/13/2013			
	Site ope	ration procedures									
1	Is the fi	lter pack being changed	d every Tı	iesda	y as scheduled?		Filter changed afte	rnoons			
2	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		ers protected from cont oping? How?	aminatior	ı duri	ng handling		Clean gloves on and off				
9		site conditions reported ons manager or staff?	d regularl	y to t	he field						
QC	Check P	erformed		Freq	uency			Compliant			
N	<b>Iulti-poi</b>	nt MFC Calibrations		Semi	annually						
F	low Syst	em Leak Checks		Weeł	dy						
F	ilter Pac	k Inspection									
F	low Rate	Setting Checks		Week	kly	********					
V	isual Ch	eck of Flow Rate Rotor	meter 🗹	Week	kly						
I	In-line Filter Inspection/Replacement Semiannually										
S	Sample Line Check for Dirt/Water Weekly										
		dditional explanation ( n-made, that may affe					y) regarding condit	ions listed above, or a	any other features,		

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CAL	D150-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 Nu	mber Site		Fechnician	Site Visit Date	Parameter	Use Desc.
Campbell	2530	CAD	150	Sandy Grenville	02/14/2013	DAS	Primary
Das Date:	2 /14/2013	Audit Date	2 /14/2013	Mfg	Datel	Parameter	DAS
Das Time:	12:26:14	Audit Time	12:26:11		15510194		Source generator (D
Das Day:	45	Audit Day	45	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Channel	:	High Channel	:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0002	0.0004	0.0002	0.0004		2/13/201		1.00000
				Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/26/201	3 CorrCoff	1.00000
Channel	Input D	VM 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	3 V	V	-0.0004	
7	0.5000	0.4996	0.4998	8 V	V	0.0002	
7	0.7000	0.6995	0.6997		V	0.0002	
7	0.9000	0.8994	0.8990		V	0.0002	
7	1.0000	0.9993	0.9990	5 V	V	0.0003	

## Flow Data Form

Mfg	Serial Num	ıber Ta	Site	Тес	chnician	Site Visit Da	te Param	eter	Owner ID
Tylan	AW990130	48	CAD150	Sa	ndy Grenville	02/14/2013	flow rat	te	000090
Mfg	Teledyne				Mfg	BIOS	P	arameterF	low Rate
SN/Owner ID	149	01517			Serial Number	103471	Т	fer Desc. n	nexus
Parameter	MFC power sup	ply			Tfer ID	01420			
					Slope	1.00	000 Inte	ercept	0.00000
					Cert Date	6/13/2	012 <b>Cor</b>	rCoff	1.00000
					Mfg	BIOS	Р	arameter	Flow Rate
					Serial Number	103424	Т	fer Desc. E	BIOS cell
					Tfer ID	01410			
					Slope	1.00	000 Inte	ercept	0.00000
					Cert Date	1/27/2	012 <b>Cor</b>	rCoff	1.00000
DAS 1:		<b>DAS 2:</b>		<u> </u>	Cal Factor Z	ero	0.1	2	
A Avg % Diff:		A Avg %	Dif <u>A Max</u>	: % Di	Cal Factor F	ull Scale	1.2	21	
2.02%	2.15%				Rotometer R	eading:	1.3	35	
UseDescription:	Test type:	Input l/m	: Input STP:	MfcDisp.:	OutputSignal:	Output S E: In	nputUnit:	OutputSign	allPctDifference:
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	1/m	-1.96%
primary	test pt 2	1.509	1.533	2.54	1.268	1.50	l/m	1/m	-2.15%
primary	test pt 3	1.509	1.530	2.54	1.268	1.50	l/m	l/m	-1.96%
Sensor Compo	onent Leak Tes	t		Conditio	n		Status	pass	
Sensor Compo	<b>Filter</b> Azir	nuth		Conditio	n 290 deg		Status	pass	
Sensor Compo	onent Filter Dep	oth		Conditio	<b>n</b> 1.5 cm		Status	pass	
Sensor Compo	onent Filter Pos	ition		Conditio	n Good		Status	pass	
Sensor Compo	Moisture	Present		Conditio	n No moisture pr	resent	Status	pass	
Sensor Compo	nent Rotomete	er Conditio	n	Conditio	n Clean and dry		Status	pass	
Sensor Compo	onent System M	lemo		Conditio	n		Status	pass	
Sensor Compo	onent Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Compo	<b>nent</b> Filter Dist	ance		Conditio	<b>n</b> 5.5 cm		Status	pass	

## **Ozone Data Form**

Mfg	Serial Number Ta Site		Site	Techni		nician		Site Visit Date		Parameter		D
ThermoElectron In	ermoElectron Inc 1009241792		CAD150 Sa		andy Grenville		02/14/2013		Ozone		000624	
Slope:0.98806Slope:Intercept0.40998InterceptCorrCoff0.99997CorrCoff		0.00000		Mfg Serial Number		I IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII			Parameter ozone Tfer Desc. Ozone transfer		·	
DAS 1: A Avg % Diff: A 0.8%	Max	DAS 2:	6Dif A Max	% Di	Tfer ID Slope Cert Da		01100	1.00121 1/2/2013			-0.18	
UseDescription	1:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	Unit:	PctDiffe	rence:	
primary		1	0.02	0.2	20	0.9	94	ppb				
primary		2	46.73	46.	.85	46.	.36	ppb			-1.05%	
primary		3	66.60	66.		66.05		ppb		-0.97%		
primary		4	85.16	85.24		1		ppb		-0.87%		
primary		5	110.77	110	.81	110	0.30	ppb			-0.46%	
Sensor Compon	ent	Cell B Noise		Conditio	on 1.3 pp	b			Status	pass		
Sensor Compon	ent	Cell B Tmp.		Conditio	on				Status	pass		
Sensor Compon	ent	Fullscale Voltage		Conditio	on N/A				Status	pass		
Sensor Compon	ent	Inlet Filter Conditio	n	Conditio	on Clear				Status	pass		
Sensor Compon	ent	Line Loss		Conditio	<b>n</b> Not te	sted			Status	pass		
Sensor Compon	ent	Offset		Conditio	<b>on</b> 0.02				Status	pass		
Sensor Compon	ent	Span		Conditio	<b>n</b> 1.021				Status	pass		
Sensor Compon	ent	Cell B Freq.		Conditio	on 82.8 k	κHz			Status	pass		
Sensor Component System Memo			Condition				Status	pass				
Sensor Compon	ent	Sample Train		Conditio	dition Good				Status	pass		
Sensor Compon	ent	Cell B Pressure		Condition				Status	s pass			
Sensor Component Cell B Flow			Conditio	ndition 0.75 lpm				Status	pass			
Sensor Compon	ent	Cell A Tmp.		Conditio	on 32.7 (	C			Status	pass		
Sensor Component Cell A Pressure			Conditio	ondition 737 mmHg				Status	pass			
Sensor Component Cell A Noise			Conditio	dition 0.9 ppb				Status	pass			
Sensor Compon	ent	Cell A Freq.		Conditio	on 84.9 k	κHz			Status	pass		
Sensor Component Cell A Flow			Conditio	dition 0.75 lpm				Status	pass			
Sensor Component Battery Backup			Conditio	ion N/A				Status	pass			
Sensor Component Zero Voltage			Conditio	ion N/A				Status	pass			

## Temperature Data Form

Mfg		Serial Nun	nber Ta	a Site		Tech	nician	Site Visit Date	Param	eter	<b>Owner ID</b>
Climatronics		none		CAD150		San	dy Grenville	02/14/2013	Tempe	rature	06648
						N	ſſg	Extech	Pa	arameter Te	mperature
						S	erial Number	H232734	T	fer Desc. RT	D
						Т	fer ID	01227			
DAS 1:			DAS 2			S	lope	1.004	35 Inte	rcept	-0.08480
Abs Avg Err	Abs	Max Er	Abs Av		Max Er	C	Cert Date	1/12/20	13 Cor	rCoff	1.00000
0.08	,	0.13				]					
UseDesc.:		Test type:	Ir	nputTmpRaw	InputTm	oCorr	.: OutputTmpS	ignal: OutputSi	gnalEng:	OSE Unit:	Difference:
primary	Temp	Low Range	e	0.23	0.3	1	0.000	0.	2	С	-0.13
primary	Temp	Mid Range	e	25.24	25.2	22	0.000	25	.3	С	0.1
primary	Temp	High Rang	e	46.33	46.2	21	0.000	46	.2	C	-0.02
Sensor Com	ponen	t Shield			Cond	lition	Clean		Status	pass	
Sensor Com	ponen	t Blower S	tatus Sv	witch	Cond	lition	Functioning		Status	pass	
Sensor Component Blower			Cond	ndition Functioning			Status	s pass			
Sensor Com	ponen	t System M	Nemo		Cond	lition			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	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Sample Tower Type	Condition	Туре А	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:	<b>DAS 2:</b>		Mfg	Extech	Parameter She	Iter Temperatur
Abs Avg ErrAb0.07	os Max Er Abs Avg 0.14	Err Abs Max Er	Serial Number	H232734	Tfer Desc. RTD	)
			Tfer ID	01227		
			Slope	1.0043	5 Intercept	-0.08480
			Cert Date	1/12/201	3 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	С	0.06
primary	Temp Mid Range	21.89	21.88	0.000	21.9	С	0
primary	Temp Mid Range	22.68	22.67	0.000	22.5	С	-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.

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	34.17927
Site Address 1	DeGray Regulating Dam	Audit Longitude	-93.09875
Site Address 2	Route 390	Audit Elevation	7
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 Me	odel 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		

Immediately west of the interstate. This road runs parallel to the interstate for approximately 1 west. Continue for approximately 1 mile, the site will be on the left just before the dam.

### **Field Systems Data Form**

CAD150

F-02058-1500-S2-rev001

Site ID

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** 

Fi	eld Systems	Data Fo	orm		F-02058-1500-S3-rev00				
Site	CAD150		Technician	Sandy Grenville	Site Visit Date 02/14/2013				
1	Are wind speed as being influenced l			as to avoid	Ν/Α				
2	Are wind sensors (i.e. wind sensors horizontally exten tower into the pro-	should be m ded boom >	ounted atop the 2x the max dian	tower or on a	N/A				
3	Are the tower and				N/A				
4	Are the temperate avoid radiated he	CONTRACTOR OF A DESCRIPTION OF A		Construction of the second state of the second					
5	Are temperature conditions? (i.e. g surface and not st standing water sh	round below eeply sloped	sensors should . Ridges, hollow	be natural					
6	Is the solar radiat	ion sensor p	lumb?		N/A				
7	Is it sited to avoid light?	shading, or	any artificial or	• reflected	N/A				
8	Is the rain gauge	plumb?			N/A				
9	Is it sited to avoid towers, etc?	sheltering e	ffects from buil	dings, trees,	N/A				
10	Is the surface wet facing north?	ness sensor s	sited with the gr	id surface	N/A				
11	Is it inclined app	roximately 3	0 degrees?		N/A				
Dre	wide one additions	lovnlonatio	n (nhatagranh c	n akatah if nasa	 x) regarding conditions listed above or any other feet				

conditi	CAD150				₽.	-02058-1500-S4-	-revuul
conditi		Technician S	andy Grenville		Site Visit Date 02/14/2	2013	
	the meterological se	ensors appear to be in tined?	ntact, in good		Temperature only		
		sensors operational	online, and		Temperature only		
3 Are the	e shields for the tem	perature and RH se	nsors clean?				
4 Are the	e aspirated motors	working?					
5 Is the s		or's lens clean and fr	ee of		N/A		
6 Is the s	surface wetness sens	or grid clean and un	damaged?		N/A		
	e sensor signal and jon, and well mainta	power cables intact, ined?	in good		N/A		
	e sensor signal and j he elements and wel	power cable connecti l maintained?	ions protected		N/A		
Parameter		Manufacturer	Model		S/N	Client ID	
Temperatur	e	Climatronics	100093	<u>895.53</u>	none	06648	

eld Systems Data Form		F-02058-1500-S5-rev001
ID CAD150 Technician Sandy Grenville		Site Visit Date 02/14/2013
Siting Criteria: Are the pollutant analyzers and deposition eq	uip	<u>ment sited in accordance with 40 CFR 58, Appendix E</u>
Do the sample inlets have at least a 270 degree arc of unrestricted airflow?		
Are the sample inlets 3 - 15 meters above the ground?		
Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?		
Pollutant analyzers and deposition equipment operations and	l ma	<u>intenance</u>
Do the analyzers and equipment appear to be in good condition and well maintained?		
Are the analyzers and monitors operational, on-line, and reporting data?		
Describe ozone sample tube.		1/4 teflon by 12 meters
Describe dry dep sample tube.		3/8 teflon by 12 meters
Are in-line filters used in the ozone sample line? (if yes indicate location)		At inlet only
Are sample lines clean, free of kinks, moisture, and obstructions?		
Is the zero air supply desiccant unsaturated?		
Are there moisture traps in the sample lines?		
Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry
	Siting Criteria: Are the pollutant analyzers and deposition equipment of the sample inlets have at least a 270 degree arc of unrestricted airflow?         Are the sample inlets 3 - 15 meters above the ground?         Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?         Pollutant analyzers and deposition equipment operations and 20 meters from trees?         Pollutant analyzers and equipment appear to be in good condition and well maintained?         Are the analyzers and monitors operational, on-line, and reporting data?         Describe ozone sample tube.         Describe dry dep sample tube.         Are in-line filters used in the ozone sample line? (if yes indicate location)         Are sample lines clean, free of kinks, moisture, and obstructions?         Is the zero air supply desiccant unsaturated?         Are there moisture traps in the sample lines?         Is there a rotometer in the dry deposition filter line, and is it	a D       CAD150       Technician       Sandy Grenville         Siting Criteria: Are the pollutant analyzers and deposition equipmers and the position equipmers and the position equipmers and the position equipmers and the position equipmers and equipmers above the ground?       Image: Comparison of the position equipmers and the posis the position equipmers

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

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.

Fie	eld Sy	stems Data F	orm				F-02058	-1500-S6-re	ev001	
Site	ID	CAD150	Technician	Sandy Grenville		Site Visit Date	e 02/14/2013			
	DAS, sensor translators, and peripheral equipment operations and maintenance									
1		DAS instruments app intained?	ear to be in good (	condition and						
2		the components of the , backup, etc)	e DAS operational	? (printers,						
3		analyzer and sensor si g protection circuitry		rough		let sensors only				
4		signal connections pr intained?	otected from the	weather and						
5	Are the	signal leads connecte	d to the correct D	AS channel?						
6	Are the ground	DAS, sensor translate ed?	ors, and shelter p	roperly						
7	Does th	e instrument shelter h	ave a stable powe	er source?						
8	Is the in	nstrument shelter tem	perature controlle	ed?						
9	Is the n	net tower stable and g	rounded?			Stable	Grow			
10	Is the sa	ample tower stable an	d grounded?							
11	Tower	comments?			S	Managements with the second	able but not ground	ed		
Par	ameter	M	lanufacturer	Model		S/N		Client ID		
Con	nputer		ell	D520	920866 1552162	unknown		000306		
DAS	5	C	ampbell	CR3000		2530		000421	Contract -	

3875

06515

NL115

Raven

Modem

Field Systems Data H	'orm			<b>F-02</b>	058-	1500-S7-rev001
Site ID CAD150	Tech	nician	Sandy Grenville Site Visit Date	02/14/2013		
						A States
<b>Documentation</b>						
<b>Does the site have the required</b>	COLOR STREET, ST	Section 201				
	es No	N/A	Data logger	Yes	No ✓	N/A
			Data logger			
Contraction of the second s			Strip chart recorder Computer			
		<ul> <li>Image: A start of the start of</li></ul>	Modem			
			Printer			
			Zero air pump			
and the second secon			Filter flow pump			
remperature translator			Surge protector			
			UPS			
			Lightning protection device			
11 0			Shelter heater			
			Shelter air conditioner			
Court of the second state of the second state of the second state of the						
		st rocor	at QC documents and report forms?			
	USARA USAS	<u>st recen</u>	it we documents and report forms.	C		
	resent			Currei	n	
Station Log SSRF						
Site Ops Manual						
HASP			0			
Field Ops Manual		Nov 200				
Calibration Reports		July 199				
Ozone z/s/p Control Charts						
Preventive maintenance schedul						
		Sec. Sec.				
1 Is the station log properly co	mpleted d	luring e	very site visit?  Minimal information			
2 Are the Site Status Report F current?	orms bein	g comp	leted and			
3 Are the chain-of-custody for sample transfer to and from		rly used	to document			
4 Are ozone z/s/p control char current?	ts properl	y compl	leted and Control charts not us	sed		
Provide any additional explanation natural or man-made, that may a			r sketch if necessary) regarding conditi ing parameters:	ions listed a	lbove, a	or any other features,
					1333	

Fi	eld S	ystems Data	Form			<b>F-02058-1</b>	1500-S8-rev001
Sit	te ID	CAD150	Technician	Sandy Grenville	Site Visit Date	02/14/2013	
1	Has th	peration procedure ne site operator att e? If yes, when and	ended a formal CAS	STNET training			
2			r attended a formal vhen and who instru	Select Cherrory and Print Providence of the Astronomy As			
3	Is the s schedu	The second s	y on the required T	uesday 🗸			
4		e standard CASTN ed by the site oper	NET operational pro ator?	cedures being			
5			owledgeable of, and s? (including docum				
	No. Con	mlan anonational (	A OC abacha nowf	united an excitation la	-iaal instruments?		

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	

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

0	C	Ch	ool.	D			 
V	L	CII	eck	. <b>P</b>	eri	.01	eu

3

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

reported? If yes, how?

Frequency	Compliant
Semiannually	
Daily	
Daily	
Weekly	
Every 2 weeks	
N/A	
Weekly	
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?

Are the automatic and manual z/s/p checks monitored and

he 🔽 📃

SSRF, call-in

Unknown

Provide any additional 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.

Fie	eld Sy	stems Data Fo	rm					F-02058-1	1500-S9-rev001
Site	ID	CAD150	Technic	cian 🔇	Sandy Grenville		Site Visit Dat	e 02/14/2013	
	Site ope	ration procedures							
1	Is the fi	lter pack being changed	l every Tu	iesday	as scheduled		Filter changed mo	prinings	
2	Are the correctl	Site Status Report For y?	ms being o	compl	eted and filed				
3	Are dat schedul	a downloads and backu ed?	ıps being j	perfor	rmed as		No longer required	d	
4	Are gen	eral observations being	; made and	d reco	orded? How?		SSRF		
5	Are site fashion	supplies on-hand and i	replenishe	d in a	timely				
6	Are san	ple flow rates recorded	l? How?				SSRF, logbook, ca	all-in	
7	Are san fashion	ples sent to the lab on a ?	a regular :	sched	ule in a timely				
8		ers protected from cont oping? How?	amination	ı duri	ng handling		One set of gloves	only	
9		site conditions reported ons manager or staff?	d regularl	y to tł	ne field				
QC	Check P	erformed		Frequ	uency			Compliant	
N	Iulti-poi	nt MFC Calibrations		Semia	annually	706. CTR			
F	low Syst	em Leak Checks		Week	ly				
F	ilter Pac	k Inspection							
F	low Rate	Setting Checks	100 (Perfection of the 1977)	Week					
V	isual Ch	eck of Flow Rate Rotor	Sector Sector Sector	Week	CONTRACTOR AND ADDRESS OF A DECK	2773/01			
		ter Inspection/Replace	Sector Sector	THE OWNER AND INCOME.	annually	20002743			
S	ample Li	ine Check for Dirt/Wat	er 🔽	Week	ly	110.0			
		dditional explanation ( in-made, that may affe					) regarding condi	tions listed above, or	any other features,

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ALC	C188-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	В	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**

7

1.0000

0.9994

DAS Time Max Error:

0

0.0000

V

V

Mfg	Serial	Number Site	e 1	<b>Fechnician</b>	Site Visit Date	Parameter	Use Desc.
Campbell	2523	AL	C188	Sandy Grenville	02/15/2013	DAS	Primary
Das Date: Das Time: Das Day:	2 /15/2013 11:05:17 46	Audit Date Audit Time Audit Day		Mfg Serial Number	Datel 15510194	Parameter Tfer Desc.	DAS Source generator (D
Low Channel	l:	High Chann	el:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0001	0.0	003 0.000	1 0.0003	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/26/201	3 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.0001	0.0002		V	0.0003	
7	0.1000	0.0999	0.0999		V	0.0000	
7	0.3000	0.2997	0.2998		V	0.0001	
7	0.5000	0.4997	0.4997		V	0.0000	
7	0.7000	0.6996	0.6996		V	0.0000	
7	0.9000	0.8995	0.8995	V	V	0.0000	

0.9994

### Flow Data Form

Mfg	Serial Nu	mber Ta 🛛 S	Site	Тес	chnician	Site Visit I	Date Param	eter	Owner ID
Apex	54761		ALC188	Sa	ndy Grenville	02/15/2013	B Flow R	ate	000684
					Mfg	BIOS	Pa	arameter	low Rate
					Serial Number	103471	T	fer Desc.	exus
					Tfer ID	01420			
					Slope	1.	00000 Inte	ercept	0.00000
					Cert Date	6/13	3/2012 <b>Cor</b>	rCoff	1.00000
					Mfg	BIOS	Pa	arameter F	Flow Rate
					Serial Number	103424	T	fer Desc.	BIOS cell
					Tfer ID	01410			
					Slope	1.	00000 Inte	ercept	0.00000
					Cert Date	1/27	7/2012 <b>Cor</b>	rCoff	1.00000
DAS 1:		<b>DAS 2:</b>		L	Cal Factor Z	ero		0	
A Avg % Diff:	A Max % Di	A Avg %I	Dif A Max	x % Di	Cal Factor F	ull Scale	0.9	8	
3.75%	3.87%				<b>Rotometer R</b>	eading:	1.	5	
UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSign	allPctDifference:
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	1/m	1/m	-3.75%
primary	test pt 3	1.536	1.550	1.53	1.523	1.49	l/m	l/m	-3.87%
Sensor Compo	onent Leak Te	st		Conditio	n		Status	pass	
Sensor Compo	onent Filter A:	imuth		Conditio	n 190 deg		Status	pass	
Sensor Compo	onent Filter De	epth		Conditio	<b>n</b> 4.5 cm		Status	pass	
Sensor Compo	onent Filter Po	sition		Conditio	n Good		Status	pass	
Sensor Compo	onent Moistur	e Present		Conditio	n No moisture p	resent	Status	pass	
Sensor Compo	onent Rotome	ter Condition	1	Conditio	n Clean and dry		Status	pass	
Sensor Compo	onent System	Memo		Conditio	n		Status	pass	
Sensor Compo				Conditio	n Good		Status	pass	
Sensor Compo				Conditio	<u></u>		Status		
				_					

### **Ozone Data Form**

Mfg	Serial Number Ta	Site	Tee	chnician		Site Visi	it Date	Parame	eter	Owner I	D
ThermoElectron Inc	1030244802	ALC188	Sa	andy Grei	nville	02/15/2	013	Ozone		000689	
~		0.0000		Mfg		ThermoE			rameter oz	one	
•	1.01151 <b>Slope:</b>	0.0000									
	0.34553         Intercept           0.99998         CorrCoff	0.0000		Serial N	lumber	49C-731	04-373	Tf	er Desc. Oz	zone transfei	r
	CorrColl	0.0000	5	Tfer ID		01100					
DAS 1:	<b>DAS 2:</b>			Slope			1.00121	Inter	cept	-0.18	383
A Avg % Diff: A N	/Iax % Di A Avg %	<b>6</b> Dif A Max	% Di	-			1/2/2013		- L	1.00	000
0.8%	1.1%			Cert Da	ite		1/2/201	5 Corr	Coff	1.00	000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer (	Corr:	Si	te:	Site	Unit:	PctDif	ference:	
primary	1	-0.01	0.1	17	-0.	43	ppb				
primary	2	31.04	31.	18	31.	.51	ppb			1.06%	
primary	3	50.60	50.		51.		ppb			0.75%	
primary	4	81.60	81.		82.		ppb			0.51%	
primary	5	100.95	101	.01	101	.80	ppb			0.78%	
Sensor Compone	nt Cell B Noise		Conditio	on 0.8 pp	b			Status	pass		
Sensor Compone	nt Cell B Tmp.		Conditio	on				Status	pass		
Sensor Compone	nt Fullscale Voltage		Conditio	n N/A				Status	pass		
Sensor Compone	nt Inlet Filter Condition	on	Conditio	n Clean				Status	pass		
Sensor Compone	nt Line Loss		Conditio	on < 1 %				Status	pass		7
											_
Sensor Compone	nt Offset		Conditio					Status	pass		
Sensor Compone	nt Span		Conditio	<b>n</b> 1.029				Status	pass		
Sensor Compone	nt Cell B Freq.		Conditio	on 85.8 k	ίHz			Status	pass		
Sensor Compone	nt System Memo		Conditio	See c	omments			Status	pass		
Sensor Compone	nt Sample Train		Conditio	Good				Status	pass		
Sensor Compone	nt Cell B Pressure		Conditio	on				Status	pass		
Sensor Compone	nt Cell B Flow		Conditio	on 0.72 l	pm			Status	pass		
Sensor Compone	nt Cell A Tmp.		Conditio	<b>n</b> 32.1 (	<b>C</b>			Status	pass		
Sensor Compone	nt Cell A Pressure		Conditio	on 731 m	nmHg			Status	pass		7
Sensor Compone	nt Cell A Noise		Conditio					Status	pass		7
Sensor Compone			Conditio					Status			
Sensor Compone			Conditio					Status			
					F						
	nt Battery Backup		Conditio					Status			
Sensor Compone	nt Zero voltage		Conditio	n N/A				Status	pass		

## Temperature Data Form

Mfg		Serial Nun	ıber Ta	Site		Tec	hni	cian	Site V	isit Date	Param	eter	Owner II	)
RM Young		missing		ALC188		Sar	ndy	Grenville	02/15	5/2013	Tempe	rature	02997	
						]	Mf	g	Extec	h	Pa	arameter Te	mperature	
						5	Ser	ial Number	H232	734	Tí	fer Desc. RT	D	
							Tfe	er ID	01227	,				
DAS 1:			DAS 2:			5	Sloj	ре		1.0043	5 Inte	rcept	-0.084	480
Abs Avg Err	Abs	Max Er	Abs Avg	g Err Abs	Max Er	•	Cer	rt Date		1/12/201	3 Cor	rCoff	1.000	000
0.31		0.36												
UseDesc.:		Test type:	Inp	outTmpRaw	InputTmp	Cor	r.:	OutputTmpS	ignal:	OutputSig	nalEng:	OSE Unit:	Difference:	
primary	Temp	Low Range	2	0.05	0.13	3		0.000		0.4	1	С	0.23	
primary	Temp	Mid Range	:	25.44	25.4	1		0.000		25.	7	С	0.33	
primary	Temp	High Rang	e	47.54	47.4	2		0.000		47.	8	С	0.36	
Sensor Com	ponen	t Shield			Cond	itior	n N	Ioderately clea	an		Status	pass		]
Sensor Com	ponen	t Blower S	tatus Swi	tch	Cond	itior	n N	lot functioning			Status	Fail		]
Sensor Com	ponen	t Blower			Cond	itior	n F	unctioning			Status	pass		]
Sensor Com	ponen	t System N	lemo		Cond	itior	n 🗌				Status	pass		]

#### **Infrastructure Data For**

Site ID /	ALC188	Technician	Sandy Grenville		Site Visit Date	02/15/2013	
Shelter Ma	ke	Shelter Model	1	Shelte	r Size		
Shelter One	3	3128-2311	1	1024 c	cuft		

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

## Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ALC188	Sandy Grenville	02/15/2013	Shelter Temperature	none
DAS 1:	<b>DAS 2:</b>		Mfg	Extech	Parameter She	lter Temperatur
Abs Avg ErrAb0.43	os Max Er Abs Avg 0.93	Err Abs Max Er	Serial Number	H232734	Tfer Desc. RTE	)
			Tfer ID	01227		
			Slope	1.0043	5 Intercept	-0.08480
			Cert Date	1/12/201	3 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	С	0.93
primary	Temp Mid Range	23.25	23.23	0.000	23.5	С	0.28
primary	Temp Mid Range	23.58	23.56	0.000	23.6	С	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.

			5/2042
Site ID ALC188	Technician Sandy Grenville	Site Visit Date 02/1	5/2013
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
Ferrain	gently rolling	QAPP Declination	3.8
Conforms to MLM	Yes	QAPP Declination Date	9/16/2005
Site Telephone	(936) 563-2973	Audit Latitude	30.70157
Site Address 1	Poncho Rd.	Audit Longitude	-94.67401
Site Address 2	571 Park Rd. 56	Audit Elevation	10
County	Polk	Audit Declination	2.5
City, State	Livingston, TX	Present	
Zip Code	77351	Fire Extinguisher 🔽	Inspected Feb 2002
Fime 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 🔽	
Shelter Working Room	Make Shelter One M	odel 8128-2311	Shelter Size 1024 cuft
	Notes The site is clean and neat.		
Site OK	Notes		

### **Field Systems Data Form**

ALC188

F-02058-1500-S2-rev001

Site ID

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	8	
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.

Fie	eld Systems Data Form	F-02058-1500-S3-rev001	
Site	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
Pro	wide any additional explanation (photograph or sketch if nece	ssar	y) 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.

Fie	eld Systems Data	a Form		F-02058-1500-S4-rev001			
Site	ID ALC188	Technician S	andy Grenville		Site Visit Date 02/15/2013		
	Do all the meterological condition, and well main		tact, in good		Temperature only		
	Are all the meteorologica reporting data?		online, and		Temperature only		
3	Are the shields for the te	emperature and RH sen	sors clean?				
4	Are the aspirated motor	s working?					
	Is the solar radiation ser scratches?	isor's lens clean and fro	e of		N/A		
6	Is the surface wetness se	nsor grid clean and un	damaged?		N/A		
7	Are the sensor signal and condition, and well main		n good				
	Are the sensor signal and from the elements and w	d power cable connection	ons protected				
Par	ameter	Manufacturer	Model		S/N	Client ID	
Tem	perature	RM Young	41342VC	<u> 18. 9</u>	missing	02997	
	ide any additional explan ral or man-made, that ma			ary)	regarding conditions listed abov	e, or any other features,	

Fie	eld 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 eq	<u>uip</u> ı	nent 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	ma	<u>intenance</u>
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	В	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	

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.

Fie	eld Sy	ystems Data Fo	orm				<b>F-02</b>	2058-1	500-S6-rev001
Site	e ID	ALC188	Technician	Sandy Grenville		Site Visit Da	ate 02/15/2013	3	]
	DAS, se	ensor translators, and	peripheral equi	oment operation	<u>ns ai</u>	nd maintenance			
1	Do the well ma	DAS instruments appeaintained?	ear to be in good	condition and				62.0240	
2		the components of the , backup, etc)	DAS operation	al? (printers,					
3		analyzer and sensor sing protection circuitry		hrough		Met sensors only	/		
4	Are the signal connections protected from the weather and well maintained?								
5	Are the	signal leads connected	l to the correct	DAS channel?					
6	Are the ground	e DAS, sensor translate led?	ors, and shelter j	properly					
7	Does th	ie instrument shelter h	ave a stable pov	ver source?					
8	Is the i	nstrument shelter temj	perature control	led?					
9	Is the n	net tower stable and gr	ounded?			Stable		Grounde	1
10	Is the s	ample tower stable and	l grounded?						- And State
11	Tower	comments?							
Par	ameter	M	anufacturer	Model		S/N		Cl	ient ID

CR3000

H4223-C

RS900

2523

08443555843

unknown

000422

06583

06794

Campbell

Raven

APC

DAS

UPS

Modem

Field	Systems Data	Foi	m					<b>F-</b>	02058	-1500-	S7-rev001
Site ID	ALC188		Tecl	nnician	Sandy Gre	nville	Site Visit Date	e 02/15/20	013		
S.C.S.S.MA	<u>mentation</u>										
Does	<u>the site have the requir</u>	200000	States and	1 N. C. S. L.	Real Contractor	t manuals	<u>s?</u>				
Wind on	eed sensor	Yes	No	N//	4	Data log		Yes	No V	N/A	
The second second	rection sensor			<ul> <li></li> <li></li> </ul>		Data log	and the second				
						Data log	A SALES STORE CONTRACTOR			<ul> <li>Image: A start of the start of</li></ul>	
100101-01712-019	ature sensor humidity sensor					Compute	art recorder				
	diation sensor					Modem					
	wetness sensor					Printer					
	nsor translator			<ul> <li>Image: A start of the start of</li></ul>		Zero air	numn		<ul><li>▼</li></ul>		
	ature translator					Filter flo	No. of Concession, Name and States and States and				
1246 Ball 100 Ball	y sensor translator					Surge pr					
	diation translator					UPS					
	bucket rain gauge						ig protection devic	·e 🗌			
Ozone a						Shelter h	Construction of the second second second				
	ck flow controller						air conditioner				
ESSERVICE STREET	ck MFC power supply										
Real Property in the	s the site have the requi		nd m	ost recei	nt OC doer	iments ai	nd report forms?				
Duc	stile site have the requ	Pres	8 Y.S.S	<u>ost rece</u>		inicites at		Cu	rrent		
Station I	Loσ		✓				14				
SSRF			<ul> <li>✓</li> </ul>								
	Manual		<b>~</b>	Oct 200	1						
HASP			<b>~</b>	Nov 201							
Field Or	os Manual			1107 20							
	ion Reports	•	~								
Ozone z/	/s/p Control Charts	[									
	ve maintenance schedu	d -	~								
						SEL 1828					
1 Is t	he station log properly	comp	leted	during o	every site v	visit? 🔽	Minimal information	n			
2 Are the Site Status Report Forms being completed and											
3 Are the chain-of-custody forms properly used to document sample transfer to and from lab?						ent 🔽					
	ozone z/s/p control cha rent?	arts p	roper	ly comp	leted and		Control charts not	used			
	any additional explana or man-made, that may						y) regarding condi	itions list	ed above,	, or any ot	her features,
Alines i				0.000				643638			

Field Systems Data Form						F-02058-1500-S8-rev00		
Site	e ID	ALC188	Technician	Sandy Grenville		Site Visit Date 02/15/2013		
1 2	Has th course Has th	e? If yes, when an he backup operate	res ttended a formal CAS d who instructed? or attended a formal when and who instru	CASTNET				
3	Is the s schedu	the second s	rly on the required T	uesday	<			
4		e standard CAST ed by the site ope	NET operational pro rator?	cedures being				
5			nowledgeable of, and es? (including docum	Percent of Percent				

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

QC	Check	Performed	

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** 

3

**Multi-point Calibrations Automatic Zero/Span Tests** Manual Zero/Span Tests **Automatic Precision Level Tests Manual Precision Level Test Analyzer Diagnostics Tests In-line Filter Replacement (at inlet) In-line Filter Replacement (at analyze** Sample Line Check for Dirt/Water **Zero Air Desiccant Check** 

reported? If yes, how?

Frequency	Comp
Semiannually	
Daily	
As needed	
Daily	
As needed	
Weekly	
Every 2 weeks	
N/A	
Weekly	
Weekly	

1 Do multi-point calibration gases go through the complete sample train including all filters?

Are the automatic and manual z/s/p checks monitored and

2 Do automatic and manual z/s/p gasses go through complete sample train including all filters?

the		

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:

~

Unknown

liant

Fie	eld Systems Data Form				F-02058-1500-S9-rev00							
Site	ID ALC188 Te	chnician	Sandy Grenville		Site Visit Date	e 02/15/2013						
	Site operation procedures											
1	Is the filter pack being changed eve	ry Tuesda	ay as scheduled?		Filter changed mor	rnings, 80 % of the time	e					
2	Are the Site Status Report Forms be correctly?	eing com	pleted and filed									
3	Are data downloads and backups be scheduled?	eing perf	ormed as		No longer required	l						
4	Are general observations being mad	le and re	corded? How?		SSRF							
5	Are site supplies on-hand and reple fashion?	nished in	a timely									
6	Are sample flow rates recorded? Ho	ow?			SSRF, call-in							
7	Are samples sent to the lab on a reg fashion?	ular sche	dule in a timely									
8	Are filters protected from contamin and shipping? How?	ation du	ring handling		One set of gloves only							
9	Are the site conditions reported reg operations manager or staff?	ularly to	the field									
QC	Check Performed	Fre	quency			Compliant						
N	Iulti-point MFC Calibrations	Serr	niannually									
F	low System Leak Checks	✓ Wee	ekly									
F	ilter Pack Inspection											
F	low Rate Setting Checks	✓ Wee	ekly									
V	isual Check of Flow Rate Rotometer	Wee	ekly									
Iı	1-line Filter Inspection/Replacement	Ser Ser	niannually									
S	ample Line Check for Dirt/Water	✓ Wee	ekly									
Provi	ide any additional explanation (phot	ograph o	r sketch if neces	sary	) regarding condit	tions 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
MA	C426-Eric I	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	10950000033
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	В	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 N	Number Site	e T	echnician	Site Visit Date	Parameter	Use Desc.
Environmenta	I Sys A3027	MA	AC426	Eric Hebert	03/01/2013	DAS	Primary
Das Date:	3 /1 /2013 9:18:35	Audit Date Audit Time	3 /1 /2013 9:19:02	Mfg	Datel	Paramete	r DAS
Das Time:	60	Audit Thile Audit Day	60	Serial Number	4000392	Tfer Desc	Source generator (D
Low Channel	l:	High Chann	el:	Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0002	2 0.00	04 0.000	1 0.0002	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Paramete	rDAS
				Serial Number	86590148	Tfer Desc	
					01310		
				Tfer ID			
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/27/201	3 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	-0.0002	
8	0.3000	0.3000	0.2997	V	V	-0.0003	
8	0.5000	0.5000	0.4999		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	-0.0003	
13	0.0000	0.0000	0.0000		V	0.0000	
13	0.1000	0.1000	0.0999		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 Nur	nber Ta 🖇	Site	Тес	hnician	Site Visit I	Date Paran	neter	<b>Owner ID</b>	
Tylan	AW71025	3	MAC426	Eri	c Hebert	03/01/201	3 Flow F	Rate	02023	
Mfg	Tylan				Mfg	BIOS	Ι	Parameter Flo	ow Rate	
SN/Owner ID	FP9605011	03645			Serial Number	122974	1	Tfer Desc. BIOS		
	MFC power su	power supply			Tfer ID	01416				
Taranceer		PP'J			Class -	1	.00000 Int		0.00000	
					Slope	1		ercept	]	
					Cert Date	1/	8/2013 <b>Co</b>	rrCoff	1.00000	
DAS 1:		<b>DAS 2:</b>			Cal Factor Z	ero		0		
A Avg % Diff: A	A Max % Di	A Avg %I	Dif A Max	x % Di	Cal Factor F	ull Scale	5.	51		
0.85%	0.94%				Rotometer R	eading:	1.	55		
UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSigna	IPctDifference:	
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		
1 2	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 Compo	nent Leak Tes	st		Conditio	n		Statu	s pass		
Sensor Compo	nent Filter Azi	muth		Conditio	n 180 deg		Statu	s pass		
Sensor Compo	nent Filter De	pth		Conditio	n - 3.5 cm		Statu	s Fail		
Sensor Compo	nent Filter Po	sition		Conditio	n Poor		Statu	s Fail		
Sensor Compo	ment Moisture	Present		Conditio	n No moisture pr	esent	Statu	s pass		
Sensor Compo	nent Rotomet	er Condition	I	Conditio	n Clean and dry		Statu	s pass		
Sensor Compo	nent System I	Memo		Conditio	n See comments	;	Statu	s pass		
Sensor Compo	nent Tubing C	Condition		Conditio	n Good		Statu	s pass		
Sensor Component Filter Distance				Conditio	<b>n</b> 7.0 cm		Statu	s pass		

### **Ozone Data Form**

Mfg	S	erial Number Ta	Site	Te	chnician		Site Visi	it Date	Parame	eter	Owner I	D
ThermoElectro	on Inc	CM08460049	MAC426	Er	ic Hebert	:	03/01/2	013	Ozone		none	
Slope: Intercept CorrCoff	1.4	33139Slope:44173Intercept99999CorrCoff	0.00000	D	Mfg Serial N Tfer ID		ThermoE 5171121 01111			rameter 02 er Desc. 02	cone zone primary	/ stan
DAS 1:		<b>DAS 2:</b>			Slope			0.9972	0 Inter	t	0.18	3428
	f: A Ma	x % Di A Avg %	6Dif A Max 9	% Di	Slope							
5.4%		6.7%			Cert Da	ite		1/2/201	3 Cori	Coff	1.00	0000
UseDescri	iption:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	e Unit:	PctDif	ference:	
prima	ry	1	-0.14	-0.		1.	26	ppb				
prima	ry	2	37.17	37.	.08	39.	.57	ppb			6.72%	
prima	ry	3	53.20	53	.16	56	.25	ppb			5.81%	
prima	ry	4	82.02	82.	.06	85.	.84	ppb			4.61%	
prima	ry	5	110.54	110	).66	115	.80	ppb			4.64%	
Sensor Con	nponent	Cell B Noise		Conditio	on 0.9 kH	Ηz			Status	pass		
Sensor Con	nponent	Cell B Tmp.		Conditi	on				Status	pass		
Sensor Con	nponent	Fullscale Voltage		Conditi	on N/A				Status	pass		
Sensor Con	nponent	Inlet Filter Condition	n	Conditi	on Clean	1			Status	pass		
Sensor Con	nponent	Line Loss		Conditi	on Not te	sted			Status	pass		
Sensor Con	nponent	Offset		Conditio	on -1.2				Status	pass		
Sensor Con	nponent	Span		Conditio	on 1.016				Status	pass		
Sensor Con	nponent	Cell B Freq.		Conditi	on 97.9 k	κHz			Status	pass		
Sensor Con	nponent	System Memo		Conditi	on				Status	pass		
Sensor Con	nponent	Sample Train		Conditio	on Good				Status	pass		
Sensor Con	nponent	Cell B Pressure		Conditio	on				Status	pass		
Sensor Con	nponent	Cell B Flow		Conditio	on 0.72 l	pm			Status	pass		
Sensor Con	nponent	Cell A Tmp.		Conditio	on 36.7 (	2			Status	pass		
Sensor Con	nponent	Cell A Pressure		Condition	on 731 m	nmHg			Status	pass		
Sensor Con	nponent	Cell A Noise		Condition	on 0.8 pp	b			Status	pass		
Sensor Con	nponent	Cell A Freq.		Conditio	on 83.4 k	κHz			Status	pass		
Sensor Con	nponent	Cell A Flow		Conditio	on 0.72 l	pm			Status	pass		
Sensor Con	nponent	Battery Backup		Condition	on N/A				Status	pass		
Sensor Con	nponent	Zero Voltage		Conditio	on N/A				Status	pass		

## Wind Speed Data Form

Mfg	Serial Numbe	r Ta Site	Т	echnician	Site Visit Date	e Parameter	Owner ID		
Climatronics	1515	MAC420	6 E	ric Hebert	03/01/2013	Wind Speed	90924		
				Mfg	RM Young	Paramet	er wind speed		
				Serial Number		Tfer Des	c. wind speed motor (h		
				Tfer ID	01262		· · · · · · · · · · · · · · · · · · ·		
				Her ID	01202				
Prop or Cups SN	2341			Slope	1.000	00 Intercept	0.00000		
Prop or Cups To	rque 0	.2 to	0.2	Cert Date	1/13/20	)10 CorrCoff	1.00000		
<b>Prop Correction</b>	Fact N/A								
				Mfg	RM Young	Paramet	er wind speed		
				Serial Number		Tfer Des	c. wind speed motor (I		
				Tfer ID	01261				
							0.00000		
				Slope	1.000	00 Intercept	0.00000		
				Cert Date	1/13/20	010 CorrCoff	1.00000		
DA	AS 1:	D	AS 2:						
				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 Compon	ent System Men	10	Conditi	on		Status pass			
Sensor Compon	ent Sensor Plum	ıb	Conditi	on Plumb		Status pass			
Sensor Compon	Sensor Component Sensor Heater Cond					Status pass			
Sensor Compon	Sensor Component Prop or Cups Condition Cond					Status pass			
Sensor Compon	ent Condition		Conditi	on Good		Status pass			
Sensor Compon	ent Torque		Conditi	on		Status pass			

### Wind Direction Data Form

Mfg	Serial Number	Га Site		Technician		Site Visit Date Param		meter	<b>Owner ID</b>	
Climatronics	1484	MAC426		Eric Hebert		03/01/20	13 Wind	Direction	none	
				Mfg Serial Nun Tfer ID	nber	RM Youn	g]		wind direction wind direction wheel	
Vane SN: 3945 VaneTorque	5 to 7	C. A. Align. de	<mark>eg. true:</mark> 358			'				
				Mfg		Ushikata		Parameter	wind direction	
				Serial Nun	nher	190037		Tfer Desc.	transit	
					libel			The Desc.		
				Tfer ID		01265				
				Slope			1.00000	ntercept	0.00000	
				Cert Date				orrCoff	1.00000	
	S 1: ientation Line: 1.4		AS 2: rientation	Linearity:						
UseDescription:	TferID:	Input Raw:	Linearity	Output V:	Outr	out Deg.:	Difference:	Change:	Error:	
primary	01265	88		0.0000	Out	86	2		2	
primary	01265	168		0.0000		168	(		0	
primary	01265	178		0.0000		177	1		1	
primary	01265	268		0.0000		266	2	2	2	
primary	01265	358		0.0000		360	2	2	2	
primary	01266	0	$\checkmark$	0.0000		0	(	) 48	3	
primary	01266	45		0.0000		40	4	5 40	-5	
primary	01266	90		0.0000		86	4	46	1	
primary	01266	135		0.0000		132	3	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		0	
primary	01266	315		0.0000		312	3	3 46	1	
Sensor Compone	ent Mast			ition Good			Stat	us pass		
Sensor Compone	ent Condition		Cond	ition Good			Stat	us pass		
Sensor Component Sensor Heater			Cond	ition Functioni	ing	Status pass				
Sensor Component Sensor Plumb				ition Plumb		Status pass				
Sensor Component Vane Condition				ondition Fair			Stat			
Sensor Compone	Cond	ition		Status pass						
Sensor Compone	Cond	ition See com		Stat	Status pass					

## Temperature Data Form

Mfg	:	Serial Nun	nber Ta	Site		Tech	nician	Site Visit Date	Param	eter	<b>Owner ID</b>
RM Young		15105		MAC426		Eric	Hebert	03/01/2013	Tempe	rature	none
						N	/lfg	Extech	Pa	arameter Te	mperature
						S	erial Number	H232679	T	fer Desc. RT	D
						T	fer ID	01228			
DAS 1:			DAS 2:			S	lope	1.0073	32 Inte	ercept	-0.12380
Abs Avg Err	Abs	Max Er		Abs Avg Err Abs Max 1		Cert Date		1/12/2013 Cor		rCoff 1.00000	
0.31		0.34				]					
UseDesc.:	,	Test type:	In	putTmpRaw	InputTm	oCorr	.: OutputTmpS	ignal: OutputSig	gnalEng:	OSE Unit:	Difference:
primary	Temp	Low Range	e	-0.18	-0.0	6	0.0000	0.20		C	0.26
primary	Temp	Mid Range	•	24.45	24.4	0	0.0000	24.	73	С	0.33
primary	Temp	High Rang	e	43.30	43.1	1	0.0000	43.	45	C	0.34
Sensor Com	ponen	t Shield			Cond	lition	Moderately clea	an	Status	pass	
Sensor Component Blower Status Switch			Cond	lition	N/A		Status pass				
Sensor Component Blower			Cond	lition	Functioning		Status	pass			
Sensor Com	ponen	t System N	/lemo		Cond	lition			Status	pass	

# 2 Meter Temperature Data For

Calc. Difference

Mfg	Serial Numb	er Ta Site	Т	echnici	ian	Site Visi	sit Date Paramet		er	<b>Owner ID</b>
RM Young	15104	MAC42	6 E	Eric Hebert		03/01/20	013	Tempera	ture2meter	none
				Mfg		Extech		Par	ameter Ten	nperature
				Seria	l Number	H232679	)	Tfe	r Desc. RTE	D
				Tfer	ID	01228		]		
DAS 1:	D	AS 2:		Slope	е		1.00732	Intero	cept	-0.12380
Abs Avg Err			bs Max Er	Cert	Date	1	/12/2013	B Corre	Coff	1.00000
0.33	0.43									
UseDescription:	Test type:	InputTmpRaw	InputTmpCor	rected:	OutputTmp	Signal: O	OutputSig	gnalEng:	OSE Unit:	Difference:
primary	Temp Low Rang	-0.18		-0.06		0.0000		0.17	С	0.23
primary	Temp Mid Range	24.45		24.40		0.0000	00 24.74 C		С	0.34
primary	Temp High Rang	43.30		43.11		0.0000		43.54	С	0.43
Sensor Comp	onent Blower Stat	us Switch	Condit	ion N/A	٩			Status F	ass	
Sensor Comp	onent System Me	mo	Condit	ion				Status F	ass	
Sensor Comp	onent Blower		Condit	ion Fu	nctioning			Status F	ass	
Sensor Component Properly Sited Con		Condit	dition Properly sited				Status P	ass		
Sensor Comp	onent Shield		Condit	ion Mo	derately cle	an		Status F	ass	

# Humidity Data Form

Mfg	Serial N	umber Ta	Site		1	Technician		Site V	isit Date	Para	meter	Owner ID
Rotronic	Rotronic 52064 MAC426			Eric Hebert		03/01	/2013	Relat	ive Humidity	none		
						Mfg		Rotron	nic		Parameter Re	lative Humidity
						Serial Nu	mber	12443	2		Tfer Desc. Hy	groclip
						Tfer ID		01225				
						Slope			1.0000	0 In	tercept	0.00000
	DAS 1:			<b>DAS 2:</b>		Cert Dat	е		1/29/201	3 <b>C</b>	orrCoff	1.00000
	Low Range	High Ra	nge	Low Rang	ge	High Rang	e					
Abs Avg Err	14.	9	2.2									
Abs Max Er	27.	4	2.2									
UseDesc.:	Test type:	Devi	ce:	Input RH	:	GTL Raw:	RH (	Corr.:	DAS V	olts:	DAS %RH:	Difference:
primary	RH Low Ran	ge Hygro	oclip	32.8		34.8	32	2.8	0.000	00	60.2	27.4
primary	RH Low Ran	ge Hygro	clip	52.9		60.0	52	2.9	0.000	00	55.3	2.4
primary	RH High Ran	ge Hygro	clip	93.6		91.1	93	8.6	0.000	00	95.8	2.2
Sensor Com	ponent Syste	m Memo			Cond	ition				Stati	1s pass	
Sensor Com	ponent Blowe	r			Cond	ition Functio	ning			Statu	1s pass	
Sensor Com	ponent Blowe	r Status Swi	tch		Cond	ition N/A				Statu	18 Pass	
Sensor Com	ponent RH F	ter			Cond	ition Clean				Stati	1s pass	
Sensor Com	ponent Shield				Cond	ition Modera	tely cle	an		Statu	1s pass	

## Solar Radiation Data Form

Mfg	Serial Number	Ta Site	Те	echnician	Site V	isit Date	Parame	eter	Owner ID
Licor	PY98205	MAC426	E	ric Hebert	03/01	/2013	Solar Ra	adiation	none
				Mfg	Eppley	/	Pa	rameters	olar radiation
				Serial Numbe	r 10765		Tf	er Desc. S	R transfer translat
				Tfer ID	01246		7		
DAG 1.	DA	S <b>A</b> .		Slope		1.0000	0 Inter	rcept	0.00000
DAS 1: % Diff of Avg %	DA Diff of Max %I	S 2: Diff of Avg %D	iff of Max	Cert Date		1/6/201	0 Cori	Coff	1.00000
				Mfg	Eppley	/	Pa	rameters	olar radiation
				Serial Numbe					R transfer sensor
				Tfer ID	01245				
				Slope		1.0000	0 Inter	cont	0.00000
				Cert Date		12/16/201	0 Cori	Coff	1.00000
6.8%	9.2%	0.0%	0.0%						
UseDescription:	Measure Date	MeasureTime	Tfer Corr	r: DAS v	/m2:	PctDiffe	erence:		
primary	3/1/2013	10:00	223	23	9		7.2%		
primary	3/1/2013	11:00	251	27	4		9.2%		
primary	3/1/2013	12:00	234	25	7		9.8%		
primary	3/1/2013	13:00	201	20	4		1.5%		
primary	3/1/2013	14:00	191	21	2		11.0%		
primary	3/1/2013	15:00	92	87	,		-5.4%		
Sensor Compor	ent Sensor Level		Condition	on Level			Status	pass	
Sensor Compor	ent Sensor Clear	1	Conditi	on Clean			Status	pass	
Sensor Compor	ent Properly Site	d	Conditi	on Properly site	d		Status	pass	
Sensor Compor	nent System Mem	0	Conditi	on		Status			

# Precipitation Data Form

Mfg	Sei	rial Number Ta	Site	]	Tecl	hnician		Site	Visit Date	Paramo	eter		Owner ID
Climatronics	ille	egible	MAC426		Eric	: Hebert		03/	01/2013	Precipit	ation		01324
					I	Mfg		PMF	)	Pa	ramet	er Pred	cipitation
<b>DAS 1:</b>		<b>DAS 2:</b>			5	Serial Nur	nber	EW-	06134-50	Tf	er Des	<b>c.</b> 250	ml graduate
A Avg % Diff 6.0%		% Di         A Avg %           8.0%	Dif A N	/Iax % Di		<b>Ffer ID</b>		012	50				
					5	Slope			1.0000	0 Inte	rcept		0.00000
					•	C <mark>ert Date</mark>			9/5/200	)5 Cori	rCoff		1.00000
UseDesc.	Test typ	pe: TferVolume:	Iteration:	TimePerTip	p:	Eq.Ht:	DAS	eng:	Eq.HtUnit:	OSE Un	it: Tfe	rUnits:	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 Com	ponent S	System Memo		Condi	itior	See com	ments	;		Status	pass		
Sensor Com	ponent S	Sensor Heater		Condi	itior	Function	ing			Status	pass		
Sensor Com	ponent F	Properly Sited		Condi	itior	See com	ments	;		Status	pass		
Sensor Com	ponent	Gauge Drain Scree	n	Condi	itior	Not insta	lled			Status	Fail		
Sensor Com	ponent	evel		Condi	itior	Level				Status	pass		
Sensor Com	ponent	Gauge Clean		Condi	itior	Clean				Status	pass		
Sensor Com	ponent F	Funnel Clean		Condi	itior	Clean				Status	pass		
Sensor Com	ponent C	Condition		Condi	itior	Good				Status	pass		
Sensor Com	ponent	Gauge Screen		Condi	itior	Installed				Status	Fail		

#### **Infrastructure Data For**

Site ID	MAC426	Technician Eric He	bert Site Visit Date 03/01/2013
Shelter	Make	Shelter Model	Shelter Size
custom		N/A	1536 cuft

Sensor Component	Shelter Roof	Condition	Fair	Status	pass
Sensor Component	Sample Tower Type	Condition	Туре В	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:	<b>DAS 2:</b>		Mfg	Extech	Parameter She	Iter Temperatur
Abs Avg ErrAb0.98	s Max Er Abs Avg 1.40	Err Abs Max Er	Serial Number	H232679	Tfer Desc. RTD	)
			Tfer ID	01228		
			Slope	1.0073	2 Intercept	-0.12380
			Cert Date	1/12/201	3 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	С	0.79
primary	Temp Mid Range	23.51	23.46	0.000	24.9	С	1.4
primary	Temp Mid Range	23.67	23.62	0.000	24.4	С	0.75

## **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazaro	Problem
Flow Rate The filter attachment pla geometric orientation.	MAC426 ate is mounted to	Eric Hebert o high in the enclos	03/01/2013 sure resulting in	Filter Position the filter being rece	Tylan essed in the enclose	3705 sure and not expo	Dised in the s	<b>∠</b> standard
Precipitation Objects violate the 45 d	MAC426 egree rule for the	Eric Hebert tipping bucket rain	03/01/2013 n gage.	Properly Sited	Climatronics	3701		

## **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.

Site ID MAC426	Technician Eric Hebert	Site Visit Date 03/0	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
Ferrain	rolling	QAPP Declination	3
Conforms to MLM	Marginally	QAPP Declination Date	12/27/2004
Site Telephone	(270) 758-2136	Audit Latitude	37.13179
Site Address 1	Alfred Cook Road	Audit Longitude	-86.14295
Site Address 2		Audit Elevation	23
County	Edmonson	Audit Declination	-4.0
City, State	Smiths Grove, KY	Present	
Zip Code	42171	Fire Extinguisher 🔽	inspected August 2010
Fime 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 Ma	odel N/A	Shelter Size 1536 cuft
Shelter Clean	Notes The shelter is well maintained,	clean, neat, and well organize	əd.
Site OK	Notes		

#### **Field Systems Data Form**

MAC426

F-02058-1500-S2-rev001

Site ID

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.

Fie	eld Sy	vstems Data Fo	orm			F-02058-1500-S3-rev001
Site	D	MAC426	Technician	Eric Hebert		Site Visit Date 03/01/2013
1		nd speed and direction ifluenced by obstructio		as to avoid		
2	(i.e. wir horizon	nd sensors mounted so id sensors should be mo itally extended boom > nto the prevailing wind	o <mark>unted atop the</mark> 2x the max dian	e tower or on a		
3	Are the	tower and sensors plu	mb?			
4		temperature shields p adiated heat sources su				
5	condition surface	nperature and RH sens ons? (i.e. ground below and not steeply sloped g water should be avoi	sensors should Ridges, hollow	be natural		
6	Is the s	olar radiation sensor p	lumb?			
7	Is it site light?	ed to avoid shading, or	any artificial o	r reflected		
8	Is the r	ain gauge plumb?				
9	Is it site towers,	ed to avoid sheltering e etc?	ffects from bui	dings, trees,		45 degree rule violation
10	Is the set facing i	urface wetness sensor s north?	ited with the g	rid surface		N/A
11	Is it in	clined approximately 3	0 degrees?			N/A
					1011	

Field S	ystems Dat	ta Form			F-	02058-1500-S4-rev00
Site ID	MAC426	<b>Technician</b>	Eric Hebert		Site Visit Date 03/01/2	2013
	the meterologica tion, and well mai	l sensors appear to be in ntained?	ntact, in good			
	ll the meteorologi ting data?	cal sensors operational	online, and			
Are the shields for the temperature and RH sensors clean?						
4 Are th	ne aspirated moto	rs working?				
5 Is the scrate		ensor's lens clean and fr	ee of			
6 Is the	surface wetness s	ensor grid clean and ur	damaged?	✓ N	/Α	
	ne sensor signal an tion, and well mai	nd power cables intact, ntained?	in good			
	ne sensor signal an the elements and	nd power cable connect well maintained?	ions protected			
Parameter	r	Manufacturer	Model		S/N	Client ID
Met tower		Climatronics	illegible	110400000	illegible	none
Wind Direc	tion	Climatronics	100076		1484	none
Solar Radia	ation	Licor	LI-200		PY98205	none
Relative H	umidity	Rotronic	MP 601A		52064	none
Precipitatio	n	Climatronics	100508-2		illegible	01324
Temperatu	emperature RM Young 41342		41342		15105	none
Temperatu	re2meter	RM Young	41342		15104	none
AND INCOMENTATION OF A DESCRIPTION OF A	ed	Climatronics	100075	a management of the	1515	90924

Fi	eld Systems Data Form		F-02058-1500-S5-rev001					
Site	MAC426 Technician Eric Hebert		Site Visit Date 03/01/2013					
	Siting Criteria: Are the pollutant analyzers and deposition e	<u>quip</u>	ment 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 an	d ma	<u>intenance</u>					
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					
Pa	ameter Manufacturer Model		S/N Client ID					

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	В	none	none
Ozone	ThermoElectron Inc	49i A3NAA	CM08460049	none
Filter pack flow pump	Thomas	107CAB11A	10950000033	none
MFC power supply	Tylan	RO-32	FP9605011	03645
Zero air pump	Werther International	PC70/4	000665778	none

Fie	eld Syst	tems Data Fo	orm			F-02058-1500-S6-rev001				
Site	ID N	IAC426	Technician	Eric Hebert		Site Visit I	Date 03/01/201	3		
	DAS cons	or translators, and j	parinharal aqui	ment operation	16 91	d maintanance				
	DAS, Senso		<u>peripherar equi</u>	<u>Differit operation</u>	<u>15 ai</u>		<u>-</u>			
1	Do the DA well maint	S instruments appe ained?	ar to be in good	condition and						
2	Are all the modem, ba	components of the ackup, etc)	DAS operation	al? (printers,						
3		ulyzer and sensor sign protection circuitry		hrough		Met sensors on	lly			
4	Are the signal connections protected from the weather and well maintained?									
5	Are the sig	gnal leads connected	to the correct	DAS channel?						
6	Are the DA grounded?	AS, sensor translato	rs, and shelter j	oroperly						
7	Does the in	nstrument shelter h	ave a stable pov	ver source?						
8	Is the inst	rument shelter temp	oerature control	led?						
9	Is the met	tower stable and gr	ounded?			Stable		Grounded		
10	Is the sam	ple tower stable and	l grounded?							
11	Tower con	nments?								
				Model		CAT		CIT		

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
the second states of the state of the				

Solar radiation sensor Image: Solar radiation sensor   Surface wetness sensor Image: Solar radiation ranslator   Image: Solar radiation translator Image: Solar radiation ranslator   Image: Solar radiation translator Image: Solar radiation translator   Image: Solar radiation tra	Field Systems Data	Fo	rm					<b>F-02</b>	058-	-1500-S7-rev001
Documentation         Ves       No       Ves       No       No         Ves       No       No       Ves       No       No         Wind speed sensor       Image: Imag	Site ID MAC426		Tec	hnician	Eric Hebert		Site Visit Date	03/01/2013		A CONTRACTOR
Des the site have the required instrument all equipment manuals?       Yes       No       N/A       Yes       No       N/A         Wind speed sensor       I       Data logger       I										
Yes       No       N/A       Yes       No       N/A         Wind speed sensor       I       Data logger       I       I       I         Wind direction sensor       I       I       Data logger       I       I       I         Temperature sensor       I       I       Strip chart recorder       I       I       I         Relative humidity sensor       I       I       Computer       I       I       I         Solar radiation sensor       I       I       Modem       I       I       I         Surface wetness sensor       I       I       Printer       I       I       I         Wind sensor translator       I       I       I       I       I       I       I         Surface wetness sensor       I <th><b>Documentation</b></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	<b>Documentation</b>									
Wind speed sensor I   Data logger I   Wind direction sensor I   Temperature sensor I   Relative humidity sensor I   I Computer   Solar radiation sensor I   V Computer   Solar radiation sensor I   V Printer   Surface wetness sensor I   V Printer   V I   Surface wetness sensor I   V Printer   V I   Surface wetness sensor I   V I   Surface wetness sensor I   V I   Surface wetness sensor I   V Printer   Vind sensor translator I   V I   Iter flow pump I   Humidity sensor translator I   V I   Surface wetnes and report forms?   Solar radiation translator I   V I   Ipping bucket rain gauge I   V I   Subter heater V   Solar translator I   V I   Shelter heater V   Shelter heater V   Shelter heater V   Shelter heater V   Shelter heater V <th>Does the site have the requir</th> <th><mark>ed in</mark></th> <th>strum</th> <th>ent and</th> <th>equipment</th> <th>manuals?</th> <th></th> <th></th> <th></th> <th></th>	Does the site have the requir	<mark>ed in</mark>	strum	ent and	equipment	manuals?				
Wind inection sensor Image:   Temperature sensor Image:   Relative humidity sensor Image:   Solar radiation sensor Image:   Solar radiation sensor Image:   Solar radiation sensor Image:   Image: Image:   Solar radiation sensor Image:   Image: Image:   Solar radiation sensor Image:   Image: Ima				A COMPANY AND A COMPANY AND A						N/A
Temperature sensor Strip of art recorder   Relative humidity sensor Modem   Solar radiation sensor Modem   Surface wetness sensor Modem   Surface wetness sensor Printer   Wind sensor translator Printer   Wind sensor translator Printer   Solar radiation translator Surge protector   Surge protector Surge protector   Surge protector Surge protector   Surge protector Surge protector <			Constants	22.00		Sector Contractor				
Relative humidity sensor Image: Computer Control on the contr				Contract of the					Ľ	
Solar radiation sensor Solar radiation sensor Surface wetness sensor Modem V Modem V M		<u> </u>		A CONTRACTOR			recorder	And shares in the second	and the second	
Surface wetness sensor Image: Surface wetness sensor   Wind sensor translator   Cero air pump   Temperature translator   Image: Surface wetness sensor   Image: Surface wetnessensor	Relative humidity sensor	Server)		CALL COLOR DATE		2022/2022/2022/2022				
Wind sensor translator Image: Caro air pump   Temperature translator Image: Filter flow pump   Humidity sensor translator Image: Caro air pump   Humidity sensor translator Image: Caro air pump   Solar radiation translator Image: Caro air pump   Solar radiation translator Image: Caro air pump   Solar radiation translator Image: Caro air pump   Image: Caro air pump Image: Caro air pump   Solar radiation translator Image: Caro air pump   Solar radiation translator Image: Caro air pump   Image: Caro air pump Image: Caro air pump   Solar radiation translator Image: Caro air pump   Solar radiation translator Image: Caro air pump   Image: Caro air pump Image: Caro air pump   Solar radiation translator Image: Caro air pump	Solar radiation sensor			South States						
Temperature translator Image: Filter flow pump   Humidity sensor translator Image: Surge protector   Solar radiation translator Image: Surge protector   Solar radiation translator Image: Surge protector   Tipping bucket rain gauge Image: Surge protecton device   Ozone analyzer Image: Shelter heater   Filter pack flow controller Image: Shelter air conditioner   Filter pack MFC power supply Image: Shelter air conditioner   Filter pack stie have the required and most recent QC documents and report forms?   Dess the site have the required and most recent QC documents and report forms?   Station Log Image: DataView2   SSRF Image: DataView2   Site Ops Manual Image: DataView2   Filted Ops Manual Image: DataView2   Field Ops Manual Image: DataView2	Surface wetness sensor	LANSING MAL				Printer				
Humidity sensor translator Image: Surge protector   Solar radiation translator Image: Surge protector   Solar radiation translator Image: Surge protector   Tipping bucket rain gauge Image: Lightning protection device   Ozone analyzer Image: Shelter heater   Ozone analyzer Image: Shelter heater   Filter pack flow controller Image: Shelter air conditioner   Filter pack MFC power supply Image: Shelter air conditioner   Dees the site have the required and most recent QC documents and report forms?   Present Current   Station Log Image: DetaView2   Station Log Image: DetaView2   Station Log Image: DetaView2   Site Ops Manual Image: DetaView2   Field Ops Manual Image: DetaView2   Field Ops Manual Image: DetaView2   Calibration Reports Image: DetaView2	Wind sensor translator	20 <u>20 20 20</u>		a second second		Zero air pı	ımp			
Solar radiation translator Image: Solar radiation translator   Tipping bucket rain gauge Image: Lightning protection device   Ozone analyzer Image: Shelter heater   Ozone analyzer Image: Shelter heater   Filter pack flow controller Image: Shelter air conditioner   Filter pack MFC power supply Image: Shelter air conditioner   Filter pack MFC power supply Image: Shelter air conditioner   Filter pack MFC power supply Image: Shelter air conditioner   Filter pack MFC power supply Image: Shelter air conditioner   Station Log Image: Shelter air conditioner   Station Log Image: DataView2   Station Log Image: DataView2   Site Ops Manual Image: Shelter air conditioner   HASP Image: Shelter air conditioner   Field Ops Manual Image: Shelter air conditioner   Calibration Reports Image: Shelter air conditioner	Temperature translator	61 <u>00</u> 54	2010/02/02			Filter flow	pump			
Tipping bucket rain gauge Image: Clightning protection device   Ozone analyzer Shelter heater   Filter pack flow controller Shelter air conditioner   Filter pack MFC power supply Shelter air conditioner   Does the site have the required and recent QC documents and report forms?   Filter pack MFC power supply Image: Current   Station Log Image: Current   Station Station Current Image: Current   Station Log Image: Current   Station Log Image: Current   Station Current Image: Current   Station Current Image: Current   Station Current Image: Current   Current Image: Current   Station Current Image: Current   Current Image: Current   Station Current <t< td=""><td>Humidity sensor translator</td><td></td><td></td><td></td><td></td><td>Surge prot</td><td>ector</td><td></td><td></td><td></td></t<>	Humidity sensor translator					Surge prot	ector			
Ozone analyzer Image: Shelter heater   Filter pack flow controller Image: Shelter air conditioner   Filter pack MFC power supply Image: Shelter air conditioner   Does the site have the required and most recent QC documents and report forms?   Does the site have the required and most recent QC documents and report forms?   Station Log Image: DataView2   SSRF Image: DataView2   Site Ops Manual Image: DataView2   Field Ops Manual Image: DataView2   Field Ops Manual Image: DataView2   Calibration Reports Image: DataView2	Solar radiation translator			States and states		UPS			20000	
Filter pack flow controller     Filter pack MFC power supply     Does the site have the required and most recent QC documents and report forms?   Present   Station Log   SSRF   I   DataView2   SSRF   I   Site Ops Manual   I   Field Ops Manual   I <t< td=""><td>Tipping bucket rain gauge</td><td></td><td></td><td>and the second</td><td></td><td>Lightning</td><td>protection device</td><td>and the second secon</td><td></td><td></td></t<>	Tipping bucket rain gauge			and the second		Lightning	protection device	and the second secon		
Filter pack MFC power supply   Does the site have the required and most recent QC documents and report forms?   Present   Station Log   SSRF   Image: Site Ops Manual	Ozone analyzer			A DECEMBER OF		Shelter hea	iter	2009 <u></u> 2009 -		
Does the site have the required and most recent QC documents and report forms?         Present       Current         Station Log	Filter pack flow controller		and the second	Sector Sector		Shelter air	conditioner			
Present Current   Station Log DataView2   SSRF I   Site Ops Manual I   HASP I   Field Ops Manual I   I I	Filter pack MFC power supply									
Station Log Image: DataView2   SSRF Image: DataView2   Site Ops Manual Image: DataView2   HASP Image: DataView2   Field Ops Manual Image: DataView2   Calibration Reports Image: DataView2	Does the site have the requi	ired a	and m	ost rece	nt QC docu	ments and	report forms?			
SSRF Image: Sintermatrice   Site Ops Manual Image: Sintermatrice   HASP Image: Sintermatrice   Field Ops Manual Image: Sintermatrice   Calibration Reports Image: Sintermatrice		Pre	sent					Curren	nt	
Site Ops Manual Image: Constraint of the second seco	Station Log			DataVie	ew2					
HASP   HASP   HASP   HASP   HASP   HASP   HASP   HASP   HASP	SSRF									
Field Ops Manual     Image: Calibration Reports     Image: Calibration Reports	Site Ops Manual									
Calibration Reports	HASP			1						
	Field Ops Manual									
	Calibration Reports									
Uzone z/s/p Control Charts	Ozone z/s/p Control Charts									
Preventive maintenance schedul	Preventive maintenance schedu	l.								
1 Is the station log properly completed during every site visit? ✓ DataView	1 Is the station log properly	comi	nleted	during	everv site v	isit? 🔽 D	ataView	14		
2 Are the Site Status Report Forms being completed and current?		For	ms bei	ng comp	pleted and					
3 Are the chain-of-custody forms properly used to document sample transfer to and from lab?				erly used	d to docum	ent 🔽				
4 Are ozone z/s/p control charts properly completed and Control charts not used		arts p	propei	rly comp	oleted and		ontrol charts not us	sed		
Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:							regarding conditi	ions listed a	ıbove,	or any other features,

Fie	eld Sy	stems Data	Form		F-02058-1500-S8-rev001				
Site	ID	MAC426	Technician	Eric Hebert		Site Visit Date	03/01/2013		
1	Has the	eration procedures e site operator atte ? If yes, when and	nded a formal CAS	TNET training	•	Receives training ev	very 6 months dur	ing calibration visits	
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?			SACTOC CONTRACTOR AND	<	Receives training every 6 months during calibration visits			
3	Is the si schedul	CONTRACTOR CONTRACTOR OF A DESCRIPTION	on the required T	iesday	•				
4		standard CASTN d by the site opera	ET operational pro tor?	cedures being	~				
5			wledgeable of, and a ? (including docum	Percent of the second s	✓				
	A ro roo	ular anarational O	A/OC checks porto	rmod on motoor	alo	gial instruments?			

QC	Chec	k Perf	formed

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** 

**Multi-point Calibrations Automatic Zero/Span Tests Manual Zero/Span Tests Automatic Precision Level Tests Manual Precision Level Test Analyzer Diagnostics Tests In-line Filter Replacement (at inlet) In-line Filter Replacement (at analyze** Sample Line Check for Dirt/Water Zero Air Desiccant Check

Frequency	Comj
Monthly, quarterly, semiannually	
Daily	
Every 2 weeks	
Daily	
Alarm values only	
Every 2 weeks	
N/A	
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?
- Are the automatic and manual z/s/p checks monitored and 3 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:

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 $\checkmark$ 

pliant

Fie	Field Systems Data Form					F-02058-1500-S9-rev001				
Site	ID	MAC426	Tech	nician	Eric Hebert		Site Visit Dat	te [	03/01/2013	
	Site ope	ration procedures								
1	Is the fi	lter pack being change	d every	Tuesd	ay as scheduled	2	Filter changed mo	orni	ngs (90%)	
	Are the correctl	Site Status Report For y?	ms beir	ıg com	pleted and filed					
	Are data downloads and backups being performed as scheduled?					No longer required	d			
4	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 san	ple flow rates recorde	d? How	?			SSRF			
	Are san fashion	pples sent to the lab on ?	a regul	ar sche	edule in a timely					
		ers protected from con oping? How?	taminat	ion du	ring handling		Clean gloves on a	and	off	
		site conditions reporte ons manager or staff?	d regula	arly to	the field					
QC	Check P	erformed		Fre	quency				Compliant	
M	lulti-poi	nt MFC Calibrations	[	Sen	niannually				✓	
F	low Syst	em Leak Checks		✔ We	ekly					
Fi	ilter Pac	k Inspection								
F	Flow Rate Setting Checks						✓			
V	Visual Check of Flow Rate Rotometer						✓			
In	n-line Fil	ter Inspection/Replace	ment	✓ Sen	niannually and as	nee	ded			
Sa	ample L	ine Check for Dirt/Wa	ter			21 H. T.A				
Provi	ide anv a	dditional explanation	(photog	raph o	or sketch if neces	sary	() regarding condi	itio	ns listed above, or any oth	ner 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 V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
CHE	185-Eric H	lebert-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	В	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 Nu	imber Site	7	Technician	Site Visit Date	Parameter	Use Desc.
Environmental	Sys A0656-b	CHE	185	Eric Hebert	03/03/2013	DAS	Primary
Das Date: 3 /3 /2013 Audit Date		Audit Date	3 /3 /2013	Mfg	Datel Parameter		DAS
Das Time: 10:00:02 Audit Ti			10:00:00	U U	400000		
Das Day:	62	Audit Day	62	Serial Number	4000392	Tfer Desc.	Source generator (D
Low Channel: High Ch			l:	Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.00000	Intercept	0.00000
0.0010	0.0011	0.0010	0.0011	Cart Data	2/13/2012		1.00000
				Cert Date	2/13/2012	2 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	<b>CorrCoff</b>	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
6	0.0000	0.0000	-0.0009	9 V	V	-0.0009	
6	0.1000	0.1000	0.0991	1 V	V	-0.0009	
6	0.3000	0.3000	0.2991	1 V	V	-0.0009	
6	0.5000	0.5000	0.4990		V	-0.0010	
6	0.7000	0.7001	0.6990		V	-0.0011	
6	0.9000	0.9001	0.8990		V	-0.0011	
6	1.0000	1.0001	0.9991	1 V	V	-0.0010	

## Flow Data Form

Mfg	Serial Nun	nber Ta S	ite	Tec	hnician	Site Visit l	Date Paran	neter	<b>Owner ID</b>
Apex	116		CHE185	Eri	c Hebert	03/03/201	3 Flow F	late	000641
					Mfg	BIOS	F	arameter FI	ow Rate
					Serial Number	122974	1	fer Desc. Bl	OS 220-H
					Tfer ID	01416			
					Slope	1.	.00000 Int	ercept	0.00000
					Cert Date			rrCoff	1.00000
DAS 1:		DAS 2:			Col Frankers 7		-0.0		
DAS 1: A Avg % Diff: A	A Moy % Di	DAS 2: A Avg %I	Dif A Max	, 0/, <b>D</b> ;	Cal Factor Z Cal Factor F		-0.0 5.1	=	
1.38%	1.65%	A Avg 701			Rotometer R			.5	
UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:			InputUnit:	OutputSigna	llPctDifference
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 Compo	onent Leak Tes	st		Conditio	n		Status	pass	
Sensor Compo	nent Filter Azi	muth		Conditio	n 180 deg		Statu	pass	
Sensor Compo	nent Filter Dep	oth		Conditio	n - 1.0 cm		Status	Fail	
Sensor Compo	nent Filter Pos	sition		Conditio	n Poor		Statu	Fail	
Sensor Compo	onent Moisture	Present		Conditio	No moisture p	resent	Statu	pass	
Sensor Compo	nent Rotomete	er Condition		Conditio	Clean and dry		Status	pass	
Sensor Compo	onent System M	/lemo		Conditio	n See comments	3	Status	pass	
Sensor Compo	ment Tubing C	ondition		Conditio	Good		Status	pass	
Sensor Compo	nent Filter Dis	tance		Conditio	n 5.0 cm		Statu	pass	

## **Ozone Data Form**

Mfg	Serial Number Ta	Site	Technician Si		Site Visit Date		Parameter		Owner I	D	
Monitor Labs, Inc.	191	CHE185	Erie	c Hebert	:	03/03/2	013	Ozone		54901	
Intercept	0.99014         Slope:           2.27140         Intercept           0.99990         CorrCoff	0.00000	) )	Mfg Serial N Tfer ID		Thermol 5171121 01111	Electron		rameter C er Desc. C	ozone Ozone primary	y stan
DAS 1:	<b>DAS 2:</b>			Slope			0.9972	0 Inter	roomt	0.18	3428
A Avg % Diff: A I 3.4%		%Dif A Max %	% Di	Cert Da	nte		1/2/201		-		0000
UseDescription	: ConcGroup:	Tfer Raw:	Tfer C	Corr:	Si	te:	Site	Unit:	PctD	ifference:	
primary	1	0.08	-0.1	0	1.9	98	ppb				
primary	2	28.46	28.3	35	30.	.20	ppb			6.53%	
primary	3	55.31	55.2	28	57.	.33	ppb			3.71%	
primary	4	82.86	82.9	<del>)</del> 0	85.	.14	ppb			2.70%	
primary	5	101.81	101.	91	102	.40	ppb			0.48%	
Sensor Compone	Cell B Noise		Conditio	n				Status	pass		
Sensor Compone	ent Cell B Tmp.		Conditio	n				Status	pass		
Sensor Compone	Ent Fullscale Voltage		Conditio	n N/A				Status	pass		
Sensor Compone	ent Inlet Filter Condition	on	Conditio	n Clean	1			Status	pass		
Sensor Compone	ent Line Loss		Conditio	n Not te	ested			Status	pass		
Sensor Compone	ent Offset		Conditio	<b>n</b> 0.06				Status	pass		
Sensor Compone	ent Span		Conditio	<mark>n</mark> 1.024				Status	pass		
Sensor Compone	ent Cell B Freq.		Conditio	n				Status	pass		
Sensor Compone	ent System Memo		Conditio	n				Status	pass		
Sensor Compone	ent Sample Train		Conditio	n Good				Status	pass		
Sensor Compone	ent Cell B Pressure		Conditio	n				Status	pass		
Sensor Compone	ent Cell B Flow		Conditio	n				Status	pass		
Sensor Compone	ent Cell A Tmp.		Conditio	<mark>n</mark> 37.9 (	C			Status	pass		
Sensor Compone	ent Cell A Pressure		Conditio	<mark>n</mark> 701 m	nmHg			Status	pass		
Sensor Compone	Cell A Noise		Conditio	n N/A				Status	pass		
Sensor Compone	Cell A Freq.		Conditio	<b>n</b> 42 kH	z			Status	pass		
Sensor Compone	Cell A Flow		Conditio	n 0.5 lp	m			Status	pass		
Sensor Compone	Battery Backup		Conditio	n N/A				Status	pass		
Sensor Compone	ent Zero Voltage		Condition N/A					Status pass			

# Wind Speed Data Form

Mfg	Serial Number	r Ta Site	Tecl	nnician	Site Visit Dat	e Parameter	Owner ID
RM Young	34948wsp	CHE185	Eric	Hebert	03/03/2013	Wind Speed	04335
			Ι	Mfg	RM Young	Paramet	er wind speed
			5	Serial Number		Tfer Des	c. wind speed motor (h
				lfer ID	01262		
Prop or Cups SI				Slope	1.000	000 Intercept	0.00000
Prop or Cups To		.9 <b>to</b>	1.1	Cert Date	1/13/20	010 CorrCoff	1.00000
Prop Correction	Fact 0.0049			Te	PM Voung	D	wind anood
				Mfg	RM Young		er wind speed
			5	Serial Number		Tfer Des	c. wind speed motor (I
			]	<b>Ffer ID</b>	01261		
				Slope	1.000	000 Intercept	0.00000
			(	Cert Date	1/13/20	010 CorrCoff	1.00000
D	OAS 1:	DA	AS 2:				
L	ow Range Hig	h Range Lo	w Range Hig	gh 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	0.240/	-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 nent System Mem	9400	46.06	0.0000	46.4	0.74% Status pass	
Sensor Compo	System Mem		Condition			Status pass	
Sensor Compo	nent Sensor Plum	b	Condition	Plumb		Status pass	
Sensor Compo	nent Sensor Heate	er	Condition	N/A		Status pass	
Sensor Compo	nent Prop or Cups	Condition	Condition	Good		Status pass	
Sensor Compo	nent Condition		Condition	Good		Status pass	
Sensor Compo	nent Torque		Condition	1		Status Fail	

## Wind Direction Data Form

Mfg	Serial Nu	nber Ta	Site		Technician	Site Visit	t Date Param	leter	<b>Owner ID</b>	
RM Young	34948wdr		CHE18	5	Eric Hebert	03/03/20	13 Wind E	Direction	04335	
Vane SN: N VaneTorque	I/A 15 <u>to</u>	<b>C.</b> /	A. Align.	<mark>leg. true:</mark> 360	Mfg Serial Num Tfer ID Slope Cert Date Mfg	01265	1.00000 Into 1/4/2011 Cor	fer Desc. [ ercept rrCoff	wind direction transit 0.00000 1.00000 wind direction	
					Serial Nun Tfer ID	nber 01266	T	fer Desc. 🛛	wind direction whee	
	DAS 1:		Ι	DAS 2:						
	Orientation	Lineari		Orientation	Linearity:	_				
Abs Avg Err	0.5		1.0							
Abs Max Er	2		3							
UseDescription		I	nput 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		225 270		0.0000	225 270	0	45 45	0	
primary primary	01266		315		0.0000	314	1	43	-1	
primary	01265		90		0.0000	90	0		-1	
primary	01265		180		0.0000	180	0		0	
primary	01265		270		0.0000	270	0		0	
primary	01265		360		0.0000	2/0	2		2	
Sensor Comp				Cond	lition Good		Status	pass		
Sensor Comp	onent Conditio	n		Cond	lition Good		Status	pass		
Sensor Comp	onent Sensor I	Heater		Cond	lition N/A		Status	pass		
Sensor Comp	onent Sensor I	Plumb		Cond	lition Plumb		Status	pass		
Sensor Comp	onent Torque			Cond	lition		Status	pass		
Sensor Component Vane Condition Con			Cond	lition Good		Status pass				
Sensor Comp	Sensor Component System Memo				lition		Status	IS pass		

# Temperature Data Form

Mfg	1	Serial Nun	ıber Ta	Site			hnic	cian	Site Vi	isit Date	Param	eter	Owner I	D
RM Young		8897		CHE185		Eric	c Hel	bert	03/03/	2013	Temper	rature	04945	
						1	Mfg		Extech		Pa	arameter Te	emperature	
						5	Seria	al Number	H2326	79	Tf	fer Desc. RT	٢D	
							Tfer	: ID	01228					
DAS 1:			DAS 2:			5	Slop	e		1.0073	2 Inte	rcept	-0.12	380
Abs Avg Err	Abs	Max Er	Abs Av		Max Er	•	Cert	t Date		1/12/201	3 Cor	rCoff	1.00	000
0.13		0.24				]								
UseDesc.:		Test type:	In	putTmpRaw	InputTm	oCor	r.: (	OutputTmpS	ignal: (	OutputSig	nalEng:	OSE Unit:	Difference:	
primary	Temp	Low Range	e	-0.08	0.04	4		0.0000		-0.0	19	С	-0.13	
primary	Temp	Mid Range	;	17.02	17.0	)2		0.0000		16.9	99	С	-0.03	
primary	Temp	High Rang	e	42.36	42.1	8		0.0000		42.4	12	С	0.24	
Sensor Com	ponen	t Shield			Cond	litior	n Mo	oderately clea	an		Status	pass		
Sensor Com	ponen	t Blower S	tatus Sw	vitch	Cond	litior	n N/	Ά			Status	pass		
Sensor Com	ponen	t Blower			Cond	litior	n Fu	unctioning			Status	pass		
Sensor Component System Memo C		Cond	litior	n 🗌				Status	pass					

# 2 Meter Temperature Data For

**Calc. Difference** 

Mfg	Serial Number	r Ta Site	Te	chnician	Site Visit Dat	te Paramet	er	Owner ID
RM Young	12791	CHE185	Er	ic Hebert	03/03/2013	Temperat	ture2meter	06244
				Mfg	Extech	Par	ameter Terr	perature
				Serial Number	H232679	Tfe	r Desc. RTE	)
				Tfer ID	01228			
DAS 1:	DA	S 2:		Slope	1.00	732 Interc	ept	-0.12380
Abs Avg Err Ab	os Max Er Ab	s Avg Err Abs	s Max Er	Cert Date	1/12/2	013 <b>Corr(</b>	Coff	1.00000
0.15	0.17							
UseDescription:	Test type:	InputTmpRaw	InputTmpCorr	ected: OutputTr	mpSignal: Outpu	tSignalEng:	OSE Unit:	Difference:
primary T	emp Low Rang	-0.08		0.04	0.0000	-0.09	С	-0.13
primary T	emp Mid Rang	17.02		17.02	0.0000	16.87	С	-0.15
primary T	emp High Ran	42.36		42.18	0.0000	42.35	С	0.17
Sensor Compone	ent Blower Statu	s Switch	Conditio	N/A		Status P	ass	
Sensor Compone	ent System Mem	0	Conditio	)n		Status P	ass	
Sensor Compone	ent Blower		Conditio	Functioning		Status P	ass	
Sensor Compone	ent Properly Site	d	Conditio	Properly sited	ł	Status P	ass	
Sensor Compone	ent Shield		Conditio	Moderately c	lean	Status P	ass	

# Humidity Data Form

Mfg	Serial Nu	mber Ta	Site			chnician		Site V	isit Date	Para	meter	Owner ID
Rotronic	31161		CHE	185	E	ric Hebert		03/03	/2013	Relati	ive Humidity	06385
						Mfg		Rotron	nic		Parameter Re	lative Humidity
						Serial Nu	mber	12443	2		Tfer Desc. Hy	groclip
						Tfer ID		01225				
						Slope			1.0000	0 In	tercept	0.00000
	DAS 1:			DAS 2:		Cert Dat	e		1/29/201	3 <b>C</b> o	orrCoff	1.00000
	Low Range	High Ran		Low Range	ŀ	High Rang	e					
Abs Avg Err	7.2		1.5									
Abs Max Er	8.1		1.5									
UseDesc.:	Test type:	Devic	e:	Input RH:	G	TL Raw:	RH (	Corr.:	DAS V	olts:	DAS %RH:	Difference:
primary	RH Low Range	Hygroc	lip	32.8		35.5	32	2.8	0.000	00	24.7	-8.1
primary	RH Low Range	Hygroc	lip	52.9		54.8	52	2.9	0.000	00	46.6	-6.3
primary	RH High Range	Hygroc	lip	93.6		89.9	93	6.6	0.000	00	95.1	1.5
Sensor Com	ponent System	Memo		Con	diti	on				Statu	Is pass	
Sensor Com	ponent Blower			Con	diti	on N/A				Statu	Is pass	
Sensor Com	ponent Blower	Status Swite	ch	Con	diti	on N/A				Statu	Is pass	
Sensor Com	ponent RH Filte	r		Con	diti	on Clean				Statu	Is pass	
Sensor Com	ponent Shield			Con	diti	on Modera	tely cle	an		Statu	Is pass	

## **Solar Radiation Data Form**

Mfg	Serial Numbe	r Ta Site	T	echnic	ian	Site Visit	Date P	aramo	eter	<b>Owner ID</b>
Licor	illegible	CHE185	E	Eric Hel	bert	03/03/201	3 S	olar R	adiation	04009
Mfg	RM Young			Mfg		Eppley		Pa	rameter	solar radiation
SN/Owner ID	none	02533		Seria	al Number	10765		Tf	er Desc.	SR transfer translat
Parameter	Solar Radiation Tra	anslator		Tfer	· ID	01246				
Mfg	RM Young			Slop	e	1	.00000	Inte	rcept	0.00000
SN/Owner ID		06630		Cert	t Date	1/	6/2010	Cori	rCoff	1.00000
Parameter	Solar Radiation Tra	anslator		Mfg		Eppley		Pa	rameter	solar radiation
DAS 1:	DA	AS 2:		Seria	al Number	34341F3		Tf	er Desc.	SR transfer sensor
	%Diff of Max %		iff of Max	Tfer	· ID	01245				
				Slop	e	1	.00000	Inte	rcept	0.00000
				Cert	t Date	12/1	6/2010	Cori	rCoff	1.00000
1.4%	1.7%	0.0%	0.0%							
UseDescription	: Measure Date	MeasureTime	Tfer Cor	r:	DAS w/r	m2: Pc	tDiffere	nce:		
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%		
									nace	
Sensor Comp	onent Sensor Leve		Conditi	ion Le	vel		S	tatus	pass	
	onent Sensor Leve		Conditi					tatus tatus		
Sensor Comp		n	Conditi	ion Cl			S		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 su	rface wetness
			Serial Number	296-1200	Tfer Desc. de	ecade box
			Tfer ID	01210		
			Slope	1.0000	0 Intercept	0.00000
			Cert Date	1/4/201	1 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 Compor	nent Grid Orientati	on	Condition Condition			tus pass	
Sensor Compor				About 30 deg		tus pass	
Sensor Compor	nent Grid Condition	n	Condition	Fair	Sta	tus pass	
Sensor Compor	nent Properly Sited	Ł	Condition	Properly sited	Sta	tus pass	
Sensor Compor	nent System Mem	0	Condition		Sta	tus pass	
Sensor Compor	nent Grid Type		Condition	Grid without ho	les Sta	tus pass	

# Precipitation Data Form

Mfg	Serial Number Ta Site			Те	Technician			Site Visit Date Parameter			<b>Owner ID</b>
Texas Electror	nics 30094	-202	CHE185	E	ric Hebert		03/0	03/2013	Precipitat	ion	04714
					Mfg		PMF	)	Par	ameterP	recipitation
<b>DAS 1:</b>		<b>DAS 2:</b>			Serial Num	nber	EW-	06134-50	Tfe	Desc. 2	50ml graduate
A Avg % Diff 2.0%		Di A Avg %	Dif A N	Aax % Di	Tfer ID		012	50			
2.070					Slope			1.0000	0 Interc	ept	0.00000
					Cert Date			9/5/200	5 Corr(	Coff	1.00000
UseDesc.	Test type:	TferVolume:	Iteration:	TimePerTip:	Eq.Ht:	DAS	eng:	Eq.HtUnit:	OSE Unit	: TferUni	ts: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	0.5	50	in	in	ml	0.0%
primary	test 2	231.5	2	10 sec	0.50	0.4	18	in	in	ml	-4.0%
Sensor Com	ponent Syste	em Memo		Conditi	on				Status P	ass	
Sensor Com	ponent Sens	or Heater		Conditi	on Not funct	ioning			Status F	ail	
Sensor Com	ponent Prop	erly Sited		Conditi	on Properly	sited			Status P	ass	
Sensor Com	ponent Gaug	ge Drain Scree	n	Conditi	on Installed				Status P	ass	
Sensor Com	ponent Leve	1		Conditi	on Level				Status P	ass	
Sensor Com	ponent Gaug	ge Clean		Conditi	on Clean				Status P	ass	
Sensor Com	ponent Funr	el Clean		Conditi	on Clean				Status P	ass	
Sensor Com	ponent Cond	dition		Conditi	on Good				Status P	ass	
Sensor Com	ponent Gau	ge Screen		Conditi	on Installed				Status F	ail	

#### **Infrastructure Data For**

Site ID	CHE185	Technician Eric He	bert Site Visit Date 03/03/2013
Shelter	Make	Shelter Model	Shelter Size
Shelter 0	Dne	8128	768 cuft

Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Sample Tower Type	Condition	Туре В	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
unknown	015	CHE185	Eric Hebert	03/03/2013	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	Iter Temperatur
Abs Avg ErrAb0.58	0.82 Abs Avg	Err Abs Max Er	Serial Number	H232679	Tfer Desc. RTD	D
			Tfer ID	01228		
			Slope	1.0073	2 Intercept	-0.12380
			Cert Date	1/12/201	3 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	С	0.82
primary	Temp Mid Range	23.87	23.82	0.000	24.3	С	0.49
primary	Temp Mid Range	25.02	24.96	0.000	25.4	С	0.44

## **Site Visit Comments**

Parameter Si	Site	Technician	S.V. Date Component		Mfg	Serial No.		Hazard Problem	
Flow Rate Cl	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.

Site ID CHE185	Technician Eric Hebert	Site Visit Date 03/0	03/2013
		LISCS Man	Stilwell West
Site Sponsor (agency)	EPA	USGS Map	
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
<b>Deposition Measurement</b>	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	35.75078
Site Address 1	Cherry Tree	Audit Longitude	-94.66978
Site Address 2	Dahlonegah School	Audit Elevation	30
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 M	<b>Iodel</b> 8128	Shelter Size 768 cuft
Shelter Clean	Notes The shelter is in very good co	ndition, clean, neat, and well or	ganized.
Site OK	Notes		

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**

CHE185

F-02058-1500-S2-rev001

Site ID

Technician Eric Hebert

Site Visit Date 03/03/2013

Potential Interferent	Minimum Distance From Dis Measurement Apparatus	stance 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.

Fie	eld Sy	stems Data Fo	rm	F-02058-1500-S3-rev001
Site	e ID	CHE185	Technician Eric Hebert	Site Visit Date 03/03/2013
1		d speed and direction fluenced by obstructio	sensors sited so as to avoid ns?	
2	(i.e. win horizon	d sensors should be m	as to minimize tower effects? Ounted atop the tower or on a 2x the max diameter of the )	
3	Are the	tower and sensors plu	nb?	
4			ointed north or positioned to ch as buildings, walls, etc?	
5	condition surface	ns? (i.e. ground below	ors sited to avoid unnatural sensors should be natural Ridges, hollows, and areas of led)	
6	Is the so	lar radiation sensor p	umb?	
7	Is it site light?	d to avoid shading, or	any artificial or reflected	
8	Is the ra	in gauge plumb?		
9	Is it site towers,		fects from buildings, trees,	
10	Is the su facing n		ited with the grid surface	
11	Is it inc	lined approximately 3	) degrees?	

Field S	ystems Dat	a Form		F-02058-1500-S4-rev0		
Site ID	CHE185	Technician Eric He	bert	Site Visit Date	03/03/2013	
	the meterological tion, and well main	sensors appear to be intact, i ntained?	in good 🛛 🗹			
	ll the meteorologic ting data?	al sensors operational online	, and 🗹			
3 Are th	ne shields for the t	emperature and RH sensors (	clean? 🔽			
4 Are th	ne aspirated motor	rs working?				
5 Is the solar radiation sensor's lens clean and free of scratches?						
5 Is the	surface wetness se	ensor grid clean and undama	ged?			
	ie sensor signal an tion, and well mair	d power cables intact, in goo ntained?	d 🔽			
	ne sensor signal an the elements and v	d power cable connections pr vell maintained?	rotected 🔽			
Parameter	r	Manufacturer M	Iodel	S/N		Client ID
Solar Radi	ation	Licor	1-200	illegible		04009
Shield (10	meter)	RM Young A	spirated 434	08 none		04620
Shield (2 m	neter)	RM Young A	spirated 434	08 none		04680
Surface W	etness	RM Young 5	8101	none		06313

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

MP 101A-C5

AQ05305V

AQ05305V

TR-525i-HT

unknown

41342VC

41342VC

34948wsp

34948wdr

30094-202

none

8897

12791

31161

RM Young

RM Young

RM Young RM Young

Rotronic

Texas Electronics

Universal Tower

04335

04335

04714

03662

04945

06244

06385

Wind Speed

Precipitation

Temperature

Temperature2meter

Relative Humidity

Met tower

Wind Direction

Fie	ld 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 ed	<u>juip</u>	ment 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	l ma	<u>intenance</u>
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
Dos	ameter Manufacturer Model		S/N Client ID

Parameter	Manufacturer	Model	S/N	Client ID	
Sample Tower	Aluma Tower	В	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	

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.

Fie	eld Sy	stems Data Fo	orm				<b>F-02</b>	058-1	500-S6-rev001
Site	e ID	CHE185	Technician	ric Hebert		Site Visit Dat	te 03/03/2013	:	
	DAS, se	ensor translators, and j	peripheral equip	nent operatior	<u>15 ai</u>	nd maintenance			
1		DAS instruments appe intained?	ar to be in good o	condition and					
2		the components of the , backup, etc)	DAS operational	? (printers,					
3		analyzer and sensor sig ng protection circuitry		rough		Met sensors only			
4		signal connections pro intained?	weather and						
5	Are the	signal leads connected	to the correct D	AS channel?					
6	Are the ground	DAS, sensor translato ed?	rs, and shelter pr	operly					
7	Does th	e instrument shelter h	ave a stable powe	r source?					
8	Is the in	nstrument shelter temp	erature controlle	ed?					
9	Is the m	net tower stable and gr	ounded?			Stable		Groundee	Ĩ
10	Is the sa	ample tower stable and	l grounded?						
11	Tower	comments?							
Par	ameter	M	anufacturer	Model		S/N		Cl	ient ID

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

Field S	ystems Data	Fo	rm					<b>F-02</b>	058-	1500-8	7-rev001
Site ID	CHE185		Те	chnicia	an	Eric Hebert	Site Visit Date	03/03/2013			
P											
Docume	States and the states of the										
Does the	site have the require	2000	(Allowed and	23.34233			<u>?</u>				
Wind speed		Yes	and the second second second	io 	N/#	A Data logg	IAT.	Yes	No	N/A	
Charles and the second second	tion sensor		228 P		Η	Data loga					
Temperatu				2		Contraction of the second second	rt recorder				
NOT THE PARTY OF THE PARTY OF	midity sensor		5 L _			Compute					
Solar radia		✓				Modem					
Surface we	tness sensor					Printer					
Wind sense	or translator					Zero air	pump				
Temperatu	re translator					Filter flo	w pump				
Humidity s	ensor translator					Surge pro	otector				
Solar radia	tion translator					UPS					
Tipping bu	cket rain gauge					Lightning	g protection device	, 🗆			
Ozone anal	yzer					Shelter h	eater				
Filter pack	flow controller					Shelter a	ir conditioner				
Filter pack	MFC power supply										
Does th	e site have the requi	ired a	and 1	nost r	ecei	nt QC documents an	d report forms?				
		Pre	sent					Currer	ıt		
Station Log							les l				
SSRF											
Site Ops M	anual			Oct	200	1					
HASP				Nov							
Field Ops M	Ianual										
Calibration	Reports										
Ozone z/s/p	Control Charts			1							
Preventive	maintenance schedu	1									
1 Is the	station log properly	comj	plete	d duri	ng e	every site visit? 🔽					
2 Are th currer	e Site Status Report t?	For	ns bo	eing co	mp	eleted and					
3 Are th	e chain-of-custody fo e transfer to and from			perly u	ised	l to document					
4 Are oz	one z/s/p control cha			erly co	тр	leted and	Control charts not u	sed			
currer									17868		
	y additional explanation man-made, that may						) regarding condit	ions listed a	bove,	or any oth	er features,
		0000000	Television			123155 210 W 50 W 200 200 - 100 - 100			100000000		

Fiel	d Systems Data	Form			F-02058	8-1500-S8-rev001
Site I	D CHE185	Technician Eric Hebert		Site Visit Date	03/03/2013	
1 2	course? If yes, when and	nded a formal CASTNET train who instructed? attended a formal CASTNET	ing 🗆 🏾			
	s the site visited regularly chedule?	on the required Tuesday				
	Are the standard CASTN lollowed by the site opera	ET operational procedures bein tor?	g 🔽			
		vledgeable of, and able to perfo ? (including documentation)	rm 🗹 🛛			

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

#### **OC Check Performed**

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 **Multi-point Calibrations** ~ ~ Quarterly ~ ~ Daily **Automatic Zero/Span Tests** < ~ Every 2 weeks Manual Zero/Span Tests  $\checkmark$ **Automatic Precision Level Tests** ~ Every 2 weeks **Manual Precision Level Test**  $\checkmark$ ~ Every 2 weeks **Analyzer Diagnostics Tests**  $\checkmark$ ~ Monthly **In-line Filter Replacement (at inlet)** ~ V Monthly **In-line Filter Replacement (at analyze** ~ ~ Weekly Sample Line Check for Dirt/Water ~  $\checkmark$ Weekly **Zero Air Desiccant Check** 

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

~

#### Compliant

Fie	eld Sy	stems Data Fo	rm						F-02058-15	00-S9-rev001	
Site	ID	CHE185	Tech	nician	Eric Hebert		Site Visit Dat	te 🖸	03/03/2013		
	<u>Site ope</u>	ration procedures									
1	Is the fi	lter pack being change	d every	Tuesda	ay as scheduled	<b>?</b> ∠	Filter changed morinings				
	Are the correctl	Site Status Report For y?	g comj	oleted and filed							
3	Are dat schedul	a downloads and backı ed?	ups bein	g perfo	ormed as		No longer required				
4	Are gen	eral observations being	and rec	corded? How?		SSRF, logbook					
	Are site fashion	supplies on-hand and	hed in	a timely							
6	Are san	ple flow rates recorde	d? How	?			SSRF, call-in				
	Are san fashion'	ples sent to the lab on ?	a regul:	ar sche	dule in a timely						
		ers protected from cont oping? How?	taminat	io <mark>n du</mark> ı	ing handling		Clean gloves on a	and	off		
		site conditions reporte ons manager or staff?	d regula	arly to	the field						
QC	Check P	erformed		Free	quency			(	Compliant		
Μ	lulti-poi	nt MFC Calibrations	•	Sem	iannually				✓		
F	low Syst	em Leak Checks		✓ Wee	kly			•	✓		
	Filter Pack Inspection							[			
	Flow Rate Setting Checks					101001123		•	✓		
	Visual Check of Flow Rate Rotometer V Weekly							[	✓		
In	-line Fil	ter Inspection/Replace	ment [	Sem	iannually				✓		
		ine Check for Dirt/Wat		✓ Wee	kly			6	✓		
	1.1	dditional explanation		raph o	r sketch if neces	sarv	) regarding condi	itio	ns listed above, or ar	v 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 V	isit 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	Арех	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	В	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 Nu	mber Site	ſ	<b>Fechnician</b>	chnician Site Visit Date		Use Desc.
Campbell	2130 CDZ171 S		Sandy Grenville	03/05/2013	DAS	Primary	
Das Date:	3 /5 /2013	Audit Date	3 /5 /2013	Mfg	Datel	Parameter	DAS
Das Time:	15:25:30	Audit Time	15:25:30	Serial Number	15510194	Tfer Desc.	Source generator (D
Das Day:	64	Audit Day	64	Tfer ID	01320		· · · · · ·
Low Channe		High Channel	:		01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0001	0.0002	0.0001	0.0002	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
					95740135	Tfer Desc.	
				Serial Number		Tier Desc.	
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/26/201	3 CorrCoff	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.0001	0.0000	) V	V	0.0001	
7	0.1000	0.0998	0.0999	0 V	V	0.0001	
7	0.3000	0.2997	0.2998		V	0.0001	
7	7 0.5000 0.4996		0.4997	' V	V	0.0001	
7	7 0.7000 0.6995 0.		0.6997		V	0.0002	
7	0.9000	0.8995	0.8995		V	0.0000	
7	1.0000	0.9994	0.9994	V	V	0.0000	

### Flow Data Form

Mfg	Serial Nur	nber Ta 🛛 S	Site	Тео	chnician	Site Visit L	ate Param	eter	Owner ID
Арех	50742		CDZ171	Sa	ndy Grenville	03/05/2013	B Flow R	ate	000548
					Mfg	BIOS	Pa	arameter	Flow Rate
					Serial Number	103471		Ifer Desc. nexus	
					Tfer ID	01420			
				Slope	1.	00000 <b>Inte</b>	ercept	0.00000	
					Cert Date	6/13	3/2012 <b>Cor</b>	rCoff	1.00000
					Mfg	BIOS	Pa	arameter	low Rate
					Serial Number	103424	T	fer Desc. E	BIOS cell
					Tfer ID	01410			
					Slope	1.	00000 <b>Inte</b>	rcept	0.00000
					Cert Date	1/27	7/2012 <b>Cor</b>	rCoff	1.00000
DAS 1:		DAS 2:		L	Cal Factor Z	ero	-0.0	1	
A Avg % Diff:	A Max % Di	A Avg %I	Dif A Max	x % Di	Cal Factor F	ull Scale	0.9	9	
2.95%	3.18%				Rotometer R		1.	5	
UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSign	allPctDifference:
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 Compo	onent Leak Tes	st		Conditio	n		Status	pass	
Sensor Compo	onent Filter Azi	muth		Conditio	n 225 deg		Status	pass	
Sensor Compo	onent Filter De	oth		Conditio	<b>n</b> 3.5 cm		Status	pass	
Sensor Compo	onent Filter Pos	sition		Conditio	n Good		Status	pass	
Sensor Compo	onent Moisture	Present		Conditio	n No moisture pr	esent	Status	pass	
Sensor Compo	nent Rotomet	er Condition		Conditio	n Clean and dry		Status	pass	
Sensor Component System Memo		Conditio	n		Status	pass			
Sensor Component Tubing Condition		Conditio	n Good		Status				
Sensor Component Filter Distance			n 2.5 cm			itus pass			
							]	L	

### **Ozone Data Form**

Mfg	Se	rial Number Ta	Site	Te	chnician		Site Visi	t Date	Parame	eter	Owner II	D
ThermoElectron In	c 10	09241787	CDZ171	Sa	andy Grei	nville	03/05/20	013	Ozone		000615	
Intercept -1.30738 Intercept (			0.0000	0	Mfg Serial N		49C-731	49C-73104-373 <b>T</b>		rameter ozone er Desc. Ozone transfer		
DAS 1: A Avg % Diff: A 0.7%	Max	DAS 2: % Di A Avg % 1.3%	bDif A Max	% Di	Tfer ID Slope Cert Da		01100	1.0012 <sup>-</sup> 1/2/201:		•cept •Coff	-0.183	
UseDescription	n:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	Unit:	PctDiffe	rence:	
primary		1	0.09	0.2	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		80.	29	ppb			-0.16%	
primary		5	100.68	100	).74	100	.50	ppb			-0.24%	
Sensor Compor	nent	Cell B Noise		Condition	<mark>on</mark> 0.7 pp	b			Status	pass		
Sensor Compor	nent	Cell B Tmp.		Conditio	on				Status	pass		
Sensor Compon	nent	Fullscale Voltage		Conditio	on N/A				Status	pass		
Sensor Compon	nent	Inlet Filter Conditio	n	Conditio	on Clean				Status	pass		
Sensor Compon	nent	Line Loss		Conditio	on < 1 %				Status	pass		
Sensor Compon	nent	Offset		Conditio	on 0.000				Status	pass		
Sensor Compon	nent	Span		Condition 1.014				Status	pass			
Sensor Compor	nent	Cell B Freq.		Conditio	on 84.3 k	ίHz			Status	pass		
Sensor Compor	nent	System Memo		Conditio	on				Status	pass		
Sensor Compor	nent	Sample Train		Conditio	on Good				Status	pass		
Sensor Compor	nent	Cell B Pressure		Condition	on				Status	pass		
Sensor Compor	nent	Cell B Flow		Conditio	on 0.70 l	pm			Status	pass		
Sensor Compor	nent	Cell A Tmp.		Conditio	on 31.9 (	0			Status	pass		
Sensor Compon	nent	Cell A Pressure		Condition	on 726 m	nmHg			Status	pass		
Sensor Compon	nent	Cell A Noise		Condition	on 0.6 pp	b			Status	pass		
Sensor Compon	nent	Cell A Freq.			on 105.2				Status	pass		
Sensor Compon	nent	Cell A Flow		Conditio	on 0.70 l	pm			Status	pass		
Sensor Compon	nent	Battery Backup		Conditio	on Funct	ioning			Status	pass		
Sensor Compor	nent	Zero Voltage		Condition	on N/A				Status	pass		

## Temperature Data Form

Mfg	\$	Serial Nun	nber Ta	Site		Technician		Site V	isit Date	Param	eter	Owner II	)
RM Young		14036		CDZ171		Sar	ndy Grenville	03/05	/2013	Temper	rature	06403	
						I	Mfg	Extect	ו	Pa	arameter Te	mperature	
						\$	Serial Number	H2327	'34	Tf	fer Desc. RT	D	
						1	Гfer ID	01227					
DAS 1:			<b>DAS 2:</b>			5	Slope		1.0043	5 Inte	rcept	-0.084	480
Abs Avg Err   Abs Max Er   Abs Avg Err   Abs Max Er		Max Er	Cert Date			1/12/2013 Cor		rCoff 1.00000		000			
0.13		0.21				]							
UseDesc.:	,	Test type:	In	putTmpRaw	InputTm	Cor	r.: OutputTmp	Signal:	OutputSig	nalEng:	OSE Unit:	Difference:	
primary	Temp	Low Range	e	0.39	0.47	0.47 0.0000		0	0.4		С	-0.1	
primary	Temp	Mid Range	;	24.43	24.4	-1	0.000	0	24.6		С	0.21	
primary	Temp	High Rang	e	47.54	47.4	-2	0.000	0	47.	5	С	0.08	
Sensor Com	ponen	t Shield			Cond	lition	Clean			Status	pass		
Sensor Component Blower Status Switch			Cond	Condition N/A				Status pass					
Sensor Com	ponen	Blower			Cond	ondition N/A			Status		pass		
Sensor Com	ponen	t System N	/lemo		Cond	lition	1			Status	pass		]

#### **Infrastructure Data For**

Site ID	CDZ171	Technician Sandy C	Grenville Site Visit Date 03/05/2013
Shelter	Make	Shelter Model	Shelter Size
Ekto		8810	640 cuft

Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Sample Tower Type	Condition	Туре В	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 T		Technician	Site Visit Date	Parameter	Owner ID
Campbell	none CDZ171		Sandy Grenville	03/05/2013	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	elter Temperatur
Abs Avg Err Ab			Serial Number	H232734	Tfer Desc. RTI	D
			Tfer ID	01227		
			Slope	1.0043	5 Intercept	-0.08480
			Cert Date	1/12/201	3 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	С	-1
primary	Temp Mid Range	22.98	22.96	0.000	21.9	С	-1.06
primary	Temp Mid Range	23.86	23.84	0.000	22.6	С	-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.

Site ID CDZ171	Technician Sandy Grenvil	le Site Visit Date 03/0	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	36.78405
Site Address 1	4560 Old Dover Road	Audit Longitude	-87.8501
Site Address 2	route 1175	Audit Elevation	19
County	Trigg	Audit Declination	-2.7
City, State	Cadiz, KY	Present	
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 🗹	
Shelter Working Room	Make Ekto	<b>Iodel</b> 8810	Shelter Size 640 cuft
Shelter Clean	Notes The shelter floor and door had cluttered and dirty.	ve been repaired since the prev	vious audit visit. The shelter is still
Site OK	Notes		
	route 68 in Cadiz turn south on 1175 an		iles. The site will be visible in the field 1560 Old Dover Road, which is on the

### **Field Systems Data Form**

CDZ171

F-02058-1500-S2-rev001

Site ID

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	52	]
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.

Fie	eld Systems Data Fo	orm		F-02058-1500-S3-rev001					
Site	CDZ171	Technician Sandy Grer	nville	Site Visit Date 03/05/2013					
1	Are wind speed and direction being influenced by obstructi			N/A					
2	Are wind sensors mounted so (i.e. wind sensors should be m horizontally extended boom > tower into the prevailing wind	ounted atop the tower or o 2x the max diameter of the	on a	N/A					
3	Are the tower and sensors plu			N/A					
4	Are the temperature shields p avoid radiated heat sources st								
5	Are temperature and RH sen conditions? (i.e. ground below surface and not steeply sloped standing water should be avo	y sensors should be natural I. Ridges, hollows, and area							
6	Is the solar radiation sensor p	lumb?		N/A					
7	Is it sited to avoid shading, or light?	any artificial or reflected	✓	N/A					
8	Is the rain gauge plumb?			N/A					
9	Is it sited to avoid sheltering o towers, etc?	ffects from buildings, trees	s, ⊻	N/A					
10	Is the surface wetness sensor facing north?	sited with the grid surface		N/A					
11	Is it inclined approximately 3	0 degrees?		N/A					
	11 112 1 1 1			a) and a line and lititized line of a line					

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

Field	Systems Data	Form		F-02058-1500-S4-rev00					
Site ID	CDZ171	Technician	Sandy Grenville		Site Visit Date 03/05/2013				
	all the meterological s dition, and well main		ntact, in good	∎т	emperature only				
2 Are	all the meteorologica orting data?		online, and	∎т	emperature only				
3 Are	the shields for the ter	nperature and RH se	ensors clean?						
4 Are	the aspirated motors	working?			I/A				
	he solar radiation sen atches?	sor's lens clean and fi	ree of		I/A				
6 Is t	he surface wetness ser	sor grid clean and u	ndamaged?		I/A				
	the sensor signal and dition, and well main		in good						
	the sensor signal and n the elements and we		ions protected						
Parame	ter	Manufacturer	Model		S/N	Client ID			
		Constraint and a state of the second state of the second state of the second state of the second state of the s							
				ary) r	egarding conditions listed abo	06403 ove, or any other features,			
Provide a	ny additional explana	ntion (photograph or	sketch if necess	ary) r	Share and the second second second second				
Provide a	ny additional explana	ntion (photograph or	sketch if necess	ary) r	Share and the second second second second				
Provide a	ny additional explana	ntion (photograph or	sketch if necess	ary) r	Share and the second second second second				
Provide a	ny additional explana	ntion (photograph or	sketch if necess	ary) r	Share and the second second second second				
Provide a	ny additional explana	ntion (photograph or	sketch if necess	ary) r	Share and the second second second second				
Provide a	ny additional explana	ntion (photograph or	sketch if necess	ary) r	Share and the second second second second				
Provide a	ny additional explana	ntion (photograph or	sketch if necess	ary) r	Share and the second second second second				
Provide a	ny additional explana	ntion (photograph or	sketch if necess	ary) r	Share and the second second second second				
Provide a	ny additional explana	ntion (photograph or	sketch if necess	ary) r	Share and the second second second second				
Provide a	ny additional explana	ntion (photograph or	sketch if necess	ary) r	Share and the second second second second				

Fie	eld Sy	stems Da	ta Form		F-02058-1500-S5-rev001
Site	ID	CDZ171	Technician Sa	andy Grenville	Site Visit Date 03/05/2013
	Siting C	Criteria: Are the	e pollutant analyzers and	deposition equip	ment sited in accordance with 40 CFR 58, Appendix E
1		sample inlets ha icted airflow?	we at least a 270 degree a	rc of 🗹	
2	Are the	sample inlets 3	- 15 meters above the gr	ound?	
3		sample inlets > meters from tre	1 meter from any major es?	obstruction,	
	Pollutar	nt analyzers and	l deposition equipment o	perations and ma	<u>intenance</u>
1		analyzers and e on and well mai	quipment appear to be in ntained?	good 🗹	
2	Are the reportir		monitors operational, on	-line, and   ✓	
3	Describ	e ozone sample	tube.		1/4 teflon by 18 meters
4	Describ	e dry dep samp	le tube.		3/8 teflon by 15 meters
5		ine filters used location)	in the ozone sample line?	' (if yes	At inlet only
6	Are sam		free of kinks, moisture,	and 🔽	
7	Is the ze	ero air supply d	esiccant unsaturated?		
8	Are the	re moisture traj	ps in the sample lines?		
9	Is there clean?	a rotometer in	the dry deposition filter	line, and is it 🛛 🗹	Clean and dry
Par	ameter	-	Manufacturer	Model	S/N Client ID

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	В	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

Fie	eld Sy	stems Data Fo				F-0205	8-15	00-S6-rev001		
Site	ID	CDZ171	Technician	Sandy Grenville		Site Visit	Date 03/0	05/2013		
	DAS, se	nsor translators, and p	<mark>peripheral equi</mark>	pment operation	<u>15 ai</u>	<u>nd maintenan</u>	<u>ce</u>			
1		DAS instruments appearntained?	ar to be in good	l condition and			1400-40-694 EU			
2	2 Are all the components of the DAS operational? (printers, modem, backup, etc)									
3						Met sensors o	nly			
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 grounde	DAS, sensor translato d?	rs, and shelter	properly						
7	Does the	e instrument shelter ha	ave a stable pov	ver source?						
8	Is the in	strument shelter temp	erature control	lled?						
9	Is the m	et tower stable and gr	ounded?			Stable		Gro	ounded	
		mple tower stable and							✓	
		omments?	5.00000							
11	Tower	onincity,							1997 (1997) 1997 (1997)	

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

Field Systems Data	Fo	rn	n					<b>F-02</b>	)58-	1500-S7-rev0	01
Site ID CDZ171		Т	ech	nician	Sandy Grenv	ille	Site Visit Date	03/05/2013		a transfer a se	
<b>Documentation</b>											
Does the site have the requir	ed iı	nstr	um	ent and	<u>equipment n</u>	nanuals?					
	Yes		No	N/A				Yes	No	N/A	
Wind speed sensor						ata logge					
Wind direction sensor						ata logge					
Temperature sensor						1277 200 200 200	recorder				
Relative humidity sensor						omputer					
Solar radiation sensor						lodem					
Surface wetness sensor						rinter					
Wind sensor translator						ero air pı					
Temperature translator						ilter flow	The second s				
Humidity sensor translator					Sı	urge prot	ector				
Solar radiation translator					U.	PS					
Tipping bucket rain gauge					Li	ightning <sub>l</sub>	protection device	A DESCRIPTION OF THE OWNER OF THE			
Ozone analyzer					SI	helter hea	iter				
Filter pack flow controller					SI SI	helter air	conditioner				
Filter pack MFC power supply											
Does the site have the requi	ired	and	m	ost recen	nt QC docum	ents and	report forms?				
	Pre	esen	t					Curren	t		
Station Log											
SSRF											
Site Ops Manual				Oct 200	1						
HASP				Nov 200							
Field Ops Manual											
Calibration Reports											
Ozone z/s/p Control Charts											
Preventive maintenance schedu	1										
				S. Statistics							
1 Is the station log properly	com	plet	ed	during e	every site visi	<b>t?                                    </b>	inimal information	ו			19994
2 Are the Site Status Report current?	For	ms	beir	ng comp	leted and						
3 Are the chain-of-custody f sample transfer to and fro			ope	rly used	l to documen	t 🗹					
4 Are ozone z/s/p control cha current?	arts :	pro	per	ly compl	leted and		ontrol charts not u	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:										

Fie	eld Sy	stems Data Fo	orm				<b>F-02058-</b>	1500-S8-rev001
Site	ID	CDZ171	Technician	Sandy Grenville	CAR:	Site Visit Date	03/05/2013	
1	Has the	eration procedures site operator attended If yes, when and who		STNET training		During site installation	on	
2		backup operator atte g course? If yes, when				Site operator refresh	ner training course	
	Is the sit	te visited regularly on a second second	the required T	uesday				
		standard CASTNET o d by the site operator?	CONTRACTOR CONTRACTOR CONTRACTOR	cedures being				
		te operator(s) knowled lired site activities? (in	Constraint and the second	and a second second second second second				
	Are reg	ular operational QA/Q	C checks perfo	ormed on meteo	<u>rolo</u>	gical instruments?		
QC	Check P	erformed		Frequency			Complian	ıt

QC Check Performed	Frequency	CO	
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?

00	Ch	ool.	De		2	
QU	Ch	еск	re	<b>L10</b>	rm	et

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

Frequency	Compliant
Semiannually	
Daily	
Daily	
	]
Weekly	
Every 2 weeks	
N/A	
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:

~

 $\checkmark$ 

Fie	eld Sy	stems Data Fo	rm				F-02058-1500-S9-rev					
Site	ID	CDZ171	Techn	ician	Sandy Grenville		Site Visit Date	e 03/05/201	3	]		
	Site ope	ration procedures										
1	Is the fil	ter pack being change	d every T	'uesda	y as scheduled		Filter changed afte	ernoons (90%	6 of the time	9)		
2	Are the correctl	Site Status Report For y?	ms being	comp	leted and filed							
3	Are data schedule	a downloads and backu ed?	ıps being	perfo	rmed as		No longer required					
4	Are gen	eral observations being	g made a	nd rec	orded? How?		SSRF					
5	Are site fashion?	supplies on-hand and	replenish	ed in :	a timely							
6	Are sam	ple flow rates recorded	d? How?				SSRF, call-in					
7	Are sam fashion?	ples sent to the lab on	a regulai	• scheo	lule in a timely							
8		ers protected from cont oping? How?	aminatio	n dur	ing handling		One set of gloves	only				
9		site conditions reported ons manager or staff?	d regulai	ly to t	he field							
QC	Check P	erformed		Freq	luency			Complian	t			
M	Iulti-poir	nt MFC Calibrations		Semi	iannually							
F	low Syste	em Leak Checks		Wee	kly							
F	Filter Pack Inspection											
F	low Rate	Setting Checks		Wee	kly							
V	isual Ch	eck of Flow Rate Rotor	meter 🗹	Wee	kly							
Ir	n-line Filter Inspection/Replacement											
S	ample Li	ne Check for Dirt/Wat	er 🗌									
Provi	ide any a	dditional explanation (	(photogra	aph or	sketch if neces	sary	) regarding condi	tions listed a	above, or a	ny other features,		

Tower is lowered and filter changed without downing ozone channel.

# Site Inventory by Site Visit

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
МСК	131-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	Арех	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	А	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 Nu	mber Site	]	Fechnician	Site Visit Date	Parameter	Use Desc.
Campbell	2535	MCF	(131	Sandy Grenville	03/06/2013	DAS	Primary
Das Date:	3 /6 /2013	Audit Date	3 /6 /2013	Mfg	Datel	Parameter	DAS
Das Time:	17:57:49	Audit Time	17:57:50				Osumos ana sastan (D
Das Day:	65	Audit Day	65	Serial Number	15510194 Tfer Desc		Source generator (D
Low Channe	l:	High Channel	l:	Tfer ID	01320		
Avg Diff:			Max Diff:	Slope	1.00000 Intercept		0.00000
0.0001	0.0001 0.0002 0.		0.0002		2/13/2012		1.00000
				Cert Date	2/13/2012	2 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	<b>CorrCoff</b>	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.0001	0.0000	) V	V	0.0001	
7	0.1000	0.0998	0.0996	5 V	V	-0.0002	
7	0.3000	0.2997	0.2998	8 V	V	0.0001	
7	0.5000	0.4996	0.4997		V	0.0001	
7	0.7000	0.6995	0.6997		V	0.0002	
7	0.9000	0.8994	0.8996		V	0.0002	
7	1.0000	0.9994	0.9995	5 V	V	0.0001	

### Flow Data Form

Mfg	Serial Nur	nber Ta	Site	Tee	chnician	Site Visit D	Date Param	eter	Owner ID
Арех	48097		MCK131	Sa	indy Grenville	03/06/2013	B Flow R	ate	000528
					Mfg	BIOS	Pa	arameter	low Rate
					Serial Number	103471	T	fer Desc. n	exus
					Tfer ID	<b>Tfer ID</b> 01420			
					Slope	1	00000 Inte	ercept	0.00000
					Cert Date			rCoff	1.00000
					Mfg	BIOS		arameter	
					Serial Number	103424	T	fer Desc.	BIOS cell
					Tfer ID	01410			
					Slope	1.0	00000 <b>Inte</b>	ercept	0.00000
					Cert Date	1/27	7/2012 Cor	rCoff	1.00000
DAS 1:		<b>DAS 2:</b>		L	Cal Factor Z	ero	-0.0	1	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F			1	
0.24%	0.40%				Rotometer R	eading:	1.	5	
UseDescription	: Test type:	Input l/m	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSign	allPctDifference:
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	0.100
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%
	onent Leak Tes			Conditio	n		Status	pass	
Sensor Comp	onent Filter Azi	muth		Conditio	Not tested		Status	pass	
Sensor Comp	onent Filter De	pth		Conditio	n 1.5 cm		Status	pass	
Sensor Comp	onent Filter Po	sition		Conditio	n Good		Status	pass	
Sensor Comp	onent Moisture	Present		_ Conditio	n No moisture pr	esent	Status	pass	
	Sensor Component Moisture Present		2		Clean and dry		Status		
Sensor Component Rotometer Condition			_						
Sensor Component System Memo			Conditio			Status			
Sensor Component Tubing Condition			Conditio	n Good	Status pass				
Sensor Component Filter Distance			Conditio	ondition 5.0 cm Status pass					

### **Ozone Data Form**

Mfg	5	Serial Number Ta	Site	Te	chnician		Site Visi	t Date	Parame	ter	Owner I	D
ThermoElect	tron Inc	1030244798	MCK131	Sa	andy Grei	nville	03/06/20	013	Ozone		000683	
Slope: [ Intercept [ CorrCoff [	-0.	01600Slope:62386Intercept99999CorrCoff	0.00000	0	Mfg Serial N Tfer ID		ThermoE 49C-731 01100			rameter oz er Desc. Oz	zone zone transfe	er
DAS 1:		<b>DAS 2:</b>			Slone			1.0012	1 Inton		-0.18	2283
	iff: A Ma	ax % Di A Avg %	6Dif A Max 9	% Di	Slope					- L		
0.5		1.2%			Cert Da	ite		1/2/201	3 Corr	Coff	1.00	0000
UseDesc	cription:	ConcGroup:	Tfer Raw:	Tfer (	Corr:	Si	te:	Site	Unit:	PctDif	ference:	
prim	nary	1	0.20	0.3	38	-0.	17	ppb				
prim	nary	2	35.77	35.	91	35.	.92	ppb			0.03%	
prim	nary	3	51.51	51.	63	51.	.69	ppb			0.12%	
prim	nary	4	80.03	80.	11	80.	.60	ppb			0.61%	
prim	nary	5	101.95	102	.01	103	.20	ppb			1.17%	
Sensor Co	omponen	t Cell B Noise		Conditio	<b>n</b> 1.4 pp	b			Status	pass		
Sensor Co	mponen	t Cell B Tmp.		Conditio	on				Status	pass		
Sensor Co	mponen	t Fullscale Voltage		Conditio	n N/A				Status	pass		
Sensor Co	mponen	Inlet Filter Condition	on	Conditio	n Clean	1			Status	pass		
Sensor Co	mponen	t Line Loss		Conditio	on < 1 %	,			Status	pass		
Sensor Co	omponen	t Offset		Conditio	on -0.2				Status	pass		
Sensor Co	-			Conditio					Status	[		
	-	t Cell B Freq.		Conditio					Status			
	•	t System Memo		Conditio					Status			
		t Sample Train		Conditio					Status			
	-											
		Cell B Pressure		Conditio					Status			
		t Cell B Flow		Conditio					Status			
	•	t Cell A Tmp.		Conditio					Status			
Sensor Co	omponen	Cell A Pressure		Conditio	<b>n</b> 739 m	nmHg			Status	pass		
Sensor Co	mponen	t Cell A Noise		Conditio	<b>n</b> 2.0 pp	b			Status	pass		
Sensor Co	omponen	t Cell A Freq.		Conditio	<b>n</b> 111.7	kHz			Status	pass		
Sensor Co	Sensor Component Cell A Flow		Conditio	<b>0.71</b> l	pm			Status	pass			
Sensor Component Battery Backup			Condition N/A					Status	pass			
Sensor Component Zero Voltage			Condition N/A					Status	pass			

## Temperature Data Form

Mfg	i	Serial Nun	nber Ta	Site		Tec	hni	cian	Site V	isit Date	Param	eter	Owner I	D
RM Young		14804		MCK131		Sai	ndy	Grenville	03/06	/2013	Temper	rature	06543	
							Mf	g	Extech	1	Pa	arameter Te	emperature	
							Ser	ial Number	H2327	34	Tí	fer Desc. RT	ſD	
							Tfe	er ID	01227					
DAS 1:			DAS 2:			;	Slo	ре		1.0043	5 Inte	rcept	-0.08	480
Abs Avg Err	Abs	Max Er			Max Er	Er Cert Date			1/12/2013 Cor		rCoff	1.00	000	
0.08		0.12				]								
UseDesc.:		Test type:	Inp	outTmpRaw	InputTmp	oCor	r.:	OutputTmpS	ignal:	OutputSig	nalEng:	OSE Unit:	Difference:	
primary	Temp	Low Range	9	-0.11	-0.0	3 0.000		-0.2		2	С	-0.12		
primary	Temp	Mid Range	;	25.70	25.6	7	0.000		25.6		С	-0.12		
primary	Temp	High Rang	e	49.00	48.8	7		0.000		48.	9	С	-0.01	
Sensor Com	ponen	t Shield			Cond	litio	n C	lean			Status	pass		
Sensor Component Blower Status Switch			Cond	litio	n F	unctioning			Status	pass				
Sensor Component Blower			Cond	litio	n F	unctioning			Status	pass				
Sensor Com	Sensor Component System Memo			Cond	litio	n 🗌				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	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Sample Tower Type	Condition	Туре А	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:	<b>DAS 2:</b>		Mfg	Extech	Parameter She	lter Temperatur
Abs Avg ErrAbs Max ErAbs Avg ErrAbs Max Er1.531.701.00		Err Abs Max Er	Serial Number	H232734	Tfer Desc. RTE	)
			Tfer ID	01227		
			Slope	1.0043	5 Intercept	-0.08480
			Cert Date	1/12/201	3 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	С	-1.7
primary	Temp Mid Range	19.00	19.00	0.000	17.5	С	-1.5
primary	Temp Mid Range	19.30	19.30	0.000	17.9	С	-1.4

# **Field Systems Comments**

1 Parameter: ShelterCleanNotes

The shelter is neat, clean, and well organized.

Site ID MCK131	Technician Sandy Grenville	Site Visit Date 03/0	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	37.70467
Site Address 1	Westley Miller Road	Audit Longitude	-85.04870
Site Address 2		Audit Elevation	29
County	Washington	Audit Declination	-4.5
City, State	Harrodsburg, KY	Present	
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 🗹	
Shelter Working Room	Make Ekto Mo	odel 8810	Shelter Size 640 cuft
	Notes The shelter is neat, clean, and	well organized.	
Site OK	Notes		

### **Field Systems Data Form**

MCK131

F-02058-1500-S2-rev001

Site ID

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	4	
Obstacles to wind	10 times obstacle height		

Siting Distances OK

**Siting Criteria Comment** 

Fi	eld Systems Data Form		F-02058-1500-S3-rev001				
Site	MCK131 Technician Sandy Grenvi	lle	Site Visit Date 03/06/2013				
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?		Ν/Α				
2	Are wind sensors mounted so as to minimize tower effects' (i.e. wind sensors should be mounted atop the tower or on 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 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				
Dro	wide one additional evaluation (abotegraph or sketch if a	000000	w) regarding conditions listed above or any other features				

Field 8	Systems Data	Form			<b>F-020</b>	058-1500-S4-rev001
Site ID	MCK131	Technician	Sandy Grenville		Site Visit Date 03/06/2013	
	ll the meterological s lition, and well main	ensors appear to be i ained?	ntact, in good		Temperature only	
2 Area		l sensors operational	online, and		Temperature only	
		nperature and RH se	ensors clean?			
4 Are	the aspirated motors	working?				
	e solar radiation sens tches?	sor's lens clean and fi	ree of		N/A	
6 Is th	e surface wetness ser	sor grid clean and u	ndamaged?		N/A	
	the sensor signal and lition, and well main	power cables intact, ained?	in good			
	the sensor signal and 1 the elements and we	power cable connect ell maintained?	tions protected			
Paramet	er	Manufacturer	Model		S/N	Client ID
Temperat						
Provide ar	ny additional explana	RM Young ation (photograph or y affect the monitorin		sary)	regarding conditions listed abo	06543 ove, or any other features,
Provide ar	ny additional explana	tion (photograph or	sketch if necess	sary)		
Provide ar	ny additional explana	tion (photograph or	sketch if necess	sary)		
Provide ar	ny additional explana	tion (photograph or	sketch if necess	sary)		
Provide ar	ny additional explana	tion (photograph or	sketch if necess	sary)		
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Provide ar	ny additional explana	tion (photograph or	sketch if necess	sary)		
Provide ar	ny additional explana	tion (photograph or	sketch if necess	sary)		
Provide ar	ny additional explana	tion (photograph or	sketch if necess	sary)		

Fie	ld Systems Data Form		F-02058-1500-S5-rev001
Site	ID MCK131 Technician Sandy Grenville	e	Site Visit Date 03/06/2013
	Siting Criteria: Are the pollutant analyzers and deposition e	equip	nent 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 an	id ma	intenance
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?	<b>I</b>	Clean and dry
Par	ameter Manufacturer Model		S/N Client ID

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

Field Systems Data Form							F-02058	-15	00-S6-rev001
Site	ID	MCK131	Technician	Sandy Grenville		Site Visit Date	03/06/2013		
	DAS, sei	nsor translators, and j	peripheral equi	pment operation	<u>is ai</u>	nd maintenance			
1	Do the E well mai	OAS instruments appe ntained?	ar to be in good	l condition and	•				
2		he components of the backup, etc)	DAS operation	al? (printers,					
3		nalyzer and sensor sig g protection circuitry?		linougi		Met sensors only			
4		signal connections pro ntained?	otected from the	e weather and					
5	Are the	signal leads connected	to the correct	DAS channel?					
6	Are the grounde	DAS, sensor translato d?	rs, and shelter	properly					
7	Does the	instrument shelter h	ave a stable pov	ver source?					
8	Is the in	strument shelter temp	erature control	lled?					
9	Is the m	et tower stable and gr	ounded?			Stable	Grou	nded	
10	Is the sa	mple tower stable and	l grounded?					2	
11	Tower c	omments?						•	
								COLUMN TO A	

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

Field S	Systems Data	For	m					<b>F-02</b>	058-	1500-S	7-rev001
Site ID	MCK131		Tech	nician	Sandy Grenville	•	Site Visit Date 0	3/06/2013	5		
Deserve											
ALL AND ALL AN	<u>entation</u>										
Does th	<u>ne site have the requir</u>	Sector of		10.23		nuals?					
Wind spe		Yes	No	N//		a logge		Yes	No ✓	N/A	
Contraction of the second	ection sensor					a logge				<ul> <li>✓</li> </ul>	
	ure sensor						recorder			✓	
	umidity sensor					nputer					
	iation sensor					dem					
Surface w	etness sensor				Prii	nter					
Wind sens	sor translator				Zer	o air pu	ımp				
Temperat	ure translator				Filt	er flow	pump				
Humidity	sensor translator				Sur	ge prot	ector				
Solar radi	iation translator				UPS	5					
Tipping b	ucket rain gauge				Lig	htning J	protection device				
Ozone ana	alyzer				She	lter hea	iter				
Filter pac	k flow controller				She	lter air	conditioner				
Filter pac	k MFC power supply										
Does	the site have the requi	ired a	nd m	ost rece	nt QC documer	nts and	report forms?				
		Pres	ent					Curre	nt		
Station Lo	og						No. of Concession, Name				
SSRF	The state of the state of the		2								
Site Ops N	<b>Janual</b>		2	Oct 200	)1						
HASP				Nov 200	09						
<b>Field Ops</b>	Manual										
Calibratio	on Reports		2	Electror	nic copy						
Ozone z/s	p Control Charts										
Preventiv	e maintenance schedu	d [									
1 Is the	e station log properly	comp	leted	during	every site visit?						
	he Site Status Report	Form	s bei	ng comp	pleted and						
curre	ent?										
	he chain-of-custody for the chain-of-custody for the chain of the chai			erly used	d to document						
4 Are o curro	ozone z/s/p control cha ent?	arts pi	roper	ly comp	leted and		ontrol charts not use	d			
Drovido	ny additional avalance	tion (	hoto	graph -	r skotah if nav		rogarding aanditia	ng listod	ahora	or one othe	r faatumaa
	ny additional explana <sup>.</sup> man-made, that may						regarding conditio	its listed a	above, o	or any othe	r leatures,
	,	Call State	Sec. 2	Contra Cont	<b>0</b>			SECURIC			
Concernation of the	MARKING MARKAGES AND A MARKAGES	10000000	COLORG	222010/0222	ALL CONTRACTORS AND A STATE	ADCANESS:	and the second second second		220202400	ALC: NO. OF COMPANY OF COMPANY	

Fie	eld Sy	stems Data Fo	rm				F-02058-	-1500-S8-rev001
Site	ID	MCK131	Technician	Sandy Grenville		Site Visit Date	03/06/2013	
1	Has the	<u>eration procedures</u> e site operator attended ? If yes, when and who		STNET training	•	Frained on-site by M	IACTEC techniciar	
2		e backup operator atter g course? If yes, when a						
3	Is the si schedul	te visited regularly on t e?	the required T	uesday				
4		standard CASTNET o d by the site operator?	CONTRACTOR OF A	cedures being				
5		te operator(s) knowled ured site activities? (in						
	Are reg	ular operational QA/Q	C checks perfo	ormed on meteo	rolog	ical instruments?		
QC	Check I	Performed		Frequency			Complia	nt
	141-01-04	Calibrations		Semiannual				

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 Multi-point Calibrations** 

Zero Air Desiccant Check

**Automatic Zero/Span Tests** Manual Zero/Span Tests **Automatic Precision Level Tests Manual Precision Level Test Analyzer Diagnostics Tests In-line Filter Replacement (at inlet) In-line Filter Replacement (at analyze** Sample Line Check for Dirt/Water

Frequency	Comp
Semiannually	
Daily	
Daily	
Weekly	
Every 2 weeks	
N/A	
Weekly	
Weekly	

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

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

~

 $\checkmark$ 

SSRF, logbook, call-in

liant

~  $\checkmark$  $\checkmark$  $\checkmark$  $\checkmark$ 

Fie	eld Sy	stems Data Fo	rm					F-02058-1	500-S9-rev001			
Site	ID	MCK131	Techni	cian S	Sandy Grenville		Site Visit Date	03/06/2013				
	Site ope	ration procedures										
1	I 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	3 Are data downloads and backups being performed as scheduled?						No longer required					
4	Are gen	eral observations being	made an	d reco	orded? How?		SSRF, logbook					
5	Are site fashion	supplies on-hand and r	eplenishe	ed in a	timely							
6	Are san	ple flow rates recorded	l? How?				SSRF, logbook, ca	ll-in				
7	Are san fashion	pples sent to the lab on a	a regular	sched	ule in a timely							
8		ers protected from conta oping? How?	aminatio	ı duri	ng handling		Clean gloves on ar	nd off				
9		site conditions reported ons manager or staff?	l regularl	y to th	he field							
QC	Check P	erformed		Frequ	uency			Compliant				
N	Iulti-poir	nt MFC Calibrations		Semia	annually							
F	low Syste	em Leak Checks		Week	ly							
F	ilter Pac	k Inspection										
F	Flow Rate Setting Checks			ly								
V	Visual Check of Flow Rate Rotometer 🗹 Weekly			ly								
h	n-line Filter Inspection/Replacement 🗹 As needed			eded								
S	Sample Line Check for Dirt/Water Weekly				ly							
	rovide any additional explanation (photograph or sketch if nece atural or man-made, that may affect the monitoring parameter						y) regarding condit	tions listed above, or	any other features,			

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
MCK	231-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 N	Number Sit	e ,	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2137	M	CK231	Sandy Grenville	03/06/2013	DAS	Primary
Das Date:	3 /6 /2013 17:55:20	Audit Date		Mfg	Datel	Parameter	DAS
Das Time:	65	Audit Time Audit Day	65	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Channe		High Chann		Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0001	0.000	0.000	0.0002	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/26/201	3 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	0 V	V	0.0000	
7	0.1000	0.0998	0.0999	9 V	V	0.0001	
7	0.3000	0.2997	0.2998	8 V	V	0.0001	
7	0.5000	0.4996	0.4998	8 V	V	0.0002	
7	0.7000	0.6995	0.699		V	0.0002	
7	0.9000	0.8995	0.899		V	0.0001	
7	1.0000	0.9993	0.9993	5 V	V	0.0002	

### Flow Data Form

Mfg	S	erial Nun	iber Ta S	ite	Tec	hnician	Site Visit D	ate Param	ieter	<b>Owner ID</b>
Mykrolis	A	W062730	02	MCK231	Sar	ndy Grenville	03/06/2013	Flow R	ate	000236
Mfg	MAC	TEC			· ·	Mfg	BIOS	Р	arameter F	low Rate
SN/Owner ID	none		04998			Serial Number	103471	Т	fer Desc. n	exus
Parameter	MFC	power supply			Tfer ID	01420				
						Slope	1.0	00000 Inte	ercept	0.00000
						Cert Date	6/13	/2012 <b>Cor</b>	rCoff	1.00000
						Mfg	BIOS	P	arameter F	low Rate
						Serial Number	103424	Т	fer Desc. B	IOS cell
						Tfer ID	01410			
					}	Slope	1.0	00000 <b>Inte</b>	ercept	0.00000
						Cert Date	1/27	/2012 <b>Cor</b>	rCoff	1.00000
DAS 1:			<b>DAS 2:</b>		L	Cal Factor Z	ero		0	
A Avg % Diff:	A Ma	x % Di	A Avg %E	Dif A Max	: % Di	Cal Factor F	ull Scale		1	
2.81%		2.98%				<b>Rotometer R</b>	eading:	1.	.5	
UseDescription:	Tes	st type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSigna	allPctDifference:
primary	pump	off	0.000	0.000	-0.15	-0.142	-0.03	l/m	l/m	
primary	leak c	check	0.000	0.000	-0.15	-0.146	-0.04	l/m	l/m	
primary	test p	t 1	1.539	1.542	1.28	1.283	1.50	l/m	l/m	-2.72%
primary	test p	t 2	1.539	1.542	1.28	1.283	1.50	l/m	l/m	-2.72%
primary	test p	t 3	1.542	1.546	1.28	1.283	1.50	l/m	l/m	-2.98%
Sensor Comp	onent	Leak Tes	t		Condition	n		Status	pass	
Sensor Comp	onent	Filter Azir	muth		Condition	n 135 deg		Status	pass	
Sensor Comp	onent	Filter Dep	oth		Condition	n 1.5 cm		Status	pass	
Sensor Comp	onent	Filter Pos	ition		Condition	n Good		Status	pass	
Sensor Comp	onent	Moisture	Present		Condition	No moisture p	resent	Status	pass	
Sensor Comp	onent	Rotomete	er Condition		Condition	Clean and dry		Status	pass	
Sensor Comp	onent	System M	lemo		Condition	n		Status	pass	
Sensor Component Tubing Condition Co		Condition	Good		Status					
Sensor Component Filter Distance			Condition			Status	pass			

### **Ozone Data Form**

Mfg	Serial Number Ta	Site	Tee	chnician		Site Visi	it Date	Parame	eter	Owner I	D
ThermoElectron Inc	1030244792	MCK231	Sa	andy Gre	nville	03/06/2	013	Ozone		000680	
	2 20205			Mfg		ThermoE			rameter OZ	ne	
• •	0.86335 Slope:	0.0000				I					
• <u>-</u>	1.19057         Intercept           0.99997         CorrCoff	0.0000		Serial N	lumber	49C-731	04-373	Tf	er Desc. Oz	one transfer	·
CorrCoff	0.99997 CorrCoff	0.0000	5	Tfer ID		01100					
DAS 1:	<b>DAS 2:</b>			Slope			1.0012	1 Inter	rcept	-0.18	383
A Avg % Diff: A N	/Iax % Di A Avg %	<b>%Dif</b> A Max	% Di	Ĩ		L			- L		
15.7%	17.1%			Cert Da	ite		1/2/2013	3 Cori	Coff	1.00	000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer (	Corr:	Si	te:	Site	Unit:	PctDiff	erence:	
primary	1	0.12	0.3	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 Compone	nt Cell B Noise		Conditio	<b>n</b> 1.1 pp	b			Status	pass		
Sensor Compone	nt Cell B Tmp.		Conditio	on				Status	pass		
Sensor Compone	nt Fullscale Voltage		Conditio	n N/A				Status	pass		
Sensor Compone	nt Inlet Filter Condition	on	Conditio	n Clear	1			Status	pass		
Sensor Compone	nt Line Loss		Conditio	on < 1 %	•			Status	pass		
Sensor Compone	nt Offset		Conditio	<b>n</b> -0.01				Status	pass		
Sensor Compone	nt Span		Conditio	<b>n</b> 1.02				Status	pass		
Sensor Compone	nt Cell B Freq.		Conditio	<b>n</b> 94.0 k	κHz			Status	pass		
Sensor Compone	nt System Memo		Conditio	n See c	omments	;		Status	pass		
Sensor Compone	nt Sample Train		Conditio	on Good				Status	pass		
Sensor Compone	nt Cell B Pressure		Conditio	on				Status	pass		
Sensor Compone	nt Cell B Flow		Conditio	on 0.71 l	pm			Status	pass		
Sensor Compone	nt Cell A Tmp.		Conditio	on 29.3 (	C			Status	pass		
Sensor Compone	nt Cell A Pressure		Conditio	<b>n</b> 723 m	nmHg			Status	pass		
Sensor Compone	nt Cell A Noise		Conditio	<b>n</b> 0.9 pp	b			Status	pass		
Sensor Compone	nt Cell A Freq.		Conditio	on 95.2 k	κHz			Status	pass		
Sensor Compone	nt Cell A Flow		Conditio	on 0.70 l	pm			Status	pass		
Sensor Compone	nt Battery Backup		Conditio	n N/A				Status	pass		
Sensor Compone	nt Zero Voltage		Conditio	n N/A				Status	pass		

## **Temperature Data Form**

Mfg		Serial Nun	nber Ta	Site		Tec	hni	cian	Site V	isit Date	Param	eter	Owner I	D
RM Young		14803		MCK231		Sar	ndy	Grenville	03/06	/2013	Temper	rature	06542	
						]	Mf	g	Extech	<u>າ</u>	Pa	arameter Te	emperature	
						:	Ser	ial Number	H2327	'34	T	fer Desc. RT	٢D	
							Tfe	r ID	01227					
DAS 1:			DAS 2:			:	Sloj	ре		1.0043	5 Inte	rcept	-0.08	480
Abs Avg Err	Abs	Max Er	Abs Av		Max Er		Cei	rt Date		1/12/201	3 Cor	rCoff	1.00	000
0.15		0.30				]								
UseDesc.:		Test type:	In	putTmpRaw	InputTmp	Cor	r.:	OutputTmpS	ignal:	OutputSig	nalEng:	OSE Unit:	Difference:	
primary	Temp	Low Range	e	-0.11	-0.0	3		0.000		0.0	)	С	0.02	
primary	Temp	Mid Range	•	25.70	25.6	7		0.000		25.	6	С	-0.12	
primary	Temp	High Rang	e	49.00	48.8	7		0.000		48.	6	С	-0.3	
Sensor Com	ponen	t Shield			Cond	litio	n C	lean			Status	pass		
Sensor Com	ponen	t Blower S	tatus Sw	vitch	Cond	litio	n F	unctioning			Status	pass		
Sensor Com	ponen	t Blower			Cond	litio	n F	unctioning			Status	pass		
Sensor Com	ponen	t System N	Nemo		Cond	litio	n 🗌				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	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Sample Tower Type	Condition	Туре А	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:	<b>DAS 2:</b>		Mfg	Extech	Parameter She	Iter Temperatur
Abs Avg Err Ab	os Max Er Abs Avg 1.25	Err Abs Max Er	Serial Number	H232734	Tfer Desc. RTE	)
			Tfer ID	01227		
			Slope	1.0043	5 Intercept	-0.08480
			Cert Date	1/12/201	3 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	С	-1.25
primary	Temp Mid Range	22.61	22.60	0.000	21.5	С	-1.07
primary	Temp Mid Range	20.40	20.40	0.000	19.4	С	-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.

Site ID MCK231	Technician Sandy Grenvill	le Site Visit Date 03/0	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
Ferrain	rolling	QAPP Declination	4.25
Conforms to MLM	Marginally	QAPP Declination Date	12/28/2004
Site Telephone	(859) 262-5181	Audit Latitude	37.70467
Site Address 1	Wesley Miller Road	Audit Longitude	-85.04870
Site Address 2		Audit Elevation	29
County	Washington	Audit Declination	-4.5
City, State	Harrodsburg, KY	Present	
Zip Code	40330	Fire Extinguisher	Inspected Nov 1992
lime 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 M	<b>Iodel</b> 8810	Shelter Size 640 cuft
Shelter Clean	Notes The site instruments are locat sites.	ed in the MCK131 shelter. The	e same site operator is servicing both
Site OK	Notes		

FOR SALES

### **Field Systems Data Form**

MCK231

F-02058-1500-S2-rev001

Site ID

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	4	
Obstacles to wind	10 times obstacle height		

Siting Distances OK

**Siting Criteria Comment** 

Fi	eld 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?		Ν/Α				
2			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				
Dm	vide any additional evaluation (photograph or sketch if page		x) recording conditions listed above on one other features				

Provide any additional 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			
	all the meterological s dition, and well maint		ntact, in good		Temperature only			
2 Are	e all the meteorologica orting data?		online, and		Temperature only			
	e the shields for the ter	nperature and RH se	ensors clean?					
4 Are	e the aspirated motors	working?						
	he solar radiation sens atches?	sor's lens clean and fi	ree of		N/A			
6 Is t	he surface wetness sen	sor grid clean and u	ndamaged?		N/A			
	e the sensor signal and idition, and well maint		in good					
	e the sensor signal and m the elements and we		tions protected					
Parame	eter	Manufacturer	Model		S/N	Client ID		
Tempera	ature	RM Young	41342VC			00540		
		ntion (photograph or	sketch if necess	ary)	regarding conditions listed above	06542 ve, or any other features,		
	any additional explana or man-made, that may	ntion (photograph or	sketch if necess	ary)	and the second second second second second			
		ntion (photograph or	sketch if necess	ary)	and the second second second second second			
		ntion (photograph or	sketch if necess	ary)	and the second second second second second			
		ntion (photograph or	sketch if necess	ary)	and the second second second second second			
		ntion (photograph or	sketch if necess	ary)	and the second second second second second			
		ntion (photograph or	sketch if necess	ary)	and the second second second second second			
		ntion (photograph or	sketch if necess	ary)	and the second second second second second			
		ntion (photograph or	sketch if necess	ary)	and the second second second second second			
		ntion (photograph or	sketch if necess	ary)	and the second second second second second			

Fi	eld Systems Data Form		F-02058-1500-S5-rev001
Site	MCK231 Technician Sandy Grenville		Site Visit Date 03/06/2013
	Siting Criteria: Are the pollutant analyzers and deposition eq	<u>uip</u> ı	nent 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	ma	intenance
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
Contraction of the			

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.

Fie	eld Sy	stems Data Fo	orm				<b>F-0205</b>	8-15	500-S6-rev001
Site	ID	MCK231	Technician	Sandy Grenville	20122	Site Visit Date	03/06/2013		
	DAS, se	nsor translators, and p	peripheral equi	pment operation	<u>ıs aı</u>	nd maintenance			
1		DAS instruments appe intained?	ar to be in good	l condition and					
2		he components of the backup, etc)	DAS operation	al? (printers,					
3		nalyzer and sensor sig g protection circuitry?		through		Met sensors only			
4		signal connections pro intained?	otected from the	e weather and					
5	Are the	signal leads connected	to the correct	DAS channel?					
6	Are the grounde	DAS, sensor translato cd?	rs, and shelter	properly					
7	Does the	e instrument shelter ha	ave a stable pov	ver source?					
8	Is the in	strument shelter temp	erature control	lled?					
9	Is the m	et tower stable and gr	ounded?			Stable	Gro	unded	
		mple tower stable and	r grounded?					✓	
11	Tower c	omments?							

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	Foi	m				<b>F-02</b>	058-	1500-S7-rev001
Site ID MCK231		Tech	nician	Sandy Grenville	Site Visit Date	03/06/2013		
Documentation								
Does the site have the require	d ins	strume	nt and	equipment manual	2			
	Yes	No	N/A		<u>.</u>	Yes	No	N/A
Wind speed sensor				- Data log	ger			
Wind direction sensor				Data log	ger			
Temperature sensor				Strip ch	art recorder			
Relative humidity sensor				Comput	er			
Solar radiation sensor				Modem				
Surface wetness sensor				Printer				
Wind sensor translator				Zero air	pump			
Temperature translator				Filter flo	ow pump			
Humidity sensor translator				Surge p	rotector			
Solar radiation translator				UPS				
Tipping bucket rain gauge				Lightnii	ig protection device			
				Shelter				
Ther pack now controller				Shelter	air conditioner			
Filter pack MFC power supply								
Does the site have the requir	ed a	nd mo	st rece	nt QC documents a	nd report forms?			
	Pres	ent				Currer	nt	
Station Log		<						
SSRF	ŀ	<						
Site Ops Manual	[							
HASP	[							
Field Ops Manual								
Calibration Reports	ŀ	✓	Electror	піс сору				
Ozone z/s/p Control Charts								
Preventive maintenance schedul								
1 Is the station log properly c	omp	leted d	luring	every site visit? 🔽				
2 Are the Site Status Report I current?	Forn	ns bein	g comp	oleted and				
3 Are the chain-of-custody fo sample transfer to and from			rly used	l to document 🔽				
4 Are ozone z/s/p control char current?	rts p	roperl	y comp	leted and	Control charts not u	sed		
Provide any additional explanati natural or man-made, that may					y) regarding condit	ions listed a	bove,	or any other features,

Fie	ld Sy	stems Data Fo	orm			F-02058-1500-S8-rev00			
Site	ID	MCK231	Technician	Sandy Grenville		Site Visit Date	03/06/2013		
1	Has th	<u>eration procedures</u> e site operator attende ? If yes, when and who		STNET training		Trained on-site by M	IACTEC technicia	n	
2		e backup operator atte g course? If yes, when							
	Is the si schedul	ite visited regularly on e?	the required T	uesday					
		standard CASTNET of by the site operator?	CONTRACTOR OF CONTRACTOR OF CONTRACTOR	cedures being					
		ite operator(s) knowled uired site activities? (in	CONTRACTOR OF CONTRACTOR OF CONTRACTOR	CONTRACTOR OF A CONTRACT OF					
	<u>Are reg</u>	ular operational QA/Q	OC checks perfo	ormed on meteo	<u>rolog</u>	<u>tical instruments?</u>			
QC	Check I	Performed		Frequency			Complia	ant	
Mul	tipoint	Calibrations		Semiannua	ly				

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

Zero Air Desiccant Check

Multi-point Calibrations Automatic Zero/Span Tests Manual Zero/Span Tests Automatic Precision Level Tests Manual Precision Level Test Analyzer Diagnostics Tests In-line Filter Replacement (at inlet) In-line Filter Replacement (at analyze Sample Line Check for Dirt/Water

Frequency	Compliant
Semiannually	
Daily	
Daily	
Weekly	
Every 2 weeks	
N/A	
Weekly	
Weekly	

 $\mathbf{Y} \mathbf{Y} \mathbf{Y}$ 

- 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:

~

 $\checkmark$ 

Fie	eld Sy	stems Data Fo	orm					<b>F-02058-1</b>	500-S9-rev001			
Site	e ID	MCK231	Technie	cian	Sandy Grenville		Site Visit Date	03/06/2013				
	Site ope	ration procedures										
1	Is the fi	lter pack being change	d every Ti	iesda	y as scheduled		Filter changed mori	nings				
2	Are the correctl	Site Status Report For y?	rms being	comp	oleted and filed							
3	Are data	a downloads and back ed?	ups being	perfo	ormed as		No longer required					
4	Are gen	eral observations bein	g made an	d rec	orded? How?		SSRF, logbook					
5	fashion?											
6	and the second						SSRF, logbook, call-in					
7	Are san fashion:	ples sent to the lab on ?	a regular	sche	dule in a timely							
8		ers protected from con oping? How?	taminatio	ı dur	ing handling		Clean gloves on an	d off				
9		site conditions reporte ons manager or staff?	ed regularl	y to I	the field							
QC	Check P	erformed		Freq	luency			Compliant				
N	/ulti-poin	nt MFC Calibrations		Sem	iannually							
F	low Syste	em Leak Checks		Wee	kly							
F	ilter Pac	k Inspection										
F	low Rate	Setting Checks		Wee	kly							
7	isual Ch	eck of Flow Rate Roto	meter 🗹	Wee	kly							
I	n-line Fil	ter Inspection/Replace	ment 🗹	As n	eeded	200000						
S	ample Li	ine Check for Dirt/Wa	ter 🗹	Wee	kly							
		dditional explanation in-made, that may affe					) regarding condit	ions listed above, or a	any other features,			

# Site Inventory by Site Visit

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
BBE4	401-Eric H	lebert-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	В	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 V	isit 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**

0.02 DAS Time Max Error:

Mfg	Serial	Number Site	e T	echnician	Site Visit Date	Parameter	Use Desc.
Environmenta	l Sys 2689	BB	E401 E	Eric Hebert	03/06/2013	DAS	Primary
Das Date:	3 /6 /2013 9:09:33	Audit Date	3 /6 /2013 9:09:32	Mfg	Datel	Parameter	rDAS
Das Time: Das Day:	9.09.33	Audit Time Audit Day	9.09.32	Serial Number	4000392	Tfer Desc	Source generator (D
Low Channel	l:	High Chann	el:	Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0000	0.0	000 0.000	0 0.0001	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Paramete	DAS
				Serial Number	86590148	Tfer Desc	
					01310		
				Tfer ID	01310		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/27/201	3 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	0.0000	
2	0.3000	0.3000	0.3000		V	0.0000	
2	0.5000	0.5000	0.5000		V	0.0000	
2	0.7000	0.7000	0.7000		V	0.0000	
2	0.9000	0.9000	0.9000		V	0.0000	
2	1.0000	1.0001	1.0001	V	V	0.0000	
10	0.0000	0.0000	0.0000		V	0.0000	
10	0.1000	0.1000	0.1000		V	0.0000	
10	0.3000	0.3000	0.3000		V	0.0000	
10	0.5000	0.5000	0.5000		V	0.0000	
10	0.7000	0.7000	0.7000		V	0.0000	
10	0.9000	0.9000	0.9000		V	0.0000	
10	1.0000	1.0001	1.0000	V	V	-0.0001	

### Flow Data Form

Mfg	Serial Nur	nber Ta 🖇	Site	Tec	hnician	Site Visit I	Date Paran	neter	<b>Owner ID</b>
Tylan	AW94030	18	BBE401	Eri	c Hebert	03/06/201	3 flow ra	te	03392
Mfg	Tylan				Mfg	BIOS	F	arameter Flo	ow Rate
SN/Owner ID	FP9403013	03680			Serial Number	122974	]	fer Desc. Bl	OS 220-H
~~~~~	MFC power su				Tfer ID	01416			
Parameter	MFC power su	рріу						_	
					Slope	1.	.00000 Int	ercept	0.00000
					Cert Date	1/	8/2013 <b>Co</b>	rrCoff	1.00000
DAS 1:		<b>DAS 2:</b>		L	Cal Factor Z	ero	0.0	)7	
A Avg % Diff: A	A Max % Di	A Avg %I	Dif A Max	x % Di	Cal Factor F	ull Scale	5.3	37	
0.43%	0.70%				<b>Rotometer R</b>	eading:	3.	05	
UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignal	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	
1 2	test pt 1	0.000	2.969	3.04	2.755	2.99	l/m	1/m	0.70%
	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 Compo	nent Leak Tes	st		Conditio	n		Statu	pass	
Sensor Compo	nent Filter Azi	muth		Conditio	n Not tested		Statu	pass	
Sensor Compo	nent Filter De	pth		Conditio	n 0.5 cm		Status	pass	
Sensor Compo	nent Filter Po	sition		Conditio	n Good		Status	pass	
Sensor Compo	nent Moisture	Present		Conditio	n No moisture pr	esent	Statu	pass	
Sensor Compo	nent Rotomet	er Condition	1	Conditio	Clean and dry		Statu	pass	
Sensor Compo	nent System I	Memo		Conditio	n		Statu	pass	
Sensor Compo	nent Tubing C	Condition		Conditio	Good		Status	pass	
Sensor Compo	nent Filter Dis	tance		Conditio	n 5.5 cm		Statu	pass	

### **Ozone Data Form**

Mfg	:	Serial Number Ta	Site	Te	chnician		Site Visi	t Date	Parame	eter	Owner I	D
ThermoElec	ctron Inc	49C-58468-318	BBE401	Er	ic Hebert	t	03/06/20	013	Ozone		90517	
Slope: Intercept CorrCoff	2	.98260 Slope: .09900 Intercept .99991 CorrCoff	0.00000	0	Mfg Serial N Tfer ID		ThermoE 5171121 01111			rameter oz er Desc. O	zone zone primary	/ stan
DAS 1:		<b>DAS 2:</b>			Slone			0.9972	0 Into	nont [	0.19	3428
	)iff: A M	ax % Di A Avg %	<b>%Dif</b> A Max <sup>9</sup>	% Di	Slope					rcept		
0	0%	3.5%			Cert Da	nte		1/2/201	3 Corr	Coff	1.00	0000
UseDes	cription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	e Unit:	PctDi	fference:	
prin	nary	1	0.26	0.0	)7	2.	31	ppb				
prin	nary	2	29.17	29.	06	30.	.07	ppb			3.48%	
prin	nary	3	52.05	52.	01	53.	.55	ppb			2.96%	
prin	nary	4	79.97	80.	00	81.	.29	ppb			1.61%	
prin	nary	5	97.66	97.	74	97.	.65	ppb			-0.09%	
Sensor Co	omponen	t Cell B Noise	·	Conditio	on 2.9 pp	b			Status	pass		
Sensor Co	omponen	t Cell B Tmp.		Conditio	on				Status	pass		
Sensor Co	omponen	t Fullscale Voltage		Conditio	<b>n</b> 1.000	5			Status	pass		
Sensor Co	omponen	t Inlet Filter Condition	on	Conditio	n Clear	1			Status	pass		
Sensor Co	omponen	t Line Loss		Conditio	n Not te	ested			Status	pass		
Sensor Co	omponen	t Offset		Conditio	<b>n</b> -2.3				Status	pass		
Sensor Co	omponen	t Span		Conditio	<b>n</b> 1.018				Status	pass		
Sensor Co	omponen	t Cell B Freq.		Conditio	on 80.8 k	κHz			Status	pass		
Sensor Co	omponen	t System Memo		Conditio	on				Status	pass		
Sensor Co	omponen	t Sample Train		Conditio	on Good				Status	pass		
Sensor Co	omponen	t Cell B Pressure		Conditio	on				Status	pass		
Sensor Co	omponen	t Cell B Flow		Conditio	on 0.69 l	pm			Status	pass		
Sensor Co	omponen	t Cell A Tmp.		Conditio	on 37.7 (	C			Status	pass		
Sensor Co	omponen	t Cell A Pressure		Conditio	on 657 m	nmHg			Status	pass		
Sensor Co	omponen	t Cell A Noise		Conditio	<b>n</b> 3.0 pp	ob			Status	pass		
Sensor Co	omponen	t Cell A Freq.		Conditio	<b>n</b> 86.4 k	κHz			Status	pass		
Sensor Co	omponen	t Cell A Flow		Conditio	on 0.66 l	pm			Status	pass		
Sensor Co	omponen	t Battery Backup		Conditio	n N/A				Status	pass		
Sensor Co	omponen	t Zero Voltage		Conditio	<b>n</b> 0.000	6			Status	pass		

#### Wind Speed Data Form

Sensor Component Prop or Cups Condition

Sensor Component Condition

Sensor Component Torque

Mfg	Serial Numbe	er Ta Site	Te	chnician	Site Visit Date	Parameter	Owner ID
Climatronics	1725	BBE40	D1 Er	ic Hebert	03/06/2013	Wind Speed	90921
Mfg	Climatronics			Mfg Serial Number	RM Young		er wind speed
	688 F460 translator	none		Tfer ID	01262		
Prop or Cups S	N 1967			Slope	1.000	00 Intercept	0.00000
Prop or Cups T Prop Correction		).2 to	0.3	Cert Date	1/13/20	10 CorrCoff	1.00000
<b>r</b>				Mfg	RM Young	Paramet	er wind speed
				Serial Number		Tfer Des	c. wind speed motor (I
				Tfer ID	01261		
				Slope	1.000	00 Intercept	0.00000
				Cert Date	1/13/20	10 CorrCoff	1.00000
Ι	DAS 1:		DAS 2:				
I	Low Range Hig	gh Range	Low Range H	ligh 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 Compo	onent System Mer	no	Conditio	on		Status pass	
Sensor Compo	onent Sensor Plun	nb	Conditio	n Plumb		Status pass	
Sensor Compo	onent Sensor Hea	ter	Conditio	n N/A		Status pass	

Condition Good

Condition Good

Condition

Status pass

Status pass

Status pass

### Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	<b>Owner ID</b>
Climatronics	1813	BBE401	Eric Hebert	03/06/2013	Wind Direction	90885
Mfg	Climatronics		Mfg	Ushikata	Parameter	ind direction
SN/Owner ID	688 none		Serial Number	190037	Tfer Desc. tra	ansit
Parameter	F460 translator		Tfer ID	01265		
Vane SN: 36	<b>C.</b> <i>A</i>	A. Align. deg. true:	Slope	1.0000	0 Intercept	0.00000
VaneTorque	10 <b>to</b> 10	360	Cert Date	1/4/201	1 CorrCoff	1.00000
			Mfg	RM Young	Parameter	ind direction
			Serial Number		Tfer Desc. wi	ind direction wheel
			Tfer ID	01266		

Difference: Change:

1

Error:

-1

44

	DAS 1:		DA	<b>S 2:</b>			
	Orientation	Linearity	: Or	ientation	Linearity:		
Abs Avg Err	1.8		0.8				
Abs Max Er	3		2				
UseDescription	n: TferID:	Inp	ut Raw:	Linearity	Output V:	Output Deg.:	Ī
primary	01266		0	$\checkmark$	0.000	359	
primary	01266		45	$\checkmark$	0.000	42	
primary	01266		90	$\checkmark$	0.000	87	
primary	01266		135	✓	0.000	132	
primary	01266		180	✓	0.000	178	
primary	01266		225	✓	0.000	224	
	01266		270		0.000	260	

Sensor Compone	Sensor Component System Memo				Condition			
Sensor Compone	ensor Component Vane Condition			ition Good		Status	pass	
Sensor Compone	Sensor Component Torque			ition		Status	pass	
Sensor Compone	ent Sensor Plumb	)	Cond	ition Plumb		Status	pass	
	ent Sensor Heate			ition N/A		Status	pass	
Sensor Compone			Cond	Condition Good			pass	
Sensor Compone	ent Mast		Cond	ition Good		Status	pass	
primary	01265	360		0.000	359	1		1
primary	01265	270		0.000	269	1		1
primary	01265	180		0.000	178	2		2
primary	01265	90		0.000	87	3		3
primary	01266	315	$\checkmark$	0.000	315	0	46	1
primary	01266	270	$\checkmark$	0.000	269	1	45	0
primary	01266	225		0.000	224	1	46	1
primary primary	01266	135		0.000	132	2	45	1
primary	01266 01266	90 135		0.000	87 132	3	45 45	0
primary	01266	45		0.000	42	3	43	-2
· ·	01200	0	✓	0.000	357	1	42	-1

## Temperature Data Form

Mfg	8	Serial Nun	ıber Ta	Site		Т	echr	nici	an	Site V	isit Date	Param	eter	Owner ID
Climatronics		missing		BBE401		E	Eric H	Heb	ert	03/06	6/2013	Temper	ature	01049
Mfg	Clim	atronics					Μ	lfg		Extect	า	Ра	rameter	emperature
SN/Owner ID	482		none				Se	eria	l Number	H2326	679	Tf	er Desc.	TD
Parameter	Tem	perature Ti	ranslatoi	r			Tf	fer I	ID	01228	;			
DAS 1:			DAS 2:				SI	lope	e		1.0073	2 Inte	rcept	-0.12380
Abs Avg Err	Abs ]		Abs Av		Max	Er	C	ert	Date		1/12/201	3 Cor	rCoff	1.00000
0.16		0.22												
UseDesc.:	-	Fest type:	In	putTmpRaw	Input	TmpC	Corr.:	.: C	OutputTmpS	ignal:	OutputSig	nalEng:	OSE Unit:	Difference:
primary T	emp l	Low Range	,	-0.10		0.02			0.000		0.2	2	С	0.14
primary T	emp ]	Mid Range		29.23		29.14			0.000		29.	3	С	0.12
primary T	emp l	High Range	e	46.44		46.23			0.000		46.	5	С	0.22
Sensor Comp	onent	Shield			0	Condit	ion	Cle	an			Status	pass	
Sensor Comp	onent	Blower St	atus Sw	ritch	<b>C</b>	Condit	ion	N/A	Ą			Status	pass	
Sensor Comp	onent	Blower			<b>C</b>	ondit	ion	Fur	nctioning			Status	pass	
Sensor Comp	onent	System M	1emo		<b>C</b>	ondit	ion					Status	pass	

## Humidity Data Form

Mfg	Serial Nu	mber Ta	Site		T	echnician		Site V	isit Date	Para	meter	Owner ID
Rotronic	59221		BBE4	.01	E	ric Hebert		03/06	/2013	Relati	ve Humidity	none
						Mfg		Rotror	nic	]	Parameter Re	lative Humidity
						Serial Nu	mber	12443	2	,	<b>Ffer Desc.</b> Hy	groclip
						Tfer ID		01225				
						Slope			1.0000	0 In	tercept	0.00000
	DAS 1:			DAS 2:		Cert Date	е		1/29/201	3 <b>C</b> o	orrCoff	1.00000
	Low Range	High Ran		Low Range	]	High Range	e					
Abs Avg Err	1.9		2.0									
Abs Max Er	2.5		2.0									
UseDesc.:	Test type:	Device	e:	Input RH:	G	TL Raw:	RH (	Corr.:	DAS V	olts:	DAS %RH:	Difference:
primary	RH Low Range	Hygroc	lip	32.8		34.1	32	2.8	0.34	0	34.0	1.2
primary	RH Low Range	Hygroc	lip	52.9		52.0	52	2.9	0.55	4	55.4	2.5
primary	RH High Range	Hygroc	lip	93.6		90.3	93	3.6	0.91	6	91.6	-2.0
Sensor Com	ponent System	Memo		Сог	nditi	on				Statu	Is pass	
Sensor Com	ponent Blower			Сог	nditi	on Functio	ning			Statu	Is pass	
Sensor Com	ponent Blower S	Status Switc	:h	Сог	nditi	on N/A				Statu	Is pass	
Sensor Com	ponent RH Filte	r		Сог	nditi	on Clean				Statu	Is pass	
Sensor Com	ponent Shield			Сог	nditi	on Clean				Statu	Is pass	

#### **Solar Radiation Data Form**

Mfg	Serial Number	Ta Site	T	echni	cian	Site Vi	isit Date	Param	eter	Owner ID
Licor	PY35732	BBE401	E	ric He	ebert	03/06/	2013	Solar R	adiation	none
Mfg	Climatronics			Mf	g	Eppley		Ра	arameter	solar radiation
SN/Owner ID	385 n	one		Ser	ial Number	10765		Tf	fer Desc.	SR transfer translat
Parameter	Solar Radiation Tra	inslator		Tfe	er ID	01246				
DAS 1:	DA	S 2:		Slo	ре		1.0000	0 Inte	rcept	0.00000
	%Diff of Max %I		iff of Max	Cer	rt Date		1/6/201	0 Cor	rCoff	1.00000
				Mf	g	Eppley		Pa	arameter	solar radiation
				Ser	ial Number	34341F	-3	Tf	fer Desc.	SR transfer sensor
				Tfe	er ID	01245				
				Slo	ре		1.0000	0 Inte	rcept	0.00000
				Cer	rt Date		12/16/201	0 Cor	rCoff	1.00000
9.0%	8.7%	0.0%	0.0%							
UseDescription	: Measure Date	MeasureTime	Tfer Cor	r:	DAS w/r	m2:	PctDiff	erence:		
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 Comp	onent Sensor Level		Conditi	ion L	evel			Status	pass	
Sensor Comp	onent Sensor Clear	1	Conditi	ion C	Clean			Status	pass	
Sensor Comp	onent Properly Site	d	Conditi	ion P	Properly sited			Status	pass	
Sensor Comp	onent System Mem	0	Conditi	ion				Status	pass	

## Precipitation Data Form

Mfg	<b>Serial</b>	Number Ta	Site	]	<b>Fecl</b>	hnician		Site	Visit Date	Param	eter		<b>Owner ID</b>
Climatronics	illegibl	e	BBE401		Eric	Hebert		03/	06/2013	Precipit	ation		01474
					I	Mfg PM			0	Pa	ramete	r Prec	cipitation
<b>DAS 1:</b>		<b>DAS 2:</b>			5	Serial Nun	nber	EW-	06134-50	Tf	er Desc	250	ml graduate
A Avg % Diff			<b>Dif</b> A N	Max % Di	1	<b>Ffer ID</b>		012	50				
3.0%	4.0	0%				Slope			1.0000	0 Inte	rcept		0.00000
						•					•		
						Cert Date			9/5/200	5 Cor	rCoff		1.00000
UseDesc.	Test type:	TferVolume:	Iteration:	TimePerTip	p:	Eq.Ht:	DAS	eng:	Eq.HtUnit:	OSE Un	it: Tfer	Units:	PctDifference
primary	tip check	10 manual	1	2 sec		1.00	1.0		mm	mm		nl	
primary	test 1	231.5	1	12 sec		5.00	5.2	20	mm	mm	r	nl	4.0%
primary	test 2	231.5	2	8 sec		5.00	5.	10	mm	mm	r	nl	2.0%
Sensor Com	ponent Syste	em Memo		Condi	tion	ı				Status	pass		
Sensor Com	ponent Sens	or Heater		Condi	tion	Not funct	ioning			Status	Fail		
Sensor Com	ponent Prop	erly Sited		Condi	tion	Properly	sited			Status	pass		
Sensor Com	ponent Gaug	ge Drain Scree	n	Condi	tion	Not insta	lled			Status	Fail		
Sensor Com	ponent Leve	I		Condi	tion	Level				Status	pass		
Sensor Com	ponent Gaug	ge Clean		Condi	tion	Clean				Status	pass		
Sensor Com	ponent Funn	el Clean		Condi	tion	Clean				Status	pass		
Sensor Com	ponent Conc	lition		Condi	tion	Good				Status	pass		
Sensor Com	ponent Gaug	ge Screen		Condi	tion	Installed				Status	pass		

#### **Infrastructure Data For**

Site ID	BBE401	Technician Eric He	bert Site Visit Date 03/06/2013
Shelter	·Make	Shelter Model	Shelter Size
Ekto		8814	896 cuft

Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Sample Tower Type	Condition	Туре В	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:		Mfg	Extech	Parameter She	elter Temperatur
Abs Avg ErrAb0.44	os Max Er Abs Avg 0.61	Err Abs Max Er	Serial Number	H232679	Tfer Desc. RTI	)
			Tfer ID	01228		
			Slope	1.0073	2 Intercept	-0.12380
			Cert Date	1/12/201	3 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	С	0.61
primary	Temp Mid Range	24.32	24.27	0.000	23.9	С	-0.39
primary	Temp Mid Range	25.19	25.13	0.000	24.8	С	-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.

Site ID BBE401		Technician E	ric Hebert	Site Visit Date 03	/06/2013
				She visit Date 05	
Site Sponsor (agency)	NPS/EPA	<u></u>	<u></u>	USGS Map	Panther Junction
Operating Group	NPS			Map Scale	
AQS#	48-043-01	101		Map Date	
Meteorological Type	Climatron	lics			
Air Pollutant Analyzer	Ozone, IN	MPROVE, 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	Marginall	у		QAPP Declination Date	
Site Telephone	(432) 477	-2258		Audit Latitude	29.30265
Site Address 1	K-Bar Ra	nch		Audit Longitude	-103.17781
Site Address 2	Big Bend	National Park		Audit Elevation	105
County	Brewster			Audit Declination	7.0
City, State	Big Bend	National Park, T	X	Present	
Zip Code	79834			Fire Extinguisher 🗹	Inspected Nov 2009
Time Zone	Central			First Aid Kit 🛛 🗹	
Primary Operator	Keith Sau	iter		Safety Glasses	
Primary Op. Phone #	(432) 477	-1150		Safety Hard Hat 🔲	
Primary Op. E-mail	Keith_Sa	uter@nps.gov		Climbing Belt	
Backup Operator	Jeff Benn	ett		Security Fence	
Backup Op. Phone #	(432) 477	-1141		Secure Shelter 🔽	
Backup Op. E-mail	en e	ett@nps.gov	Contraction of the second s	Stable Entry Step 🔽	
Shelter Working Room		Ekto	and the second second	<b>el</b> 8814	Shelter Size 896 cuft
Shelter Clean	Notes	The shelter is clo	ean, neat, and w	ell organized.	
	Notes				
Nation near t and c	nal Park.( he visitor continue ap	Continue on the p center. Turn left proximately 0.5 r	park road past the (east) and contin miles. Turn right	e entrance station 26 miles ue approximately 2.5 miles	proximately 120 miles to Big Bend to the stop sign at Panther Junction s. Turn left on the dirt road marked K-Bar ast the Chihuahuan Desert Research d.

Field S	vstems	Data	Form
I ICIU D	ystems	Data	I UI III

BBE401

F-02058-1500-S2-rev001

Site ID

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

Fie	eld Sy	stems Data Fo	orm		F-02058-1500-S3-rev001
Site	e ID	BBE401	Technician Eric Hebert		Site Visit Date 03/06/2013
1		id speed and direction	sensors sited so as to avoid ns?		
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					
		nto the prevailing wind			
3	Are the	tower and sensors plu	mb?		
4	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 so	olar radiation sensor p	umb?		
7	Is it site light?	ed to avoid shading, or	any artificial or reflected		
8	Is the r	ain gauge plumb?			
9	Is it site towers,		fects from buildings, trees,		
10	Is the st facing r		ited with the grid surface		N/A
11	Is it in	lined approximately 3	0 degrees?		N/A

#### **Field Systems Data Form** F-02058-1500-S4-rev001 BBE401 Site Visit Date 03/06/2013 Site ID Technician Eric Hebert ~ 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? ~ Are the shields for the temperature and RH sensors clean? 3 ~ Are the aspirated motors working? 4 ~ 5 Is the solar radiation sensor's lens clean and free of scratches? ✓ N/A Is the surface wetness sensor grid clean and undamaged? 6 Cables deteriorating 7 Are the sensor signal and power cables intact, in good condition, and well maintained? ~ Are the sensor signal and power cable connections protected 8 from the elements and well maintained? S/N **Client ID Parameter** Manufacturer Model 100508-2 01474 Precipitation Climatronics illegible 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						<b>F-02058-1</b>	500-S5-rev001
Site	e ID	BBE401	Technician Eric	c Hebert		Site Visit Date 03/06/2013	
	Siting C	riteria: Are the j	collutant analyzers and (	deposition eq	<u>uipr</u>	nent sited in accordance with 40 CFR	58, Appendix E
1		ample inlets hav cted airflow?	e at least a 270 degree ai	rc of			
2	Are the	sample inlets 3 -	15 meters above the gro	und?			
3		sample inlets > 1 neters from trees	meter from any major ( s?	obstruction,			
	<b>Pollutan</b>	t analyzers and	deposition equipment op	erations and	mai	intenance	
1		nalyzers and equ n and well main	upment appear to be in ained?	good			
2	Are the a reportin		onitors operational, on-l	ine, and			
3	Describe	e ozone sample ti	ıbe.			1/4 teflon by 12 meters	
4	Describe	e dry dep sample	tube.			1/2 teflon by 12 meters	
5		ne filters used in location)	the ozone sample line?	(if yes		At inlet only	
6	Are sam obstruct		ree of kinks, moisture, a	ınd			
7	Is the ze	ro air supply des	siccant unsaturated?				
8	Are ther	e moisture traps	in the sample lines?			Flow line only	
9	Is there clean?	a rotometer in tl	ne dry deposition filter li	ne, and is it		Clean and dry	
Pai	rameter		Manufacturer	Model		S/N C	lient ID

Parameter	Manufacturer	Model	S/IN	Client ID
Sample Tower	Aluma Tower	В	AT-5381-F9-1	
Ozone	ThermoElectron Inc	49C	49C-58468-318	90517
Filter pack flow pump	Thomas	107CAB18B	07000012920	none
MFC power supply	Tylan	RO-32	FP9403013	03680
Zero air pump	Werther International	PC70/4	606489	none

Fie	eld Sy	stems Data Fo	orm				<b>F-</b>	02058-1	500-S6	-rev001
Site ID BBE401 Technician Eric Hebert					Site Visi	it Date 03/06/2	013			
	DAS, se	ensor translators, and	peripheral equip	oment operatio	<u>ns an</u>	<u>d maintena</u>	nce			
1		DAS instruments appe intained?	ar to be in good	condition and						
2		the components of the , backup, etc)	DAS operation:	al? (printers,						
3		analyzer and sensor sig g protection circuitry		hrough		Met sensors	only			
4		signal connections pro intained?	otected from the	weather and						
5	Are the	signal leads connected	l to the correct l	DAS channel?						
6	Are the ground	DAS, sensor translato ed?	rs, and shelter <b>j</b>	oroperly						
7	Does th	e instrument shelter h	ave a stable pow	er source?						
8	Is the in	nstrument shelter temp	oerature control	led?						
9	Is the m	iet tower stable and gr	ounded?			Stable		Grounde	d	
10	Is the sa	ample tower stable and	l grounded?							
11	Tower of	comments?			1833					

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

Field Systems Data	Fo	rm				<b>F-02</b>	058-	-1500-S7-rev001
Site ID BBE401		Tecl	nician	Eric Hebert	Site Visit Date	03/06/2013		- The Area
<b>Documentation</b>			X 66 6	Contraction of the	A A A			
Does the site have the requir	224660	C CONTRACTOR			<u>ials?</u>			
Wind speed sensor	Yes	No	N/		logger	Yes V	No	N/A
Wind direction sensor					logger			
Temperature sensor					chart recorder			
Relative humidity sensor				Com				
Solar radiation sensor				Mode				
Surface wetness sensor				Print	er			
Wind sensor translator				Zero	air pump			
Temperature translator					flow pump			
Humidity sensor translator				Surge	protector			
Solar radiation translator				UPS				
Tipping bucket rain gauge				Light	ning protection device	,		
Ozone analyzer				Shelte	er heater			
Filter pack flow controller				Shelto	er air conditioner			
Filter pack MFC power supply								
Does the site have the requ	ired a	and m	ost rece	nt QC documents	s and report forms?			
	Pres	sent				Curre	nt	
Station Log			Datavie	W				
SSRF								Design of the second
Site Ops Manual								
HASP								
Field Ops Manual								
Calibration Reports			Electro	nic copy				
Ozone z/s/p Control Charts								
Preventive maintenance schedu	u .							
1 Is the station log properly	comp	pleted	during	every site visit?	Dataview			
2 Are the Site Status Report current?	t Forr	ns bei	ng comp	pleted and	Flow and observation	on 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 Control charts not used								
Provide any additional explana natural or man-made, that may					ary) regarding condit	tions listed a	above,	or any other features,
		the last second	a construction of the			10, 84, 90 P. (0.1, 4, 5)	A CONTRACTOR OF	

Fi	eld Sy	ystems Data	Form		F-02058-1500-S8-rev0			-1500-S8-rev001
Site	e 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								
3	<ul><li>training course? If yes, when and who instructed?</li><li>3 Is the site visited regularly on the required Tuesday schedule?</li></ul>							
4	Are the standard CASTNET operational procedures being flollowed by the site operator?							
5			wledgeable of, and s? (including docum					

Frequency

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

QC	Check	Performed	
1.56	100000	Margaret and State	

The second se Second second s Second second seco	A COMPANY AND A COMPANY AND A COMPANY
Multipoint Calibrations	Semiannually
Visual Inspections	Weekly
Franslator Zero/Span Tests (climatronics)	Weekly
Manual Rain Gauge Test	Monthly
Confirm Reasonableness of Current Values	Weekly
Fest Surface Wetness Response	N/A

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

**QC Check Performed** 

Multi-point Calibrations Automatic Zero/Span Tests Manual Zero/Span Tests Automatic Precision Level Tests Manual Precision Level Test Analyzer Diagnostics Tests In-line Filter Replacement (at inlet) In-line Filter Replacement (at analyze Sample Line Check for Dirt/Water

<b>Zero</b> Air	Desiccant	Check

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

Frequency	Com
Monthly and semiannually	
Daily	
Monthly	
Daily	
Monthly	
Alarm values only	
Monthly	
N/A	

Unknown

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.

pliant

Compliant

Field Systems Data Forn	n –		F-02058-1500-S9-rev001		
Site ID BBE401 T	echnician Eric Hebert		Site Visit Date 03/06/2013		
Site operation procedures					
1 Is the filter pack being changed ev	ery Tuesday as scheduled?		Filter changed morinings (90%)		
2 Are the Site Status Report Forms correctly?	being completed and filed				
3 Are data downloads and backups scheduled?	being performed as		No longer required		
4 Are general observations being ma	de and recorded? How?		SSRF		
5 Are site supplies on-hand and repl fashion?	enished in a timely				
6 Are sample flow rates recorded? H	Iow?		SSRF		
7 Are samples sent to the lab on a refashion?	gular schedule in a timely				
8 Are filters protected from contami and shipping? How?	ination during handling				
9 Are the site conditions reported re operations manager or staff?	gularly to the field				
QC Check Performed	Frequency		Compliant		
Multi-point MFC Calibrations	Semiannually				
Flow System Leak Checks	Weekly				
Filter Pack Inspection					
Flow Rate Setting Checks	Weekly	2700 Hills			
Visual Check of Flow Rate Rotomete	er 🗹 Weekly				
In-line Filter Inspection/Replacemen	t Semiannually				
Sample Line Check for Dirt/Water		2646,3723			
Provide any additional explanation (pho natural or man-made, that may affect th			r) regarding conditions listed above, or any other features,		

# Site Inventory by Site Visit

Site V	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
PAL1	90-Eric H	ebert-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	В	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 Si	te 1	Fechnician	Site Visit Date	Parameter	Use Desc.
Campbell	2126	P	AL190	Eric Hebert	03/07/2013	DAS	Primary
Das Date:	3 /7 /2013 13:32:20	Audit Date Audit Tim		Mfg	Datel	Parameter	DAS
Das Day:	66	Audit Day		Serial Number	4000392	Tfer Desc.	Source generator (D
Low Channe	l:	High Cham	nel:	Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0000	0.0	0.00	0.0002	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	86590148	Tfer Desc.	DVM
				Tfer ID	01310		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/27/201	3 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	-0.0001	
7	0.7000	0.7000	0.7000		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 Nun	nber Ta S	lite	Tec	chnician	Site Visit I	Date Paran	neter	<b>Owner ID</b>
Арех	unknown		PAL190	Eri	c Hebert	03/07/201	3 Flow F	late	000604
					Mfg	BIOS	P	arameter F	low Rate
				Serial Number 12		122974	122974 <b>Tf</b>		IOS 220-H
					Tfer ID	01416			
					Slope	1.	.00000 Int	ercept	0.00000
					Cert Date			rrCoff	1.00000
DAS 1:		<b>DAS 2:</b>			Cal Factor Z	ero	-0.0	14	
A Avg % Diff:	A Max % Di	A Avg %I	Dif A Max	w Di	Cal Factor E		0.9		
1.33%	1.43%				Rotometer R		3.2		
UseDescription:	Test type:	Input 1/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSign	allPctDifference
primary	pump off	0.000	0.000	0.00	0.024	-0.02	l/m	1/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 Compo	ment Leak Tes	st		Conditio	n		Status	pass	
Sensor Compo	Filter Azi	muth		Conditio	n 135 deg		Status	pass	
Sensor Compo	nent Filter Dep	oth		Conditio	<b>n</b> 1.0 cm		Status	pass	
Sensor Compo	nent Filter Pos	sition		Conditio	n Good		Status	pass	
Sensor Compo	Moisture	Present		Conditio	n No moisture p	resent	Status	pass	
Sensor Compo	Sensor Component Rotometer Condition		Conditio	n Clean and dry		Status	pass		
Sensor Compo	onent System N	/lemo		Conditio	n		Status	pass	
Sensor Compo	ment Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Compo	nent Filter Dis	tance		Conditio	n 5.5 cm		Status	pass	

### **Ozone Data Form**

Mfg	Serial Number Ta	Site	Te	chnician		Site Vis	it Date	Parame	eter	Owner I	D
ThermoElectron Inc	1009241783	PAL190	Er	ic Hebert		03/07/2	013	Ozone		000613	
Intercept	0.98874         Slope:           0.63510         Intercept           1.00000         CorrCoff	0.0000	0	Mfg Serial N	umber	Thermol			rameter <sup>oz</sup> er Desc. O	zone zone primary	/ stan
	CorrCon	0.0000	0	Tfer ID		01111					
DAS 1:	<b>DAS 2:</b>			Slope			0.9972	0 Inter	cent	0.18	428
A Avg % Diff: A N	Max % Di A Avg	%Dif A Max	% Di	-	4.	L	1/2/201		- L	1.00	
0.5%	0.7%			Cert Da	lite		1/2/201	3 Corr		1.00	000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	e Unit:	PctDif	ference:	
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	2.00	ppb			-0.44%	
Sensor Compone	Cell B Noise		Conditio	on 1.3 pp	b			Status	pass		7
Sensor Compone	ent Cell B Tmp.		Conditio	on				Status	pass		
Sensor Compone	Tullscale Voltage		Conditio	on N/A				Status	pass		
Sensor Compone	Inlet Filter Conditi	on	Conditio	on Clean				Status	pass		
Sensor Compone	ent Line Loss		Conditio	on Not te	sted			Status	pass		
Sensor Compone	ent Offset		Conditio	<b>0.10</b>				Status	pass		
Sensor Compone	ent Span		Conditio	<b>n</b> 1.001				Status	pass		
Sensor Compone	Cell B Freq.		Conditio	on 92.5 k	Hz			Status	pass		
Sensor Compone	System Memo		Conditio	on				Status	pass		
Sensor Compone	ent Sample Train		Conditio	on Good				Status	pass		
Sensor Compone	ent Cell B Pressure		Conditio	on				Status	pass		
Sensor Compone	Cell B Flow		Conditio	on 0.65 l	om			Status	pass		
Sensor Compone	ent Cell A Tmp.		Conditio	on 32.1 (	2			Status			
Sensor Compone	ent Cell A Pressure		Conditio	on 648 m	nmHg			Status	pass		
Sensor Compone	ent Cell A Noise		Conditio	<b>on</b> 0.6 pp	b			Status			
Sensor Compone				on 99.8 k				Status			
Sensor Compone				on 0.64 l	om			Status			
Sensor Compone	ent Battery Backup		Conditio					Status			
Sensor Compone	Zero Voltage		Conditio	on N/A				Status	pass		

## Wind Speed Data Form

Mfg	Serial Number	r Ta Site	Tec	hnician	Site Visit Date	e Parameter	Owner ID
RM Young	17101wsp	PAL190	Eric	c Hebert	03/07/2013	Wind Speed	03421
			-	Mfg	RM Young	Parame	ter wind speed
				Serial Number		Tfer De	sc. wind speed motor (h
				Tfer ID	01262		····
Prop or Cups SN				Slope	1.000	000 Intercept	0.00000
Prop or Cups To		.3 to	0.4	Cert Date	1/13/20	010 CorrCoff	1.00000
Prop Correction	Fact 0.0512			N.T.C.	RM Young	D	ter wind speed
				Mfg	Kivi Touriy		
				Serial Number		Tfer De	sc. wind speed motor (I
				Tfer ID	01261		
				Slope	1.000	000 Intercept	0.00000
				Cert Date	1/13/20		1.00000
				Cert Date	1/10/20	Correon	1.00000
D	AS 1:	D	AS 2:				
Le			ow Range Hi	gh 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	0 200	0.20	0.000	0.0		-0.20
primary	01262 01262	400	2.05	0.000	2.1		0.00
primary primary	01262	800	4.10	0.000	4.1		0.00
primary	01262	1200	6.14	0.000	6.1	0.00%	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%	
1 1	nent System Merr		Condition		1011	Status pass	
	L			Dlumb			
Sensor Compor	nent Sensor Plum	U	Condition			Status pass	
Sensor Compor	nent Sensor Heat	er	Condition	n N/A		Status pass	
Sensor Compor	nent Prop or Cups	s Condition	Condition	Good		Status pass	
Sensor Compor	nent Condition		Condition	Good		Status pass	
Sensor Compor	nent Torque		Condition	1		Status pass	

### Wind Direction Data Form

Mfg	Serial Number	<b>Fa</b> Site		Technician	Site Visi	t Date Param	eter	<b>Owner ID</b>
RM Young	17101wdr	PAL190		Eric Hebert	03/07/20	)13 Wind D	Direction	03421
Vane SN: <u>N/</u> VaneTorque	A ( 12 to 18	C. A. Align. de	<mark>g. true:</mark> 360	Mfg Serial Nur Tfer ID Slope Cert Date Mfg Serial Nur Tfer ID	01265 RM Your	T 1.00000 Inte 1/4/2011 Cor	fer Desc. tr ercept rCoff arameter	vind direction cansit 0.00000 1.00000 vind direction vind direction wheel
	DAS 1: Drientation Linea 1.3 3		AS 2: ientation	Linearity:				
UseDescription	: TferID:	Input Raw:	Linearity	Output V:	Output Deg.:	Difference:	Change:	Error:
primary	01266	0	<ul> <li>Image: A start of the start of</li></ul>	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	270 315		0.000	270 317	0	46	1
primary primary	01265	90		0.000	93	2	47	2
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 Compo	onent Mast		Cond	lition Good		Status	pass	
Sensor Compo	onent Condition		Cond	lition Good		Status	pass	
Sensor Compo	Sensor Heater		Cond	lition N/A		Status	pass	
Sensor Compo	Sensor Plumb		Cond	lition Plumb		Status	pass	
Sensor Compo	onent Torque		Cond	lition		Status	pass	
Sensor Compo	onent Vane Condition	า	Cond	lition Good		Status	pass	
Sensor Compo	onent System Memo		Cond	lition		Status	pass	

## Temperature Data Form

Mfg	5	Serial Nun	ıber Ta	Site		Tecl	hnician	Site	e Visit Date	Param	eter	Owner II	)
RM Young		12542		PAL190		Eric	c Hebert	03/	/07/2013	Temper	rature	06303	
						I	Mfg	Exte	ech	Pa	arameter Te	mperature	
						\$	Serial Numb	er H23	32679	Tf	fer Desc. R	D	
							Tfer ID	012	28				
DAS 1:			<b>DAS 2:</b>			5	Slope		1.0073	2 Inte	rcept	-0.123	380
Abs Avg Err	Abs ]	Max Er	Abs Av		Max Er		Cert Date		1/12/201	3 Cor	rCoff	1.000	000
0.04		0.07				]							
UseDesc.:		Test type:	In	putTmpRaw	InputTm	oCor	r.: OutputTn	npSigna	l: OutputSig	gnalEng:	OSE Unit:	Difference:	
primary	Temp	Low Range	e	-0.03	0.09	9	0.0	00	0.0	5	С	-0.04	
primary	Temp	Mid Range	:	26.20	26.1	3	0.0	00	26.1	11	С	-0.02	
primary	Temp	High Rang	e	46.29	46.0	)8	0.0	00	46.1	15	C	0.07	
Sensor Com	ponen	t Shield			Cond	litior	Clean			Status	pass		]
Sensor Com	ponen	Blower S	tatus Sw	itch	Cond	litior	Functioning			Status	pass		]
Sensor Com	ponen	Blower			Cond	litior	Functioning			Status	pass		]
Sensor Com	ponen	t System N	lemo		Cond	litior	n			Status	pass		]

## 2 Meter Temperature Data For

Calc. Difference

Mfg	Serial Number	Ta Site	Тес	chnician	Site Visit Date	Paramete	r	Owner ID
RM Young	12541	PAL190	Eri	ic Hebert	03/07/2013	Temperatu	ure2meter	06302
				Mfg	Extech	Para	meter Tem	perature
				Serial Number	H232679	Tfer	Desc. RTD	
				Tfer ID	01228			
DAS 1:	DA	S 2:		Slope	1.007	32 Interce	ept	-0.12380
Abs Avg Err A	bs Max Er Ab	s Avg Err Ab	os Max Er	Cert Date	1/12/20	13 CorrC	off	1.00000
0.04	0.07							
UseDescription:	Test type:	InputTmpRaw	InputTmpCorre	ected: OutputTm	pSignal: Output	SignalEng:	OSE Unit:	Difference:
primary 7	Femp Low Rang	-0.03		0.09	0.000	0.04	С	-0.05
primary 7	Femp Mid Rang	26.20		26.13	0.000	26.14	С	0.01
primary 7	Femp High Ran	46.29		46.08	0.000	46.15	С	0.07
Sensor Compon	ent Blower Status	s Switch	Conditio	n Functioning		Status pa	ass	
Sensor Compon	ent System Mem	0	Conditio	n		Status pa	ass	
Sensor Compon	ent Blower		Conditio	n Functioning		Status pa	ass	
Sensor Compon	ent Properly Site	d	Conditio	n Properly sited		Status pa	ass	
Sensor Compon	ent Shield		Conditio	n Clean		Status pa	ass	

## Humidity Data Form

Mfg	Serial Nu	mber Ta	Site		Te	chnician		Site V	isit Date	Para	meter	Owner ID
Vaisala	B3220003	3	PAL1	90	Er	ric Hebert		03/07	/2013	Relat	ive Humidity	06223
						Mfg		Rotror	ic		Parameter Re	lative Humidity
						Serial Nu	mber	12443	2		Tfer Desc. Hy	groclip
						Tfer ID		01225				
						Slope			1.0000	0 In	tercept	0.00000
	DAS 1:			DAS 2:		Cert Date	e		1/29/201	3 <b>C</b>	orrCoff	1.00000
	Low Range	High Ran		Low Range	E	ligh Range	e					
Abs Avg Err	3.3		9.1									
Abs Max Er	4.9		9.1									
UseDesc.:	Test type:	Device	e:	Input RH:	G	TL Raw:	RH (	Corr.:	DAS V	olts:	DAS %RH:	Difference:
primary	RH Low Range	Hygroc	lip	32.8		35.0	32	2.8	0.00	0	34.4	1.6
primary	RH Low Range	Hygroc	lip	52.9		51.2	52	2.9	0.00	0	48.0	-4.9
primary	RH High Range	Hygroc	lip	93.6		90.8	93	8.6	0.00	0	84.5	-9.1
Sensor Com	ponent System	Memo		Con	ditio	on				Statı	1s pass	
Sensor Com	ponent Blower			Con	ditio	on N/A				Statı	1s pass	
Sensor Com	ponent Blower S	Status Switc	h	Con	ditio	on N/A				Statu	1s pass	
Sensor Com	ponent RH Filte	r		Con	ditio	on Clean				Statu	1s pass	
Sensor Com	ponent Shield			Con	ditio	on Clean				Statu	1s pass	

## **Solar Radiation Data Form**

Mfg	Serial Number	<b>Fa</b> Site	T	echnici	an	Site Visit D	ate Param	eter	Owner ID
Licor	PY55110	PAL190	E	ric Heb	ert	03/07/2013	Solar R	adiation	06311
Mfg	RM Young			Mfg		Eppley	P	arameter	solar radiation
SN/Owner ID	one 06	310		Seria	l Number	10765	Т	fer Desc.	SR transfer translat
Parameter S	Solar Radiation Tran	slator		Tfer ID					
DAS 1:	DAS	2:		Slope	9	1.(	00000 Inte	ercept	0.00000
	Diff of Max %Di		ff of Max	Cert	Date	1/6	/2010 <b>Cor</b>	rCoff	1.00000
				Mfg		Eppley	P	arameter	solar radiation
				Seria	l Number	34341F3	T	fer Desc.	SR transfer sensor
				Tfer	ID	01245			
				Slope	e	1.(	00000 <b>Inte</b>	ercept	0.00000
				Cert	Date	12/16	/2010 <b>Cor</b>	rCoff	1.00000
1.5%	0.9%	0.0%	0.0%						
UseDescription:	Measure Date	MeasureTime	Tfer Cor	r:	DAS w/r	n2: Pct	Difference:		
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 Compor	ent Sensor Level		Conditi	ion Lev	/el		Status	pass	
Sensor Compor	ent Sensor Clean		Conditi	ion Cle	an		Status	pass	
Sensor Compon	Sensor Component Properly Sited		Conditi	lition Properly sited			Status	pass	
Sensor Compor	ent System Memo		Conditi	ion			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 Su	rface wetness
			Serial Number	296-1200	Tfer Desc. de	cade box
			Tfer ID	01210		
			Slope	1.0000	0 Intercept	0.00000
			Cert Date	1/4/201	1 CorrCoff	1.00000

#### Manual Test Pass

UseDescription:	Test Type:	Tfer kOhms:	OutputSignal:	DAS eng:	OutputSignalEngUr	i 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 Compor	nent Grid Orientati	on	Condition	northwest	Sta	tus pass	
Sensor Compor	nent Grid Clean		Condition	Clean	Sta	itus pass	
Sensor Compor	ent Grid Angle		Condition	Condition about 45 deg			
Sensor Compor	nent Grid Condition	า	Condition	Fair	Sta	itus pass	
Sensor Compor	nent Properly Sited	1	Condition	Properly sited	Sta	tus pass	
Sensor Compor	nent System Memo	0	Condition		Sta	itus pass	
Sensor Compor	nent Grid Type		Condition	Grid with holes	Sta	tus pass	

## Precipitation Data Form

Mfg	Serial	Number Ta	Site	Т	echnician		Site	Visit Date	Paramet	er	<b>Owner ID</b>
Texas Electror	nics 41276	6-107	PAL190	E	ric Hebert		03/0	07/2013	Precipitat	tion	06307
					Mfg		PMF	PMP Parame		ameterP	recipitation
<b>DAS 1:</b>		<b>DAS 2:</b>			Serial Nur	nber	EW-	06134-50	Tfe	r Desc. 2	50ml graduate
		Di A Avg %	bDif A N	/Iax % Di	Tfer ID		0125	50			
1.0%	2	.0%					r		2		
					Slope			1.0000	0 Intere	cept	0.00000
					Cert Date			9/5/200	5 Corre	Coff	1.00000
	1					1					
UseDesc.	Test type:	TferVolume:		*			<u> </u>	•			its:PctDifference
primary primary	tip check test 1	10 manual 231.5	1	2 sec 8 sec	0.10	0.1		in in	in in	ml ml	0.0%
primary	test 1	231.5	2	8 sec	0.50	0.		in	in	ml	-2.0%
	1					•••					
Sensor Com	ponent Sys			Conditi	on				Status F	0855	
Sensor Com	ponent Sen	sor Heater		Conditi	on Function	ing			Status F	ass	
Sensor Com	ponent Prop	perly Sited		Conditi	on Properly	sited			Status F	ass	
Sensor Com	ponent Gau	ge Drain Scree	n	Conditi	on Installed				Status [	ass	
Sensor Com	ponent Leve	əl		Conditi	on Level				Status F	ass	
Sensor Com	ponent Gau	ge Clean		Conditi	on Clean				Status [	ass	
Sensor Com	ponent Fun	nel Clean		Conditi	on Clean				Status F	ass	
Sensor Com	ponent Con	dition		Conditi	on Good				Status F	ass	
Sensor Com	ponent Gau	ge Screen		Conditi	on Installed				Status F	ass	

#### **Infrastructure Data For**

Site ID	PAL190	Technician Eric Hel	bert Site Visit Date 03/07/2013
Shelter	Make	Shelter Model	Shelter Size
Met One	9	E-8109-26012-2	720 cuft

Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Sample Tower Type	Condition	Туре В	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:	<b>DAS 2:</b>		Mfg	Extech	Parameter She	Iter Temperatur
Abs Avg ErrAb0.73	os Max Er Abs Avg 0.77	Err Abs Max Er	Serial Number	H232679	Tfer Desc. RTE	)
			Tfer ID	01228		
			Slope	1.0073	2 Intercept	-0.12380
			Cert Date	1/12/201	3 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	С	-0.68
primary	Temp Mid Range	19.78	19.76	0.000	20.5	С	0.75
primary	Temp Mid Range	23.38	23.33	0.000	22.6	С	-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.

Site ID PAL190	Technician Eric Hebert	Site Visit Date 03/	07/2013
A Contraction	and the second second		
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	34.8806
Site Address 1		Audit Longitude	-101.66470
Site Address 2		Audit Elevation	105
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 M	lodel E-8109-26012-2	Shelter Size 720 cuft
	Notes New shelter, in very good con	dition.	
	NEW YORK, TO SAME THESE AND		
Driving Directions From dirt ro Pullm	Notes I27 take exit 99 and go east on Hungate bad. At the next intersection turn left (eas an. Continue and follow sharp right turn ng. Site will be visible on the left.	t) on Lawrence (also dirt). Cor	ntinue and follow sharp left turn onto

#### **Field Systems Data Form**

PAL190

F-02058-1500-S2-rev001

Site ID

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	1	
Intensive agricultural ops (including aerial spraying)	500 m	10	
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.

Fie	eld Sy	stems Data Fo	rm			F-02058-1500-S3-rev001	L
Site	e ID	PAL190	Technician	Eric Hebert		Site Visit Date 03/07/2013	
1		nd speed and direction ifluenced by obstruction		as to avoid			
2	Are win (i.e. win horizon	id sensors mounted so id sensors should be mo tally extended boom > ito the prevailing wind	as to minimize ounted atop the 2x the max diar	tower or on a			
3	Are the	tower and sensors plu	nb?				
4		temperature shields po adiated heat sources su					
5	condition surface	perature and RH sens ons? (i.e. ground below and not steeply sloped g water should be avoi	sensors should Ridges, hollow	be natural			
6	Is the so	olar radiation sensor p	umb?				
7	Is it site light?	d to avoid shading, or	any artificial o	reflected			_
8	Is the ra	ain gauge plumb?					
9	Is it site towers,	ed to avoid sheltering e etc?	fects from buil	dings, trees,			_
10	Is the su facing n	irface wetness sensor s orth?	ited with the gr	id surface		NW	
11	Is it inc	lined approximately 3	) degrees?			Approximately 45 degrees	
					1.20		1000

The surface wetness sensor grid is inclined approximately 45 degrees and is oriented to the northwest.

Field S	Systems Da	ita Form		F-	02058-1500-S4-rev001
Site ID	PAL190	Technician Eric Hel	bert	Site Visit Date 03/07/2	2013
	l the meterologica tion, and well ma	al sensors appear to be intact, i sintained?	in good 🗹		
	ll the meteorolog ting data?	ical sensors operational online,	, and 🗹		
3 Are t	he shields for the	temperature and RH sensors of	clean? 🗹		
4 Are t	he aspirated moto	ors working?			
5 Is the scrate		sensor's lens clean and free of			
5 Is the	surface wetness	sensor grid clean and undama	ged?		
	he sensor signal a tion, and well ma	and power cables intact, in good aintained?	d 🔽		
	PROPERTY AND A REPORT OF A DESCRIPTION OF A	and power cable connections pr well maintained?	rotected 🔽		
Paramete	r	Manufacturer M	lodel	S/N	Client ID
Solar Radi	ation	Licor	-200	PY55110	06311
Surface W	etness	RM Young 58	8101	none	06288
Temperatu	ire	RM Young 4'	1342VO	12542	06303

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

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.

Fie	eld Sy	stems Data	Form			F-02058-1500-S5-rev001
Site	ID	PAL190	Technician Eric He	ebert		Site Visit Date 03/07/2013
	Siting C	riteria: Are the po	ollutant analyzers and dep	osition equi	<u>pmen</u>	<u>t sited in accordance with 40 CFR 58, Appendix E</u>
1		ample inlets have cted airflow?	at least a 270 degree arc o	f 🔽		
2	Are the	sample inlets 3 - 1	5 meters above the ground	d? ⊻	]	
3		sample inlets > 1 neters from trees?	meter from any major obs	truction, 🔽	]	
	Pollutan	t analyzers and d	eposition equipment opera	ations and m	ainte	nance
1		nalyzers and equi n and well mainta	pment appear to be in goo ined?	od 🔽		
2	Are the reportin		nitors operational, on-line	, and <b>⊻</b>	]	
3	Describe	ozone sample tu	be.		1/4	teflon by 12 meters
4	Describe	e dry dep sample (	ube.		3/8	teflon by 12 meters
5		ne filters used in location)	the ozone sample line? (if y	yes 🔽	At	nlet only
6	Are sam obstruct		ee of kinks, moisture, and	V		
7	Is the ze	ro air supply desi	ccant unsaturated?		]	
8	Are ther	e moisture traps i	in the sample lines?	V	]	
9	Is there clean?	a rotometer in the	e dry deposition filter line,	and is it 🔽	Cle	an and dry
Par	ameter		Manufacturer 1	Model		S/N Client ID

Taranieter	Manufacturer	Model	0/11	Chem ID	
Sample Tower	Aluma Tower	В	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	

Fie	eld Sy	ystems Data Fo	orm				F-	02058-1	500-S6-rev001
Site	D	PAL190	Technician	Eric Hebert		Site Visi	t Date 03/07/2	2013	
	DAS, se	ensor translators, and j	<mark>peripheral equi</mark>	<u>pment operatio</u>	<u>ns and</u>	<u>maintena</u>	nce		
1		DAS instruments appe aintained?	ar to be in good	l condition and					
2		the components of the , backup, etc)	DAS operation	al? (printers,					
3		analyzer and sensor signs of the sensor sign of the		through					
4		e signal connections pro aintained?	tected from the	e weather and					
5	Are the	e signal leads connected	to the correct	DAS channel?					
6	Are the ground	e DAS, sensor translato ed?	rs, and shelter	properly					
7	Does th	ie instrument shelter ha	ive a stable pov	ver source?					
8	Is the i	nstrument shelter temp	erature control	lled?					
9	Is the n	net tower stable and gr	ounded?			Stable		Grounde	a
10	Is the s	ample 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

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 l	Foi	rm					<b>F-02</b>	058-	1500-S7-rev(	)01
Site ID PAL190		Те	chnician	Eric Hebert		Site Visit Date	03/07/2013		Test to All	
Company and the second										
<b>Documentation</b>										
<b>Does the site have the require</b>	<u>d in</u>	<u>stru</u>	ment and	l equipment	manuals:	<u>1</u>				
	res			Ά			Yes	No	N/A	
		23.52			Data logg					
					Data logg					
				CAREAS STREET	STATE (1997)	rt recorder				
			Res Contra		Compute	r				
			Statistics of the	No. CONTRACTOR OF STREET	Modem					
Surface wetness sensor				SUGAL STREET	Printer					
Wind sensor translator			Constant States		Zero air p		<ul> <li>Image: A start of the start of</li></ul>			
Temperature translator		2.12.22	<u></u>		Filter flov					
					Surge pro	otector				
				STORES STORES	UPS					
			2010		2010 Sec. 19	protection device				
					Shelter he					
The president controller					Sneller al	r conditioner				
Does the site have the requir	red a	<u>ınd ı</u>	most rec	ent QC docu	ments and	d report forms?				
	Pres						Curre	ıt		
Station Log		✓								
SSRF		✓							A CONTRACTOR	
Site Ops Manual		✓	Feb 20	05						
HASP		✓	Nov 20	009						
Field Ops Manual										
Calibration Reports		✓	Electro	nic copy						
Ozone z/s/p Control Charts										
Preventive maintenance schedul	[									
							and the			
1 Is the station log properly c	omp	olete	d during	every site vi	sit?					
2 Are the Site Status Report I current?	Forn	ns bo	eing com	pleted and						
3 Are the chain-of-custody for sample transfer to and from			perly use	ed to docume	nt 🗸					
4 Are ozone z/s/p control char current?	rts p	rop	erly com	pleted and		Control charts not u	ised			
Provide any additional explanati natural or man-made, that may a						) regarding condit	tions listed a	bove,	or any other features	5,
The site logbook is not used for rou	utine	wee	kly site v	sits.						

Fi	eld Sy	stems Data	Form		F-02058-1500-S8-rev001						
Sit	e ID	PAL190	Technician	Eric Hebert	293 () 1225 ()	Site Visit Date 03/07/2013					
1 2	Has th course Has th	? If yes, when and e backup operato	<u>es</u> ended a formal CAS l who instructed? r attended a formal when and who instru	CASTNET		Trained by backup operator Trained on site by MACTEC during site installation					
3		ite visited regular	ly on the required T								
4		standard CASTN ed by the site oper	NET operational pro vator?	cedures being							
5			owledgeable of, and s? (including docum								

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

OC	Chook	Dorf	formed
QC.	CHECK	геп	formed

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	

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

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

Frequency	Compliant
Semiannually	
Daily	
As needed	
Daily	
As needed	
Weekly	
Every 2 weeks	
N/A	
Weekly	
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?
- Are the automatic and manual z/s/p checks monitored and 3 reported? If yes, how?

Unknown

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.

Fie	ld Sy	stems Data For	m				F-02058-1500-S9-rev00				
Site	ID	PAL190	Technic	cian E	Eric Hebert		Site Visit Dat	Site Visit Date 03/07/2013			
	<u>Site ope</u>	ration procedures									
1	Is the fil	ter pack being changed	every Tu	iesday	as scheduled?		Filter changed mo	rinings			
	Are the correctly	Site Status Report Form v?	s being o	comple	eted and filed						
	Are data schedule	a downloads and backup ed?	s being J	perfor	med as		No longer required	ł			
4	Are general observations being made and recorded? How?						SSRF, logbook				
	Are site supplies on-hand and replenished in a timely fashion?										
6.	Are sam	ple flow rates recorded?	How?				SSRF				
	Are sam fashion?	ples sent to the lab on a	regular	schedu	ule in a timely						
		rs protected from contai ping? How?	mination	durin	ng handling		Clean gloves on and off				
		site conditions reported ns manager or staff?	regularl	y to th	ie field						
QC (	Check Po	erformed		Frequ	iency			Compli	ant		
M	ulti-poir	t MFC Calibrations		Semia	annually						
Fl	ow Syste	em Leak Checks		Weekl	ly						
Fi	lter Pacl	<b>Inspection</b>									
Fl	ow Rate	Setting Checks		Weekl	ly	- THE PARTY					
Vi	Visual Check of Flow Rate Rotometer 🗹 Weekly										
In	In-line Filter Inspection/Replacement										
Sa	mple Li	ne Check for Dirt/Water	r 🗸	Weekl	ly						
		dditional explanation (p n-made, that may affect					y) regarding condi	tions liste	d above, or ai	ny other features,	

# Site Inventory by Site Visit

Site V	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CKT1	36-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	А	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 S	lite	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2132		CKT136	Sandy Grenville	03/09/2013	DAS	Primary
Das Date:	3 /9 /2013 13:32:00	Audit Da		Mfg	Datel	Parameter	DAS
Das Time: Das Day:	68	Audit Tir Audit Da		Serial Number	15510194	Tfer Desc.	Source generator (D
Low Channel: High Ch				Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0002	0.0	003 0.0	002 0.0003	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/26/201	3 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.000	0.000	0 V	V	0.0001	
7	0.1000	0.099	0.100	0 V	V	0.0002	
7	0.3000	0.299	0.299		V	0.0002	
7	0.5000	0.499		8 V	V	0.0002	
7	0.7000	0.699	0.699		V	0.0003	
7	0.9000	0.899			V	0.0002	
7	1.0000	0.999	0.999	7 V	V	0.0003	

### Flow Data Form

Mfg	Serial Nur	nber Ta	Site	Тес	chnician	Site Visit Da	ate Param	eter	Owner ID	
Арех	illegible		CKT136	Sa	ndy Grenville	03/09/2013	Flow Ra	ate	000468	
					Mfg	BIOS	Pa	arameter	Flow Rate	
					Serial Number	103471	Т	fer Desc.	nexus	
					Tfer ID	01420				
					Slope	1.0	0000 <b>Inte</b>	rcept	0.00000	
					Cert Date			rCoff	1.00000	
									1	
					Mfg	BIOS		arameter		
					Serial Number	103424	Ti	fer Desc.	BIOS cell	
					Tfer ID	01410				
					Slope	1.0	0000 Inte	rcept	0.00000	
					Cert Date	1/27/	2012 Cor	rCoff	1.00000	
DAS 1:		<b>DAS 2:</b>		L	Cal Factor Z	ero	-0.0	4		
A Avg % Diff:	A Max % Di	A Avg %l	Dif A Max	: % Di	Cal Factor F		0.9	_		
1.27%	1.32%				<b>Rotometer R</b>		1.	4		
UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit: (	OutputSign	allPctDifference:	
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	1/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 Compo	onent Leak Tes	st		Conditio	n	Status		, pass		
Sensor Compo	onent Filter Azi	muth		Conditio	n 330 deg		Status			
Sensor Compo	onent Filter De	pth		Conditio	n 1.4 cm		Status	pass		
Sensor Compo	onent Filter Po	sition		Conditio	n Good		Status	pass		
Sensor Compo				_	n No moisture pr	esent	Status	pass		
			<b>,</b>		n Clean and dry					
Sensor Compo			I				Status			
Sensor Compo	onent System I	Vemo		Conditio	n See comments	3	Status	pass		
Sensor Compo	onent Tubing C	Condition		Conditio	n Good	Status	Status pass			
Sensor Compo	onent Filter Dis	tance		Conditio	<b>n</b> 4.7 cm	Status	pass			

### **Ozone Data Form**

Mfg	5	Serial Number Ta	Site	Technician			Site Visi	t Date	Parame	Parameter		D
ThermoElec	tron Inc	1009241780	CKT136	Sa	andy Grenville		03/09/2013		Ozone		000617	
Slope: [ Intercept [ CorrCoff [	ercept -0.26696 Intercept 0.0000			0 Serial Number			I			rameter oz er Desc. Oz	one cone transfei	 r
DAS 1:		<b>DAS 2:</b>			Slope		I	1.0012	1 Inter	recont	-0.18	383
		<b>ax % Di A Avg %</b> 2.4%	6Dif A Max	% Di	Cert Da	nte		1/2/201			1.00	
UseDesc	cription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	Unit:	PctDif	ference:	
prim	nary	1	0.10	0.2	28	0.	18	ppb				
prim	nary	2	36.89	37.	.02	36.	14	ppb			-2.38%	
prim	nary	3	51.32	51.	.44	50.	70	ppb			-1.44%	
prim	nary	4	80.11	80.	.19	79.	45	ppb			-0.92%	
prim	nary	5	101.29	101	.35	100	.20	ppb			-1.13%	
Sensor Co	omponen	t Cell B Noise		Conditio	on 0.8 p	b			Status	pass		
Sensor Co	omponen	t Cell B Tmp.		Conditio	on				Status	pass		
Sensor Co	omponen	t Fullscale Voltage		Conditio	n N/A				Status	pass		
Sensor Co	omponen	t Inlet Filter Condition	n	Conditio	on Clear	1			Status	pass		
Sensor Co	omponen	t Line Loss		Conditio	on < 1 %	,			Status	pass		
Sensor Co	omponen	t Offset		Conditio	<b>on</b> 0.2				Status	pass		
Sensor Co	omponen	t Span		Condition 1.008					Status	pass		
Sensor Co	omponen	t Cell B Freq.		Condition 85.2 kHz					Status	pass		
Sensor Co	mponen	t System Memo		Condition See comments					Status	pass		
Sensor Co	omponen	t Sample Train		Condition Good					Status	pass		
Sensor Co	omponen	t Cell B Pressure		Conditio	on				Status	pass		
Sensor Co	omponen	t Cell B Flow		Conditio	on 0.63 l	pm			Status	pass		
Sensor Co	omponen	t Cell A Tmp.		Conditio	on 31.3 (	C			Status	pass		
Sensor Co	omponen	t Cell A Pressure		Conditio	<b>on</b> 709 n	nmHg			Status	pass		
Sensor Co	omponen	t Cell A Noise		Conditio	<b>on</b> 1.2 pp	b			Status	pass		
Sensor Co	omponen	t Cell A Freq.		Conditio	<b>on</b> 78.9	κHz			Status	Fail		
Sensor Co	omponen	t Cell A Flow		Conditio	on 0.67 I	pm			Status	pass		
Sensor Co	omponen	t Battery Backup		Conditio	on N/A				Status	pass		
Sensor Component Zero Voltage			Conditio	Condition N/A				Status	pass			

## Temperature Data Form

Mfg	5	Serial Nun	ıber Ta	Site		Tecł	hnician		Site V	isit Date	Param	eter	Owner II	)
RM Young		14605		CKT136		San	ndy Gren	ville	03/09	/2013	Tempe	rature	06500	
						N	Mfg		Extect	ı	Pa	arameter Te	mperature	
						Serial Number		H2327	H232734 Tf		fer Desc. RTD			
						ſ	Tfer ID		01227					
DAS 1:			<b>DAS 2:</b>			S	Slope			1.00435 Inter		rcept	-0.08480	
			Abs Av		Max Er	Cert Date			1/12/2013 Corre		rCoff	1.00000		
0.20		0.27				]								
UseDesc.:	Desc.: Test type:		In	putTmpRaw	Raw InputTmpC		orr.: OutputTmpS		ignal:	OutputSignalEng:		OSE Unit:	Difference:	
primary	mary Temp Low Range			0.10	0.18			0.000		0.4		С	0.23	
primary	primary Temp Mid Range			24.93	24.9	24.91		0.000		25.0		С	0.09	
primary	Temp	Temp High Range		49.10	48.9	97		0.000		48.7		С	-0.27	
Sensor Component Shield					Cond	Condition Clean					Status	pass		
Sensor Component Blower Status			tatus Sw	itch	ch Condit		tion N/A			Status		pass		]
Sensor Component Blower					Cond	lition	on N/A				Status pass			
Sensor Com	t System N	System Memo				1				Status	pass		]	

#### **Infrastructure Data For**

Site ID	CKT136	Technician Sandy G	renville Site Visit Date 03/09/2013
Shelter	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2116-2)	640 cuft

Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Sample Tower Type	Condition	Туре А	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:	<b>DAS 2:</b>		Mfg	Extech	Parameter She	lter Temperatur
Abs Avg ErrAb0.42	os Max Er Abs Avg 0.42	Err Abs Max Er	Serial Number	H232734	Tfer Desc. RTE	D
	0.42 0.42		Tfer ID	01227		
			Slope	1.0043	5 Intercept	-0.08480
			Cert Date	1/12/201	3 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	С	0.42
primary	Temp Mid Range	23.20	23.18	0.000	23.6	С	0.42
primary	Temp Mid Range	23.20	23.18	0.000	23.6	С	0.42

### **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate The filter sample tubing	CKT136 has drops of moi	Sandy Grenville		Moisture Present elter.	Apex	3721		
Ozone This analyzer diagnostic	CKT136 check is outside	Sandy Grenville the manufacturer's		Cell A Freq. /alue.	ThermoElectron	3464		V

### **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.

	ata Form				
Site ID CKT136	Technician Sandy Grenvill	e 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		
<b>Deposition Measurement</b>	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	-83.06629		
Site Address 2		Audit Elevation	376		
County	Morgan	Audit Declination	-6.1		
City, State	West Liberty, KY	Present			
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 🗹			
Shelter Working Room	Make Ekto M	lodel 8810 (s/n 2116-2)	Shelter Size 640 cuft		
	Notes The shelter is very clean and v	well organized.			
Contraction of the second s	Notes				
onto turn r dirt ro	I-64 in Morehead go south on route 519 froute 460. Continue approximately 1 mile ight onto route 437. Continue approximated ad at the top of the hill before the closed oximately 1/2 mile on the left.	and turn left onto route 172. tely 8 miles staying on 437. Th	continue approximately 8 miles and then ne road will climb a hill, turn left onto a		

### **Field Systems Data Form**

CKT136

F-02058-1500-S2-rev001

Site ID

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** 

Fi	eld Sy	stems Data	Form		F-02058-1500-S3-rev001
Site	e ID	CKT136	Technician Sandy C	Grenville	Site Visit Date 03/09/2013
1		nd speed and direct afluenced by obstru	ion sensors sited so as to av ctions?	void 🔽	N/A
2	(i.e. win horizon	d sensors should b	so as to minimize tower ef e mounted atop the tower of n >2x the max diameter of rind)	or on a	N/A
3		tower and sensors			N/A
4			ls pointed north or position s such as buildings, walls, o		
5	condition surface	ons? (i.e. ground be	ensors sited to avoid unna low sensors should be natu ped. Ridges, hollows, and a voided)	ıral	
6	Is the so	olar radiation senso	r plumb?		N/A
7	Is it site light?	ed to avoid shading,	or any artificial or reflect	ed 🔽	N/A
8	Is the ra	ain gauge plumb?			N/A
9	Is it site towers,		ng effects from buildings, t	rees, 🔽	N/A
10	Is the su facing n		or sited with the grid surfa	ice 🔽	N/A
11	Is it inc	clined approximate	ly 30 degrees?		N/A
Dro	wide any	additional evaluation	tion (nhotograph or skate)	h if nacassar	v) regarding conditions listed above or any other features

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

Fiel	Do all the meterological sensors appear to be intact, in grondition, and well maintained? Are all the meteorological sensors operational online, an eporting data? Are the shields for the temperature and RH sensors clear Are the aspirated motors working? s the solar radiation sensor's lens clean and free of				F	00-S4-rev001		
Site 1	D	CKT136	Technician	Sandy Grenville		Site Visit Date 03/09/	2013	
	conditi	on, and well main	tained?	interest, in Bood		Temperature only		
1	Are all the meteorological sensors operational online, and reporting data? Are the shields for the temperature and RH sensors clean?				<ul> <li>Image: A start of the start of</li></ul>	Temperature only		
4 /	Are the aspirated motors working?					N/A		
	Is the solar radiation sensor's lens clean and free of scratches?			ee of	✓	N/A		
61	is the s	urface wetness ser	nsor grid clean and ur	ndamaged?	✓	N/A		
		e sensor signal and on, and well main	l power cables intact, tained?	m 2000				
U		e sensor signal and ne elements and w	l power cable connect ell maintained?	ions protected				
Para	Parameter Manufacturer Model		Model		S/N	Cli	ent ID	
Temp	perature	e	Temperature RM Young 41342VC		1000100	14605	065	00

The temperature sensor has been installed at approximately 8 meters from the ground on the sample tower in a naturally aspirated shield.

Fi	eld Systems Data Form			F-02058-1500-S5-rev001
Site	D CKT136 Technician	Sandy Grenville		Site Visit Date 03/09/2013
	Siting Criteria: Are the pollutant analyzers	and deposition equ	<u>iipn</u>	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the sample inlets have at least a 270 deg unrestricted airflow?	ree arc of	<	
2	Are the sample inlets 3 - 15 meters above th	e ground?	✓	
3	Are the sample inlets > 1 meter from any m and 20 meters from trees?	ajor obstruction,		
	Pollutant analyzers and deposition equipme	ent operations and	mai	<u>ntenance</u>
1	Do the analyzers and equipment appear to condition and well maintained?	be in good		
2	Are the analyzers and monitors operational reporting data?	l, on-line, and	✓	
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 indicate location)	line? (if yes	✓	At inlet only
6	Are sample lines clean, free of kinks, moistrobstructions?	ire, and		
7	Is the zero air supply desiccant unsaturated	!?	✓	
8	Are there moisture traps in the sample line	s?	✓	
9	Is there a rotometer in the dry deposition fice clean?	lter line, and is it		Clean and dry
100.000		ALC AND A REAL PROPERTY OF A	1000	

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.

Fie	eld Sy	stems Data Fo				<b>F-020</b>	58-15	00-S	6-rev00	)1	
Site	ID	CKT136	Technician	Sandy Grenville	2122	Site Visit Date	03/09/2013				
	DAS, sei	<u>isor translators, and j</u>	<mark>peripheral equi</mark>	pment operation	<u>s ai</u>	<u>nd maintenance</u>					
1	Do the DAS instruments appear to be in good condition and well maintained?										
2		he components of the backup, etc)									
3		nalyzer and sensor sig g protection circuitry?		through		Met sensors only					1000
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 grounde	DAS, sensor translato d?	rs, and shelter	properly							10000
7	Does the	instrument shelter ha	ave a stable pov	ver source?							Contraction of the
8	Is the in	strument shelter temp	erature contro	lled?							
9	Is the m	et tower stable and gr	ounded?			Stable	Gr	counded		t +	
10	Is the sa	mple tower stable and	l grounded?								
11	Tower c	omments?									

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:

Temperature sensor Image: Strip chart recorder   Relative humidity sensor Image: Computer   Solar radiation sensor Image: Modem   Surface wetness sensor Image: Printer   Surge protector <th>Field Systems Data</th> <th>Form</th> <th>i</th> <th></th> <th></th> <th><b>F-02</b></th> <th>058-</th> <th>1500-S7-rev001</th>	Field Systems Data	Form	i			<b>F-02</b>	058-	1500-S7-rev001
Ves No N/A Yes No N/A   Wind speed sensor Images Images Images Images Images Images   Vind direction sensor Images Images Images Images Images Images   Temperature sensor Images Images Images Images Images Images   Solar radiation sensor Images Images Images Images Images Images   Solar radiation sensor Images Images Images Images Images Images   Solar radiation sensor Images Images Images Images Images Images   Solar radiation sensor Images Images Images Images Images Images   Solar radiation translator Images Images Images Images Images Images   Solar radiation translator Images Images Images Images Images Images   Solar radiation translator Images Images Images Images Images Images   Solar radiation translator Images Images Images Images Images Images   Solar radiation translator Images Images Images Images Images Images   Solar radiation translator Images Images Images Images Images Images   Solar radiation translator Images Images Images Images Images Images	Site ID CKT136	Т	echnician Sa	ndy Grenville	Site Visit Date	03/09/2013		arth Asia
Ves No N/A Yes No N/A   Wind speed sensor Images Images Images Images Images Images   Vind direction sensor Images Images Images Images Images Images   Temperature sensor Images Images Images Images Images Images   Solar radiation sensor Images Images Images Images Images Images   Solar radiation sensor Images Images Images Images Images Images   Solar radiation sensor Images Images Images Images Images Images   Solar radiation sensor Images Images Images Images Images Images   Solar radiation translator Images Images Images Images Images Images   Solar radiation translator Images Images Images Images Images Images   Solar radiation translator Images Images Images Images Images Images   Solar radiation translator Images Images Images Images Images Images   Solar radiation translator Images Images Images Images Images Images   Solar radiation translator Images Images Images Images Images Images   Solar radiation translator Images Images Images Images Images Images	Documentation							
Yes No N/A Yes No N/A   Wind speed sensor I I Data logger I I   Wind direction sensor I I Data logger I I   Temperature sensor I I Strip chart recorder I I   Relative humidity sensor I I I I I   Solar radiation sensor I I I I I   Surface wetness sensor I I I I I   Sufar calaitor translator I I I I I   Sufar radiation translator I I I I I   Tipping bucket rain gauge I I I I I   Sufer cale have the required and report forms! I I I   Tester Current I I I I   Suton Log I <tdi< td=""> I I&lt;</tdi<>								
Wind speed sensor Image:   Wind direction sensor Image:   Wind direction sensor Image:   Temperature sensor Image:   Temperature sensor Image:   Relative humidity sensor Image:   Solar radiation sensor Image:   Solar radiation sensor Image:   Solar radiation sensor Image:   Surface wetness sensor Image: <th>Does the site have the requi</th> <th>ALC: NO DECISION</th> <th></th> <th><u>uipment man</u></th> <th><u>uais:</u></th> <th>Vec</th> <th>No</th> <th>N/A</th>	Does the site have the requi	ALC: NO DECISION		<u>uipment man</u>	<u>uais:</u>	Vec	No	N/A
Wind direction sensor Image: Im	Wind speed sensor		the second s	Data	logger	the test of the second s		
Relative humidity sensor Computer   Solar radiation sensor Modem   Surface wetness sensor Printer   Surface wetness sensor Printer   Wind sensor translator Printer   Temperature translator Printer   Solar radiation translator Surge protector   Humidity sensor translator Printer   Solar radiation translator Printer   UPS Printer   Solar radiation translator Printer   Present Printer   Does the site have the required and most recent QC documents and report forms?   Present Current	Wind direction sensor		The second second second second					
Relative humidity sensor    Solar radiation sensor    Surface wetness sensor    Image: Sensor <th>Temperature sensor</th> <th></th> <th></th> <th></th> <th>and the second designed and the</th> <th></th> <th></th> <th></th>	Temperature sensor				and the second designed and the			
Sour Automic Source   Surface wetness sensor   Image: Source wetness sensor  <	Relative humidity sensor							
Wind sensor translator Image   Temperature translator Image   Image Image  <	Solar radiation sensor			Mod	em			
Temperature translator Image: Filter flow pump   Humidity sensor translator Image: Surge protector   Solar radiation translator Image: Surge protector   Station Log Image: Surge protector	Surface wetness sensor			Prin	ter			
Humidity sensor translator Image in the fill of pump   Humidity sensor translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation translator Image in the fill of pump   Solar radiation tradiation translator Image in the fill of	Wind sensor translator		An a hanna an Anna an A	Zero	air pump			
Solar radiation translator Image of the protector   Solar radiation translator Image of the protector   Tipping bucket rain gauge Image of the protection device   Ozone analyzer Image of the protector   Ozone analyzer Image of the protector   Filter pack flow controller Image of the protector   Filter pack MFC power supply Image of the protector   Does the site have the required and most recent QC documents and report forms?   Present Current   Station Log Image of the protector	Temperature translator			Filte	r flow pump			
Tipping bucket rain gauge Image: Construction device   Ozone analyzer Image: Construction device   Filter pack flow controller Image: Construction device   Filter pack flow controller Image: Construction device   Filter pack MFC power supply Image: Construction device   Does the site have the required and most recent QC documents and report forms?   Present Current   Station Log Image: Construction device	Humidity sensor translator			Surg	e protector	STATES STATES		
Ozone analyzer Shelter heater   Filter pack flow controller Shelter air conditioner   Filter pack MFC power supply Shelter air conditioner   Does the site have the required and most recent QC documents and report forms?   Present   Station Log	Solar radiation translator			UPS				
Filter pack flow controller Image: Control initial   Filter pack MFC power supply Image: Control initial   Does the site have the required and most recent QC documents and report forms?   Present   Current   Station Log	Tipping bucket rain gauge			Ligh	tning protection device			
Filter pack MFC power supply     Image: Contraction of the contrest of the contrest of the contraction of the contractio	Ozone analyzer			Shelt	er heater			
Does the site have the required and most recent QC documents and report forms?       Present     Current       Station Log	Filter pack flow controller		A PROPERTY OF A PROPERTY OF A PROPERTY OF	Shelt	ter air conditioner			
Present     Current       Station Log     Image: Constant of the second	Filter pack MFC power supply							
Station Log	Does the site have the requ	ired and	most recent (	QC documen	ts and report forms?			
		Present				Curre	nt	
SSRF 🗸	Station Log				New York Street Stre			
	SSRF							
Site Ops Manual	Site Ops Manual							
HASP 🔽 Nov 2001	HASP		Nov 2001					
Field Ops Manual Oct 2001	Field Ops Manual		Oct 2001					
Calibration Reports  Electronic copy	Calibration Reports		Electronic o	сору				
Ozone z/s/p Control Charts	Ozone z/s/p Control Charts							
Preventive maintenance schedul	Preventive maintenance schedu	ıl 🗌						
							232.3	
1 Is the station log properly completed during every site visit? ✓	1 Is the station log properly	complete	ed during even	ry site visit?				
2 Are the Site Status Report Forms being completed and current? ✓		t Forms b	being complete	ed and				
3 Are the chain-of-custody forms properly used to document	3 Are the chain-of-custody f							
sample transfer to and from lab?	sample transfer to and fro	m lab?						
4 Are ozone z/s/p control charts properly completed and Control charts not used current?		arts prop	perly complete	ed and	Control charts not us	sed		
Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:						ons listed a	above,	or any other features,

Fie	eld Sy	stems Data	a Form		F-02058-1500-S8-rev001					
Site	e ID	CKT136	Technician	Sandy Grenville		Site Visit Date	03/09/2013			
	Site op	eration procedur	<u>es</u>							
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
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
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

Compliant

Compliant

 $\mathbf{X}$ 

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

 $\checkmark$ 

~

Fie	Field Systems Data Form						F-02058-1500-S9-rev001			
Site	ID	CKT136	Techr	ician	Sandy Grenvill	e	Site Visit Dat	Site Visit Date 03/09/2013		]
	Site oper	ration procedures								
1	Is the fil	ter pack being change	d every ?	Fuesda	vy as scheduled	? 🗹	Filter changed var	rious	s 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	5 Are site supplies on-hand and replenished in a timely fashion?									
6	6 Are sample flow rates recorded? How?				SSRF, logbook, c	all-ir	1			
7	7 Are samples sent to the lab on a regular schedule in a timely fashion?									
		rs protected from cont pping? How?	taminati	o <mark>n du</mark> r	ing handling		Clean gloves on and off			
9		site conditions reporte ns manager or staff?	d regula	rly to a	the field					
QC	Check Pe	erformed		Free	luency			C	Compliant	
Μ	lulti-poir	nt MFC Calibrations		Sem	iannually	28038 - S <sup>-18</sup>			2	
F	low Syste	em Leak Checks		Wee	kly					
Fi	ilter Pacl	k Inspection					C			
		Setting Checks	V	Wee	kly					
		eck of Flow Rate Roto	meter 屋	Wee	kly			2		
Ir	-line Filt	ter Inspection/Replace	ment 🔽	Sem	iannually	121740				
S	ample Li	ne Check for Dirt/Wat	ter 🔽	Wee	kly	0.2116.7773				
Provi	ide anv a	dditional explanation	(photogr	aph o	r sketch if nece	ssarv	) regarding condi	itior	is listed above, or a	ny 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** 

Data Compiled: 5/25

d: 5/25/2013 3:48:13 PM

SiteVisitDate	Site	Technician
02/13/2013	CVL151	Sandy Grenville

Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
Temperature average error	Р	4	0.5	6	0.16	c	Р
Temperature max error	Р	4	0.5	6	0.38	с	Р
Ozone Slope	Р	0	1.1	4	1.00458	unitless	Р
Ozone Intercept	Р	0	5	4	-0.04842	ppb	Р
Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
Ozone % difference avg	Р	7	10	4	0.5	%	Р
Ozone % difference max	Р	7	10	4	0.6	%	Р
Flow Rate average % difference	Р	10	5	6	1.53	%	Р
Flow Rate max % difference	Р	10	5	6	1.7	%	Р
DAS Time maximum error	Р	0	5	1	0.00	min	Р
DAS Voltage average error	Р	7	0.003	28	0.0001	V	Р
Shelter Temperature average error	Р	5	1	3	0.06	с	Р
Shelter Temperature max error	Р	5	1	3	0.10	с	Р
	Temperature max error Ozone Slope Ozone Intercept Ozone correlation Ozone % difference avg Ozone % difference max Flow Rate average % difference Flow Rate max % difference DAS Time maximum error DAS Voltage average error Shelter Temperature average error	Temperature average errorPTemperature max errorPOzone SlopePOzone InterceptPOzone correlationPOzone % difference avgPOzone % difference maxPFlow Rate average % differencePFlow Rate max % differencePDAS Time maximum errorPDAS Voltage average errorPShelter Temperature average errorP	Temperature average errorP4Temperature max errorP4Ozone SlopeP0Ozone InterceptP0Ozone correlationP0Ozone % difference avgP7Ozone % difference maxP7Flow Rate average % differenceP10Flow Rate max % differenceP10DAS Time maximum errorP0DAS Voltage average errorP5	Temperature average errorP40.5Temperature max errorP40.5Ozone SlopeP01.1Ozone InterceptP05Ozone correlationP00.995Ozone % difference avgP710Ozone % difference maxP710Flow Rate average % differenceP105Flow Rate max % differenceP105DAS Time maximum errorP70.003Shelter Temperature average errorP51	Temperature average errorP40.56Temperature max errorP40.56Ozone SlopeP01.14Ozone SlopeP054Ozone InterceptP00.9954Ozone correlationP00.9954Ozone % difference avgP7104Ozone % difference maxP7104Flow Rate average % differenceP1056Flow Rate max % differenceP1051DAS Voltage average errorP70.00328Shelter Temperature average errorP513	Temperature average errorP40.560.16Temperature max errorP40.560.38Ozone SlopeP01.141.00458Ozone InterceptP054-0.04842Ozone correlationP00.99540.99999Ozone % difference avgP71040.5Ozone % difference maxP71040.6Flow Rate average % differenceP10561.53Flow Rate max % differenceP10561.63DAS Time maximum errorP0510.001DAS Voltage average errorP70.003280.0001Shelter Temperature average errorP5130.66	Temperature average errorP40.560.16cTemperature max errorP40.560.38cOzone SlopeP01.141.00458unitlessOzone InterceptP054-0.04842ppbOzone correlationP00.99540.99999unitlessOzone % difference avgP71040.5%Ozone % difference maxP71040.6%Flow Rate average % differenceP10561.73%DAS Time maximum errorP70.003280.0001VDAS Voltage average errorP5130.6c

### **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.

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5/25/2013 4:35:44 PM

# SiteVisitDateSiteTechnician02/14/2013CAD150Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	6	0.08	c	Р
2	Temperature max error	Р	4	0.5	6	0.13	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98806	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.40998	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.8	%	Р
7	Ozone % difference max	Р	7	10	4	1.0	%	Р
8	Flow Rate average % difference	Р	10	5	6	2.02	%	Р
9	Flow Rate max % difference	Р	10	5	6	2.15	%	Р
10	DAS Time maximum error	Р	0	5	1	0.05	min	Р
11	DAS Voltage average error	Р	7	0.003	28	0.0002	V	Р
12	Shelter Temperature average error	Р	5	1	3	0.07	с	Р
13	Shelter Temperature max error	Р	5	1	3	0.14	c	Р

### **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.

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# SiteVisitDateSiteTechnician02/15/2013ALC188Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	3	0.31	с	Р
2	Temperature max error	Р	4	0.5	3	0.36	с	Р
3	Ozone Slope	Р	0	1.1	4	1.01151	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.34553	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.8	%	Р
7	Ozone % difference max	Р	7	10	4	1.1	%	Р
8	Flow Rate average % difference	Р	10	5	2	3.75	%	Р
9	Flow Rate max % difference	Р	10	5	2	3.87	%	Р
10	DAS Time maximum error	Р	0	5	1	0.00	min	Р
11	DAS Voltage average error	Р	7	0.003	28	0.0001	V	Р
12	Shelter Temperature average error	Р	5	1	3	0.43	с	Р
13	Shelter Temperature max error	Р	5	1	3	0.93	с	Р

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.

#### Parameter: ShelterCleanNotes 3

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.

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SiteVisitDate	Site	Technician
02/17/2013	SUM156	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.98315	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.12501	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99995	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.7	%	Р
5	Ozone % difference max	Р	7	10	4	2.4	%	Р

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d: 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	Р	0	1.1	4	1.00643	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.28276	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.2	%	Р
5	Ozone % difference max	Р	7	10	4	0.4	%	Р

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SiteV	isitDate	Site	Technician				
02/28/2	2013	GAS153	Sandy Grenville				
Line	Audited	l Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult
1	Ozone Sl	ope	Р	0	1.1	4	1.01205
2	Ozone In	tercept	Р	0	5	4	-0.25812
3	Ozone co	rrelation	Р	0	0.995	4	0.99998

4	Ozone % difference avg	Р
5	Ozone % difference max	Р

## **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.							

7

7

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10

Page 1 of 1

Units

unitless

unitless

ppb

%

%

1.0

1.8

4

4

Pass/Fail Р

Р

Р

Р

Р

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SiteVisitDate	Site	Technician
02/20/2013	IRL141	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.00192	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.84313	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99996	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.8	%	Р
5	Ozone % difference max	Р	7	10	4	1.1	%	Р

Data Compiled: 5/2

5/27/2013 3:35:21 PM

# SiteVisitDateSiteTechnician03/01/2013MAC426Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.33	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.43	c	Р
3	Wind Speed average error below 5m/s in m/s	Р	3	0.5	4	0.01	m/s	Р
4	Wind Speed max error below 5m/s in m/s	Р	3	0.5	4	0.03	m/s	Р
5	Wind Speed average % difference above 5 m/s	Р	3	5	4	0.1	%	Р
6	Wind Speed max % difference above 5 m/s	Р	3	5	4	0.3	%	Р
7	Wind Speed Torque average error	Р	3	0.5	1	0.20	g-cm	Р
8	Wind Speed Torque max error	Р	3	0.5	1	0.2	g-cm	Р
9	Wind Direction Input Deg True average error (de	Р	2	5	10	1.4	degrees	Р
10	Wind Direction Input Deg True max error (deg)	Р	2	5	10	2	degrees	Р
11	Wind Direction Linearity average error (deg)	Р	2	5	16	1.5	degrees	Р
12	Wind Direction Linearity max error (deg)	Р	2	5	16	5	degrees	Р
13	Wind Direction Torque average error	Р	2	20	1	6	g-cm	Р
14	Wind Direction Torque max error	Р	2	20	1	7	g-cm	Р
15	Temperature average error	Р	4	0.5	3	0.31	c	Р
16	Temperature max error	Р	4	0.5	3	0.34	c	Р
17	Relative Humidity average above 85%	Р	6	10	2	2.2	%	Р
18	Relative Humidity max above 85%	Р	6	10	2	2.2	%	Р
19	Relative Humidity average below 85%	Р	6	10	4	14.9	%	Fail
20	Relative Humidity max below 85%	Р	6	10	4	27.4	%	Fail
21	Solar Radiation % diff of avg	Р	3	10	18	6.8	%	Р
22	Solar Radiation % diff of max STD value	Р	3	10	18	9.2	%	Р
23	Precipitation average % difference	Р	1	10	2	6.0	%	Р
24	Precipitation max % difference	Р	1	10	2	8.0	%	Р
25	Ozone Slope	Р	0	1.1	4	1.03139	unitless	Р
26	Ozone Intercept	Р	0	5	4	1.44173	ppb	Р
27	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
28	Ozone % difference avg	Р	7	10	4	5.4	%	Р
29	Ozone % difference max	Р	7	10	4	6.7	%	Р
30	Flow Rate average % difference	Р	10	5	2	0.84	%	Р
31	Flow Rate max % difference	Р	10	5	2	0.94	%	Р
32	DAS Time maximum error	Р	0	5	1	0.45	min	Р
33	DAS Voltage average error	Р	13	0.003	21	0.0001	V	Р
34	DAS Voltage average error	Р	8	0.003	21	0.0002	V	Р

SiteVisitDate	Site	Technician		_				
03/01/2013	MAC426	Eric Hebert						
35 Shelter T	emperature average error	Р	5	1	6	0.98	с	Р
36 Shelter T	emperature max error	Р	5	1	6	1.4	с	Fa

### **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.

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SiteVisitDate	Site	Technician
03/03/2013	CHE185	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.15	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.17	с	Р
3	Wind Speed average error below 5m/s in m/s	Р	3	0.5	8	0.12	m/s	Р
4	Wind Speed max error below 5m/s in m/s	Р	3	0.5	8	0.30	m/s	Р
5	Wind Speed average % difference above 5 m/s	Р	3	5	8	0.5	%	Р
6	Wind Speed max % difference above 5 m/s	Р	3	5	8	0.7	%	Р
7	Wind Speed Torque average error	Р	3	0.5	1	1.00	g-cm	Fail
8	Wind Speed Torque max error	Р	3	0.5	1	1.1	g-cm	Fail
9	Wind Direction Input Deg True average error (de	Р	2	5	8	0.5	degrees	Р
10	Wind Direction Input Deg True max error (deg)	Р	2	5	8	2	degrees	Р
11	Wind Direction Linearity average error (deg)	Р	2	5	16	1.0	degrees	Р
12	Wind Direction Linearity max error (deg)	Р	2	5	16	3	degrees	Р
13	Wind Direction Torque average error	Р	2	20	1	22	g-cm	Fail
14	Wind Direction Torque max error	Р	2	20	1	30	g-cm	Fail
15	Temperature average error	Р	4	0.5	3	0.13	с	Р
16	Temperature max error	Р	4	0.5	3	0.24	с	Р
17	Relative Humidity average above 85%	Р	6	10	1	1.5	%	Р
18	Relative Humidity max above 85%	Р	6	10	1	1.5	%	Р
19	Relative Humidity average below 85%	Р	6	10	2	7.2	%	Р
20	Relative Humidity max below 85%	Р	6	10	2	8.1	%	Р
21	Solar Radiation % diff of avg	Р	9	10	10	1.41	%	Р
22	Solar Radiation % diff of max STD value	Р	9	10	10	1.7	%	Р
23	Precipitation average % difference	Р	1	10	2	2.0	%	Р
24	Precipitation max % difference	Р	1	10	2	4.0	%	Р
25	Ozone Slope	Р	0	1.1	4	0.99014	unitless	Р
26	Ozone Intercept	Р	0	5	4	2.2714	ppb	Р
27	Ozone correlation	Р	0	0.995	4	0.99990	unitless	Р
28	Ozone % difference avg	Р	7	10	4	3.4	%	Р
29	Ozone % difference max	Р	7	10	4	6.5	%	Р
30	Flow Rate average % difference	Р	10	5	2	1.38	%	Р
31	Flow Rate max % difference	Р	10	5	2	1.65	%	Р
32	DAS Time maximum error	Р	0	5	1	0.03	min	Р
33	DAS Voltage average error	Р	6	0.003	7	0.0010	V	Р
34	Surface Wetness Sensitivity test on	Р	9	10000	1	230	k ohms	Р

SiteVisitDate Site	Technician						
03/03/2013 CHE185	Eric Hebert						
35 Surface Wetness Sensitivity test of	f P	9	10000	1	240	k ohms	
36 Surface Wetness Response	Р	9	0.5	1	1.05		
37 Shelter Temperature average error	Р	5	1	9	0.58	с	
38 Shelter Temperature max error	Р	5	1	9	0.82	с	

### **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.
 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.

Data Compiled: 5/26/2013 5:11:24 PM

# SiteVisitDateSiteTechnician03/05/2013CDZ171Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail	
1	Temperature average error	Р	4	0.5	6	0.13	с	Р	
2	Temperature max error	Р	4	0.5	6	0.21	с	Р	
3	Ozone Slope	Р	0	1.1	4	1.01314	unitless	Р	
4	Ozone Intercept	Р	0	5	4	-1.30738	ppb	Р	
5	Ozone correlation	Р	0	0.995	4	0.99996	unitless	Р	
6	Ozone % difference avg	Р	7	10	4	0.7	%	Р	
7	Ozone % difference max	Р	7	10	4	1.3	%	Р	
8	Flow Rate average % difference	Р	10	5	3	2.95	%	Р	
9	Flow Rate max % difference	Р	10	5	3	3.18	%	Р	
10	DAS Time maximum error	Р	0	5	1	0.00	min	Р	
11	DAS Voltage average error	Р	7	0.003	35	0.0001	V	Р	
12	Shelter Temperature average error	Р	5	1	3	1.1	с	Fail	
13	Shelter Temperature max error	Р	5	1	3	1.23	с	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.

30 DAS Time maximum error

31 DAS Voltage average error

32 DAS Voltage average error

34 Shelter Temperature max error

33

Shelter Temperature average error

SiteV	isitDate Site Tecl	nnician						
03/06/2	2013 BBE401 Eric I	Hebert						
Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fai
1	Wind Speed average error below 5m/s in m/s	Р	3	0.5	4	0.01	m/s	Р
2	Wind Speed max error below 5m/s in m/s	Р	3	0.5	4	0.03	m/s	Р
3	Wind Speed average % difference above 5 m/s	Р	3	5	4	0.2	%	Р
4	Wind Speed max % difference above 5 m/s	Р	3	5	4	0.4	%	Р
5	Wind Speed Torque average error	Р	3	0.5	1	0.25	g-cm	Р
6	Wind Speed Torque max error	Р	3	0.5	1	0.3	g-cm	Р
7	Wind Direction Input Deg True average error (de	e P	2	5	12	1.8	degrees	Р
8	Wind Direction Input Deg True max error (deg)	Р	2	5	12	3	degrees	Р
9	Wind Direction Linearity average error (deg)	Р	2	5	24	0.8	degrees	Р
10	Wind Direction Linearity max error (deg)	Р	2	5	24	2	degrees	Р
11	Wind Direction Torque average error	Р	2	20	1	10	g-cm	Р
12	Wind Direction Torque max error	Р	2	20	1	10	g-cm	Р
13	Temperature average error	Р	4	0.5	9	0.16	с	Р
14	Temperature max error	Р	4	0.5	9	0.22	с	Р
15	Relative Humidity average above 85%	Р	6	10	2	2.0	%	Р
16	Relative Humidity max above 85%	Р	6	10	2	2.0	%	Р
17	Relative Humidity average below 85%	Р	6	10	4	1.8	%	Р
18	Relative Humidity max below 85%	Р	6	10	4	2.5	%	Р
19	Solar Radiation % diff of avg	Р	9	10	15	8.95	%	Р
20	Solar Radiation % diff of max STD value	Р	9	10	15	8.7	%	Р
21	Precipitation average % difference	Р	1	10	2	3.0	%	Р
22	Precipitation max % difference	Р	1	10	2	4.0	%	Р
23	Ozone Slope	Р	0	1.1	4	0.98260	unitless	Р
24	Ozone Intercept	Р	0	5	4	2.099	ppb	Р
25	Ozone correlation	Р	0	0.995	4	0.99991	unitless	Р
26	Ozone % difference avg	Р	7	10	4	2.0	%	Р
27	Ozone % difference max	Р	7	10	4	3.5	%	Р
28	Flow Rate average % difference	Р	10	5	6	0.43	%	Р
29	Flow Rate max % difference	Р	10	5	6	0.70	%	Р

Р

Р

Р

Р

Р

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0.003

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35

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6

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0.61

Р

Р

Р

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min

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с

с

03/06/2013 **BBE401** 

# **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.

Parameter: MetOpMaintCom 3

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

Data Compiled: 5/27/2

ed: 5/27/2013 9:39:16 AM

# SiteVisitDateSiteTechnician03/06/2013MCK131Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	6	0.08	c	Р
2	Temperature max error	Р	4	0.5	6	0.12	с	Р
3	Ozone Slope	Р	0	1.1	4	1.016	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.62386	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.5	%	Р
7	Ozone % difference max	Р	7	10	4	1.2	%	Р
8	Flow Rate average % difference	Р	10	5	3	0.24	%	Р
9	Flow Rate max % difference	Р	10	5	3	0.40	%	Р
10	DAS Time maximum error	Р	0	5	1	0.02	min	Р
11	DAS Voltage average error	Р	7	0.003	7	0.0001	V	Р
12	Shelter Temperature average error	Р	5	1	3	1.53	c	Fail
13	Shelter Temperature max error	Р	5	1	3	1.7	c	Fail

# **Field Systems Comments**

#### 1 Parameter: ShelterCleanNotes

The shelter is neat, clean, and well organized.

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	Р	4	0.5	6	0.15	с	Р
2	Temperature max error	Р	4	0.5	6	0.30	с	Р
3	Ozone Slope	Р	0	1.1	4	0.86335	unitless	Fail
4	Ozone Intercept	Р	0	5	4	-1.19057	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р
6	Ozone % difference avg	Р	7	10	4	15.7	%	Fail
7	Ozone % difference max	Р	7	10	4	17.1	%	Fail
8	Flow Rate average % difference	Р	10	5	4	2.81	%	Р
9	Flow Rate max % difference	Р	10	5	4	2.98	%	Р
10	DAS Time maximum error	Р	0	5	1	0.00	min	Р
11	DAS Voltage average error	Р	7	0.003	28	0.0001	V	Р
12	Shelter Temperature average error	Р	5	1	3	1.11	с	Fail
13	Shelter Temperature max error	Р	5	1	3	1.25	с	Fail

### **Field Systems Comments**

#### 1 Parameter: ShelterCleanNotes

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

#### Parameter: PollAnalyzerCom 2

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.

**Data Compiled:** 5/27/2013 8:55:27 AM

SiteVisitDate Site T

SiteVisitDate	Site	Technician		
03/07/2013	PAL190	Eric Hebert		

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.04	c	Р
2	Temperature2meter max error	Р	5	0.5	3	0.07	с	Р
3	Wind Speed average error below 5m/s in m/s	Р	3	0.5	8	0.05	m/s	Р
4	Wind Speed max error below 5m/s in m/s	Р	3	0.5	8	0.20	m/s	Р
5	Wind Speed average % difference above 5 m/s	Р	3	5	8	0.0	%	Р
6	Wind Speed max % difference above 5 m/s	Р	3	5	8	0.0	%	Р
7	Wind Speed Torque average error	Р	3	0.5	1	0.35	g-cm	Р
8	Wind Speed Torque max error	Р	3	0.5	1	0.4	g-cm	Р
9	Wind Direction Input Deg True average error (de	Р	2	5	8	1.2	degrees	Р
10	Wind Direction Input Deg True max error (deg)	Р	2	5	8	3	degrees	Р
11	Wind Direction Linearity average error (deg)	Р	2	5	16	1.0	degrees	Р
12	Wind Direction Linearity max error (deg)	Р	2	5	16	2	degrees	Р
13	Wind Direction Torque average error	Р	2	20	1	15	g-cm	Р
14	Wind Direction Torque max error	Р	2	20	1	18	g-cm	Р
15	Temperature average error	Р	4	0.5	9	0.04	с	Р
16	Temperature max error	Р	4	0.5	9	0.07	с	Р
17	Relative Humidity average above 85%	Р	6	10	2	9.1	%	Р
18	Relative Humidity max above 85%	Р	6	10	2	9.1	%	Р
19	Relative Humidity average below 85%	Р	6	10	4	3.3	%	Р
20	Relative Humidity max below 85%	Р	6	10	4	4.9	%	Р
21	Solar Radiation % diff of avg	Р	9	10	12	1.52	%	Р
22	Solar Radiation % diff of max STD value	Р	9	10	12	0.90	%	Р
23	Precipitation average % difference	Р	1	10	2	1.0	%	Р
24	Precipitation max % difference	Р	1	10	2	2.0	%	Р
25	Ozone Slope	Р	0	1.1	4	0.98874	unitless	Р
26	Ozone Intercept	Р	0	5	4	0.63510	ppb	Р
27	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
28	Ozone % difference avg	Р	7	10	4	0.5	%	Р
29	Ozone % difference max	Р	7	10	4	0.7	%	Р
30	Flow Rate average % difference	Р	10	5	3	1.33	%	Р
31	Flow Rate max % difference	Р	10	5	3	1.43	%	Р
32	DAS Time maximum error	Р	0	5	1	0.00	min	Р
33	DAS Voltage average error	Р	7	0.003	35	0.0000	V	Р
34	Surface Wetness Sensitivity test on	Р	12	10000	1	210	k ohms	Р

e Site	Technician					
PAL190	Eric Hebert					
Wetness Sensitivity test off	Р	12	10000	1	220	k ohms
Wetness Response	Р	12	0.5	1	1.02	
Temperature average error	Р	5	1	9	0.73	с
Temperature max error	Р	5	1	9	0.77	с
	Wetness Sensitivity test off Wetness Response Temperature average error	Wetness Sensitivity test offPWetness ResponsePTemperature average errorP	Wetness Sensitivity test offP12Wetness ResponseP12Temperature average errorP5	Wetness Sensitivity test offP1210000Wetness ResponseP120.5Temperature average errorP51	Wetness Sensitivity test offP12100001Wetness ResponseP120.51Temperature average errorP519	Wetness Sensitivity test offP12100001220Wetness ResponseP120.511.02Temperature average errorP5190.73

### **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.

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#### SiteVisitDate Site Technician lle

03/09/2013 CKT136	Sandy Grenvil
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Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	3	0.20	с	Р
2	Temperature max error	Р	4	0.5	3	0.27	с	Р
3	Ozone Slope	Р	0	1.1	4	0.99158	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.26696	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.5	%	Р
7	Ozone % difference max	Р	7	10	4	2.4	%	Р
8	Flow Rate average % difference	Р	10	5	2	1.27	%	Р
9	Flow Rate max % difference	Р	10	5	2	1.32	%	Р
10	DAS Time maximum error	Р	0	5	1	0.00	min	Р
11	DAS Voltage average error	Р	7	0.003	14	0.0002	V	Р
12	Shelter Temperature average error	Р	5	1	9	0.42	с	Р
13	Shelter Temperature max error	Р	5	1	9	0.42	С	Р

03/09/2013 CKT136 Sandy Grenville

### **Field Performance Comments**

1	Parameter:	Flow Rate	SensorComponent:	Moisture Present	CommentCode	72
	The filter samp					
2	Parameter:	Ozone	SensorComponent:	Cell A Freq.	CommentCode	99

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

### **Field Systems Comments**

#### Parameter: SiteOpsProcComm 1

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.

#### Parameter: PollAnalyzerCom 3

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.

#### Parameter: MetOpMaintCom 4

The temperature sensor has been installed at approximately 8 meters from the ground on the sample tower in a naturally aspirated shield.

**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	Р	0	1.1	4	1.02623	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.19778	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	2.5	%	Р
5	Ozone % difference max	Р	7	10	4	2.8	%	Р

### **EEMS Spot Report**

Data Compiled: 5/

d: 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	Р	0	1.1	4	1.00977	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.33906	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.6	%	Р
5	Ozone % difference max	Р	7	10	4	0.6	%	Р

### **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	Р	0	1.1	4	1.0111	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.20253	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99995	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.0	%	Р
5	Ozone % difference max	Р	7	10	4	2.1	%	Р

**APPENDIX C** 

**CASTNET Ozone Performance Evaluation Forms** 

Site	Site Visit Date Parameter		Mfg	Owner ID	Model Number	Serial Number
SUM	156-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

Mfg	Serial Number Ta	Site	Tec	hnician		Site Visi	it Date	Parame	eter	Owner II	D
ThermoElectron Inc	1009241790	SUM156	Sar	ndy Grei	nville	02/17/2	013	Ozone		00823	
Slope:	0.98315 <b>Slope:</b>	0.0000	0	Mfg		ThermoE	Electron	Inc Pa	rameter ozo	ne	
	0.12501 Intercept	0.0000	0	Serial N	umber	49C-731	04-373	Tf	er Desc. Ozo	one transfer	r
CorrCoff	0.99995 <b>CorrCoff</b>	0.0000		Tfer ID		01100		7			
DAS 1:	<b>DAS 2:</b>			Slope			1.0012	1 Inter	cept	-0.18	383
A Avg % Diff: A N	/Iax % Di A Avg 9	<b>%Dif</b> A Max	% Di	•			1/2/201		-		
1.7%	2.4%			Cert Da	ite		1/2/201	3 Corr	Coff	1.00	000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer C	Corr:	Si	te:	Site	Unit:	PctDiffe	erence:	
primary	1	0.25	0.4	3	0.	14	ppb				
primary	2	46.96	47.0	)8	46.	.79	ppb			-0.62%	
primary	3	65.34	65.4	4	63.	.88	ppb			-2.38%	
primary	4	85.70	85.7	'8	83.	.90	ppb			-2.19%	
primary	5	109.55	109.	60	107	.80	ppb			-1.64%	
Sensor Compone	nt Cell B Noise		Condition	<b>n</b> 1.0 pp	b			Status	pass		
Sensor Compone	nt Cell B Tmp.		Condition	n				Status	pass		
Sensor Compone	nt Fullscale Voltage		Condition	n N/A				Status	pass		
Sensor Compone	nt Inlet Filter Condition	on	Condition	n Clean	l			Status	pass		
Sensor Compone	nt Line Loss		Condition	n Not te	sted			Status	pass		
Sensor Compone	nt Offset		Condition	<b>n</b> 0.3				Status	pass		
Sensor Compone	nt Span		Condition	<b>n</b> 1.032				Status	pass		
Sensor Compone	nt Cell B Freq.		Condition	<b>n</b> 111.3	lHz			Status	pass		
Sensor Compone	nt System Memo		Condition	n				Status	pass		
Sensor Compone			Condition	n Good				Status	pass		
	nt Cell B Pressure		Condition	n				Status	pass		
Sensor Compone	nt Cell B Flow		Condition					Status	pass		
Sensor Compone	nt Cell A Tmp.		Condition					Status	pass		
Sensor Compone	nt Cell A Pressure		Condition					Status	pass		
Sensor Compone	nt Cell A Noise		Condition	n 0.9 pp	b			Status	pass		
Sensor Compone			Condition					Status			
Sensor Compone	nt Cell A Flow		Condition		pm			Status			
Sensor Compone	nt Battery Backup		Condition					Status			
Sensor Compone	nt Zero Voltage		Condition	n N/A				Status	pass		

Site V	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
IRL14	41-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	В	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

Mfg Serial Number Ta S			Site	Site Technician Si			Site Visit Date Paramet			ter	Owner I	D
ThermoElect	tron Inc	1105347328	IRL141	Sa	andy Gre	nville	02/20/20	)13	Ozone		000724	
Slope: Intercept CorrCoff	-0	.00192         Slope:           .84313         Intercept           .99996         CorrCoff	0.0000	0 Serial Number			1			er Desc. Ozone transfer		r
DAS 1:		<b>DAS 2:</b>			Slope			1.0012	1 Inter	reent	-0.18	383
	iff: A M	ax % Di A Avg %	6Dif A Max	% Di	•		L			-		
0.8	%	1.1%			Cert Da	ate		1/2/201	3 Corr	Coff	1.00	000
UseDesc	ription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	e Unit:	PctDiff	erence:	
prim	ary	1	0.14	0.1	32	-0.	93	ppb				
prim	ary	2	35.57	35.	.71	35.	.32	ppb			-1.09%	
prim	ary	3	66.02	66.	.12	65.	.72	ppb			-0.60%	
prim	ary	4	85.84	85.	.91	85.		ppb			-0.71%	
prim	-	5	111.65	111	.69	110		ppb			-0.89%	
-	-	t Cell B Noise		Conditio	1 4 pr	h h	ŀ		Status	nass		7
	_	t Cell B Tmp.		Conditio					Status			
Sensor Co	mponen	t Fullscale Voltage		Conditio	n N/A				Status	pass		
	_	t Inlet Filter Condition	on	Conditio		1			Status			
Sensor Co	omponen	t Line Loss		Conditio	on Not te	ested			Status	pass		
Sensor Co	omponen	t Offset		Conditio	<b>on</b> -0.10				Status	pass		
Sensor Co	omponen	t Span		Conditio	on 1.011				Status	pass		
Sensor Co	omponen	t Cell B Freq.		Conditio	on 91.7 k	κHz			Status	pass		
Sensor Co	mponen	t System Memo		Conditio	on				Status	pass		
Sensor Co	omponen	t Sample Train		Conditio	on Good				Status	pass		
Sensor Co	omponen	t Cell B Pressure		Conditio	on				Status	pass		
Sensor Co	omponen	t Cell B Flow		Conditio	on 0.73 l	pm			Status	pass		
Sensor Co	omponen	t Cell A Tmp.		Conditio	on 30.4 (	0			Status	pass		
Sensor Co	omponen	t Cell A Pressure		Conditio	<b>on</b> 736 m	nmHg			Status	pass		
Sensor Co	omponen	t Cell A Noise		Conditio	on 1.1 pp	b			Status	pass		
	-	t Cell A Freq.		Conditio					Status			
		t Cell A Flow		Conditio	<u> </u>				Status	pass		
Sensor Co	omponen	t Battery Backup		Conditio	Funct	ioning			Status	pass		
Sensor Co	omponen	t Zero Voltage		Conditio	n N/A				Status	pass		

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
SND	152-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	В	none
7	2/28/2013	Zero air pump	Werther International	06867	C 70/4	000814279

Mfg	Afg Serial Number Ta			ite Technician Si			Site Visi	Site Visit Date Paramet			neter Owner ID	
ThermoElect	tron Inc 1	009241791	SND152	Sa	andy Gre	nville	02/28/20	013	Ozone		000619	
Slope: Intercept CorrCoff	-0.2	00643Slope:28276Intercept09999CorrCoff	0.00000	Serial Number				49C-73104-373 Tfe			rameter ozone er Desc. Ozone transfer	
DAS 1:		<b>DAS 2:</b>			Slone			1.0012	1 Inton	a ant	-0.18	283
	iff: A Ma	x % Di A Avg %	6Dif A Max 9	% Di	Slope							
0.2		0.4%			Cert Da	ate		1/2/201	3 Corr	Coff	1.00	0000
UseDesc	ription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	Unit:	PctDif	ference:	
prim	ary	1	-0.08	0.1	10	-0.	29	ppb				
prim	ary	2	30.69	30.	83	30.	.86	ppb			0.10%	
prim	ary	3	50.66	50.	78	50.	.97	ppb			0.37%	
prim	ary	4	79.72	79.	80	79.	.82	ppb			0.03%	
prim	ary	5	102.01	102	.07	102	.50	ppb			0.42%	
Sensor Co	omponent	Cell B Noise		Conditio	<b>on</b> 0.9 pp	ob			Status	pass		
Sensor Co	mponent	Cell B Tmp.		Conditio	on				Status	pass		
Sensor Co	omponent	Fullscale Voltage		Conditio	on N/A				Status	pass		
Sensor Co	mponent	Inlet Filter Condition	n	Conditio	on Clear	1			Status	pass		
Sensor Co	mponent	Line Loss		Conditio	n Not te	ested			Status	pass		
Sensor Co	mponent	Offset		Conditio	on 0.000				Status	pass		
Sensor Co	mponent	Span		Conditio	<b>n</b> 1.04				Status	pass		
Sensor Co	omponent	Cell B Freq.		Conditio	on 99.0 k	κHz			Status	pass		
Sensor Co	omponent	System Memo		Conditio	on				Status	pass		
Sensor Co	omponent	Sample Train		Conditio	on Good				Status	pass		
Sensor Co	mponent	Cell B Pressure		Conditio	on				Status	pass		
Sensor Co	mponent	Cell B Flow		Conditio	on 0.70 l	pm			Status	pass		
Sensor Co	omponent	Cell A Tmp.		Conditio	on 34.8 (	0			Status	pass		
Sensor Co	mponent	Cell A Pressure		Conditio	<b>on</b> 711 m	nmHg			Status	pass		
Sensor Co	mponent	Cell A Noise		Conditio	on 0.9 pp	b			Status	pass		
Sensor Co	omponent	Cell A Freq.		Conditio	<b>n</b> 108.9	kHz			Status	pass		
Sensor Co	omponent	Cell A Flow		Conditio	on 0.72	pm			Status	pass		
Sensor Co	omponent	Battery Backup		Conditio	n N/A				Status	pass		
Sensor Co	mponent	Zero Voltage		Conditio	n N/A				Status	pass		

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
GAS	153-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	В	none
6	2/28/2013	UPS	APC	missing	BP6505	NB0009260535
7	2/28/2013	Zero air pump	Werther International	06865	C 70/4	000814277

Mfg	Serial Number Ta	Site	Tec	hnician		Site Visi	it Date	Parame	eter	Owner I	D
ThermoElectron Inc	1105347323	GAS153	Sa	ndy Grei	nville	02/28/2	013	Ozone		000729	
Intercept	1.01205         Slope:           0.25812         Intercept		0	Mfg Serial N	lumber	ThermoE 49C-731			rameter ozo er Desc. Oz		
CorrCoff	0.99998 CorrCoff	0.0000		Tfer ID		01100		7			
DAS 1: A Avg % Diff: A N	DAS 2: Max % Di A Avg 9	%Dif A Max '	% Di	Slope			1.0012		-	-0.18	
1.0%	1.8%			Cert Da	ite		1/2/2013	3 Corr	Coff	1.00	000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer C	Corr:	Sit	te:	Site	Unit:	PctDiff	erence:	
primary	1	-0.01	0.1		-0.		ppb				
primary	2	30.70	30.8	84	31.		ppb			1.78%	
primary	3	49.84	49.9		50.		ppb			0.72%	
primary	4	80.64	80.7		81.		ppb			0.84%	
primary	5	99.81	99.8	87	100	0.70	ppb			0.83%	
Sensor Compone	Cell B Noise		Conditio	<b>n</b> 0.9 pp	b			Status	pass		
Sensor Compone	nt Cell B Tmp.		Conditio	n				Status	pass		
Sensor Compone	Fullscale Voltage		Conditio	n N/A				Status	pass		
Sensor Compone	Inlet Filter Conditi	on	Conditio	n Clean	I			Status	pass		
Sensor Compone	nt Line Loss		Conditio	n Not te	ested			Status	pass		
Sensor Compone	ont Offset		Conditio	<b>n</b> -0.60				Status	pass		
Sensor Compone	nt Span		Conditio	<b>n</b> 1.016				Status	pass		
Sensor Compone	ent Cell B Freq.		Conditio					Status	Fail		
Sensor Compone	nt System Memo		Conditio	n See c	omments			Status	pass		
Sensor Compone	ant Sample Train		Conditio	n Good				Status	pass		
Sensor Compone	Cell B Pressure		Conditio					Status	pass		
Sensor Compone	Cell B Flow		Conditio					Status	pass		
Sensor Compone			Conditio					Status	pass		
Sensor Compone	Cell A Pressure		Conditio					Status			
Sensor Compone	Cell A Noise		Conditio	<b>n</b> 0.8 pp	b			Status			
Sensor Compone			Conditio					Status			
Sensor Compone			Conditio					Status			
	nt Battery Backup		Conditio		Inctioning			Status			
Sensor Compone	ant Zero Voltage		Conditio	n N/A				Status	pass		

### **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone This analyzer diagnostic	GAS153 check is outside	Sandy Grenville the manufacturer's		Cell B Freq. value.	ThermoElectron	3537		
Ozone This analyzer diagnostic	GAS153 check is outside	Sandy Grenville the manufacturer's		Cell A Freq. value.	ThermoElectron	3537		

Site	Site Visit Date Parameter		Mfg	Owner ID	Model Number	Serial Number
СОИ	V137-Sandy	v 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

Mfg	5	Serial Number Ta	Site	Te	chnician		Site Visit Date		Parameter		Owner I	D
ThermoElec	tron Inc	1009241785	COW137	Sa	Sandy Grenville		03/29/2013		Ozone		000622	
Slope: [ Intercept [ CorrCoff [	-0.	02623         Slope:           19778         Intercept           99999         CorrCoff	Intercept 0.0000		0 Serial Number		1			arameter ozone fer Desc. Ozone transfer		
DAS 1:		<b>DAS 2:</b>			Slope			1.0012	1 Inter	reent	-0.18	383
A Avg % D		ax % Di A Avg %	6Dif A Max	% Di	Cert Da	te		1/2/201		- L	1.00	
2.5	5%	2.8%										
UseDesc	cription:	ConcGroup:	Tfer Raw:	Tfer		Si			Unit:	PctDiff	erence:	
prim	•	1	0.09	0.2		-0.		ppb				
prim	nary	2	30.59	30.	.73	31.	.59	ppb			2.80%	
prim	nary	3	49.81	49.	.93	51	.09	ppb			2.32%	
prim	nary	4	81.19	81.	.27	83.	.20	ppb			2.37%	
prim	nary	5	100.79	100	).85	103	.20	ppb			2.33%	
Sensor Co	omponen	t Cell B Noise		Conditio	on 0.6 pp	b			Status	pass		
Sensor Co	omponen	t Cell B Tmp.		Conditio	on				Status	pass		
Sensor Co	omponen	t Fullscale Voltage		Conditio	on N/A				Status	pass		
Sensor Co	omponen	t Inlet Filter Condition	n	Conditio	on Mode	rately clea	an		Status	pass		
Sensor Co	omponen	t Line Loss		Condition Not tested					Status	us pass		
Sensor Co	omponen	t Offset		Condition -0.10					Status	IS pass		
Sensor Co	omponen	t Span		Conditio	on 1.044				Status	pass		
Sensor Co	omponen	t Cell B Freq.		Condition 93.1 kHz					Status	pass		
Sensor Co	omponen	t System Memo		Conditio	on				Status	pass		
Sensor Co	omponen	t Sample Train		Conditio	on Good				Status	pass		
Sensor Co	omponen	t Cell B Pressure		Conditio	on				Status	pass		
Sensor Co	omponen	t Cell B Flow		Conditio	on 0.65 l	pm			Status	pass		
Sensor Co	omponen	t Cell A Tmp.		Conditio	on 32.4 (	2			Status	pass		
Sensor Co	omponen	t Cell A Pressure		Conditio	on 685 n	nmHg			Status	pass		
Sensor Co	omponen	t Cell A Noise		Conditio	on 0.9 pp	b			Status	pass		
	-	t Cell A Freq.			on 109.0				Status	pass		
Sensor Co	omponen	t Cell A Flow		Conditio	on 0.67 l	pm			Status	pass		
Sensor Co	omponen	t Battery Backup		Conditio	on Not fu	Inctioning			Status	Fail		
Sensor Co	omponen	t Zero Voltage		Conditio	on N/A				Status	pass		

Site	ite Visit Date Parameter		Mfg	Owner ID	Model Number	Serial Number
ESP	127-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

Mfg	Serial Number Ta	Site	Teo	Technician		Site Visit Date		Parame	ter Owner ID		D
ThermoElectron Inc	1030244804	ESP127	Sa	ndy Grei	nville	03/30/2013		Ozone		000699	
•	.00977 Slope: 0.00000 .33906 Intercept 0.00000				ThermoElectron Inc Parameter						
	0.99999 CorrCoff	0.0000		Serial N	umber	49C-731	04-373		er Desc. Oz	one transfel	<u> </u>
				Tfer ID		01100					
DAS 1:	<b>DAS 2:</b>			Slope			1.0012	1 Inter	rcept	-0.18	383
	Iax % Di A Avg %	<b>A Max</b>	% Di	Cert Da	nto		1/2/201	3 Corr	Coff	1.00	000
0.6%	0.7%		[				1/2/201				
UseDescription:	ConcGroup:	Tfer Raw:	Tfer (	Corr:	Sit	te:	Site	Unit:	PctDiff	ference:	
primary	1	-0.08	0.1		-0.		ppb				
primary	2	30.02	30.		30.		ppb			0.56%	
primary	3	50.31	50.4		50.		ppb			0.58%	
primary	4	80.10	80.		80.		ppb			0.65%	
primary	5	99.60	99.	66	100	.10	ppb			0.44%	
Sensor Compone	nt Cell B Noise		Conditio	<b>n</b> 1.1 pp	b			Status	pass		
Sensor Compone	nt Cell B Tmp.		Conditio	on				Status	pass		
Sensor Compone	nt Fullscale Voltage		Conditio	n N/A				Status	pass		
Sensor Compone	nt Inlet Filter Condition	วท	Conditio	n Clean	I			Status	pass		
Sensor Compone	nt Line Loss		Condition Not tested					Status	tus pass		
Sensor Compone	nt Offset		Condition -0.20					Status	tus pass		
Sensor Compone	nt Span		Condition 1.009					Status	pass		
Sensor Compone	nt Cell B Freq.		Condition 84.7 kHz					Status	Status pass		
Sensor Compone	nt System Memo		Conditio					Status	pass		
Sensor Compone			Conditio	n Good				Status	pass		
	nt Cell B Pressure		Conditio					Status			
Sensor Compone	nt Cell B Flow		Conditio					Status	pass		
Sensor Compone	nt Cell A Tmp.		Conditio	<b>n</b> 30.1 (	2			Status	pass		
Sensor Compone	nt Cell A Pressure		Condition 715 mmHg				Status	pass			
Sensor Compone	nt Cell A Noise		Conditio	<b>n</b> 1.3 pp	b			Status	pass		
Sensor Compone	nt Cell A Freq.		Conditio	<b>n</b> 91.8 k	κHz			Status	pass		
Sensor Compone	nt Cell A Flow		Conditio	Condition 0.68 lpm				Status	pass		
Sensor Compone	nt Battery Backup		Conditio	n N/A				Status	pass		
Sensor Component Zero Voltage			Conditio	Condition N/A				Status	tus pass		

Site	ite Visit Date Parameter		Mfg	Owner ID	Model Number	Serial Number
SPD	111-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

Mfg	5	Serial Number Ta	Site	Te	Technician Sandy Grenville		<b>Site Visit Date</b> 03/30/2013		Parameter		Owner I	D
ThermoElect	tron Inc	1030244794	SPD111	Sa					Ozone		000676	
Slope: [ Intercept [ CorrCoff [	-0.	01110         Slope:         0.0000           20253         Intercept         0.0000           99995         CorrCoff         0.0000		0 Serial Number		I I			arameter ozone fer Desc. Ozone transfer		r i	
DAS 1:		<b>DAS 2:</b>			Slope			1.0012	1 Inter	cent	-0.18	383
		<b>A Avg %</b> 2.1%	6Dif A Max	% Di	Cert Da	nte		1/2/201		-	1.00	
UseDesc	cription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	Unit:	PctDiff	erence:	
prim	nary	1	-0.05	0.1	13	-0.	39	ppb				
prim	nary	2	30.63	30.	.77	30.	.91	ppb			0.45%	
prim	nary	3	49.80	49.	.92	50.	.95	ppb			2.06%	
prim	nary	4	79.84	79.	.92	80.	.50	ppb			0.73%	
prim	nary	5	99.69	99.	.75	100	.40	ppb			0.65%	
Sensor Co	mponen	t Cell B Noise		Conditio	on 0.9 pp	b			Status	pass		
Sensor Co	mponen	t Cell B Tmp.		Conditio	on				Status	pass		
Sensor Co	mponen	t Fullscale Voltage		Conditio	n N/A				Status	pass		
Sensor Co	mponen	Inlet Filter Condition	n	Conditio	on Clean	1			Status	pass		
Sensor Co	mponen	t Line Loss		Conditio	n Not te	ested			Status	pass		
Sensor Co	mponen	t Offset		Conditio	<b>on</b> 0.20				Status	pass		
Sensor Co	mponen	t Span		Conditio	<b>n</b> 1.021				Status	pass		
Sensor Co	mponen	t Cell B Freq.		Conditio	on 88.0 k	κHz			Status	Pass		
Sensor Co	mponen	t System Memo		Conditio	on				Status	pass		
Sensor Co	mponen	t Sample Train		Conditio	on Good				Status	pass		
Sensor Co	mponen	t Cell B Pressure		Conditio	on				Status	pass		
Sensor Co	mponen	t Cell B Flow		Conditio	on 0.62 l	pm			Status	pass		
Sensor Co	mponen	t Cell A Tmp.		Conditio	on 30.1 (	C			Status	pass		
Sensor Co	mponen	t Cell A Pressure		Conditio	<b>on</b> 704 m	nmHg			Status	pass		
Sensor Co	mponen	t Cell A Noise		Conditio	<b>on</b> 1.4 pp	b			Status	pass		
Sensor Co	mponen	t Cell A Freq.		Conditio	on 89.9 k	κHz			Status	pass		
Sensor Co	mponen	t Cell A Flow		Conditio	on 0.61 l	pm			Status	pass		
Sensor Co	omponent	Battery Backup		Conditio	Funct	ioning			Status	pass		
Sensor Co	mponen	t Zero Voltage		Conditio	n N/A				Status	pass		