2014 – 2nd Quarter Report Support for Conducting Systems & Performance Audits of CASTNET Sites and NADP Monitoring Stations

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Table of Contents

1.0 CAS	TNET Quarterly Report	
1.1	Introduction	
1.2	Project Objectives	
1.3	CASTNET Sites Visited Second Quarter 2014	
1.4	Audit Results	
2.0 NAI	OP Quarterly Report	
2.0 NAI 2.1	DP Quarterly Report Introduction	
2.0 NAI 2.1 2.2	DP Quarterly Report Introduction Project Objectives	2-1 2-1 2-1
2.0 NAI 2.1 2.2 2.3	DP Quarterly Report Introduction Project Objectives Sites Visited Second Quarter 2014	2-1 2-1 2-1 2-2

List of Appendices

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

List of Tables

Table 1.	Performance Audit Challenge and Acceptance Criteria	1-2
Table 2.	Site Audit Visits	1-4
Table 3.	Site Ozone PE Visits	1-4
Table 4.	Sites Surveyed – Second Quarter 2015	2-2

List of Acronyms and Abbreviations

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

1.0 CASTNET Quarterly Report

1.1 Introduction

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

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

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

As of May 2016, the network is comprised of 94 active rural sampling sites across the Untied States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Environment Canada, Bureau of Land Management (BLM) and several independent partners. AMEC is responsible for operating the EPA and Environment Canada sponsored sites, and Air Resource Specialist, Inc. (ARS) is responsible for operating the NPS and BLM sponsored sites.

1.2 Project Objectives

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

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

and PAL190. Five new sites sponsored by EPA and operated by the BLM in WY also operate meteorological sensors and are BAS601, NEC602, BUF603, FOR604, and SHE604.

Some or all of the additional monitored variables, NOy, CO, and SO₂ have been added to the EPA sponsored sites BVL130, HWF187, PND165, PNF126, ROM206, and BEL116. None of those sites were audited in second quarter 2014.

Sensor	Parameter	Audit Challenge	Acceptance Criteria	
Precipitation	Response	10 manual tips	1 DAS count per tip	
Precipitation	Accuracy	2 introductions of known amounts of water	$\leq \pm 10.0\%$ of input amount	
Relative Humidity	Accuracy	Compared to reference instrument or standard solution	≤±10.0% RH	
Solar Radiation	Accuracy	Compared to WRR traceable standard	$\leq \pm 10.0\%$ of daytime average	
Surface Wetness	Response	Distilled water spray mist	Positive response	
Surface Wetness	Sensitivity	1% decade resistance	N/A	
Temperature	TemperatureAccuracyComparison to 3 NIST measured baths (~ 0° C, ambient, ~ full-scale)		$\leq \pm 0.5^{\circ} \mathrm{C}$	
Temperature Difference	Accuracy	Comparison to station temperature sensor	$\leq \pm 0.50^{\circ} \mathrm{C}$	
Wind Direction	Orientation Accuracy	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	≤±5° mean absolute error	
Wind Direction	Response Threshold	Starting torque tested with torque gauge	< 10 g-cm Climatronics; < 20 g-cm R.M. Young	
Wind Speed	Vind 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-point	$0.9000 \le m \le 1.1000$	

 Table 1. Performance Audit Challenge and Acceptance Criteria

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Ozone	Intercept	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	$\leq \pm 0.003 \text{ VDC}$

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

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

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

1.3 CASTNET Sites Visited Second Quarter 2014

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

Table 2.	Site A	Audit	Visits
----------	--------	-------	--------

<u>Side ID</u>	<u>Audit Type</u>	<u>Sponsor</u>	Site Visit Date	Station Name
CAN407	With met	NPS	5/6/2014	Canyonlands NP
CHA467	With met	NPS	4/23/2014	Chiricahua NM
DEN417	Without met	NPS	6/24/2014	Denali NP
GRB411	With met	NPS	5/27/2014	Great Basin NP
GRC474	With met	NPS	4/8/2014	Grand Canyon NP
JOT403	With met	NPS	4/28/2014	Joshua Tree NP
MEV405	With met	NPS	5/5/2014	Mesa Verde NP
PET427	With met	NPS	4/7/2014	Petrified Forest NP

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

<u>Site ID</u>	Sponsor Agency	Site Location	<u>Visit dates</u>
DCP114	EPA	Deer Creek St. Park	4/9/2014
LAV410	NPS	Lassen Volcanic NP	5/31/2014
OXF122	EPA	Oxford	4/10/2014
PIN414	NPS	Pinnacles NM	5/1/2014
QAK172	EPA	Quaker City	4/8/2014
SAN189	NPS	Santee Sioux	6/2/2014
SEK430	NPS	Sequoia NP - Ash Mountain	5/30/2014
YOS404	NPS	Yosemite NP	5/29/2014

 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.

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 6 sites. The Mercury Deposition Network (MDN) measures total mercury in precipitation samples from more than 100 stations. The MDN began operation in 1996 and includes sites throughout the US and Canada. The Atmospheric Mercury Network (AMNet) and the Ammonia Monitoring Network (AMoN) measure ambient concentrations of mercury and ammonia, respectively.

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

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

2.2 **Project Objectives**

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

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

2.3 Sites Visited Second Quarter 2014

This report covers the results from the NADP sites surveyed during the second quarter (April through June) of 2014. The station names and dates of the audits are presented in Table 4.

<u>Side ID</u>	<u>Network</u>	<u>Visit Date</u>	Station Name
AZ06	NTN	4/22/2014	Organ Pipe Cactus NP
AZ97	NTN	4/7/2014	Petrified Forest National Park-Rainbow Forest
AZ98	AMoN/NTN	4/23/2014	Chiricahua NM
AZ99	NTN	4/25/2014	Oliver Knoll
NM07	NTN	4/15/2014	Bandelier National Monument
NM08	NTN	4/14/2014	Mayhill
OH09	NTN	4/10/2014	Oxford
OH49	NTN	4/8/2014	Caldwell
OH54	AMoN/NTN	4/9/2014	Deer Creek State Park
OH71	NTN	4/9/2014	Wooster
KS04	MDN	5/29/2014	West Mineral
KS07	NTN	5/31/2014	Farlington Fish Hatchery
KS24	MDN	5/30/2014	Glen Elder State Park
KS31	AMoN/NTN	5/31/2014	Konza Prarie
KS99	MDN	5/30/2014	Cimarron National Grassland
CO93	NTN	6/2/2014	Dry Lake
KS03	AMoN/MDN	6/1/2014	Reserve
KS05	MDN	6/3/2014	Coffey County Lake

 Table 4. Sites Surveyed – Second Quarter 2014

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 V	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number		
PET4	PET427-Eric Hebert-04/07/2014							
1	4/7/2014	Computer	Hewlett Packard	none	6560 b	5CB22906TB		
2	4/7/2014	DAS	Environmental Sys Corp	90641	8816	2526		
3	4/7/2014	Elevation	Elevation	None	1	None		
4	4/7/2014	Filter pack flow pump	Thomas	none	107CAB18B	10950000032		
5	4/7/2014	Flow Rate	Mykrolis	none	FC280SAV-4S	AW9510056		
6	4/7/2014	Infrastructure	Infrastructure	none	none	none		
7	4/7/2014	Met tower	Universal Tower	none	unknown	none		
8	4/7/2014	MFC power supply	Mykrolis	none	RO-32	FP9510004		
9	4/7/2014	Modem	US Robotics	none	56k	unknown		
10	4/7/2014	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460048		
11	4/7/2014	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1015543061		
12	4/7/2014	Precipitation	Climatronics	none	100097-1-G0	646		
13	4/7/2014	Relative Humidity	Rotronic	none	MP 601A	59217		
14	4/7/2014	Sample Tower	Aluma Tower	none	В	none		
15	4/7/2014	Shelter Temperature	ARS	none	none	none		
16	4/7/2014	Siting Criteria	Siting Criteria	None	1	None		
17	4/7/2014	Solar Radiation	Licor	none	LI-200	PY46776		
18	4/7/2014	Temperature	RM Young	none	41342	7036		
19	4/7/2014	Temperature Translator	RM Young	none	PT05592	PT05572		
20	4/7/2014	Wind Direction	RM Young	90879	AQ05103-5	55389wdr		
21	4/7/2014	Wind Speed	RM Young	90879	AQ05103-5	55389wsp		
22	4/7/2014	Zero air pump	Werther International	none	PC 70/4	531382		

DAS Data Form

9

9

0.9000

1.0000

0.8998

0.9999

DAS Time Max Error: 1.33

Mfg	Serial	Number Site	T	echnician	Site Visit Date	Parameter	Use Desc.
Environmental	Sys 2526	PET	۲427 I	Eric Hebert	04/07/2014	DAS	Primary
Das Date:	4 /7 /2014 9:28:40	Audit Date Audit Time	4 /7 /2014 9:30:00	Mfg Serial Number	Datel 4000392	Parameter Tfer Desc.	DAS Source generator (D
Low Channel:		High Channe	1:	Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0002	0.0	0.0004	0.0006	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740243	Tfer Desc.	DVM
				Tfer ID	01312		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	12/28/201	3 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
3	0.0000	-0.0002	0.0000	V	V	0.0002	
3	0.1000	0.0998	0.0999	V	V	0.0001	
3	0.3000	0.2998	0.2999	V	V	0.0001	
3	0.5000	0.4999	0.5000	V	V	0.0001	
3	0.7000	0.6999	0.7001	V	V	0.0002	
3	0.9000	0.8999	0.9001	V	V	0.0002	
3	1.0000	0.9999	1.0002	V	V	0.0003	
9	0.0000	-0.0002	0.0000	V	V	0.0002	
9	0.1000	0.0998	0.1000	V	V	0.0002	
9	0.3000	0.2998	0.3001	V	V	0.0003	
9	0.5000	0.4999	0.5002	V	V	0.0003	
9	0.7000	0.6998	0.7003	V	V	0.0005	

0.9004

1.0005

V

V

V

V

0.0006

0.0006

Flow Data Form

Mfg	Ser	rial Num	ber Ta	Site	Te	chnician	Site Visit I	Date Para	neter	Owner ID
Mykrolis	A۷	V951005	6	PET427	Er	ic Hebert	04/07/2014	4 Flow	Rate	none
Mfg	Mykroli	S				Mfg	BIOS]	Parameter Flow	w Rate
SN/Owner ID	FP9510	0004	none			Serial Number	131818	,	Ffer Desc. BIC	S 220-H
Parameter	MFC po	ower sup	ply			Tfer ID	01417			
						Slope	1.	00000 In	tercept	0.00000
						Cert Date	1/8	8/2014 C o	orrCoff	1.00000
DAS 1:			DAS 2:			Cal Factor Z	ero	-0	.11	
A Avg % Diff:	A Max	% Di	A Avg %l	Dif A Max	% Di	Cal Factor F	ull Scale	5	.08	
0.67%		1.35%				Rotometer R	eading:		3.3	
Desc.	Test	t type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump o	off	0.000	0.000	0.08	0.0830	-0.02	l/m	l/m	
primary	leak ch	leck	0.000	0.000	0.09	0.0886	-0.02	l/m	l/m	
primary	test pt 1	1	2.974	2.970	3.02	3.0038	3.01	l/m	l/m	1.35%
primary	test pt 2	2	2.993	2.990	3.02	3.0038	3.01	l/m	l/m	0.67%
primary	test pt 3	3	3.012	3.010	3.02	3.0038	3.01	l/m	l/m	0.00%
Sensor Comp	onent L	eak Test	t		Conditio	on		Statu	s pass	
Sensor Comp	onent T	ubing Co	ondition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent F	ilter Posi	ition		Conditio	Poor		Statu	s fail	
Sensor Comp	onent R	Rotomete	r Conditior	1	Conditio	Clean and dry		Statu	s pass	
Sensor Comp	onent N	Aoisture I	Present		Conditio	n No moisture pr	resent	Statu	s pass	
Sensor Comp	onent F	ilter Dist	ance		Conditio	4.0 cm		Statu	s pass	
Sensor Comp	onent F	ilter Dep	th		Conditio	n -1.0 cm		Statu	s fail	
Sensor Comp	onent F	ilter Azin	nuth		Conditio	n 90 deg		Statu	s pass	
Sensor Comp	onent S	System M	lemo		Conditio	See comments	3	Statu	s pass	

Ozone Data Form

Mfg	Serial Number Ta	Site	Te	chnician		Site Visi	it Date	Parame	eter	Owner I	D
ThermoElectron Inc	CM08460048	PET427	E	ric Hebert		04/07/2	014	Ozone		none	
Slope: Intercept CorrCoff	1.01633 Slope: 1.89013 Intercept 1.00000 CorrCoff	0.0000	0 0 0	Mfg Serial N	lumber	ThermoE 49CPS-7	Electron 70008-30	Inc Pa	rameter 0. er Desc. 0	zone Dzone primary	/ stan
DAS 1: A Avg % Diff: A M 5.0%	DAS 2: 1 ax % Di A Avg % 7.2%	6Dif A Max	% Di	Slope Cert Da	ıte		1.0070 1/8/201	7 Inter 4 Corr	·cept ·Coff	-0.21	032 1000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Sit	te:	Site	Unit:	PctDi	fference:	
primary	1	0.43	0.	63	2.5	50	ppb				
primary	2	33.29	33	.26	35.	64	ppb			7.16%	
primary	3	51.25	51	.09	53.	90	ppb			5.50%	
primary	4	77.95	77	.61	80.	83	ppb			4.15%	
primary	5	116.00	115	5.39	119	.10	ppb			3.22%	
Sensor Compone	nt Cell B Noise		Conditi	on 1.6 pp	b			Status	pass		
Sensor Compone	nt Cell B Tmp.		Conditi	on				Status	pass		
Sensor Compone	nt Fullscale Voltage		Conditi	on 1.002	1			Status	pass		
Sensor Compone	nt Inlet Filter Condition	n	Conditi	on Clean	1			Status	pass		
Sensor Compone	nt Line Loss		Conditi	on Not te	sted			Status	pass		
Sensor Compone	nt Offset		Conditi	on -1.0				Status	pass		
Sensor Compone	nt Span		Conditi	on 1.004				Status	pass		
Sensor Compone	nt Cell B Freq.		Conditi	on 81.7 k	κHz			Status	pass		
Sensor Compone	nt System Memo		Conditi	on				Status	pass		
Sensor Compone	nt Sample Train		Condition	on Good				Status	pass		
Sensor Compone	nt Cell B Pressure		Condition	on				Status	pass		
Sensor Compone	nt Cell B Flow		Condition	on 0.66 l	pm			Status	pass		
Sensor Compone	nt Cell A Tmp.		Condition	on 37.1 (C			Status	pass		
Sensor Compone	nt Cell A Pressure		Conditi	on 613 m	nmHg			Status	pass		
Sensor Compone	nt Cell A Noise		Conditi	on 1.8 pp	b			Status	pass		
Sensor Compone	nt Cell A Freq.		Condition	on 79.7 k	κHz			Status	pass		
Sensor Compone	nt Cell A Flow		Conditi	on 0.67 l	pm			Status	pass		
Sensor Compone	nt Battery Backup		Condition	on N/A				Status	pass		
Sensor Compone	nt Zero Voltage		Conditi	on 0.002	4			Status	pass		

Wind Speed Data Form

Mfg	S	erial Numbo	er Ta	Site			Tech	nician	Site Visit Dat	e Parar	neter	Ow	ner II)
RM Young	5	5389wsp		PET42	27		Eric	Hebert	04/07/2014	Wind	Speed	908	379	
							N S	Afg Ferial Number	RM Young CA04013		Parameto Ffer Deso	er wind spe c. wind spe	ed ed mo	tor (h
							T	fer ID	01253					
Prop or Cups S	SN	83718					S	lope	1.000	000 Int	tercept		0.000)00
Prop or Cups	Forque n Fact	0.0512	0.3 to		(0.4	C	Cert Date	1/16/20	014 Co	orrCoff		1.000	000
Trop correction		•			DAS 2.									
		·	ah Dar			nao	Ц	h Dongo						
Abs Avg Enn				1ge .	LUW Na	inge	mg	gii Kange						
AUS AVE LIT		0.00	0.	.0070										
Abs Max Er		0.20	0.	.00%										
UseDescription	: In	put Device	Inpu	ıt RPM	In	put m/s	5	Out V	DAS m/s	Diff/ %	Diff	Diff		WsM
primary		none		0		0.20		0.0	0.0				-0.20	
primary		01253		200		1.02		0.0	1.0				0.00	
primary		01253	4	400		2.05		0.0	2.1				0.00	
primary		01253	:	800		4.10		0.0	4.1				0.00	
primary		01253	1	200		6.14		0.0	6.1		0.00%			
primary		01253	2	400		12.29		0.0	12.3		0.00%			
primary		01253	4	-000		20.48		0.0	20.5		0.00%			
primary		01253	9	400		48.13		0.0	48.1		0.00%			
Sensor Comp	onent	Condition				Condi	ition	Good		Statu	s pass]
Sensor Comp	onent	Prop or Cup	os Conc	dition		Condi	ition	Good		Statu	s pass]
Sensor Comp	onent	Sensor Hea	ter			Condi	ition	N/A		Statu	s pass]
Sensor Comp	onent	Torque				Condi	ition	Good		Statu	s pass]
Sensor Comp	onent	Sensor Plur	nb			Condi	ition	Plumb		Statu	s pass]
Sensor Comp	onent	System Mer	no			Condi	ition			Statu	s pass]

Wind Direction Data Form

Mfg	Serial Number	Ta Site		Technician		Site Visit	Date Param	neter	Owner ID
RM Young	55389wdr	PET427		Eric Hebert		04/07/20	14 Wind E	Direction	90879
				Mfg Serial Nun Tfer ID	nber	RM Youn 01264	g P	arameter V fer Desc. V	vind direction
Vane SN: N VaneTorque	I/A 18 to 18	C. A. Align. de	e g. true: 180						
				Mfg		Ushikata	Р	arameter v	vind direction
				Serial Nun	nher	192034	т	fer Desc. t	ransit
				Tfer ID	libel	01270			
				Slope			1.00000 Inte	ercept	0.00000
				Cert Date		1/	30/2014 Co	rrCoff	1.00000
Abs Avg Err Abs Max Er	DAS 1: Orientation Line 1.8 3	earity: Or 2.3 _ 5 _	AS 2: rientation	Linearity:					
UseDescriptio	n TferID	Input Raw	Linearity	Output V	Outp	out Deg.	Difference	Change	Error
primary	01264	0		0.0000		359	1	43	-2
primary	01264	45		0.0000		43	2	44	-1
primary	01264	90		0.0000		8/	3	44	-1
primary	01264	133		0.0000		134	0	47	1
primary	01264	225		0.0000	,	227	2	47	2
primary	01264	270		0.0000	,	267	3	40	-5
primary	01264	315		0.0000	, -	316	1	49	4
primary	01270	90		0.0000		87	3		3
primary	01270	180		0.0000		180	0		0
primary	01270	270		0.0000		267	3		3
primary		300		0.0000		339			
Sensor Comp	onent Sensor Plumb)	Cond	ition Plumb			Status Status	pass pass	
Sensor Comp	onent Sensor Heate	Pr	Cond	ition N/A			Status	pass	
Sensor Comp	oonent Mast		Cond	ition Poor			Status	Fail	
Sensor Comp	Condition		Cond	ition Good			Status	pass	
Sensor Comp	Vane Condition	on	Cond	ition Good			Status	pass	
Sensor Comp	onent System Memo	0	Cond	ition See com	ments		Status	pass	

Temperature Data Form

Sensor Component System Memo

Mfg	Serial Number T	a Site	Те	echnie	cian	Site Vis	it Date	Param	eter	Owner II)
RM Young	7036	PET427	E	ric He	ebert	04/07/2	2014	Tempe	rature	none	
Mfg	RM Young			Mfg	3	Eutechr	nics	Pa	arameter Te	emperature	
SN/Owner ID	PT05572 nor	e		Seri	ial Number	01D102	193	Tí	fer Desc. R	TD translator	
Parameter	Temperature Translat	or		Tfe	r ID	01231					
DAS 1:	DAS	2:		Slop	ре		1.0013	3 Inte	rcept	-0.057	731
Abs Avg Err	Abs Max Er Abs A	vg Err Abs	Max Er	Cer	t Date	1:	2/27/201	3 Cor	rCoff	1.000	000
				Mfg	g	Eutechr	nics	Pa	arameter Te	emperature	
				Seri	ial Number	01H006	0	T	fer Desc. R	TD probe	
				Tfe	r ID	01230					
				Slop	ре		1.00133	3 Inte	rcept	-0.057	731
				Cer	t Date	1	2/27/201	3 Cor	rCoff	1.000	000
0.24	0.27										
UseDesc.	Test type	InputTmpRaw	InputTmpC	Corr.	OutputTmpS	Signal C	OutputSig	nalEng	OSE Unit	Difference	
primary 7	Temp Low Range	0.01	0.07		0.0000		-0.2	2	С	-0.27	
primary 7	Femp Mid Range	25.44	25.46		0.0000		25.2	2	С	-0.24	
primary	Femp High Range	45.40	45.40		0.0000		45.2	2	С	-0.21	
Sensor Comp	Shield		Conditi	ion C	lean			Status	pass]
Sensor Comp	Blower		Conditi	ion Fu	unctioning			Status	pass		
Sensor Comp	onent Blower Status S	Switch	Conditi	ion N	/A			Status	pass		

Condition

Status pass

Humidity Data Form

Mfg	Serial Number Ta Site		Te	chnician		Site Vis	sit Date	Param	eter	Owner ID	
Rotronic	59217	PET	427	Er	ic Hebert		04/07/2	2014	Relativ	e Humidity	none
					Mfg		Rotronio	C	P	arameter Re	lative Humidity
					Serial Nu	mber	75296		Т	fer Desc. GT	Ľ
					Tfer ID		01220				
					Slope			1.0000	0 Inte	ercept	0.00000
	DAS 1:		DAS 2:		Cert Date	e		1/5/201	0 Cor	rCoff	1.00000
	Low Range	High Range	Low Rar	nge H	ligh Range	e					
Abs Avg Err	1.6	0.8									
Abs Max Er	1.8	0.8									
UseDesc.	Test type	Device	Input RI	H G	TL Raw	RH (Corr.	DAS V	olts	DAS %RH	Difference
primary	RH Low Range	GTL	32.8		0.0	32	2.8	0.000	0	34.2	1.4
primary	RH Low Range	GTL	52.9		0.0	52	2.9	0.000	0	54.7	1.8
primary	RH High Range	GTL	93.6		0.0	93	6.6	0.000	0	92.8	-0.8
Sensor Com	ponent RH Filter			Conditio	n Clean				Status	pass	
Sensor Com	ponent Shield			Conditio	n Clean				Status	pass	
Sensor Com	ponent Blower			Conditio	Function	ning			Status	pass	
Sensor Com	ponent Blower S	status Switch		Conditio	n N/A				Status	pass	
Sensor Com	ponent System I	Vemo		Conditio	n				Status	pass	

Solar Radiation Data Form

Mfg	Serial Number	r Ta Site	Т	echni	ician	Site Visit Date	Param	eter	Owner ID
Licor	PY46776	PET427	E	Eric H	ebert	04/07/2014	Solar R	adiation	none
				Mf Ser	g rial Number	RM Young	Pa Ti	arameter solar fer Desc. SR tra	radiation
				Tfe	er ID	01240			
DAS 1:	DA	S 2:		Slo	ppe	1.0267	'8 Inte	ercept	-16.91000
% Diff of Avg %	Diff of Max %	Diff of Avg %	Diff of Max	Ce	rt Date	6/14/201	4 Cor	rCoff	0.99800
				Mf	g	Licor	Pa	arameter solar	radiation
				Ser	rial Number		T	fer Desc. SR tra	ansfer sensor
				Tfe	er ID	01241			
				Slo	ope	1.0267	'8 Inte	ercept	-16.91000
				Ce	rt Date	6/14/201	4 Cor	rCoff	0.99800
8.4%	8.9%	0.0%	0.0%						
UseDescription	Measure Date	MeasureTime	Tfer Ra	W	Tfer Corr	DAS w	/m2	PctDifference	2
primary	4/7/2014	9:00	704		702	754		7.4	%
primary	4/7/2014	10:00	842		836	900		7.7	%
primary	4/7/2014	11:00	923		915	983		7.4	%
primary	4/7/2014	12:00	934		926	1008	3	8.9	%
primary	4/7/2014	13:00	879		873	962		10.2	%
Sensor Compon	ent Sensor Clear	١	Condit	ion	Clean		Status	pass	
Sensor Compon	ent Sensor Level		Condit	ion	_evel		Status	pass	
Sensor Compon	Properly Site	d	Condit	ion F	Properly sited		Status	pass	
Sensor Compon	ent System Mem	0	Condit	ion			Status	pass	

Precipitation Data Form

Mfg	Seri	al Number Ta	Site		Тес	chnician		Site	Visit Date	Param	eter		Owner ID	
Climatronics	646		PET427		Eri	ic Hebert		04/0	07/2014	Precipit	ation		none	
						Mfg		PMF)	Pa	aramete	er Pre	cipitation	
DAS 1:		DAS 2:				Serial Num	ıber	EW-	06134-50	Tf	er Desc	250	ml graduate	
A Avg % Diff	f: A Max 9	6 Di A Avg %	6Dif A N	Max % Di		Tfer ID		012	50					
1.070		0.270				Slope			1.0000	0 Inte	rcept		0.000	00
						Cert Date			9/5/200	5 Cor	rCoff		1.000	00
UseDesc.	Test typ	e TferVolume	Iteration	TimePerT	ip	Eq.Ht	DAS	eng	Eq.HtUnit	OSE UI	nit Tfer	Units	PctDifferen	ce
primary	test 1	231.5	1	12 sec		7.14	7.	11	mm	mm	1	nl	-0.49	%
primary	test 2	231.5	2	12 sec		7.14	7.3	37	mm	mm	1	nl	3.29	%
Sensor Com	ponent Pr	operly Sited		Cond	itio	Properly :	sited			Status	pass			
Sensor Com	ponent G	auge Drain Scree	en	Cond	itio	n Installed				Status	pass			
Sensor Com	ponent Fu	Innel Clean		Cond	itio	Clean				Status	pass			
Sensor Com	ponent Co	ondition		Cond	itio	n Fair				Status	pass			
Sensor Com	ponent G	auge Screen		Cond	itio	Not instal	led			Status	pass			
Sensor Com	ponent G	auge Clean		Cond	itio	n Clean				Status	pass			
Sensor Com	ponent Le	evel		Cond	itio	n Level				Status	pass			
Sensor Com	ponent Se	ensor Heater		Cond	itio	Not functi	ioning			Status	Fail			
Sensor Com	ponent Sy	vstem Memo		Cond	itio	n				Status	pass			

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	PET427	Eric Hebert	04/07/2014	Shelter Temperatu	ure none
ARS DAS 1: Abs Avg Err A 0.89	Inone DAS 2: Abs Max Er Abs Avg 1.60 1.60	Err Abs Max Er	HebertMfgSerial NumberTfer IDSlopeCert DateMfgSerial NumberTfer IDSlopeSlope	04/07/2014 Eutechnics 01D102193 01231 1.00133 12/27/2013 Eutechnics 01H0060 01230 1.00133	Shelter Temperatu Parameter S Tfer Desc. F Intercept CorrCoff Parameter S Tfer Desc. F Intercept	Shelter Temperatur CTD translator -0.05731 1.00000 Shelter Temperatur RTD probe -0.05731
			Cert Date	12/27/201	3 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.98	24.01	0.000	25.6	С	1.6
primary	Temp Mid Range	27.41	27.43	0.000	26.8	С	-0.63
primary	Temp Mid Range	26.81	26.83	0.000	26.4	С	-0.43

Infrastructure Data For

Site ID	PET427	Technician Eric He	bert Site Visit Date 04/07/2014
Shelter	Make	Shelter Model	Shelter Size
Ekto		8814	896 cuft
and the second second			

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazar	d Problem
Flow Rate	PET427	Eric Hebert	04/07/2014	Filter Position	Mykrolis	3559		
The filter attachment orientation.	plate is mounted	too low in the enclos	sure resulting in	the filter being expo	osed to wind-driv	ven rain and in the	standard	geometric
Wind Direction	PET427	Eric Hebert	04/07/2014	Mast	RM Young	3916		\checkmark
m 1 1 1				1 1				

The wind direction sensor mast is loose on the tower causing inaccurate wind direction measurement.

Field Systems Comments

1 Parameter: SiteOpsProcComm

The site operator was not available for the site audit. Reported information is from the previous site audit.

2 Parameter: DasComments

The heating and air conditioning systems run simultaneously.

3 Parameter: ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID PET427	Technician Eric Hebert	Site Visit Date 04/07	7/2014					
Site Sponsor (agency)	NPS/EPA	USGS Map	Padilla Tank					
Operating Group	NPS	Map Scale						
AQS #	04-017-0119	Map Date						
Meteorological Type	R.M. Young							
Air Pollutant Analyzer	Ozone, neph	QAPP Latitude						
Deposition Measurement	dry, wet	QAPP Longitude						
Land Use	desert	QAPP Elevation Meters						
Terrain	flat	QAPP Declination						
Conforms to MLM	Yes	QAPP Declination Date						
Site Telephone	(928) 524-6668	Audit Latitude	34.822508					
Site Address 1		Audit Longitude	-109.892485					
Site Address 2		Audit Elevation	1712					
County	Navajo	Audit Declination	10.5					
City, State Petrified Forest, AZ		Present						
Zip Code	85942	Fire Extinguisher						
Time Zone	Mountain	First Aid Kit						
Primary Operator		Safety Glasses						
Primary Op. Phone #		Safety Hard Hat						
Primary Op. E-mail		Climbing Belt						
Backup Operator		Security Fence						
Backup Op. Phone #		Secure Shelter						
Backup Op. E-mail		Stable Entry Step 🔽						
Shelter Working Room ✓	Make Ekto M	lodel 8814	Shelter Size 896 cuft					
Shelter Clean	Notes The shelter is dusty, but in go	od condition, well organized and	maintained.					
Site OK	Notes							
Driving Directions From I-40 take exit 311 to the Petrified Forest. The site operator's office is located in the visitors center. The site is another 25 miles further south on the park road near the Rainbow Forest at the south end of the park, 1.5 miles west of the main road on a closed side road. The gate at the side road is usually open. The park ranger horse stable is located past the site on the side road.								

Field Systems Data Form

PET427

F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 04/07/2014

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

Siting Distances OK

Siting Criteria Comment

Site ID PET427 Technician Eric Hebert Site Visit Date 04/07/2014 1 Are wind speed and direction sensors sited so as to avoid being influenced by obstructions? ✓ 2 Are wind sensors mounted so as to minimize tower effects? ✓	
 Are wind speed and direction sensors sited so as to avoid being influenced by obstructions? Are wind sensors mounted so as to minimize tower effects? ✓ 	
2 Are wind sensors mounted so as to minimize tower effects? ✓	
(i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	
3 Are the tower and sensors plumb?	
4 Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc? ✓	
5 Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	
6 Is the solar radiation sensor plumb?	
7 Is it sited to avoid shading, or any artificial or reflected light?	
8 Is the rain gauge plumb?	
9 Is it sited to avoid sheltering effects from buildings, trees, towers, etc? ✓	
10 Is the surface wetness sensor sited with the grid surface facing north?	
11 Is it inclined approximately 30 degrees? ✓ N/A	

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site	e ID	PET427	Technician	Eric Hebert		Site Visit Date	04/07/2014	
1	Do all the condition	e meterological sensor 1, and well maintained	rs appear to be i 1?	intact, in good				
2	Are all th reporting	ne meteorological sens g data?	sors operational	online, and	✓			
3	Are the s	hields for the tempera	ature and RH se	ensors clean?	✓			
4	Are the a	spirated motors work	king?		✓			
5	Is the sol scratches	ar radiation sensor's a	lens clean and fi	ree of	✓			
6	Is the sur	rface wetness sensor g	grid clean and u	ndamaged?		N/A		
7	Are the s condition	ensor signal and pow a, and well maintained	er cables intact, 1?	in good		Signs of wear		
8	Are the s from the	ensor signal and pow elements and well ma	er cable connect aintained?	tions protected				

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

Fi	eld Systems Data Form		F-02058-1500-S5-rev002							
Site	PET427 Technician Eric Hebert		Site Visit Date 04/07/2014							
	Siting Criteria: Are the pollutant analyzers and deposition e	quipi	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 maintenance									
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓								
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓								
3	Describe ozone sample tube.		1/4 teflon by 12 meters							
4	Describe dry dep sample tube.		3/8 teflon by 8 meters							
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	✓	At inlet only							
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓								
7	Is the zero air supply desiccant unsaturated?									
8	Are there moisture traps in the sample lines?									
9	Is there a rotometer in the dry deposition filter line, and is it clean?	✓	Clean and dry							

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

Fi	Field Systems Data Form							F-02	2058-15	00-S6-rev002
Site ID PET427 Technician Eric Hebert			Site Visi	it Date	04/07/2014	4				
	DAS, sei	<u>nsor translators, and p</u>	eripheral equi	pment operation	ns ai	nd maintena	<u>nce</u>			
1 Do the DAS instruments appear to be in good condition and well maintained?										
2 Are all the components of the DAS operational? (printers, modem, backup, etc)					✓					
3 Do the analyzer and sensor signal leads pass through lightning protection circuitry?				✓	Met sensors	only				
4	4 Are the signal connections protected from the weather and well maintained?				✓					
5	5 Are the signal leads connected to the correct DAS channel?									
6	Are the grounde	DAS, sensor translator d?	rs, and shelter	properly	✓					
7	Does the	instrument shelter ha	ive a stable pov	ver source?	✓					
8	Is the ins	strument shelter temp	erature control	lled?						
9	Is the mo	et tower stable and gro	ounded?			Stable			Grounded	
10	Is the sa	mple tower stable and	grounded?							
11	Tower c	omments?								

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

The heating and air conditioning systems run simultaneously.

Field S	ystems Data	For	m]	F-02	2058-	1500-	S7-rev002
Site ID	PET427		Techr	nician [Eric Hebert	Site Visit I	Date 04/0)7/2014	4		
Docume	ntation										
Does the	e site have the requir	ed ins	trume	nt and e	equipment manual	<u>s?</u>					
Wind speed Wind direct Temperatu Relative hu Solar radia Surface we Wind senso Temperatu Humidity s Solar radia Tipping bu Ozone anal Filter pack	d sensor etion sensor ure sensor umidity sensor ation sensor tness sensor or translator are translator tensor translator ation translator	Yes Yes V		N/A	Data log Data log Strip ch Comput Modem Printer Zero air Filter fle Surge p UPS Lightnin Shelter 1 Shelter 3	ger ger art recorder er • pump ow pump rotector • g protection de heater air conditioner	evice	Yes Yes Y	No 	N/A	
Does th	<u>ne site have the requ</u>	ired a	nd mos	<u>st recen</u>	t QC documents a	<u>nd report form</u>	<u>ns?</u>				
		Prese	ent					Curre	ent		
Station Log	3			Dataview	V			\checkmark			
SSRF								\checkmark			
Site Ops M	anual							\checkmark			
HASP											
Field Ops N	Manual										
Calibration	n Reports										
Ozone z/s/p	o Control Charts										
Preventive	maintenance schedu	ll [
1 Is the	station log properly	comp	leted d	uring e	very site visit? 🔽	Dataview					
2 Are th curren	ne Site Status Report nt?	Form	ıs bein _i	g compl	leted and	Flow section or	nly				
3 Are th sample	e chain-of-custody f e transfer to and fro	orms j m lab	proper ?	ly used	to document						
4 Are oz	zone z/s/p control chant?	arts pi	roperly	v comple	eted and 🗸	Control charts	not used				
Provide any natural or a	y additional explana man-made, that may	tion (J v affec	photog t the n	raph or 10nitori	sketch if necessar ng parameters:	y) regarding co	onditions	listed	above, o	or any otl	ner features,

Field Systems Data Form

PET427 Technician Eric Hebert Site Visit Date 04/07/2014 Site ID Site operation procedures Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

QC Check Performed

Frequency

Frequency

Multipoint Calibrations	\checkmark	Semiannually
Visual Inspections	\checkmark	Weekly
Translator Zero/Span Tests (climatronics)		N/A
Manual Rain Gauge Test	\checkmark	Monthly
Confirm Reasonableness of Current Values	\checkmark	Weekly
Test Surface Wetness Response	\checkmark	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

requency	
Monthly and semiannually	
Daily	
Every 2 weeks	
Daily	
Alarm values only	
Every 2 weeks	
N/A	
Semiannually	

- Do multi-point calibration gases go through the complete 1 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?

\checkmark		
✓		
✓	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:

Compliant

Compliant

 \checkmark

✓

✓

✓

✓

 \checkmark

F-02058-1500-S8-rev002

Field Systems Data Form F-02058-1500-S9-rev002 PET427 Technician Eric Hebert Site Visit Date 04/07/2014 Site ID Site operation procedures Is the filter pack being changed every Tuesday as scheduled? Filter changed morinings. 1 Are the Site Status Report Forms being completed and filed No observations 2 correctly? No longer required Are data downloads and backups being performed as 3 scheduled? Are general observations being made and recorded? How? 4 ✓ Are site supplies on-hand and replenished in a timely 5 fashion? SSRF Are sample flow rates recorded? How? 6 Are samples sent to the lab on a regular schedule in a timely second day 7 fashion? ✓ Bag is used as glove Are filters protected from contamination during handling 8 and shipping? How? Are the site conditions reported regularly to the field 9 operations manager or staff? **QC Check Performed** Compliant Frequency \checkmark Semiannually **Multi-point MFC Calibrations** ✓ Weekly ✓ **Flow System Leak Checks Filter Pack Inspection** \checkmark ✓ Weekly **Flow Rate Setting Checks** \checkmark ✓ Weekly Visual Check of Flow Rate Rotometer ✓ Unknown \checkmark **In-line Filter Inspection/Replacement** \square Sample Line Check for Dirt/Water Provide any additional explanation (photograph or sketch if necessary) 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:

The site operator was not available for the site audit. Reported information is from the previous site audit.

Field Systems Data Form

PET427

F-02058-1500-S10-rev002

Site ID

Techni

Technician Eric Hebert

Site Visit Date 04/07/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB22906TB	none
DAS	Environmental Sys Corp	8816	2526	90641
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	10950000032	none
Flow Rate	Mykrolis	FC280SAV-4S	AW9510056	none
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	none
MFC power supply	Mykrolis	RO-32	FP9510004	none
Modem	US Robotics	56k	unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	CM08460048	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1015543061	none
Precipitation	Climatronics	100097-1-G0	646	none
Relative Humidity	Rotronic	MP 601A	59217	none
Sample Tower	Aluma Tower	В	none	none
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria][1	None	None
Solar Radiation	Licor	LI-200	PY46776	none
Temperature	RM Young	41342	7036	none
Temperature Translator	RM Young	PT05592	PT05572	none
Wind Direction	RM Young	AQ05103-5	55389wdr	90879
Wind Speed	RM Young	AQ05103-5	55389wsp	90879
Zero air pump	Werther International	PC 70/4	531382	none
Site Inventory by Site Visit

Site V	ïsit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
GRC4	474-Eric H	lebert-04/08/2014				
1	4/8/2014	Computer	Hewlett Packard	none	6560 b	5CB22906T9
2	4/8/2014	DAS	Environmental Sys Corp	90602	8816	2270
3	4/8/2014	Elevation	Elevation	None	1	None
4	4/8/2014	Filter pack flow pump	Thomas	none	107CAB18	120000014367
5	4/8/2014	flow rate	Tylan	none	FC280SAV	AW9805027
6	4/8/2014	Infrastructure	Infrastructure	none	none	none
7	4/8/2014	MFC power supply	Tylan	none	RO-32	illegible
8	4/8/2014	Modem	US Robotics	none	33.6 sportster	unknown
9	4/8/2014	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943902
10	4/8/2014	Ozone Standard	ThermoElectron Inc	none	49C	49C-66830-354
11	4/8/2014	Precipitation	Climatronics	illegible	100508-2	illegible
12	4/8/2014	Printer	Hewlett Packard	none	842C	unknown
13	4/8/2014	Relative Humidity	Rotronic	none	MP 601A	52069
14	4/8/2014	Sample Tower	Aluma Tower	03570	В	none
15	4/8/2014	Shelter Temperature	ARS	none	none	none
16	4/8/2014	Siting Criteria	Siting Criteria	None	1	None
17	4/8/2014	Solar Radiation	Licor	none	LI-200	PY8975
18	4/8/2014	Solar Radiation Translator	RM Young	91044	70101-X	none
19	4/8/2014	Temperature	RM Young	none	41342VC	17626
20	4/8/2014	Wind Direction	RM Young	91054	AQ05103-5	24819wdr
21	4/8/2014	Wind Speed	RM Young	91054	AQ05103-5	24819wsp
22	4/8/2014	Wind Translator	RM Young	01175	05603BP	none
23	4/8/2014	Zero air pump	Werther International	none	PC70/4	531380

DAS Data Form

9

9

0.9000

1.0000

0.8999

1.0000

0.9001

1.0000

V

V

V

V

0.0002

0.0000

DAS Time Max Error: 1.83

Mfg	Serial	Number Site	e T	echnician	Site Visit Date	Parameter	Use Desc.
Environmental	Sys 2270	GR	C474 E	Eric Hebert	04/08/2014	DAS	Primary
Das Date: Das Time:	4 /8 /2014 12:31:00	Audit Date Audit Time	4 /8 /2014 12:32:50	Mfg	Datel	Parameter	DAS
Das Day:	98	Audit Day	98	Serial Number	4000392	Tfer Desc.	Source generator (D
Low Channel	:	High Channe	el:	Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0003	0.0	0.000	1 0.0002	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740243	Tfer Desc.	DVM
				Tfer ID	01312		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	12/28/201	3 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
6	0.0000	-0.0001	0.0000	V	V	0.0001	
6	0.1000	0.0999	0.1000	V	V	0.0001	
6	0.3000	0.3000	0.3002	V	V	0.0002	
6	0.5000	0.4999	0.5002	V	V	0.0003	
6	0.7000	0.7000	0.7003	V	V	0.0003	
6	0.9000	0.9000	0.9004	V	V	0.0004	
6	1.0000	1.0000	1.0005	V	V	0.0005	
9	0.0000	-0.0001	-0.0002	V	V	-0.0001	
9	0.1000	0.0999	0.1000	V	V	0.0001	
9	0.3000	0.2999	0.3000	V	V	0.0001	
9	0.5000	0.4999	0.5001	V	V	0.0002	
9	0.7000	0.6999	0.7000	V	V	0.0001	

Flow Data Form

Mfg	Serial Nu	nber Ta	Site	Tee	chnician	Site Visit I	Date Paran	neter	Owner ID
Tylan	AW98050	27	GRC474	Eri	ic Hebert	04/08/201	4 flow ra	te	none
Mfg	Tylan				Mfg	BIOS	P	arameter Flow	v Rate
SN/Owner ID	illegible	none			Serial Number	131818	1	fer Desc. BIO	S 220-H
Parameter	MFC power su	pply			Tfer ID	01417			
					Slope	1.	.00000 Int	ercept	0.00000
					Cert Date	1/	8/2014 Co	rrCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero	0.9	95	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	5.42	26	
1.21%	1.32%				Rotometer R	eading:	3	.5	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	-0.15	-0.1040	-0.16	l/m	l/m	
primary	leak check	0.000	0.000	-0.15	-0.1028	-0.16	l/m	l/m	
primary	test pt 1	3.040	3.040	2.71	2.7232	3.00	l/m	l/m	-1.32%
primary	test pt 2	3.043	3.040	2.71	2.7235	3.00	l/m	l/m	-1.32%
primary	test pt 3	3.031	3.030	2.71	2.7236	3.00	l/m	l/m	-0.99%
Sensor Comp	onent Leak Te	st		Conditio	n		Status	pass	
Sensor Comp	onent Tubing C	Condition		Conditio	n Good		Status	pass	
Sensor Compo	onent Filter Po	sition		Conditio	n Good		Status	pass	
Sensor Comp	onent Rotomet	er Conditio	n	Conditio	Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	No moisture pr	resent	Status	pass	
Sensor Comp	onent Filter Dis	tance		Conditio	n 6.0 cm		Status	pass	
Sensor Comp	Filter De	pth		Conditio	n 1.0 cm		Status	pass	
Sensor Comp	onent Filter Az	imuth		Conditio	225 deg		Status	pass	
Sensor Comp	onent System	Vemo		Conditio	n		Status	pass	

Ozone Data Form

Mfg	Serial Number Ta	Site	Te	chnician		Site Visi	it Date	Parame	eter	Owner I	D
ThermoElectron Inc	1023943902	GRC474	Er	ic Hebert		04/08/2	014	Ozone		none	
Slope: Intercept CorrCoff	1.02910 Slope: 1.89689 Intercept 0.99999 CorrCoff	0.0000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoE 49CPS-7	Electron 70008-30	Inc Pa	rameter o er Desc. O	zone Dzone primary	/ stan
DAS 1: A Avg % Diff: A M 1.5%	DAS 2: 1 ax % Di 3.2%	6Dif A Max	% Di	Slope Cert Da	ıte		1.0070 1/8/201	7 Inter 4 Corr	·cept ·Coff	-0.21	032 0000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Sit	te:	Site	Unit:	PctDi	fference:	
primary	1	0.42	0.0	62	-1.	27	ppb				
primary	2	33.07	33.	.04	31.	98	ppb			-3.21%	
primary	3	51.08	50.	.93	50.	54	ppb			-0.77%	
primary	4	76.90	76.	.56	77.	15	ppb			0.77%	
primary	5	115.51	114	.90	116	.20	ppb			1.13%	
Sensor Compone	nt Cell B Noise		Conditio	0.7 pp	b			Status	pass		
Sensor Compone	nt Cell B Tmp.		Conditio	on				Status	pass		
Sensor Compone	nt Fullscale Voltage		Conditio	on 0.999	7			Status	pass		
Sensor Compone	nt Inlet Filter Condition	on	Conditio	on Clean				Status	pass		
Sensor Compone	nt Line Loss		Conditio	on Not te	sted			Status	pass		
Sensor Compone	nt Offset		Conditio	on 1.6				Status	pass		
Sensor Compone	nt Span		Conditio	on 1.040				Status	pass		
Sensor Compone	nt Cell B Freq.		Conditio	on 87.6 k	κHz			Status	pass		
Sensor Compone	nt System Memo		Conditio	on				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 0.63 l	pm			Status	pass		
Sensor Compone	nt Cell A Tmp.		Conditio	on 37.5 ()			Status	pass		
Sensor Compone	nt Cell A Pressure		Conditio	on 598 m	nmHg			Status	pass		
Sensor Compone	nt Cell A Noise		Conditio	on 1.0 pp	b			Status	pass		
Sensor Compone	nt Cell A Freq.		Conditio	on 96.2 k	Hz			Status	pass		
Sensor Compone	nt Cell A Flow		Conditio	on 0.63 l	pm			Status	pass		
Sensor Compone	nt Battery Backup		Conditio	on N/A				Status	pass		
Sensor Compone	nt Zero Voltage		Conditio	on 0.000	1			Status	pass		

Wind Speed Data Form

Mfg	5	Serial Num	ber Ta	Site			Tech	nician	Site Visit Dat	e Para	meter	Owner II	D
RM Young	2	24819wsp		GRC4	74		Eric	Hebert	04/08/2014	Wind	Speed	91054	
Mfg	RM `	Young					N	Afg	RM Young		Paramet	er wind speed	
SN/Owner ID	none	;	01175				S	erial Number	CA04013		Tfer Des	c. wind speed mo	otor (h
Parameter	Wind	d Translator					r	fer ID	01253				
Prop or Cups S	SN	68490					S	lope	1.00	000 In	tercept	0.00	000
Prop or Cups 7	Forqu	e	0.4 to			0.4	0	Cert Date	1/16/2	014 C	orrCoff	1.00	000
Prop Correctio	on Fac	t 0.0512											
	DAS 1	1:			DAS 2:								
	oung 24819wsp GRC474 Eric Hebert 04/08/2014 Wind Speed 91054 RM Young												
Abs Avg Err		0.13	1.	.44%									
Abs Max Er		0.30	1.	.95%									
UseDescription	: Ir	nput Device	Inpu	ıt RPM	In	put m/s	5	Out V	DAS m/s	Diff/ %	6Diff	Diff	WsM
primary		none		0		0.20		0.0	-0.1			-0.30	
primary		01253		200		1.02		0.0	1.0			-0.01	
primary		01253		400		2.05		0.0	1.9			-0.12	
primary		01253	:	800		4.10		0.0	4.0			-0.10	
primary		01253	1	200		6.14		0.0	6.0		-1.95%		
primary		01253	2	2400		12.29		0.0	12.1		-1.46%		
primary		01253	4	-000		20.48		0.0	20.2		-1.27%		
primary		01253	9	400		48.13		0.0	47.6		-1.08%		
Sensor Comp	onent	Condition				Condi	ition	Good		Statu	IS pass]
Sensor Comp	onent	Prop or Cu	ups Cond	dition		Condi	ition	Good		Statu	Is pass]
Sensor Comp	onent	Sensor He	eater			Condi	ition	N/A		Statu	Is pass		
Sensor Comp	onent	Torque				Condi	ition	Good		Statu	Is pass]
Sensor Comp	onent	Sensor Plu	umb			nput m/s Out V DAS m/s Diff/ %Diff Diff WsM 0.20 0.0 -0.1 -0.30 -0.10 -0.01 -0.01 -0.01 -0.01 -0.01 -0.12 -0.12 -0.12 -0.14 -0.10 -0.12 -0.12 -0.12 -0.14 -0.10 -0.10 -0.11 -0.10 -0.11 -0.12 -0.10 <							
Sensor Comp	onent	System M	emo			Condi	ition			Statu	Is pass		

Wind Direction Data Form

Mfg	Serial Num	ber Ta Site	J	Fechnician		Site Visit	t Date	Param	eter	Owner I	D
RM Young	24819wdr	GRC474		Eric Hebert		04/08/20	14	Wind D	Direction	91054	
Mfg	RM Young	0.4.75		Mfg		RM Youn	g	P	arameter	wind direction	wheel
SN/Owner ID	none	01175		Serial Null	liber			I	ier Desc.		WIEEI
Parameter	Wind Translator			Tfer ID		01264					
Vane SN: N/ VaneTorque	A 12 to	C. A. Align. d	e <mark>g. true:</mark> 180								
				Mfg	[Ushikata		P	arameter	wind direction	
				Serial Nun	nber	192034		Т	fer Desc.	transit	
				Te ID	[01270					
				Her ID	l	01270					
				Slope			1.00000	0 Inte	ercept	0.00	000
				Cert Date	[1/	/30/201	4 Cor	rCoff	1.00	000
-		5									
1	JAS 1: Orientation I	incority: O	AS 2: rientation	L incority.							
Abs Avg Err	2.8	2.0		Linearity.							
Abs Max Er	4	4									
UseDescription	n TferID	Input Raw	Linearity	Output V	Outp	ut Deg.	Differ	rence	Change	Error	
primary	01264	0		0.0000		2		2	46	1	
primary	01264	45		0.0000		45		0	43	-2	
primary	01264	90		0.0000		92		2	47	2	
primary	01264	135		0.0000	1	41		6	49	4	
primary	01264	180		0.0000	1	187		7	46	1	
primary	01264	225		0.0000	2	231		6	44	-1	
primary	01264	270		0.0000	2	274		4	43	-2	
primary	01264	315		0.0000	3	316		1	42	-3	
primary	01270	90		0.0000		87		3		3	
primary	01270	180		0.0000]	182		2		2	
primary	01270	270		0.0000	2	268		2		2	
primary	01270	360		0.0000	2	356		4		4	
Sensor Compo	onent lorque		Condi	tion Good				Status	pass		
Sensor Compo	onent Sensor Plu	umb	Condi	tion Plumb				Status	pass		
Sensor Compo	onent Sensor He	ater	Condi	tion N/A				Status	pass		
Sensor Compo	onent Mast		Condi	tion Good				Status	pass		
Sensor Compo	onent Condition		Condi	tion Good				Status	pass		
Sensor Compo	onent Vane Con	dition	Condi	tion Good				Status	pass		
Sensor Comp	onent System M	emo	Condi	tion				Status	pass		

Temperature Data Form

Mfg	Serial Number Ta	a Site		Techn	ician	Site V	isit Date	Param	eter	Owner II)
RM Young	17626	GRC474		Eric H	ebert	04/08	8/2014	Temper	ature	none	
				Mf Sei Tfe	'g rial Number	Eutec	hnics)2193	Pa	irameter Te	emperature	
DAS 1: Abs Avg Err	DAS 2 Abs Max Er Abs A	: vg Err Abs	Max Er	Slo	ope rt Date		1.0013 12/27/201	3 Inte 3 Corr	rcept rCoff	-0.057	731 000
				Mf Sei	Cert Date12/27/2013CorrCoffVIfgEutechnicsParameterSerial Number01H0060Tfer Desc.					emperature	
				Tfe	er ID	01230)]			
				Slo	pe		1.0013	3 Inte	rcept	-0.057	731
				Ce	rt Date		12/27/201	3 Cor	rCoff	1.000	000
0.24	0.58										
UseDesc.	Test type I	nputTmpRaw	InputTm	pCorr.	OutputTmpS	Signal	OutputSig	nalEng	OSE Unit	Difference	
primary	Temp Low Range	0.08	0.14	1	0.0000		0.7	,	С	0.58	
primary	Temp Mid Range	24.35	24.3	7	0.0000		24.4	4	С	0.07	
primary	Temp High Range	45.95	45.9	5	0.0000		46.	0	С	0.07	
Sensor Com	ponent Shield		Cond	ition (Clean			Status	pass]
Sensor Com	ponent Blower		Cond	ition F	Functioning			Status	pass]
Sensor Com	ponent Blower Status St	witch	Cond	ition 🛚	N/A			Status	pass]
Sensor Com	ponent System Memo		Cond	ition				Status	pass]

Humidity Data Form

Mfg	Serial Nur	nber Ta Site		Technician		Site Visit D	ate Par	ameter	Owner ID
Rotronic	52069	GR	C474	Eric Hebert		04/08/2014	Rel	ative Humidity	none
				Mfg		Rotronic		Parameter Re	lative Humidity
				Serial Nu	mber	75296		Tfer Desc. GT	Ľ
				Tfer ID		01220			
				Slope		1.0	00000	Intercept	0.00000
	DAS 1:		DAS 2:	Cert Date	е	1/5	/2010	CorrCoff	1.00000
	Low Range	High Range	Low Range	High Range	е				
Abs Avg Err	0.5	2.6							
Abs Max Er	0.6	2.6							
UseDesc.	Test type	Device	Input RH	GTL Raw	RH (Corr. DA	S Volts	DAS %RH	Difference
primary	RH Low Range	GTL	32.8	0.0	32	2.8 0	.0000	32.4	-0.4
primary	RH Low Range	GTL	52.9	0.0	52	2.9 0	.0000	53.5	0.6
primary	RH High Range	GTL	93.6	0.0	93	6.6 0	.0000	91.0	-2.6
Sensor Com	ponent RH Filter		Con	dition Clean			Sta	tus pass	
Sensor Com	ponent Shield		Con	dition Clean			Sta	tus pass	
Sensor Com	ponent Blower		Con	dition Functio	ning		Sta	tus pass	
Sensor Com	ponent Blower S	tatus Switch	Con	dition N/A			Sta	tus pass	
Sensor Com	ponent System I	Memo	Con	dition			Sta	tus pass	

Solar Radiation Data Form

Mfg	Serial Num	ber Ta Site	e	Techn	nician	Site Visit Date	Param	eter Ov	wner ID
Licor	PY8975	GF	RC474	Eric H	lebert	04/08/2014	Solar R	adiation no	ne
Mfg	RM Young			Mi	fg	RM Young	Pa	arameter solar rad	diation
SN/Owner ID	none	91044		Se	rial Number		Tf	fer Desc. SR trans	sfer translat
Parameter	Solar Radiation	Translator		Tf	er ID	01240			
DAS 1:		DAS 2:		Slo	ope	1.0267	8 Inte	rcept	-16.91000
% Diff of Avg	%Diff of Max	%Diff of Av	g %Diff of M	lax Ce	ert Date	6/14/201	4 Cor	rCoff	0.99800
				Mi	fg	Licor	Pa	arameter solar rad	diation
				Se	erial Number		Tf	fer Desc. SR trans	sfer sensor
				Tf	er ID	01241			
				Slo	ope	1.0267	8 Inte	rcept	-16.91000
				Ce	ert Date	6/14/201	4 Cor	rCoff	0.99800
0.3%	3.6%	0.09	% 0.0)%					
UseDescription	Measure Date	e Measure	eTime Tfe	r Raw	Tfer Corr	DAS w/	m2	PctDifference	
primary	4/8/2014	12:0	0 9	949	941	907		-3.6%	
primary	4/8/2014	13:0	0 9	908	901	936		3.9%	
primary	4/8/2014	14:0	3 00	802	798	801		0.4%	
primary	4/8/2014	15:0	00 6	538	638	641		0.5%	
primary	4/8/2014	16:0	00 4	449	454	458		0.9%	
Sensor Compo	onent Sensor Cl	ean	Co	ondition	Clean		Status	pass	
Sensor Compo	onent Sensor Le	evel	Co	ondition	Level		Status	pass	
Sensor Compo	Properly S	Sited	Co	ondition	Properly sited		Status	pass	
Sensor Compo	onent System M	emo	Co	ondition			Status	pass	

Precipitation Data Form

Mfg	Seri	ial Number Ta	Site		Тес	chnician		Site	Visit Date	Parame	eter	Owner ID	
Climatronics	illeç	gible	GRC474		Eri	ic Hebert		04/0	08/2014	Precipita	ation	illegible	
						Mfg		PMF)	Pa	rameter	Precipitation	
DAS 1:		DAS 2:				Serial Nun	ıber	EW-	06134-50	Tf	er Desc.	250ml graduate	
A Avg % Diff	f: A Max ^c	% Di A Avg %	Dif A N	Aax % Di		Tfer ID		0125	50				
4.0%		4.0%						 		_		ſ	
						Slope			1.0000	0 Inter	cept	0.0000	0
						Cert Date			9/5/200	5 Corr	Coff	1.0000	0
U.D.	— • • •		T	T : D T	. L		DAG			OGEU			
UseDesc.	Test typ	221.5	Iteration	10 see	1p	Eq.Ht	DAS	eng	Eq.HtUnit	OSE Un	it TferUr	11ts PctDifference	e
primary	test 1 test 2	231.5	2	10 sec	-	5.00	4.8	30 80	mm	mm	ml	-4.0%	
Sensor Com	ponent P	roperly Sited		Cond	itio	Properly	sited			Status	pass		
Sensor Com	ponent G	auge Drain Scree	n	Cond	itio	Not instal	lled			Status	pass		
Sensor Com	ponent F	unnel Clean		Cond	itio	n Clean				Status	pass		
Sensor Com	ponent C	ondition		Cond	itio	n Good				Status	pass		
Sensor Com	ponent G	auge Screen		Cond	itio	Not instal	lled			Status	pass		
Sensor Com	ponent G	auge Clean		Cond	itio	n Clean				Status	pass		
Sensor Com	ponent Le	evel		Cond	itio	n Level				Status	pass		
Sensor Com	ponent S	ensor Heater		Cond	itio	n Functioni	ng			Status	pass		
Sensor Com	ponent S	ystem Memo		Cond	itio	n				Status	pass		

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	GRC474	Eric Hebert	04/08/2014	Shelter Temperatu	Ire none
ARS DAS 1: Abs Avg Err 0.35	None DAS 2: Abs Max Er Abs Avg 0.51	Err Abs Max Er	EffC Hebert Mfg Mfg Serial Number Tfer ID Slope Cert Date Mfg Serial Number Tfer ID Slope Serial Number Tfer ID Slope Cart Date	Eutechnics 01D102193 01231 1.00133 12/27/201 Eutechnics 01H0060 01230 1.00133 12/27/201	Parameter Parameter Tfer Desc. Intercept CorrCoff Parameter Tfer Desc. Tfer Desc. Intercept	Shelter Temperatur CTD translator -0.05731 1.00000 Shelter Temperatur RTD probe -0.05731 1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	27.10	27.12	0.000	27.3	С	0.16
primary	Temp Mid Range	26.55	26.57	0.000	26.9	С	0.37
primary	Temp Mid Range	26.59	26.61	0.000	27.1	С	0.51

Infrastructure Data For

Site ID	GRC474	Technician Eric He	oert Site Visit Date 04/08/2014
Shelter M	lake	Shelter Model	Shelter Size
Ekto		8810	640 cuft

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

Field Systems Comments

1 Parameter: ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID GRC474	Technician Eric Hebert	Site Visit Date 04/0	8/2014
			Orea d Oceana
Site Sponsor (agency)	NPS/EPA	USGS Map	Grand Canyon
Operating Group	NPS	Map Scale	
AQS #	04-005-8001	Map Date	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, UV-B	QAPP Latitude	
Deposition Measurement	dry, wet, IMPROVE	QAPP Longitude	
Land Use	woodland - evergreen	QAPP Elevation Meters	
Terrain	complex	QAPP Declination	
Conforms to MLM	No	QAPP Declination Date	
Site Telephone	(928) 638-2031	Audit Latitude	36.058642
Site Address 1	2D Albright Ave	Audit Longitude	-112.183575
Site Address 2	PO Box 129	Audit Elevation	2070
County	Coconino	Audit Declination	11.5
City, State	Grand Canyon, AZ	Present	
Zip Code	86023	Fire Extinguisher 🗹	No inspection date
Time Zone	Arizona	First Aid Kit	
Primary Operator		Safety Glasses	
Primary Op. Phone #		Safety Hard Hat	
Primary Op. E-mail		Climbing Belt	
Backup Operator		Security Fence	
Backup Op. Phone #		Secure Shelter	
Backup Op. E-mail		Stable Entry Step 🗹	
Shelter Working Room ✓	Make Ekto M	odel 8810	Shelter Size 640 cuft
Shelter Clean	Notes The shelter is in good condition	n, clean, neat, and well organiz	ed.
Site OK	Notes		
Driving Directions From Mckee few m	Flagstaff, AZ take route 180 north to the (e building on Albright Ave. Obtain a pass iles along the rim road on the left just pas	Grand Canyon National Park. T to travel the West Rim Road. t the Abyss.	The site operator's office is in the The gate code is #1965. The site is a

Field Systems Data Form

GRC474

F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 04/08/2014

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

Siting Distances OK

Siting Criteria Comment

Fie	eld Sy	stems Data F	orm				F-02058	-1500-S3-rev	002
Site	e ID	GRC474	Technician	Eric Hebert		Site Visit Date	04/08/2014		
1	Are win being in	d speed and direction fluenced by obstructi	sensors sited so ons?	as to avoid					
2	Are win (i.e. win horizont tower in	d sensors mounted so d sensors should be n tally extended boom > to the prevailing win	as to minimize nounted atop the >2x the max dian d)	tower effects? e tower or on a meter of the					
3	Are the	tower and sensors plu	ımb?						
4	Are the avoid ra	temperature shields j diated heat sources s	oointed north or uch as buildings	positioned to , walls, etc?					
5	Are tem conditio surface standing	perature and RH sen ns? (i.e. ground belov and not steeply slope g water should be avo	sors sited to avo v sensors should d. Ridges, hollov ided)	id unnatural be natural vs, and areas of					
6	Is the so	lar radiation sensor J	blumb?						
7	Is it site light?	d to avoid shading, or	any artificial o	r reflected					
8	Is the ra	in gauge plumb?							
9	Is it site towers,	d to avoid sheltering etc?	effects from buil	ldings, trees,					
10	Is the su facing n	rface wetness sensor orth?	sited with the g	rid surface		N/A			
11	Is it inc	lined approximately	30 degrees?			N/A			
					l				

Field Systems Data Form

F-02058-1500-S4-rev002

Site	e ID	GRC474	Technician	Eric Hebert		Site Visit Date	04/08/2014	
1	Do all th condition	e meterological sensor 1, and well maintained	rs appear to be ii 1?	ntact, in good				
2	Are all the reporting	he meteorological sens g data?	sors operational	online, and	✓			
3	Are the s	shields for the tempera	ature and RH se	nsors clean?	✓			
4	Are the a	aspirated motors work	king?					
5	Is the sol scratches	ar radiation sensor's	lens clean and fr	ree of				
6	Is the su	rface wetness sensor g	grid clean and un	idamaged?		N/A		
7	Are the s condition	sensor signal and pow 1, and well maintained	er cables intact, i 1?	in good		Signs of wear		
8	Are the s from the	ensor signal and pow elements and well ma	er cable connect aintained?	ions protected				

Field Systems Data Form			F-02058-1500-S5-rev002
Site	GRC474 Technician Eric Hebert		Site Visit Date 04/08/2014
	Siting Criteria: Are the pollutant analyzers and deposition e	quip	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	d 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 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	✓	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?		
8	Are there moisture traps in the sample lines?		
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry

Fi	eld Systems Data Form		F-0 2	2058-15	00-S6-rev002	
Site	e ID GRC474 Technician	Eric Hebert	Site Visit	t Date 04/08/2014	4	
	DAS, sensor translators, and peripheral equi	pment operations a	<u>nd maintenar</u>	<u>1ce</u>		
1	Do the DAS instruments appear to be in good well maintained?	d condition and 🔽				
2	Are all the components of the DAS operation modem, backup, etc)	al? (printers, 🔽				
3	Do the analyzer and sensor signal leads pass lightning protection circuitry?	through 🗸	Met sensors	only		
4	Are the signal connections protected from th well maintained?	e weather and 🔽				
5	Are the signal leads connected to the correct	DAS channel?				
6	Are the DAS, sensor translators, and shelter grounded?	properly 🗸				
7	Does the instrument shelter have a stable pov	wer source?				
8	Is the instrument shelter temperature contro	lled? ✓				
9	Is the met tower stable and grounded?		Stable		Grounded	
10	Is the sample tower stable and grounded?					
11	Tower comments?		Sample towe	r not grounded bu	t bolted to the	e shelter

Field Sys	stems Data H	Form	1			F-02)58-1	500-S7-rev002
Site ID	GRC474	Т	echnician	Eric Hebert	Site Visit Date	04/08/2014]
Document	ation							
Does the si	<u>te have the required</u>	<u>l instru</u>	iment and	equipment manua	als?			
Wind speed s Wind direction Temperature Relative hum Solar radiation Surface wethon Wind sensor to Temperature Humidity sen Solar radiation Tipping buck Ozone analyz Filter pack flor	Yensor[on sensor[sensor[idity sensor[on sensor[ess sensor[translator[sor translator[on translator[et rain gauge[er[ow controller[IFC power supply[[es]	No N/2 Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	A Data le Data le Data le Strip e Compe Moder Printe Zero a Filter f Surge UPS Lightn Shelter Shelter	ogger ogger hart recorder iter n r ir pump flow pump protector ing protection device r heater r air conditioner	Yes ✓ □ □ □ □ □ □ □ □ □ □ □ □ □	No 	N/A
Does the	site have the require	ed and	most rece	nt QC documents	and report forms?			
	I	Present				Curren	t	
Station Log			Datavie	W		\checkmark		
SSRF		\checkmark				\checkmark		
Site Ops Man	ual		July 20	09		\checkmark		
HASP		\checkmark	July 20	09		\checkmark		
Field Ops Ma	nual							
Calibration R	Reports					\checkmark		
Ozone z/s/p C	Control Charts							
Preventive ma	aintenance schedul							
1 Is the sta	ntion log properly co	omplet	ed during	every site visit? 🔽	2			
2 Are the s current?	Site Status Report F	'orms b	eing com	pleted and	Flow & observation	sections		
3 Are the o sample t	chain-of-custody for ransfer to and from	ms pro lab?	operly used	d to document	2			
4 Are ozor current?	ne z/s/p control char	ts prop	erly comp	leted and	Control charts not u	used		
Provide any a natural or ma	ndditional explanation an-made, that may a	on (pho ffect tl	otograph o ne monitor	or sketch if necessa ring parameters:	nry) regarding condi	tions listed a	bove, or a	any other features,

Field Systems Data Form

GRC474 Technician Eric Hebert Site Visit Date 04/08/2014 Site ID Site operation procedures Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark 4 Are the standard CASTNET operational procedures being flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 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	\checkmark	Weekly
Translator Zero/Span Tests (climatronics)		N/A
Manual Rain Gauge Test	\checkmark	Monthly
Confirm Reasonableness of Current Values	\checkmark	Weekly
Test Surface Wetness Response	\checkmark	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	
Monthly and semiannually	
Daily	
Every 2 weeks	
Daily	
Weekly	
Every 2 weeks	
N/A	
Weekly	
Semiannually	

- Do multi-point calibration gases go through the complete 1 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?

✓	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:

ompliant

Compliant

✓

✓

✓

✓

 \checkmark

 \checkmark

F-02058-1500-S8-rev002

Fi	eld Sy	stems Data For	m					F-02058-1	500-S9-rev002
Sit	e ID	GRC474	Technic	cian	Eric Hebert		Site Visit Date	04/08/2014	
	<u>Site ope</u>	ration procedures							
1	Is the fi	lter pack being changed	every Tu	iesda	ay as scheduled	?⊻	Filter changed mori	nings 95% of the time	
2	Are the correctl	Site Status Report Forn y?	ns being o	comj	pleted and filed				
3	Are dat schedul	a downloads and backup ed?	os being J	perf	ormed as		No longer required		
4	Are gen	eral observations being	made and	d ree	corded? How?	✓	SSRF		
5	Are site supplies on-hand and replenished in a timely fashion?								
6	Are sample flow rates recorded? How?					✓	SSRF		
7	Are san fashion	ples sent to the lab on a ?	regular	sche	dule in a timely	✓			
8	Are filte and shij	ers protected from conta pping? How?	mination	ı duı	ring handling	✓	Clean gloves on and	d off	
9	Are the operation	site conditions reported ons manager or staff?	regularly	y to	the field				
QC	Check P	erformed		Fre	quency			Compliant	
I	Multi-poi	nt MFC Calibrations		Sem	niannually				
]	Flow Syst	em Leak Checks		Wee	ekly				
]	Filter Pac	k Inspection							
I	Flow Rate	e Setting Checks		Wee	ekly				
	Visual Check of Flow Rate Rotometer Veekly				ekly			\checkmark	
1	In-line Filter Inspection/Replacement				niannually				
5	Sample Li	ample Line Check for Dirt/Water							
	de energi	dditional annlanation (n	hatamaa	a la co	n alaotah if maaa) managed in a sam diff	and listed above on	ann ath an factures

Field Systems Data Form

GRC474

F-02058-1500-S10-rev002

Site ID

Technician Eric Hebert

Site Visit Date 04/08/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB22906T9	none
DAS	Environmental Sys Corp	8816	2270	90602
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	120000014367	none
flow rate	Tylan	FC280SAV	AW9805027	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	illegible	none
Modem	US Robotics	33.6 sportster	unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	1023943902	none
Ozone Standard	ThermoElectron Inc	49C	49C-66830-354	none
Precipitation	Climatronics	100508-2	illegible	illegible
Printer	Hewlett Packard	842C	unknown	none
Relative Humidity	Rotronic	MP 601A	52069	none
Sample Tower	Aluma Tower	В	none	03570
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Solar Radiation	Licor	LI-200	PY8975	none
Solar Radiation Translator	RM Young	70101-X	none	91044
Temperature	RM Young	41342VC	17626	none
Wind Direction	RM Young	AQ05103-5	24819wdr	91054
Wind Speed	RM Young	AQ05103-5	24819wsp	91054
Wind Translator	RM Young	05603BP	none	01175
Zero air pump	Werther International	PC70/4	531380	none

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CHA	467-Eric H	lebert-04/23/2014				
1	4/23/2014	Computer	Gateway	none	Solo	B2509462726
2	4/23/2014	DAS	Environmental Sys Corp	90611	8816	2613
3	4/23/2014	Elevation	Elevation	None	1	None
4	4/23/2014	Filter pack flow pump	Thomas	none	107CAB11A	109500000036
5	4/23/2014	flow rate	Tylan	none	FC280SAV	AW9706014
6	4/23/2014	Infrastructure	Infrastructure	none	none	none
7	4/23/2014	MFC power supply	Tylan	none	RO-32	FP99706005
8	4/23/2014	Modem	US Robotics	09615	56k	unknown
9	4/23/2014	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460007
10	4/23/2014	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450193
11	4/23/2014	Precipitation	Climatronics	none	100508-2	21258-598
12	4/23/2014	Printer	Hewlett Packard	none	5610	Unknown
13	4/23/2014	Relative Humidity	Rotronic	none	MP 601A	56083
14	4/23/2014	Sample Tower	Aluma Tower	03566	A	none
15	4/23/2014	Shelter Temperature	ARS	none	none	none
16	4/23/2014	Siting Criteria	Siting Criteria	None	1	None
17	4/23/2014	Solar Radiation	Licor	none	LI-200	PY6249
18	4/23/2014	Solar Radiation Translator	RM Young	01913	70101-X	none
19	4/23/2014	Temperature	RM Young	none	41342	018535
20	4/23/2014	Wind Direction	RM Young	none	AQ05103-5	110900wdr
21	4/23/2014	Wind Speed	RM Young	none	AQ05103-5	110900wsp
22	4/23/2014	Zero air pump	Werther International	none	PC70/4	000665785

DAS Data Form

DAS Time Max Error: 1.23

Mfg		Serial Nu	mber S	ite	Technician	Site Visit Date	Parameter	Use Desc.
Environment	al Sys	2613		CHA467	Eric Hebert	04/23/2014	DAS	Primary
Das Date: Das Time:	4 /23 15	3/2014 :58:00	Audit Dat Audit Tin	te 4 /23/2014 ne 15:56:46	Mfg	Datel	Parameter	DAS
Das Day:		113	Audit Day	y 113	Serial Number	4000392	Tier Desc.	Source generator (D
Low Chann	el:		High Char	nnel:	Tfer ID	01321		
Avg Diff:	Ma	x Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.002	20	0.0021	0.0	0.0002	Cert Date	2/13/201	2 CorrCoff	1.00000
					Mfg	Fluke	Parameter	DAS
					Serial Number	95740243	Tfer Desc.	DVM
					Tfer ID	01312		
					Slope	1.0000	0 Intercept	0.00000
					Cert Date	12/28/201	3 CorrCoff	1.00000
Channel	Inp	ut D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
2	0	0.0000	0.000	0.00	19 V	V	0.0019	
2	0	0.1000	0.100	0 0.10	19 V	V	0.0019	
2	0	0.3000	0.300	0 0.302	20 V	V	0.0020	
2	0	0.5000	0.500	0 0.502	20 V	V	0.0020	
2	0	0.7000	0.700	0.702	21 V	V	0.0020	
2	0	.9000	0.900	0.902	21 V	V	0.0020	
2	2 1	.0000	1.000	1.002	22 V	V	0.0021	
14	. 0	0.0000	0.000	0.00	00 V	V	0.0000	
14	. 0	0.1000	0.100	0 0.10	00 V	V	0.0000	
14	0	0.3000	0.300	0 0.30	01 V	V	0.0001	
14	0	0.5000	0.500	0.50	02 V	V	0.0001	
14	. 0	0.7000	0.700	0.70	03 V	V	0.0002	
14	. 0	.9000	0.900	0.90	03 V	V	0.0002	
14	- 1	.0000	1.000	1.00)3 V	V	0.0002	

Flow Data Form

Mfg	Serial Nu	mber Ta	Site	Тес	chnician	Site Visit I	Date Para	neter	Owner ID
Tylan	AW97060	14	CHA467	Eri	ic Hebert	04/23/2014	4 flow ra	ate	none
Mfg	Tylan				Mfg BIOS]	Parameter Flow	v Rate
SN/Owner ID	FP99706005	none			Serial Number	131818		Ffer Desc. BIO	S 220-H
Parameter	MFC power su	ipply			Tfer ID	01417			
					Slope	1.	00000 Int	ercept	0.00000
					Cert Date	1/8	8/2014 Co	rrCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero	0.	42	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale	5.	86	
0.15%	0.20%				Rotometer R	eading:	3.	35	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	-0.39	-0.3816	0.02	l/m	l/m	
primary	leak check	0.000	0.000	-0.39	-0.3560	0.03	l/m	l/m	
primary	test pt 1	2.993	2.990	2.36	2.3654	3.00	l/m	l/m	0.20%
primary	test pt 2	3.004	3.000	2.36	2.3654	3.00	l/m	l/m	-0.13%
primary	test pt 3	3.002	3.000	2.36	2.3654	3.00	l/m	l/m	-0.13%
Sensor Comp	onent Leak Te	st		Conditio	n		Statu	s pass	
Sensor Compo	ment Tubing (Condition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Filter Po	sition		Conditio	n Fair		Statu	s pass	
Sensor Comp	onent Rotome	er Conditior	า	Conditio	Clean and dry		Statu	s pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	esent	Statu	s pass	
Sensor Component Filter Distance			Conditio	n 5.5 cm		Statu	s pass		
Sensor Component Filter Depth		Conditio	tion 0.0 cm		Status pass				
Sensor Component Filter Azimuth		Conditio	n 90 deg		Statu	s pass			
Sensor Comp	onent System	Memo		Conditio	n		Statu	s pass	

Ozone Data Form

Mfg	S	erial Number Ta	Site	Te	chnician		Site Visi	t Date	Parame	eter	Owner I	D
ThermoElec	tron Inc	CM08460007	CHA467	Er	ic Hebert	:	04/23/20	014	Ozone		none	
Slope: [Intercept [CorrCoff [1.0 2.2 0.9	Slope:25151Intercept09999CorrCoff	0.00000)))	Mfg Serial N Tfer ID	lumber	ThermoE 49CPS-7 01110	Electron 70008-36	Inc Pa	rameter oz er Desc. Oz	one zone primary	/ stan
DAS 1:		DAS 2:			Slope			1 0070	7 Into	mont [-0.21	032
A Avg % D	oiff: A Ma	x % Di A Avg %	6Dif A Max 9	% Di	Slope		l	1.00701		rcept	-0.21	052
6.9	9%	10.0%			Cert Da	ite		1/8/201	4 Cori	Coff	1.00	0000
UseDesc	cription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	Unit:	PctDif	ference:	
prim	nary	1	0.05	0.2	25	2.4	49	ppb				
prim	nary	2	33.88	33.	.85	37.	.25	ppb			10.04%	
prim	nary	3	52.43	52.	.27	55.	.98	ppb			7.10%	
prim	nary	4	78.27	77.	.92	82.	.20	ppb			5.49%	
prim	nary	5	115.51	114	.90	120	.60	ppb			4.96%	
Sensor Co	omponent	Cell B Noise		Conditio	on 0.6 pr	b			Status	pass		
Sensor Co	omponent	Cell B Tmp.		Conditio	on				Status	pass		
Sensor Co	omponent	Fullscale Voltage		Conditio	on 1.003	5			Status	pass		7
Sensor Co	omponent	Inlet Filter Condition	on	Conditio	on Clear	1			Status	pass		_
Sensor Co	omponent	Line Loss		Conditio	n Not te	ested			Status	pass		_
Someon Co		Offset		Conditio	0.1				Status	naee		
	mponent			Conditio					Status	pass		
Sensor Co	omponent	Span		Conditio	on 1.046				Status	pass		_
Sensor Co	omponent	Cell B Freq.		Conditio	on 75.2 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	omponent	Cell B Pressure		Conditio	on				Status	pass		
Sensor Co	omponent	Cell B Flow		Conditio	on 0.66 l	pm			Status	pass		
Sensor Co	omponent	Cell A Tmp.		Conditio	on 36.1 (2			Status	pass		
Sensor Co	omponent	Cell A Pressure		Conditio	on 623 m	nmHg			Status	pass		
Sensor Co	omponent	Cell A Noise		Conditio	on 0.4 pp	ob			Status	pass		
Sensor Co	omponent	Cell A Freq.		Conditio	on 82.6 k	κHz			Status	pass		7
Sensor Co	omponent	Cell A Flow		Conditio	on 0.70 l	pm			Status	pass		
Sensor Co	omponent	Battery Backup		Conditio	on N/A				Status	pass		
Sensor Co	omponent	Zero Voltage		Conditio	on 0.003	6			Status	pass		

Wind Speed Data Form

Mfg	Seria	al Number	r Ta Site		Tech	nician	Site Visit Date	Parameter	Owner I	D
RM Young	1109	00wsp	CHA4	67	Eric	Hebert	04/23/2014	Wind Speed	none	
					N S T	Ifg erial Number 'fer ID	RM Young CA04013 01253	Paramet	ter wind speed	otor (h
Prop or Cups S	N 6	64415			S	lope	1.0000	00 Intercept	0.00	000
Prop or Cups T Prop Correction	orque	0. 0.0512	.3 to	0.4	C	Cert Date	1/16/201	14 CorrCoff	1.00	000
I Abs Avg Err	DAS 1: Low Ran	ge Hig 0.11 0.15	h Range 1 1.09% [2.12% [DAS 2: Low Range	Hig	gh Range				
UseDescription:	Input	Device	Input RPM	Input m/s	s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	n	one	0	0.20		0.0	0.2		-0.05	
primary	01	253	200	1.02		0.0	1.1		0.08	
primary	01	253	400	2.05		0.0	2.2		0.15	
primary	01	253	800	4.10		0.0	4.3		0.15	
primary	01	253	1200	6.14		0.0	6.3	2.12%		
primary	01	253	2400	12.29		0.0	12.4	0.90%		
primary	01	253	4000	20.48		0.0	20.7	0.93%		
primary	01	253	9400	48.13		0.0	48.3	0.42%		
Sensor Compo	onent Co	ondition		Cond	lition	Good		Status pass		
Sensor Compo	onent Pr	op or Cups	Condition	Cond	lition	Good		Status pass		
Sensor Compo	onent Se	ensor Heate	ər	Cond	lition	N/A		Status pass		
Sensor Compo	onent To	orque		Cond	lition			Status pass		
Sensor Compo	onent Se	ensor Plum	b	Cond	lition	Plumb		Status pass		
Sensor Compo	onent Sy	System Memo			lition	tion Status pass				

Wind Direction Data Form

Mfg	Serial Number Ta	a Site	1	Fechnician		Site Visit	Date Para	meter	Owner ID
RM Young	110900wdr	CHA467		Eric Hebert		04/23/20	14 Wind	Direction	none
				Mfg Serial Nun Tfer ID	nber	RM Youn 01264	g	Parameter V Ffer Desc. V	vind direction
Vane SN: N// VaneTorque	A C. 10 to 12	A. Align. de	e <mark>g. true:</mark> 178						
				Mfg		Ushikata	1	Parameter	vind direction
				Serial Nun	nher	192034	,	Tfer Desc. t	ransit
				Tfer ID	libel	01270			
				Slope			1.00000 In	tercept	0.00000
				Cert Date		1/	30/2014 C o	orrCoff	1.00000
Abs Avg Err	DrientationLinear4.86	ity: O 2.5	rientation	Linearity:					
UseDescription	TferID	Input Raw	Linearity	Output V	Outp	out Deg.	Difference	Change	Error
primary	01264	0		0.0000		0	0	43	-2
primary	01264	45		0.0000		48	3	48	3
primary	01264	90		0.0000		94 140	4	46	1
primary	01264	135		0.0000		190	10	50	5
primary	01264	225		0.0000		228	3	38	-7
primary	01264	270		0.0000		273	3	45	0
primary	01264	315		0.0000		317	2	44	-1
primary	01270	88		0.0000		94	6		6
primary	01270	178		0.0000		180	2		2
primary	01270	358		0.0000		4	5		6
Sensor Compo	nent Torque		Condi	tion		<u> </u>	Statu	Is pass	
Sensor Compo	nent Sensor Plumb		Condi	tion Plumb			Statu	Is pass	
Sensor Compo	nent Sensor Heater		Condi	tion N/A			Statu	is pass	
Sensor Compo	nent Mast		Condi	tion Good			Statu	s pass	
Sensor Compo	nent Condition		Condi	tion Good			Statu	Is pass	
Sensor Compo	nent Vane Condition		Condi	tion Good			Statu	Is pass	
Sensor Compo	ment System Memo		Condi	tion			Statu	s pass	

Temperature Data Form

Mfg	Serial Number Ta	a Site	,	Techni	ician	Site V	isit Date	Param	eter	Owner II)
RM Young	018535	CHA467		Eric H	ebert	04/23	8/2014	Temper	ature	none	
				Mf	g	Eutec	hnics	Pa	nrameter T∈	emperature	
				Ser	rial Number	01D10	02193		er Desc. R	TD translator	
				Tfe	er ID	01231					
DAS 1:	DAS 2	2:		Slope		1.00133 Inte			rcept	-0.057	731
Abs Avg Err	Abs Max Er Abs A	vg Err Abs	Max Er	x Er Cert Date Mfg			12/27/201	3 Cor	rCoff	1.000	000
							hnics	Pa	arameter Temperature		
				Serial Number		01H00	060	Tf	er Desc. R	TD probe	
					er ID	01230)				
				Slo	ope		1.0013	3 Inte	rcept	-0.057	731
				Ce	rt Date		12/27/201	3 Cor	rCoff	1.000	000
0.51	0.61										
UseDesc.	Test type I	nputTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	OutputSig	nalEng	OSE Unit	Difference	
primary	Temp Low Range	0.17	0.23	3	0.0000)	0.8	;	С	0.61	
primary	Temp Mid Range	25.95	25.9	7	0.0000)	26.	5	С	0.56	
primary	Temp High Range	48.21	48.20	0	0.0000)	48.	6	С	0.37	
Sensor Com	ponent Shield		Condi	ition 🖸	Clean			Status	pass]
Sensor Com	ponent Blower		Condi	ition F	Functioning			Status	pass]
Sensor Com	Sensor Component Blower Status Switch			ndition N/A				Status	pass]
Sensor Com	nsor Component System Memo			ondition				Status	pass]

Humidity Data Form

Mfg	Serial Nur	nber Ta Site		Technician		Site Visit D	ate Par	ameter	Owner ID
Rotronic	56083	CHA	467	Eric Hebert	Eric Hebert		Rela	ative Humidity	none
				Mfg		Rotronic		Parameter Rel	ative Humidity
				Serial Nu	mber	75296		Tfer Desc. GT	L
				Tfer ID		01220			
				Slope		1.0	00000	ntercept	0.00000
	DAS 1:		DAS 2:	Cert Date	e	1/5	/2010	CorrCoff	1.00000
	Low Range	High Range	Low Range	High Range	e				
Abs Avg Err	3.3	0.1							
Abs Max Er	3.5	0.1							
UseDesc.	Test type	Device	Input RH	GTL Raw	RH (Corr. DA	S Volts	DAS %RH	Difference
primary	RH Low Range	GTL	32.8	0.0	32	.8 0	.0000	35.9	3.1
primary	RH Low Range	GTL	52.9	0.0	52	.9 0	.0000	56.4	3.5
primary	RH High Range	GTL	93.6	0.0	93	.6 0	.0000	93.5	-0.1
Sensor Com	ponent RH Filter	•	Con	dition Clean			Sta	tus pass	
Sensor Com	ponent Shield		Con	dition Clean			Sta	tus pass	
Sensor Com	Sensor Component Blower Co			ndition Functioning			Sta	tus pass	
Sensor Com	Sensor Component Blower Status Switch Con				idition N/A				
Sensor Com	ponent System I	Con	ondition				tus pass		

Solar Radiation Data Form

Mfg	Serial Numb	er Ta Site	Те	echnician	Site Visit Date	Param	eter Ov	vner ID
Licor	PY6249	CHA467	7 Er	ric Hebert	04/23/2014	Solar R	adiation	ne
Mfg	RM Young			Mfg	RM Young	Pa	arameter solar rac	diation
SN/Owner ID	none	01913		Serial Number		11	er Desc. Or train	
Parameter	Solar Radiation T	ranslator		Tfer ID	01240			
DAS 1:	D	AS 2:		Slope	1.0267	8 Inte	rcept	-16.91000
% Diff of Avg	%Diff of Max %	Diff of Avg %	Diff of Max	Cert Date	6/14/201	4 Corr	rCoff	0.99800
				Mfg	Licor	Pa	arameter solar rac	diation
				Serial Number		Tf	fer Desc. SR trans	sfer sensor
				Tfer ID	01241			
				Slope	1.0267	8 Inte	rcept	-16.91000
				Cert Date	6/14/201	4 Cor	rCoff	0.99800
11.4%	9.5%	0.0%	0.0%					
UseDescription	Measure Date	MeasureTime	Tfer Raw	7 Tfer Cor	r DAS w	/m2	PctDifference	
primary	4/23/2014	10:00	892	885	967		9.2%	
primary	4/23/2014	11:00	975	966	1058	3	9.5%	
primary	4/23/2014	12:00	973	964	1079)	11.9%	
primary	4/23/2014	13:00	947	938	1032	2	10.0%	
primary	4/23/2014	14:00	786	782	917		17.3%	
Sensor Compo	onent Sensor Clea	an	Conditio	on Clean		Status	pass	
Sensor Compo	onent Sensor Lev	el	Conditio	on Level		Status	pass	
Sensor Compo	onent Properly Sit	ed	Conditio	on Properly sited		Status	pass	
Sensor Compo	onent System Me	mo	Conditio	on		Status	pass	

Precipitation Data Form

Mfg	Serial 1	Number Ta	Site	r	Technician		Site	Visit Date	Parame	ter	Owner I	D
Climatronics	21258	598	CHA467		Eric Hebert		04/2	23/2014	Precipita	tion	none	
					Mfg		PMF)	Pa	rameter P	Precipitation	
DAS 1:		DAS 2:			Serial N	umber	EW-	06134-50	Tfe	er Desc. 2	50ml graduat	e
A Avg % Diff 2.0%	A Max % I	A Avg % %	6Dif A	Max % Di	Tfer ID		0125	50				
					Slope			1.0000	0 Inter	cept	0.00	000
					Cert Da	te		9/5/200	5 Corr	Coff	1.00	000
UseDesc.	Test type	TferVolume	Iteration	TimePerTi	ip Eq.Ht	DAS	s eng	Eq.HtUnit	OSE Un	it TferUn	its PctDiffere	nce
primary	test 1	231.5	1	8 sec	5.00	4.	90	mm	mm	ml	-2.0	3%
Sensor Com	ponent Prop	erly Sited		Condi	ition Prope	rly sited			Status	oass		
Sensor Com	ponent Gaug	e Drain Scree	en	Condi	ition Not in:	stalled			Status	Fail		
Sensor Com	ponent Funn	el Clean		Condi	ition Clean				Status	pass		
Sensor Com	ponent Conc	ition		Condi	ition Fair				Status	oass		
Sensor Com	ponent Gaug	e Screen		Condi	ition Not in:	stalled			Status	Fail		
Sensor Com	ponent Gaug	e Clean		Condi	ition Moder	ately cle	an		Status	oass		
Sensor Component Level		Condi	tion Level				Status	pass				
Sensor Com	ponent Sens	or Heater		Condi	ition Functi	oning			Status	pass		
Sensor Com	ponent Syste	m Memo		Condi	ition				Status	oass		

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	CHA467	Eric Hebert	04/23/2014	Shelter Temperatur	e none
DAS 1: Abs Avg Err	DAS 2: Abs Max Er Abs Avg	g Err Abs Max Er	Mfg Serial Number	Eutechnics 01D102193	Parameter SI	nelter Temperatur
0.30	0.53		Tfer ID	01231		
			Slope	1.0013	3 Intercept	-0.05731
			Cert Date	12/27/201	3 CorrCoff	1.00000
			Mfg	Eutechnics	Parameter SI	nelter Temperatur
			Serial Number	01H0060	Tfer Desc. R	TD probe
			Tfer ID	01230		
			Slope	1.0013	3 Intercept	-0.05731
			Cert Date	12/27/201	3 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.39	25.41	0.000	25.2	С	-0.2
primary	Temp Mid Range	25.15	25.17	0.000	25.0	С	-0.17
primary	Temp Mid Range	25.18	25.20	0.000	24.7	С	-0.53

Infrastructure Data For

Site ID	CHA467	Technician Eric He	bert Site Visit Date 04/23/2014
Shelter M	ake	Shelter Model	Shelter Size
Ekto		8810	640 cuft

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

Field Systems Comments

1 Parameter: SiteOpsProcedures

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

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

The shelter is in good condition, clean, well organized, and well maintained.
F-02058-1500-S1-rev002

Site ID CHA467	Technician Eric Hebert	Site Visit Date 04/23	3/2014
Sita Spansor (aganey)	NPS/FPA	USGS Map	Bowie Mountain South
Site Sponsor (agency)		Man Scale	
Operating Group	NPS	Map Scale	
AQS #	04-003-8001	Map Date	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, neph, IMPROVE	QAPP Latitude	
Deposition Measurement	dry, wet	QAPP Longitude	
Land Use	desert range, woodland - mixed	QAPP Elevation Meters	
Terrain	complex	QAPP Declination	
Conforms to MLM	No	QAPP Declination Date	
Site Telephone	(520) 824-4182	Audit Latitude	32.009405
Site Address 1	13063 East Bontia Canyon Road	Audit Longitude	-109.389058
Site Address 2		Audit Elevation	1569
County	Cochise	Audit Declination	9.6
City, State	Wilcox, AZ	Present	
Zip Code	85632	Fire Extinguisher 🔽	March 2014
Time Zone	Mountain	First Aid Kit	
Primary Operator		Safety Glasses	
Primary Op. Phone #		Safety Hard Hat	
Primary Op. E-mail		Climbing Belt	
Backup Operator		Security Fence	
Backup Op. Phone #		Secure Shelter	
Backup Op. E-mail		Stable Entry Step 🔽	
Shelter Working Room ✓	Make Ekto M	odel 8810	Shelter Size640 cuft
Shelter Clean	Notes The shelter is in good condition	n, clean, well organized, and we	ell maintained.
Site OK	Notes		
Driving Directions From appro	I-10 take exit 344 (Wilcox AZ). Continue ximately 30 miles and turn left at route 18 iles to park entrance. The site is just before the site is such that that that that that that that th	south on route 186 from Wilcox 1 (follow sign for Chiricahua Na ore the fee both on the north sic	to Chiricahua National Monument, tional Monument). Continue another le of the road about 150 meters.

CHA467

F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 04/23/2014

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

Siting Distances OK

Siting Criteria Comment

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

Fi	eld Systems Data Form	F-02058-1500-S3-rev002
Site	CHA467 Technician Eric Hebert	Site Visit Date 04/23/2014
1 2	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions? Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	
3	Are the tower and sensors plumb?	
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	Above shelter
6	Is the solar radiation sensor plumb?	
7	Is it sited to avoid shading, or any artificial or reflected light?	
8	Is the rain gauge plumb?	
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	
10	Is the surface wetness sensor sited with the grid surface facing north?	✓ N/A
11	Is it inclined approximately 30 degrees?	✓ N/A

F-02058-1500-S4-rev002

Site	e ID	CHA467	Technician E	Eric Hebert		Site Visit Date	04/23/2014	
1	Do all th condition	e meterological senso n, and well maintained	rs appear to be i 1?	ntact, in good				
2	Are all t reportin	he meteorological sens g data?	sors operational	online, and				
3	Are the	shields for the tempera	ature and RH se	msors clean?				
4	4 Are the aspirated motors working?							
5	Is the so scratche	lar radiation sensor's s?	lens clean and fr	ree of				
6	Is the su	rface wetness sensor g	rid clean and ur	ndamaged?		N/A		
7	Are the s	sensor signal and pow n, and well maintained	er cables intact, 1?	in good				
8	Are the s from the	sensor signal and powe	er cable connect hintained?	ions protected				
					_			

Fi	eld Sy	stems Data F	orm		F-02058-1500-S5-rev002
Site	e ID	CHA467	Technician Eric Hebert		Site Visit Date 04/23/2014
	Siting C	Criteria: Are the pollu	tant analyzers and deposition	<u>n equipn</u>	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the sunrestri	sample inlets have at licted airflow?	east a 270 degree arc of	✓	
2	Are the	sample inlets 3 - 15 n	eters above the ground?	✓	
3	Are the and 20 m	sample inlets > 1 met meters from trees?	er from any major obstructio	0 n , 🗹	
	<u>Pollutar</u>	nt analyzers and depo	sition equipment operations	and mai	ntenance
1	Do the a condition	analyzers and equipm on and well maintaine	ent appear to be in good d?		
2	Are the reportin	analyzers and monitong data?	ors operational, on-line, and		
3	Describ	e ozone sample tube.			1/4 teflon by 15 meters
4	Describ	e dry dep sample tub	2.		3/8 teflon by 12 meters
5	Are in-l indicate	line filters used in the e location)	ozone sample line? (if yes		At inlet only
6	Are san obstruc	nple lines clean, free o tions?	f kinks, moisture, and	\checkmark	
7	Is the ze	ero air supply desicca	nt unsaturated?		
8	Are the	re moisture traps in t	he sample lines?		
9	Is there clean?	a rotometer in the dr	y deposition filter line, and is	s it 🔽	Clean and dry

Fi	eld Sy	stems Data Fo	orm				F-02	2058-15	00-S6-rev002
Site	e ID	CHA467	Technician	Eric Hebert		Site Visit Date	04/23/2014	ł	
	DAS, sei	nsor translators, and p	peripheral equi	pment operation	ns ai	<u>nd maintenance</u>			
1	Do the D well mai	AS instruments appeantained?	ar to be in good	condition and	✓				
2	Are all t modem,	he components of the backup, etc)	DAS operation	al? (printers,	✓				
3	Do the a lightning	nalyzer and sensor sig g protection circuitry?	gnal leads pass (hrough	✓	Met sensors only			
4	Are the swell mai	signal connections pro ntained?	tected 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 j	properly	✓				
7	Does the	instrument shelter ha	ave a stable pow	ver source?	✓				
8	Is the in	strument shelter temp	erature control	led?					
9	Is the m	et tower stable and gro	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	grounded?						
11	Tower c	omments?				towers bolted to she	elter		

Field	l Systems Data	For	m				F-02	058-1	500-S7-rev002
Site ID	CHA467		Tech	nician	Eric Hebert	Site Visit Date	e 04/23/2014]
Досі	imentation								
Does	the site have the requir	ed inst	trume	nt and	equinment manuals	2			
Ducs	the site have the require	Ves	No	N/A	<u>equipment manuals</u>	<u>.</u>	Ves	No	N/A
Wind s	peed sensor				Data logg	ger			
Wind d	- lirection sensor				Data logg	ger			
Temper	rature sensor	\checkmark			Strip cha	rt recorder			
Relativ	e humidity sensor				Compute	r			
Solar ra	adiation sensor	\checkmark			Modem				
Surface	e wetness sensor			\checkmark	Printer				\checkmark
Wind s	ensor translator	\checkmark			Zero air p	pump			
Temper	rature translator	\checkmark			Filter flov	w pump		\checkmark	
Humidi	ity sensor translator			\checkmark	Surge pro	otector			\checkmark
Solar ra	adiation translator				UPS				\checkmark
Tipping	g bucket rain gauge	\checkmark			Lightning	g protection devic	e 🗌		\checkmark
Ozone a	analyzer	\checkmark			Shelter he	eater			
Filter p	ack flow controller	\checkmark			Shelter ai	ir conditioner	\checkmark		
- Filter p	ack MFC power supply								
Do	es the site have the requi	ired ar	ıd mo	st recei	nt OC documents and	d report forms?			
		Prese	nt				Currer	nt	
Station	Log			Dotovio					
SSRF				Datavie	~~~				
Site On	s Manual								
HASP									
Field O	os Manual								
Calibra	tion Reports								
Ozone z	z/s/p Control Charts								
Prevent	tive maintenance schedu								
			-						
1 Is	the station log properly	compl	eted d	luring e	every site visit? 🔽	Dataview			
2 Ar cu	e the Site Status Report rrent?	Form	s bein	g comp	oleted and 🗹	Flow & observatior	n sections		
3 Ar sat	e the chain-of-custody for mple transfer to and from	orms p m lab?	oropei ?	rly used	l to document 🗹				
4 Ar cu	e ozone z/s/p control cha rrent?	arts pr	operly	y comp	leted and	Control charts not	used		
Provide natural	e any additional explana or man-made, that may	tion (p affect	bhotog t the n	graph of nonitor	r sketch if necessary) regarding condi	itions listed a	bove, or	any other features,

CHA467 Technician Eric Hebert Site Visit Date 04/23/2014 Site ID Site operation procedures Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark 4 Are the standard CASTNET operational procedures being flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

QC Check Performed

Frequency

Multipoint Calibrations	\checkmark	Semiannually
Visual Inspections	\checkmark	Weekly
Translator Zero/Span Tests (climatronics)		N/A
Manual Rain Gauge Test	\checkmark	Monthly
Confirm Reasonableness of Current Values	\checkmark	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	Compliant
Monthly and semiannually	
Daily	
Every 2 weeks	
Daily	
Monthly	
Every 2 weeks	
N/A	
Weekly	

- Do multi-point calibration gases go through the complete 1 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?

✓	
✓	
✓	Dataview

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

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

F-02058-1500-S8-rev002

Compliant

✓

✓

✓

✓

✓

 \checkmark

Site ID CHA467 Technician Eric Hebert Site Visit Date 04/23/2014 Site operation procedures 1 Is the filter pack being changed every Tuesday as scheduled? ✓	
Site operation procedures 1 Is the filter pack being changed every Tuesday as scheduled? ✓ Filter changed morinings	
1 Is the filter pack being changed every Tuesday as scheduled? ✓ Filter changed morinings	
2 Are the Site Status Report Forms being completed and filed ✓ correctly?	
3 Are data downloads and backups being performed as scheduled?	
4 Are general observations being made and recorded? How? ✓ Dataview and SSRF	
5 Are site supplies on-hand and replenished in a timely fashion?	
6 Are sample flow rates recorded? How?	
7 Are samples sent to the lab on a regular schedule in a timely fashion?	
8 Are filters protected from contamination during handling and shipping? How? ✓ Clean gloves on and off	
9 Are the site conditions reported regularly to the field operations manager or staff?	
QC Check Performed Frequency Compliant	
Multi-point MFC Calibrations	
Flow System Leak Checks Veekly	
Filter Pack Inspection	
Flow Rate Setting Checks Image: Weekly	
Visual Check of Flow Rate Rotometer 🗹 Weekly	
In-line Filter Inspection/Replacement 🗹 Semiannually	
Sample Line Check for Dirt/Water	

CHA467

F-02058-1500-S10-rev002

Site ID

Technician Eric Hebert

Site Visit Date 04/23/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Gateway	Solo	B2509462726	none
DAS	Environmental Sys Corp	8816	2613	90611
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB11A	10950000036	none
flow rate	Tylan	FC280SAV	AW9706014	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP99706005	none
Modem	US Robotics	56k	unknown	09615
Ozone	ThermoElectron Inc	49i A3NAA	CM08460007	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1130450193	none
Precipitation	Climatronics	100508-2	21258-598	none
Printer	Hewlett Packard	5610	Unknown	none
Relative Humidity	Rotronic	MP 601A	56083	none
Sample Tower	Aluma Tower	A	none	03566
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Solar Radiation	Licor	LI-200	PY6249	none
Solar Radiation Translator	RM Young	70101-X	none	01913
Temperature	RM Young	41342	018535	none
Wind Direction	RM Young	AQ05103-5	110900wdr	none
Wind Speed	RM Young	AQ05103-5	110900wsp	none
Zero air pump	Werther International	PC70/4	000665785	none

Site Inventory by Site Visit

Site \	Site Visit Date Parameter		Mfg	Owner ID	Model Number	Serial Number
JOT4	403-Eric H	ebert-04/28/2014				
1	4/28/2014	Computer	Hewlett Packard	none	8460p	CNU1360668
2	4/28/2014	DAS	Environmental Sys Corp	90599	8816	2271
3	4/28/2014	Elevation	Elevation	None	1	None
4	4/28/2014	Filter pack flow pump	Thomas	none	107CAB11A	10950000033
5	4/28/2014	flow rate	Tylan	03378	FC280AV	AW9403016
6	4/28/2014	Infrastructure	Infrastructure	none	none	none
7	4/28/2014	MFC power supply	Tylan	03683	RO-32	FP9403017
8	4/28/2014	Modem	US Robotics	none	56k	unknown
9	4/28/2014	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460006
10	4/28/2014	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450191
11	4/28/2014	Precipitation	Climatronics	01498	100508-2	illegible
12	4/28/2014	Relative Humidity	Rotronic	none	MP601	52061
13	4/28/2014	Sample Tower	Aluma Tower	923310	В	none
14	4/28/2014	Shelter Temperature	ARS	none	none	none
15	4/28/2014	Siting Criteria	Siting Criteria	None	1	None
16	4/28/2014	Solar Radiation	Licor	02221	LI-200	PY59533
17	4/28/2014	Solar Radiation Translator	RM Young	none	70101-X	none
18	4/28/2014	Temperature	RM Young	none	41342	14960
19	4/28/2014	Wind Direction	RM Young	90893	AQ05103-5	47104wdr
20	4/28/2014	Wind Speed	RM Young	90893	AQ05103-5	47104wsp
21	4/28/2014	Zero air pump	Werther International	none	PC70/4	606491

DAS Data Form

1.67 DAS Time Max Error: _

Mfg		Serial Nu	mber Site	1	Fechnician	Site Visit Date	Parameter	Use Desc.
Environment	al Sys	2271	JOT	Г403	Eric Hebert	04/28/2014	DAS	Primary
Das Date: Das Time: Das Day:	4 /28 8	8/2014 3:58:00 118	Audit Date Audit Time Audit Day	4 /28/2014 8:56:20 118	Mfg Serial Number	Datel 4000392	Parameter Tfer Desc.	DAS Source generator (D
Low Chann	el:		High Channe	d:	Tfer ID	01321		
Avg Diff:	Ma	x Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.000	02	0.0004	0.0002	0.0004	Cert Date	2/13/201	2 CorrCoff	1.00000
					Mfg	Fluke	Parameter	DAS
					Serial Number	95740243	Tfer Desc.	DVM
					Tfer ID	01312		
					Slope	1.0000	0 Intercept	0.00000
					Cert Date	12/28/201	3 CorrCoff	1.00000
Channel	Inp	out D'	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
2	2 (0.0000	0.0000	0.0000) V	V	0.0000	
2	2 (0.1000	0.1000	0.1000) V	V	0.0000	
2	2 0	0.3000	0.3000	0.3001	V	V	0.0001	
2	2 0	0.5000	0.5000	0.5002	2 V	V	0.0002	
2	2 (0.7000	0.7001	0.7003	B V	V	0.0002	
2	2 ().9000	0.9001	0.9004	V V	V	0.0003	
2	2 1	1.0000	1.0001	1.0005	5 V	V	0.0004	
9) (0.0000	0.0000	0.0000) V	V	0.0000	
9) (0.1000	0.1000	0.1000) V	V	0.0000	
9) (0.3000	0.3000	0.3001	V	V	0.0001	
9) (0.5000	0.5000	0.5002	2 V	V	0.0002	
9) (0.7000	0.7001	0.7004	l V	V	0.0003	
9) (0.9000	0.9001	0.9004	l V	V	0.0003	
9) 1	1.0000	1.0001	1.0005	5 V	V	0.0004	

Flow Data Form

Mfg	Serial Nun	nber Tag S	Site	Тес	chnician	Site Visit	Date Paran	neter	Owner ID
Tylan	AW940301	16	JOT403	Eri	ic Hebert	04/28/201	4 flow ra	ite	03378
Mfg	Tylan				Mfg	BIOS	F	Parameter Flo	w Rate
SN/Owner ID	FP9403017	03683			Serial Number	131818	Tfer Desc. BIOS 220-H		
Parameter	MFC power sup	oply			Tfer ID	01417			
					Slope	1	.00000 Int	ercept	0.00000
					Cert Date	1/	/8/2014 Co	rrCoff	1.00000
DAS 1:		DAS 2:		_	Cal Factor Z	ero	0.	05	
A Avg % Diff:	A Max % Di	A Avg %l	Dif A Max	% Di	Cal Factor F	ull Scale	5.	38	
1.96%	1.96%				Rotometer R	eading:	3	8.1	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignal	PctDifference
primary	pump off	0.000	0.000	-0.06	-0.0245	0.02	l/m	l/m	
primary	leak check	0.000	0.000	-0.06	-0.0251	0.02	l/m	l/m	
primary	test pt 1	3.060	3.060	3.03	2.7681	3.00	l/m	l/m	-1.96%
primary	test pt 2	3.063	3.060	3.03	2.7681	3.00	l/m	l/m	-1.96%
primary	test pt 3	3.059	3.060	3.03	2.7681	3.00	l/m	l/m	-1.96%
Sensor Comp	onent Leak Tes	t		Conditio	n		Statu	s pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Fair		Statu	s pass	
Sensor Comp	onent Rotomete	er Condition	1	Conditio	Clean and dry		Statu	s pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	resent	Statu	s pass	
Sensor Comp	onent Filter Dist	tance		Conditio	n 3.5 cm		Statu	s pass	
Sensor Comp	onent Filter Dep	oth		Conditio	0.0 cm		Statu	s pass	
Sensor Comp	onent Filter Azi	muth		Conditio	n 180 deg		Statu	s pass	
Sensor Comp	onent System N	/lemo		Conditio	n		Statu	s pass	

Ozone Data Form

Mfg	5	Serial Number Ta	Site	Te	chnician		Site Visi	it Date	Parame	eter	Owner I	D
ThermoElec	tron Inc	CM08460006	JOT403	Er	ric Heber	t	04/28/2014		Ozone		none	
Slope: [Intercept [CorrCoff [0.98081 Slope: 0.000 t 1.06586 Intercept 0.000 f 1.00000 CorrCoff 0.000			00 Mfg 00 Serial Number 00 Tfer ID			ThermoElectron IncPa49CPS-70008-364Tf01110			rameter 02 er Desc. 0	zone zone primary	/ stan
DAS 1:		DAS 2:			Slone			1 0070	7 Inton	t	-0.21	032
A Avg % D	oiff: A M	ax % Di A Avg %	6 Dif A Max	% Di	Slope			1.0070	/ Inter	cept	-0.21	032
0.7	7%	1.3%			Cert Da	nte		1/8/201	4 Corr	Coff	1.00	000
UseDesc	cription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	e Unit:	PctDif	fference:	
prin	nary	1	0.08	0.2	28	1.2	26	ppb				
prin	nary	2	35.38	35.	.34	35.	.79	ppb			1.27%	
prin	nary	3	54.57	54.	.39	54.	.43	ppb			0.07%	
prin	nary	4	82.45	82.	.08	81.	.66	ppb			-0.51%	
prin	nary	5	118.21	117	7.58	116	.30	ppb			-1.09%	
Sensor Co	omponen	t Cell B Noise		Conditio	on 1.0 p	b			Status	pass		
Sensor Co	omponen	t Cell B Tmp.		Conditio	on				Status	pass		
Sensor Co	omponen	t Fullscale Voltage		Conditio	on 10.00	14			Status	pass		
Sensor Co	omponen	t Inlet Filter Condition	วท	Conditio	on Clear	1			Status	pass		7
Sensor Co	omponen	t Line Loss		Conditio	on Not te	ested			Status	pass		
Sensor Co	omponen	t Offset		Conditio	on -0.8				Status	pass		
Sensor Co	omponen	t Span		Conditio	on 1.001				Status	pass		
Sensor Co	omponen	t Cell B Freq.		Conditio	on 86.7 I	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 0.70 I	pm			Status	pass		
Sensor Co	omponen	t Cell A Tmp.		Conditio	on 32.1 (2			Status	pass		
Sensor Co	omponen	t Cell A Pressure		Conditio	on 654 n	nmHg			Status	pass		
Sensor Co	omponen	t Cell A Noise		Conditio	on 0.6 p	b			Status	pass		
Sensor Co	omponen	t Cell A Freq.		Conditio	on 90.1 l	κHz			Status	pass		
Sensor Co	omponen	t Cell A Flow		Conditio	on 0.72	pm			Status	pass		
Sensor Co	omponen	t Battery Backup		Conditio	on N/A				Status	pass		
Sensor Co	omponen	t Zero Voltage		Conditio	on -0.00	03			Status	pass		

Wind Speed Data Form

Mfg	S	erial Numb	er Tag Site	Те	chnician	Site Visit Date	Parameter	Owner ID
RM Young	4	7104wsp	JOT403	B EI	ric Hebert	04/28/2014	Wind Speed	90893
					Mfg Serial Number	RM Young CA04013	Paramet Tfer Des	er wind speed c. wind speed motor (h
					Tfer ID	01253		
Prop or Cups S	SN	63812			Slope	1.0000	00 Intercept	0.00000
Prop or Cups 7	Forque	•	0.5 to	0.5	Cert Date	1/16/20	14 CorrCoff	1.00000
Prop Correctio	n Fact	to 0.512			Cert Date	1110/20	Correon	
1	DAS 1	:	D	DAS 2:				
]	Low R	ange Hi	igh Range L	low Range H	ligh Range			
Abs Avg Err		0.05	0.00%					
Abs Max Er		0.20	0.00%					
UseDescription	: In	put Device	Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff WsN
primary		none	0	0.20	0.0	0.0		-0.20
primary		01253	200	1.02	0.0	1.0		0.00
primary		01253	400	2.05	0.0	2.1		0.00
primary		01253	800	4.10	0.0	4.1		0.00
primary		01253	1200	6.14	0.0	6.1	0.00%	
primary		01253	2400	12.29	0.0	12.3	0.00%	
primary		01253	4000	20.48	0.0	20.5	0.00%	
primary		01253	9400	48.13	0.0	48.1	0.00%	
Sensor Comp	onent	Condition		Condition	on Good		Status pass	
Sensor Comp	onent	Prop or Cu	os Condition	Conditie	on Good		Status pass	
Sensor Comp	onent	Sensor Hea	ater	Condition	on N/A		Status pass	
Sensor Comp	onent	Torque		Condition	on Fair		Status pass	
Sensor Comp	onent	Sensor Plu	mb	Condition	on Plumb		Status pass	
Sensor Comp	onent	System Me	mo	Condition	on		Status pass	

Wind Direction Data Form

Mfg	fg Serial Number Tag Site			Technician			Date Parar	neter	Owner ID	
RM Young	47104wdr	JOT403		Eric Hebert		04/28/20	14 Wind	Direction	90893	
				Mfg Serial Nun Tfer ID	nber	RM Young 01264	g I	Parameter W	vind direction	
Vane SN: N VaneTorque	A 15 to 18	C. A. Align. d	eg. true: 360							
				Mfg		Ushikata	I	Parameter W	ind direction	
				Serial Nun	nber	192034]	fer Desc. tr	ansit	
				Tfer ID		01270				
				Slope			1.00000 Int	ercept	0.00000	
				Cert Date		1/	30/2014 Co	rrCoff	1.00000	
Abs Avg Err Abs Max Er UseDescription primary primary	Drientation Line 1.0	A constraints of the second se	Linearity	Linearity:	Outŗ	out Deg. 0 44	Difference 0	Change 41 44	Error -4 -1	
primary	01264	90		0.0000		88	2	44	-1	
primary primary primary	01264 01264 01264	135 180 225		0.0000 0.0000 0.0000		134 179 229	1 1 4	46 45 50	1 0 5	
primary	01264	270		0.0000		274	4	45	0	
primary primary	01264 01270	315 71		0.0000		319 73	4	45	0 2	
primary	01270	169		0.0000		170	1		1	
primary	01270	180		0.0000		179	1		1	
primary	01270	360		0.0000		0	0		0	
Sensor Comp	onent lorque		Cond	lition Good			Statu	s pass		
Sensor Comp	onent Sensor Plum)		lition Plumb			Statu	s pass		
Sensor Comp	onent Sensor Heate	er	Cond	lition N/A			Statu	s pass		
Sensor Comp	onent Mast		Cond	lition Good			Statu	s pass		
Sensor Comp	onent Condition		Cond	lition Good			Statu	s pass		
Sensor Component Vane Condition				Condition Good			Statu	tus pass		
Sensor Comp	onent System Memo	Cond	Condition				IS pass			

Temperature Data Form

Mfg	Serial Num	ber Tag	Site		Tech	nician	Site V	Visit Date Param		eter	Owner ID
RM Young	14960		JOT403		Eric	Hebert	04/28	3/2014	Temper	ature	none
					N	Ifg	Eutec	hnics	Ра	rameter Te	emperature
					S	erial Number	01D10	02193	Tf	er Desc. R	TD translator
					Т	fer ID	01231]		
DAS 1:		DAS 2:			S	Slope		1.0013	3 Inte	rcept	-0.05731
Abs Avg Err	Abs Max Er	Abs Avg	Err Ab	s Max F	Er C	ert Date		12/27/201	3 Cor	rCoff	1.00000
					N	lfg	Eutec	hnics	Pa	rameter	emperature
					Serial Number Tfer ID		01H00	060	Tf	er Desc. R	TD probe
							01230)			
					S	Slope		1.00133 Int		rcept	-0.05731
					C	ert Date		12/27/201	3 Cor	rCoff	1.00000
0.12	0.14										
UseDesc.	Test type	Inpu	ıtTmpRav	/ Inpuť	TmpCorr	. OutputTmp	Signal	OutputSig	nalEng	OSE Unit	Difference
primary	Temp Low Range		0.03		0.09	0.0000)	0.2	2	С	0.13
primary	Temp Mid Range		26.20	2	26.22	0.000)	26.	1	С	-0.1
primary	Temp High Range	e	47.17	4	7.16	0.0000)	47.	0	С	-0.14
Sensor Com	ponent Shield			C	ondition	Clean			Status	pass	
Sensor Com	ponent Blower			C	ondition	Functioning			Status	pass	
Sensor Component Blower Status Switch				C	Condition N/A				Status	pass	
Sensor Component System Memo				C	Condition				Status	pass	

Humidity Data Form

Mfg	g Serial Number Tag Site				Technician Site V			it Date	Param	eter	Owner ID	
Rotronic	52061		JOT403		Eric Hebert		04/28/2	014	Relative	e Humidity	none	
					Mfg Serial Nu	mber	Rotronic 75296		Pa T	arameter Re fer Desc. G1	lative Humidity	
					Tfer ID		01220]			
					Slope			1.0000	D Inte	rcept	0.00000	
	DAS 1:		DAS 2	:	Cert Date	e		1/5/201	0 Cor	rCoff	1.00000	
	Low Range:	High Rang	ge Low F	lange:	High Range	è						
Abs Avg Err	1.8	ę	5.0									
Abs Max Er	2.5		5.0									
UseDesc.	Test type	Device	e Input	RH	GTL Raw	RH (Corr.	DAS V	olts	DAS %RH	Difference	
primary	RH Low Range	GTL	32	.8	0.0	32	2.8	0.000	0	35.3	2.5	
primary	RH Low Range	GTL	52	.9	0.0	52	2.9	0.000	0	53.9	1.0	
primary	RH High Range	GTL	93	.6	0.0	93	.6	0.000	0	88.6	-5.0	
Sensor Com	ponent RH Filter	ſ		Conc	dition Clean				Status	pass		
Sensor Com	ponent Shield			Conc	dition Clean				Status	pass		
Sensor Com	ponent Blower			Conc	lition Function	ning			Status	pass		
Sensor Component Blower Status Switch				Condition N/A Status pass								
Sensor Component System Memo				Conc	Condition				Status	pass		

Solar Radiation Data Form

Mfg	Serial Number Tag Site			Techi	echnician Site Visit Date		Paramo	eter	Owner I	D	
Licor	PY59533		JOT403		Eric I	Hebert	04/28/2014	Solar R	adiation	02221	
Mfg	RM Young				Μ	lfg	RM Young	Pa	rameters	olar radiation	
SN/Owner ID	none	none			Se	erial Number		Tf	er Desc. S	R transfer tra	anslat
Parameter	Solar Radiatior	n Translator			Tí	fer ID	01240				
DAS 1:		DAS 2:			SI	ope	1.0267	8 Inte	rcept	-16.91	000
% Diff of Avg	%Diff of Max	%Diff of A	Avg %I	Diff of Max	C	ert Date	6/14/201	4 Corr	rCoff	0.99	9800
					Μ	ſg	Licor	Pa	rameter so	plar radiation	
					Se	erial Number		Tf	er Desc. S	R transfer se	ensor
					Tí	fer ID	01241				
					SI	оре	1.0267	8 Inte	rcept	-16.91	000
					C	ert Date	6/14/201	4 Cor	rCoff	0.99	9800
6.7%	7.1%	0	.0%	0.0%							
UseDescription	Measure Da	te Meası	ureTime	Tfer R	aw	Tfer Corr	DAS w	/m2	PctDiffer	ence	
primary	4/28/2014	1(0:00	911		904	968			7.0%	
primary	4/28/2014	11	1:00	959		950	1017	7		7.1%	
primary	4/28/2014	12	2:00	942		934	1000)		7.1%	
primary	4/28/2014	13	3:00	861		855	904			5.7%	
Sensor Comp	onent Sensor C	lean		Cond	ition	Clean		Status	pass]
Sensor Comp	onent Sensor L	evel		Cond	ition	1/2 bubble off I	evel	Status	pass		
Sensor Comp	onent Properly	Sited		Cond	ition	Properly sited		Status	pass		
Sensor Comp	onent System M	Nemo		Cond	ition			Status	pass		

Precipitation Data Form

Mfg	Serial Number Tag Site					Fechnician Site Visit Date			Visit Date	Parame	eter		Owner ID)
Climatronics	illegible	e	JOT403		Er	ic Hebert		04/2	28/2014	Precipita	atior	า	01498	
						Mfg		PMF)	Pa	ran	neter Pre	ecipitation	
DAS 1:		DAS 2:				Serial Num	ıber	EW-	06134-50	Tf	er I)esc. 250	Oml graduate	
A Avg % Diff	f: A Max % I	Di A Avg %	bif A I	Max % Di	1	Tfer ID		012	50					
8.0%	8.0	J%				Slope			1.0000	0 Inter	rcep	ot	0.000	00
						Cert Date			9/5/200	5 Corr	rCo	ff	1.000	00
UseDesc.	Test type	TferVolume	Iteration	TimePerT	ip	Eq.Ht	DAS	s eng	Eq.HtUnit	OSE Un	nit 🛛	ΓferUnits	s PctDifferen	ce
primary	test 1	231.5	1	8 -10 see	с	5.00	4.	60	mm	mm		ml	-8.09	%
primary	test 2	231.5	2	8 - 10 se	c	5.00	4.	60	mm	mm		ml	-8.09	%
Sensor Con	nponent Prop	erly Sited		Cond	litio	n 45 degree	e rule			Status	Fail	l		
Sensor Con	nponent Gaug	ge Drain Scree	en	Cond	litio	Not instal	led			Status	Fail	I		
Sensor Con	nponent Funn	el Clean		Cond	litio	Clean				Status	pas	s		
Sensor Con	nponent Conc	lition		Cond	litio	Good				Status	pas	s		
Sensor Con	nponent Gaug	ge Screen		Cond	litio	n Installed				Status	pas	s		
Sensor Component Gauge Clean				Cond	litio	Clean				Status	pas	s		
Sensor Con	nponent Leve	I		Cond	litio	Dn Level				Status	pas	s		
Sensor Con	nponent Sens	or Heater		Cond	litio	Functioni	ng			Status	pas	s		
Sensor Component System Memo					litio	on				Status	pas	s		

Shelter Temperature Data For

Mfg	Serial Nun	nber Tag	Site		Technician	Site Visit Date	Parameter	Owner ID
ARS	none		JOT4	103	Eric Hebert	04/28/2014	Shelter Tempera	ture none
ARS DAS 1: Abs Avg Err A 0.35	hone	DAS 2: Abs Avg	Err	Abs Max Er	Eric Hebert Mfg Serial Number Tfer ID Slope Cert Date Mfg Serial Number Tfer ID Slope	04/28/2014 Eutechnics 01D102193 01231 1.0013 12/27/201 Eutechnics 01H0060 01230 1.0013	Shelter Tempera Parameter Tfer Desc. Intercept CorrCoff Parameter Tfer Desc. Intercept Intercept Intercept Intercept Intercept Intercept	Shelter Temperatur RTD translator -0.05731 1.00000 Shelter Temperatur RTD probe -0.05731
					Cert Date	12/27/201	3 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.77	22.80	0.000	23.0	С	0.19
primary	Temp Mid Range	22.54	22.57	0.000	23.1	С	0.49
primary	Temp Mid Range	23.19	23.22	0.000	23.6	С	0.37

Infrastructure Data For

Site	e ID JOT403	Technicia Eric He	bert Site Visit Date 04/28/2014
	Shelter Make	Shelter Model	Shelter Size
-	ShelterOne	E8129-28036	768 cuft
929-			

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

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The shelter is only a few years old and is in good condition, clean and well organized.

F-02058-1500-S1-rev002

Site ID	JOT403		Technician Eric He	ebert	Site	e Visit I	Date 04/2	8/2014		
Site Sponsor	(agency)	NPS/EP/	4		USGS Maj	p		Yucca valley So	buth	
Operating G	roup	NPS			Map Scale					
AQS #		06-071-9	002		Map Date					
Meteorologic	al Type	RM Your	ng							
Air Pollutant	Analyzer	Ozone, I	MPROVE	QAPP Latitude			34.0714			
Deposition M	leasuremen	t dry, wet		QAPP Lon	igitude		-116.3906			
Land Use		desert			QAPP Elev	vation 1	Meters	1244		
Terrain		complex			QAPP Dec	linatio	n			
Conforms to	MLM	No		QAPP Dec	linatio	n Date				
Site Telephor	ne	(760) 22	3-1927	Audit Latitude			34.069569			
Site Address	1				Audit Long	Audit Longitude			-11	6.388933
Site Address	2				Audit Elev	ation				1243
County		San Berr	nardino		Audit Decl	ination	L	12		
City, State		Yacca Va	alley, CA]	Present			
Zip Code		92284		Fire Extinguisher 🗹			Inspected March	2014 ו		
Time Zone		Pacific			First Aid F	Kit				
Primary Ope	erator				Safety Gla	sses				
Primary Op.	Phone #				Safety Har	d Hat				
Primary Op.	E-mail				Climbing I	Belt				
Backup Oper	rator				Security F	ence				
Backup Op.	Phone #				Secure She	elter				
Backup Op.	E-mail				Stable Ent	ry Step				
Shelter Work	king Room	Make	ShelterOne	Μ	odel E8129	-28036		Shelter Size	768 cuft	
Shelter Clean Notes The shelter is only a few year			ars old and is in good condition, clean and well organized.							
Site OK		Notes								
Driving Direc	Driving Directions At the intersection of route 62 and route 247 in Yucca Valley, take Joshua Lane south (route 247). Follow the signs for Joshua Tree National Monument. The site is up the dirt road through the locked gate (cable) toward the water tower. (gate lock = 1123 shelter lock = 5570)									

JOT403

F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 04/28/2014

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

Siting Distances OK 🗹 Siting Criteria Comment

F-02058-1500-S3-rev002

Site	ID	JOT403	Technician E	ric Hebert		Site Visit Date 04/28/2014
1	Are wind being inf	d speed and direction fluenced by obstructio	sensors sited so a ns?	is to avoid		
2	Are wind (i.e. wind horizont tower in	d sensors mounted so a l sensors should be mo ally extended boom >2 to the prevailing wind	as to minimize to ounted atop the t 2x the max diam)	ower effects? cower or on a eter of the		
3	Are the	tower and sensors plu	mb?		✓	
4	Are the avoid ra	temperature shields po diated heat sources su	ointed north or p ch as buildings,	ositioned to walls, etc?	✓	
5	Are temp condition surface a standing	perature and RH sens ns? (i.e. ground below and not steeply sloped water should be avoid	ors sited to avoic sensors should b . Ridges, hollows ded)	l unnatural be natural , and areas of		
6	Is the so	lar radiation sensor pl	lumb?		✓	
7	Is it sited	l to avoid shading, or	any artificial or	reflected light?	✓	
8	Is the ra	in gauge plumb?			✓	1/2 bubble off level
9	Is it sited towers, e	l to avoid sheltering et etc?	ffects from build	ings, trees,	✓	45 degree rule violation
10	Is the su facing no	rface wetness sensor s orth?	ited with the grid	d surface	✓	N/A
11	Is it incl	ined approximately 3	0 degrees?		✓	N/A
D				1 (1 *0		

F-02058-1500-S4-rev002

Site	e ID	JOT403	Technician	Eric Hebert		Site Visit Date	04/28/2014	
1 2	Do all th condition Are all th reporting	e meterological senso n, and well maintaine he meteorological sen g data?	rs appear to be d? sors operationa	intact, in good l online, and	>			
3	Are the a	aspirated motors wor	ature and KH s king?	sensors clean?				
5	Is the solar radiation sensor's lens clean and free of scratches?							
6	Is the su	rface wetness sensor g	grid clean and u	indamaged?		N/A		
7	Are the s condition	sensor signal and pow n, and well maintaine	er cables intact d?	, in good				
8	Are the s from the	sensor signal and pow elements and well ma	er cable connec aintained?	ctions protected				

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	JOT403 Technician Eric Hebert		Site Visit Date 04/28/2014
	Siting Criteria: Are the pollutant analyzers and deposition eq	<u>uip</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	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 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)		At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?	✓	
8	Are there moisture traps in the sample lines?	✓	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry

Fi	eld Sy	stems Data F	orm				F-02	2058-15	500-S6-rev002
Site	e ID	JOT403	Technician	Eric Hebert		Site Visit Dat	e 04/28/201	4]
	<u>DAS, se</u>	nsor translators, and	peripheral equi	pment operation	ns ai	nd maintenance			
1	Do the I well ma	DAS instruments appe intained?	ear to be in good	condition and	✓				
2	Are all t modem,	he components of the backup, etc)	DAS operation	al? (printers,					
3	3 Do the analyzer and sensor signal leads pass through lightning protection circuitry?					Met sensors only			
4	Are the well ma	signal connections pro intained?	otected from the	e weather and	✓				
5	Are the	signal leads connected	d to the correct	DAS channel?					
6	Are the grounde	DAS, sensor translate d?	ors, and shelter	properly	✓				
7	Does the	e instrument shelter h	ave a stable pov	ver source?	✓				
8	Is the in	strument shelter temj	perature control	lled?	✓				
9	Is the m	et tower stable and gi	rounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	d grounded?						
11	Tower c	omments?				The sample tower	is bolted to	the shelter	

Fie	ield Systems Data Form									F-02058-1500-S7-rev002			
Site	ID	JOT403		Tecl	nnician	Eric Hebert		Site Visit Date	04/28/2014	4			
D	ocumen	<u>tation</u>											
D	oes the	site have the require	ed in	strum	ent and	<u>equipment m</u>	anuals?						
Win Win Ten Rela Sola Surf Win Ten Hun Sola Tipp Ozo Filta	d speed d direct aperatur ative hur ar radiat face wet d sensor aperatur nidity se ar radiat oing buc ne analy er pack f er pack 1	sensor ion sensor re sensor nidity sensor ion sensor ness sensor translator re translator nsor translator ion translator ket rain gauge rzer flow controller MFC power supply	Yes	No Y Y Y Y U V Y Y Y Y		A Da Da Da St Co M Pr Ze Fi Su UI Li Sh Sh	ata logge ata logge rip chart omputer odem rinter ero air pu lter flow urge prot PS ghtning nelter hea nelter air	r r t recorder ump pump tector protection device ater conditioner	Yes	N₀ □ □ ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼	N/A V V V V V V V V V V V V V V V V V V		
	Does the	e site have the requi	ired a	und m	ost recer	nt QC docum	ents and	report forms?					
			Pres	sent					Curre	ent			
Stat SSR Site HAS Field Cali	ion Log F Ops Ma SP d Ops M bration	inual Ianual Reports]] [] [> > -	Dataviev June 20	w 00							
Ozo	ne z/s/p	Control Charts	[
Prev	ventive r	naintenance schedu	le [
1 2	Is the s Are the	tation log properly	comp Forn	oleted ns bei	during e ng comp	every site vision	t? ✓ D	ataview low & observation s	ections				
	current	t?											
3	Are the sample	e chain-of-custody fo transfer to and from	orms m lab	propo ?	erly used	l to document	t 🗹						
4	Are ozo current	one z/s/p control cha t?	arts p	roper	ly comp	leted and	C	ontrol charts not us	ed				
Prov natu	vide any ıral or n	additional explana 1an-made, that may	tion (affe	photo ct the	graph o monitor	r sketch if ne ing paramete	cessary) ers:	regarding condition	ons listed	above,	or any other features,		

F-02058-1500-S8-rev002

Site	e ID	JOT403	Technician	Eric Hebert		Site Visit Date	04/28/2014	
	Site ope	ration procedures						
1	Has the course?	site operator attende If yes, when and who	d a formal CAS instructed?	TNET training		ARS provides refres	her training during m	aintenance visits
2	Has the training	backup operator atte g course? If yes, when	nded a formal (and who instru	CASTNET cted?				
3	Is the sit	e visited regularly on ?	the required T	uesday				
4	Are the s flollowed	standard CASTNET of by the site operator?	operational pro	cedures being				
5	Is the sit the requ	e operator(s) knowled ired site activities? (ir	lgeable of, and a	able to perform entation)				
	Are regi	lar operational OA/C	C checks perfo	rmed on meteor	مام	vical instruments?		

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

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

OC	Check	Performed
VV.	Check	I CI IUI IIICu

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
Monthly and semiannually	
Daily	\checkmark
Every 2 weeks	\checkmark
Daily	\checkmark
Alarm values only	\checkmark
Every 2 weeks	\checkmark
N/A	\checkmark
As needed	

- Do multi-point calibration gases go through the complete 1 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
✓	
	Dataview

Field Systems Data Form F-02058-1500-S9-rev002 JOT403 Eric Hebert Site Visit Date 04/28/2014 Site ID Technician Site operation procedures Is the filter pack being changed every Tuesday as scheduled? Filter changed morinings (50%) 1 Are the Site Status Report Forms being completed and filed 🗹 2 correctly? No longer required Are data downloads and backups being performed as 3 scheduled? ✓ SSRF Are general observations being made and recorded? How? 4 \checkmark Are site supplies on-hand and replenished in a timely 5 fashion? SSRF Are sample flow rates recorded? How? 6 \checkmark Are samples sent to the lab on a regular schedule in a timely 7 fashion? ✓ Clean gloves on and off Are filters protected from contamination during handling 8 and shipping? How? Are the site conditions reported regularly to the field 9 operations manager or staff? **OC Check Performed** Frequency Compliant Semiannually \checkmark **Multi-point MFC Calibrations** \checkmark ✓ Weekly **Flow System Leak Checks** t j **Filter Pack Inspection** ✓

✓ Weekly Visual Check of Flow Rate Rotometer ✓ As needed **In-line Filter Inspection/Replacement**

Sample Line Check for Dirt/Water

Flow Rate Setting Checks

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

✓

✓

✓ Weekly

JOT403

F-02058-1500-S10-rev002

Site ID

Technie

Technician Eric Hebert

Site Visit Date 04/28/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	8460p	CNU1360668	none
DAS	Environmental Sys Cor	8816	2271	90599
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB11A	10950000033	none
flow rate	Tylan	FC280AV	AW9403016	03378
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP9403017	03683
Modem	US Robotics	56k	unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	CM08460006	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1130450191	none
Precipitation	Climatronics	100508-2	illegible	01498
Relative Humidity	Rotronic	MP601	52061	none
Sample Tower	Aluma Tower	В	none	923310
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Solar Radiation	Licor	LI-200	PY59533	02221
Solar Radiation Translator	RM Young	70101-X	none	none
Temperature	RM Young	41342	14960	none
Wind Direction	RM Young	AQ05103-5	47104wdr	90893
Wind Speed	RM Young	AQ05103-5	47104wsp	90893
Zero air pump	Werther International	PC70/4	606491	none

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number		
MEV405-Eric Hebert-05/05/2014								
1	5/5/2014	Computer	Gateway	none	450SX4	unknown		
2	5/5/2014	DAS	Environmental Sys Corp	90613	8816	2616		
3	5/5/2014	Elevation	Elevation	None	1	None		
4	5/5/2014	Filter pack flow pump	Thomas	01564	107CA18	0688001769		
5	5/5/2014	flow rate	Tylan	none	FC280AV-4S	AW9403013		
6	5/5/2014	Infrastructure	Infrastructure	none	none	none		
7	5/5/2014	Met tower	Universal Tower	none	unknown	none		
8	5/5/2014	MFC power supply	Tylan	none	RO-32	FP9710002		
9	5/5/2014	Modem	US Robotics	none	56k fax modem	unknown		
10	5/5/2014	Ozone	ThermoElectron Inc	none	49C	0425208058		
11	5/5/2014	Ozone Standard	ThermoElectron Inc	none	49C	0425208055		
12	5/5/2014	Precipitation	Climatronics	none	100508-2	illegible		
13	5/5/2014	Printer	Hewlett Packard	none	842C	unknown		
14	5/5/2014	Relative Humidity	Rotronic	none	MP 601A	59017		
15	5/5/2014	Sample Tower	Aluma Tower	illegible	В	none		
16	5/5/2014	Shelter Temperature	ARS	none	none	none		
17	5/5/2014	Shield (10 meter)	RM Young	none	43532	none		
18	5/5/2014	Siting Criteria	Siting Criteria	None	1	None		
19	5/5/2014	Solar Radiation	Licor	none	LI-200	PY8978		
20	5/5/2014	Solar Radiation Translator	Climatronics	none	100144	392		
21	5/5/2014	Temperature	RM Young	none	41432VC	15106		
22	5/5/2014	Wind Direction	Climatronics	91024	100076	2228		
23	5/5/2014	Wind Speed	Climatronics	90924	100075	1515		
24	5/5/2014	Zero air pump	Werther International	none	PC40/4	526289		

DAS Data Form

DAS Time Max Error: 1.1

Mfg	Serial	Number Site	. 1	Fechnician	Site Visit Date	Parameter	Use Desc.
Environmenta	al Sys 2616	ME	V405	Eric Hebert	05/05/2014	DAS	Primary
Das Date:	5 /5 /2014	Audit Date	5 /5 /2014	Mfg	Datel	Parameter	DAS
Das Time: Das Day:	10.30.46	Audit Time Audit Day	10.29.40	Serial Number	4000392	Tfer Desc.	Source generator (D
Low Channe	el:	High Channe	el:	Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.000	2 0.00	0.000	1 0.0002	Cert Date	2/13/201	2 CorrCoff	1.00000
		Mfg	Fluke	Parameter	DAS		
			Serial Number	95740243 Tfer Desc. DVM		DVM	
			Tfer ID	01312			
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	12/28/201	3 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
5	0.0000	0.0002	0.0002	V	V	0.0000	
5	0.1000	0.1000	0.1002	V	V	0.0002	
5	0.3000	0.3000	0.3002	V	V	0.0002	
5	0.5000	0.5001	0.5003	V	V	0.0002	
5	0.7000	0.7001	0.7003	V	V	0.0002	
5	0.9000	0.9001	0.9003	V	V	0.0002	
5	1 0000	1 0001	1 0004	V	V	0.0003	

5	0.9000	0.9001	0.9003	V	V	0.0002
5	1.0000	1.0001	1.0004	V	V	0.0003
10	0.0000	0.0000	0.0000	V	V	0.0000
10	0.1000	0.1000	0.1000	V	V	0.0000
10	0.3000	0.3000	0.3001	V	V	0.0001
10	0.5000	0.5001	0.5001	V	V	0.0000
10	0.7000	0.7001	0.7002	V	V	0.0001
10	0.9000	0.9001	0.9003	V	V	0.0002
10	1.0000	1.0002	1.0003	V	V	0.0001

Flow Data Form

Mfg	Serial Nu	mber Ta	Site	Те	chnician	Site Visit l	Date Parar	neter	Owner ID
Tylan	AW9403	013	MEV405	Eri	ic Hebert	05/05/201	4 flow ra	ate	none
Mfg	Tylan				Mfg	BIOS	I	Parameter Flow	w Rate
SN/Owner ID	FP9710002	none			Serial Number	131818]	Ffer Desc. BIO	S 220-H
Parameter	MFC power s	upply			Tfer ID	01417			
					Slope	1	.00000 Int	ercept	0.00000
					Cert Date	1/	8/2014 Co	rrCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero	-0.0	47	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	5.5	74	
0.33%	0.66%				Rotometer R	eading:	3	3.6	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	-0.09	-0.0435	-0.10	l/m	l/m	
primary	leak check	0.000	0.000	-0.06	-0.0140	-0.05	l/m	l/m	
primary	test pt 1	3.004	3.000	2.71	2.7178	3.00	l/m	l/m	0.00%
primary	test pt 2	3.024	3.020	2.71	2.7178	3.00	l/m	l/m	-0.66%
primary	test pt 3	3.011	3.010	2.71	2.7178	3.00	l/m	l/m	-0.33%
Sensor Comp	onent Leak Te	est		Conditio	n		Statu	s pass	
Sensor Compo	ment Tubing	Condition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Filter P	osition		Conditio	n Good		Statu	<mark>s</mark> pass	
Sensor Comp	onent Rotome	ter Conditio	n	Conditio	Clean and dry		Statu	s pass	
Sensor Comp	onent Moistur	e Present		Conditio	n No moisture pr	resent	Statu	s pass	
Sensor Comp	onent Filter D	stance		Conditio	n 5.5 cm		Statu	s pass	
Sensor Comp	onent Filter D	epth		Conditio	n 0.5 cm		Statu	s pass	
Sensor Comp	onent Filter A	zimuth		Conditio	n 360 deg		Statu	s pass	
Sensor Comp	onent System	Memo		Conditio	on		Statu	s pass	
Ozone Data Form

Mfg	Serial Number Ta	Site	Tee	chnician		Site Visi	it Date	Parame	eter	Owner I	D
ThermoElectron Inc	0425208058	MEV405	Eri	ic Hebert	t	05/05/2	014	Ozone		none	
~	0.00740			Mfa		Thermo			romotor 070		
Slope:	0.99710 Slope:	0.0000		wing		THEIMOL			railleter 020		
Intercept	2.00354 Intercept	0.0000		Serial N	lumber	49CPS-7	70008-36	64 Tf	er Desc. Oz	one primary	∕ stan
	CorrColl	0.0000	5	Tfer ID		01110					
DAS 1:	DAS 2:			Slope			1.00707	7 Inter	cept	-0.21	032
A Avg % Diff: A N	/Iax % Di A Avg %	6 Dif A Max	% Di	c D		L	4/0/004			1.00	
5.9%	10.4%			Cert Da	ate		1/8/2014	4 Cori	Coff	1.00	000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer (Corr:	Si	te:	Site	Unit:	PctDiff	erence:	
primary	1	0.40	0.6	50	-1.	13	ppb				
primary	2	32.64	32.	61	29.	.21	ppb			-10.43%	
primary	3	50.49	50.	34	46.	.80	ppb			-7.03%	
primary	4	76.47	76.	14	72.	.98	ppb			-4.15%	
primary	5	110.24	109	.67	107	.40	ppb			-2.07%	
Sensor Compone	nt Cell B Noise		Conditio	n 0.9 pp	b			Status	pass		
Sensor Compone	nt Cell B Tmp.		Conditio	n				Status	pass		
Sensor Compone	nt Fullscale Voltage		Conditio	n 1.000	2			Status	pass		7
Sensor Compone	nt Inlet Filter Condition	าก	Conditio		1			Status	pass		
Sensor Compone			Condition					Status	pace		
Sensor Compone	nt Line Loss		Conditio	n Not te	ested			Status	pass		
Sensor Compone	nt Offset		Conditio	n 1.0				Status	pass		
Sensor Compone	nt Span		Conditio	n 1.030				Status	pass		
Sensor Compone	nt Cell B Freq.		Conditio	n 81.4 k	κHz			Status	pass		
Sensor Compone	nt System Memo		Conditio	n				Status	pass		
Sensor Compone	nt Sample Train		Conditio	n Good				Status	pass		7
Sensor Compone	nt Cell B Pressure		Conditio	n				Status	pass		7
Sensor Compone	nt Cell B Flow		Conditio	n 0.58 l	pm			Status	pass		
Sensor Compone	nt Cell A Tmp.		Conditio	n 35.8 (C			Status	pass		
Songor Compone			Conditio	571 m	mHa			Status	nass		_
Sensor Compone			Conditio					Status	pass		
Sensor Compone	nt Cell A Noise		Conditio	n 1.6 pp	b			Status	pass		
Sensor Compone	nt Cell A Freq.		Conditio	n 57.8 k	κHz			Status	Fail		
Sensor Compone	nt Cell A Flow		Conditio	0.68 l	pm			Status	pass		
Sensor Compone	nt Battery Backup		Conditio	N/A				Status	pass		
Sensor Compone	nt Zero Voltage		Conditio	n 0.000	4			Status	pass		

Wind Speed Data Form

Mfg	S	erial Numbe	r Ta Site		Technician		Site Visit Date	Parameter	Owner I	D
Climatronics	1	515	MEV40	5	Eric Hebert		05/05/2014	Wind Speed	90924	
Prop or Cups	2NI	198			Mfg Serial Nur Tfer ID Slope	nber	RM Young CA04013 01253 1.0000	Paramet Tfer Des	ter wind speed	otor (h
Prop or Cups [Foran		.3 to	0.4	Corrt Doto		1/16/20/		1.00	000
Prop Correction	n Fac	t [Cert Date		1/10/20	CorrColl	1.00	000
Abs Avg Err [Abs Max Er [DAS 1 Low R	: ange Hig 0.05 0.12	I sh Range I 0.31% 0.75%	DAS 2: Low Range	High Range					
UseDescription	: In	put Device	Input RPM	Input m/s	out V		DAS m/s	Diff/ %Diff	Diff	WsM
primary		none	0	0.20		0.0	0.2		0.03	
primary		01253	50	1.40		0.0	1.4		0.01	
primary		01253	100	2.57		0.0	2.5		-0.12	
primary		01253	170	4.22		0.0	4.2		-0.02	
primary		01253	250	6.10		0.0	6.1	-0.16%		
primary		01253	500	11.97		0.0	11.9	-0.75%		
primary		01253	800	19.02		0.0	19.0	-0.21%		
primary		01253	2000	47.22		0.0	47.2	-0.11%		
Sensor Comp	onent	Condition		Cond	ition Good			Status pass		
Sensor Comp	onent	Prop or Cup	s Condition	Cond	ition Good			Status pass		
Sensor Comp	onent	Sensor Heat	er	Cond	ition Function	ng		Status pass		
Sensor Comp	onent	Torque		Cond	ition			Status pass		
Sensor Comp	onent	Sensor Plum	ıb	Cond	ition Plumb			Status pass		
Sensor Comp	onent	System Men	וס	Cond	ition			Status pass		

Wind Direction Data Form

Mfg	Serial Number	Fa Site	r	Technician		Site Visit Date Parame		eter Owner ID		
Climatronics	2228	MEV405		Eric Hebert		05/05/201	Vind [Direction	91024	
				Mfg Serial Nun Tfer ID	nber	RM Young 01264	9 P	arameter	vind direction	/heel
Vane SN: 38 VaneTorque	8 to 10	2. A. Align. de	e g. true: 180							
				Mfg	ι	Jshikata	P	arameter	wind direction	
				Serial Nun	nber [192034	T	fer Desc. t	ransit	
				Tfer ID	[01270				
				Slope		1	.00000 Int	ercept	0.000	00
				Cert Date		1/3	30/2014 Co	rrCoff	1.000	00
Abs Avg Err	DrientationLinea2.8	arity: Or 2.0	rientation	Linearity:						
UseDescription	TferID	Input Raw	Linearity	Output V	Outpu	ıt Deg.	Difference	Change	Error	
primary	01264	0		0.0000	3	59	1	47	2	
primary	01264	45		0.0000		41	4	42	-3	
primary	01264	90		0.0000	1	35 20	5	44	-1	
primary	01264	133		0.0000	1	79	1	50	5	
primary	01264	225		0.0000	2	22	3	43	-2	
primary	01264	270		0.0000	2	66	4	44	-1	
primary	01264	315		0.0000	3	12	3	46	1	
primary	01270	90		0.0000	8	35	5		5	
primary	01270	180		0.0000	1	79 66	1		1	
primary	01270	360		0.0000	3	59	4		4	
Sensor Compo	nent Torque		Condi	ition			Status	pass	-	
Sensor Compo	nent Sensor Plumb		Condi	ition Plumb			Status	pass		
Sensor Compo	nent Sensor Heater		Condi	ition Functioni	ing		Status	pass		
Sensor Compo	onent Mast		Condi	ition Good			Status	pass		
Sensor Compo	onent Condition		Condi	ition Good			Status	pass		
Sensor Compo	nent Vane Condition	1	Condi	ition Good			Status	pass		
Sensor Compo	onent System Memo		Condi	ition			Status	pass		

Temperature Data Form

Mfg	Serial Number T	a Site	1	Techn	ician	Site V	'isit Date	Param	eter	Owner II)
RM Young	15106	MEV405		Eric H	ebert	05/05	/2014	Temper	ature	none	
				Mf	g	Eutec	hnics	Pa	trameter Te	emperature	
				Sei	er ID	01231	J2 193		er Desc. 🔼	Diranslator	
DAS 1.	DAS	2.		Slo	ope		1.0013	3 Inte	rcept	-0.057	731
Abs Avg Err	Abs Max Er Abs A	vg Err Abs	Max Er	Ce	rt Date		12/27/201	3 Cor	rCoff	1.000	000
				Mf	g	Eutecl	hnics	Pa	rameter Te	emperature	
				Sei	rial Number	01H00)60	Tf	er Desc. R	TD probe	
				Tfe	er ID	01230	1				
				Slo	ope		1.0013	3 Inte	rcept	-0.057	731
				Ce	rt Date		12/27/201	3 Cor	rCoff	1.000	000
0.37	0.64										
UseDesc.	Test type	InputTmpRaw	InputTm	oCorr.	OutputTmpS	Signal	OutputSig	nalEng	OSE Unit	Difference	
primary	Temp Low Range	0.10	0.16	5	0.0000		0.8	3	С	0.64	
primary	Temp Mid Range	27.95	27.9	7	0.0000		28.	2	С	0.25	
primary	Temp High Range	45.16	45.1	6	0.0000		45.	0	С	-0.21	
Sensor Com	ponent Shield		Cond	ition (Clean			Status	pass]
Sensor Com	ponent Blower		Cond	ition F	Functioning			Status	pass]
Sensor Com	ponent Blower Status S	Switch	Cond	ition 🛛	N/A			Status	pass]
Sensor Com	ponent System Memo		Cond	ition				Status	pass]

Humidity Data Form

Mfg	Serial Nur	nber Ta Site		Technician		Site Visit D	ate Par	ameter	Owner ID
Rotronic	59017	ME	/405	Eric Hebert		05/05/2014	Rela	ative Humidity	none
				Mfg		Rotronic		Parameter Re	lative Humidity
				Serial Nu	mber	75296		Tfer Desc. GT	L
				Tfer ID		01220			
				Slope		1.0	00000	Intercept	0.00000
	DAS 1:		DAS 2:	Cert Date	e	1/5	5/2010	CorrCoff	1.00000
	Low Range	High Range	Low Range	High Range	e				
Abs Avg Err	2.1	0.1							
Abs Max Er	2.2	0.1							
UseDesc.	Test type	Device	Input RH	GTL Raw	RH (Corr. DA	AS Volts	DAS %RH	Difference
primary	RH Low Range	GTL	32.8	0.0	32	.8 (0.0000	35.0	2.2
primary	RH Low Range	GTL	52.9	0.0	52	.9 (0.0000	54.9	2.0
primary	RH High Range	GTL	93.6	0.0	93	.6 (0.0000	93.5	-0.1
Sensor Com	ponent RH Filter	•	Con	dition Clean			Sta	tus pass	
Sensor Com	ponent Shield		Con	dition Clean			Sta	tus pass	
Sensor Com	ponent Blower		Con	dition Functio	ning		Sta	tus pass	
Sensor Com	ponent Blower S	status Switch	Con	dition N/A			Sta	tus pass	
Sensor Com	ponent System I	Vemo	Con	dition			Sta	tus pass	

Solar Radiation Data Form

Mfg	Serial Nur	nber Ta	Site	Т	echni	ician	Site Visit Date	Paramo	eter	Owner II)
Licor	PY8978		MEV405	E	ric H	ebert	05/05/2014	Solar R	adiation	none	
Mfg	Climatronics				Mf	g	RM Young	Pa	rameter sola	ar radiation	
SN/Owner ID	392	none			Ser	rial Number		Tf	er Desc. SR	transfer trai	nslat
Parameter	Solar Radiation	n Translato	or		Tfe	er ID	01240				
DAS 1:		DAS 2:			Slo	ppe	1.0267	8 Inte	rcept	-16.910	000
% Diff of Avg	%Diff of Max	%Diff of	Avg %Diff	of Max	Cer	rt Date	6/14/201	4 Corr	rCoff	0.998	300
					Mf	g	Licor	Pa	rameter sola	ar radiation	
					Ser	rial Number		Tf	er Desc. SR	transfer ser	nsor
					Tfe	er ID	01241				
					Slo	ope	1.0267	8 Inte	rcept	-16.91	000
					Cer	rt Date	6/14/201	4 Corr	rCoff	0.998	300
7.6%	6.1%		0.0%	0.0%							
UseDescription	Measure Da	te Mea	sureTime	Tfer Rav	V	Tfer Corr	DAS w/	/m2	PctDifferer	nce	
primary	5/5/2014		8:00	536		538	580		7	7.8%	
primary	5/5/2014		9:00	769		765	835		ç	9.1%	
primary	5/5/2014		10:00	928		920	999		8	8.6%	
primary	5/5/2014		11:00	1000		991	1069)	7	7.9%	
primary	5/5/2014		12:00	1012		1002	1063	;	6	5.1%	
primary	5/5/2014		13:00	960		952	1014	ŀ	6	5.5%	
Sensor Comp	onent Sensor C	Clean		Conditi	on C	Clean		Status	pass]
Sensor Comp	onent Sensor L	evel		Conditi	on 1	1/2 bubble off le	evel	Status	pass]
Sensor Comp	onent Properly	Sited		Conditi	on F	Properly sited		Status	pass]
Sensor Comp	onent System M	Nemo		Conditi	on			Status	pass		

Precipitation Data Form

Mfg	Serial	Number Ta	Site		Tec	hnician		Site	Visit Date	Parame	ter	Owner ID	
Climatronics	illegibl	e	MEV405		Erio	c Hebert		05/0	05/2014	Precipita	ation	none	
						Mfg		PMF)	Pa	rameter	Precipitation	
DAS 1:		DAS 2:				Serial Nun	ıber	EW-	06134-50	Tfe	er Desc.	250ml graduate	
A Avg % Diff	f: A Max %	Di A Avg %	b Dif A I	Max % Di	, ,	Tfer ID		0125	50				
1.0%	. 2.	0%				Slope			1.0000	0 Inter	cept	0.00000	
						Cert Date			9/5/200	05 Corr	Coff	1.00000	
UseDesc.	Test type	TferVolume	Iteration	TimePerT	ip	Eq.Ht	DAS	eng	Eq.HtUnit	OSE Un	it TferUr	nits PctDifference	
primary	test 1	231.5	1	8 sce		5.00	5.	10	mm	mm	ml	2.0%	
primary	test 2	231.5	2	8 sec		5.00	5.0	00	mm	mm	ml	0.0%	
Sensor Com	ponent Prop	erly Sited		Cond	litio	n 45 degre	e rule			Status	pass		
Sensor Com	ponent Gau	ge Drain Scree	en	Cond	litio	n Not insta	led			Status	Fail		
Sensor Com	ponent Funr	el Clean		Cond	litio	n Clean				Status	pass		
Sensor Com	ponent Cond	dition		Cond	litio	n Good				Status	pass		
Sensor Com	ponent Gau	ge Screen		Cond	litio	n Installed				Status	pass		
Sensor Com	ponent Gau	ge Clean		Cond	litio	n Clean				Status	pass		
Sensor Com	ponent Leve	I		Cond	litio	n Level				Status	pass		
Sensor Com	ponent Sens	or Heater		Cond	litio	n Functioni	ng			Status	pass		
Sensor Com	ponent Syst	em Memo		Cond	litio	n				Status	pass		

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	MEV405	Eric Hebert	05/05/2014	Shelter Temperature	none
DAS 1: Abs Avg Err Abs	DAS 2: s Max Er Abs Avg	Err Abs Max Er	Mfg Serial Number	Eutechnics 01D102193	Parameter Sh	elter Temperatur
1.76	2.20] [Tfer ID	01231]	
			Slope	1.0013	3 Intercept	-0.05731
			Cert Date	12/27/201	3 CorrCoff	1.00000
			Mfg	Eutechnics	Parameter Sh	elter Temperatur
			Serial Number	01H0060	Tfer Desc. RT	D probe
			Tfer ID	01230		
			Slope	1.0013	3 Intercept	-0.05731
			Cert Date	12/27/201	3 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.46	23.49	0.000	25.2	С	1.73
primary	Temp Mid Range	23.86	23.89	0.000	25.3	С	1.36
primary	Temp Mid Range	23.01	23.04	0.000	25.2	С	2.2

Infrastructure Data For

Site ID	MEV405	Technician Eric H	lebert Site Visit Date 05/05/2014
Shelter Ma	ake	Shelter Model	Shelter Size
Ekto		888	512 cuft

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem		
Ozone	MEV405	Eric Hebert	05/05/2014	Cell A Freq.	ThermoElectron	418				
This analyzer diagnostic check is outside the manufacturer's recommended value.										

Field Systems Comments

1 Parameter: SitingCriteriaCom

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

2 Parameter: ShelterCleanNotes

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

F-02058-1500-S1-rev002

Site ID	1EV405	Technician Eric Hebert			t	Site Visit Date 05/05/2014			
Site Sponsor (a)	gency)	NPS/EPA			US	GS Map		Moccasin Mesa	
						ap Scale			
Operating Grou	սբ		4.04			n Doto			
AQS #		08-083-0	08-083-0101			ap Date			
Meteorological	Туре	Climatron	lics						
Air Pollutant A	nalyzer	Ozone			Q	APP Latitude			
Deposition Mea	asurement	dry, wet,	IMPROVE		Q	APP Longitude	e		
Land Use		woodland	- evergreen		Q	APP Elevation	Meters		
Terrain		complex			Q	APP Declination	n		
Conforms to M	onforms to MLM No			Q	APP Declination	on Date			
Site Telephone				Αι	ıdit Latitude		37.198398		
Site Address 1	Site Address 1 Natural Resources			Αι	dit Longitude		-108.490462		
Site Address 2	te Address 2 Mesa Verde National Park			Αι	dit Elevation		2170		
County		Montezur	na		Αι	dit Declinatio	10.3		
City, State		Cortez, C	0			Present			
Zip Code		81330				e Extinguishe	r 🗸	No inspection date	
Time Zone		Mountain				rst Aid Kit	\checkmark		
Primary Opera	itor				Sa	fety Glasses			
Primary Op. P	'hone #					fety Hard Hat			
Primary Op. E-	-mail				Cl	imbing Belt			
Backup Operat	tor					curity Fence			
Backup Op. Ph	none #				Se	cure Shelter	\checkmark		
Backup Op. E-	mail				St	Stable Entry Step 🗹			
Shelter Workin	ıg Room ☑	Make	Ekto		Model	888		Shelter Size 512 cuft	
Shelter Clean		Notes	The shelter is i	n good con	dition, cle	an, and well or	ganized.		
Site OK	\checkmark	Notes							
Driving Directions Just after mile marker 19 turn right on the paved service road. The air quality office is the stone building about 200 yards down the road. Continue on the same road to the site.									

MEV405

F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 05/05/2014

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

Siting Distances OK

Siting Criteria Comment

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

Field Systems Data Form						F-02058-1500-S3-rev002				
Site	e ID	MEV405	Technician	Eric Hebert		Site Visit Date	05/05/2014			
1	Are win being in	d speed and direction fluenced by obstructi	n sensors sited so ions?	as to avoid						
2	Are win (i.e. wind horizont tower in	d sensors mounted so d sensors should be n tally extended boom : to the prevailing win	o as to minimize nounted atop the >2x the max dian d)	tower effects? e tower or on a neter of the						
3	Are the	tower and sensors pl	umb?							
4	Are the avoid ra	temperature shields p idiated heat sources s	pointed north or such as buildings	positioned to , walls, etc?						
5	Are tem conditio surface a standing	perature and RH sen ns? (i.e. ground belov and not steeply slope g water should be avo	isors sited to avo w sensors should d. Ridges, hollov iided)	id unnatural be natural vs, and areas of						
6	Is the so	lar radiation sensor	plumb?							
7	Is it site light?	d to avoid shading, o	r any artificial o	r reflected						
8	Is the ra	in gauge plumb?								
9	Is it site towers,	d to avoid sheltering etc?	effects from buil	dings, trees,		45 degree rule viol	ation			
10	Is the su facing n	urface wetness sensor orth?	sited with the g	rid surface		N/A				
11	Is it inc	lined approximately	30 degrees?			N/A				

F-02058-1500-S4-rev002

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

Field Systems Data Form						F-02058-1500-S5-rev					
Site	ite ID MEV405 Technician Eric Hebert			Eric Hebert		Site Visit Date	05/05/2014				
	Siting C	criteria: Are the pollut	ant analyzers an	<mark>id deposition eq</mark>	<u>uipr</u>	nent sited in accord	dance with 40 C	FR 58, Appendix E			
1	Do the s unrestri	cample inlets have at le	east a 270 degree	e arc of							
2	Are the	sample inlets 3 - 15 m	eters above the g	ground?	✓						
3	Are the and 20 1	sample inlets > 1 mete meters from trees?	er from any maje	or obstruction,	✓						
	<u>Pollutar</u>	nt analyzers and depos	sition equipment	operations and	mai	intenance					
1	Do the a conditio	analyzers and equipme on and well maintained	ent appear to be l?	in good	✓						
2	Are the reportin	analyzers and monito ng data?	rs operational, o	n-line, and	✓						
3	Describ	e ozone sample tube.				1/4 teflon by 10 met	ters				
4	Describ	e dry dep sample tube	•			3/8 teflon by 10 met	ters				
5	Are in-l indicate	ine filters used in the o location)	ozone sample line	e? (if yes		At inlet only					
6	Are sam	ple lines clean, free of tions?	[°] kinks, moisture	, and							
7	Is the ze	ero air supply desiccan	nt unsaturated?		✓						
8	Are the	re moisture traps in th	e sample lines?			Flow line only					
9	Is there clean?	a rotometer in the dry	y deposition filte	r line, and is it		Clean and dry					

Fi	eld Sy	stems Data Fo			F-0 2	2058-15	00-S6-rev002		
Site	e ID	MEV405	Technician Eric Hebert			Site Visit Dat	e 05/05/201	4	
	DAS, se	nsor translators, and	peripheral equij	pment operation	ns a	nd maintenance			
1	Do the I well mai	DAS instruments appe intained?	ar to be in good	condition and	✓				
2	Are all t modem,	the components of the backup, etc)	DAS operation	al? (printers,					
3	Do the a lightnin	nalyzer and sensor sig g protection circuitry	gnal leads pass t ?	hrough		Met sensors only			
4	Are the well mai	signal connections pro intained?	otected from the	e weather and					
5	Are the	signal leads connected	l to the correct]	DAS channel?					
6	Are the grounde	DAS, sensor translato ed?	ors, and shelter j	properly					
7	Does the	e instrument shelter h	ave a stable pow	ver source?	✓				
8	Is the in	strument shelter temp	oerature control	led?					
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	l grounded?						
11	Tower c	comments?							

Field Systems Data Form								F-02	F-02058-1500-S7-rev002		
Site ID	MEV405		Tech	nician	Eric Hebert		Site Visit Date	05/05/2014			
<u>Documen</u>	<u>tation</u>										
Does the	site have the require	ed ins	strume	ent and	equipment	manuals?					
		Yes	No	N/ /	4			Yes	No	N/A	
Wind speed	sensor]	Data logge	r				
Wind direct	ion sensor]	Data logge	r				
Temperatur	e sensor				1	Strip chart	recorder				
Relative hui	nidity sensor				(Computer					
Solar radiat	ion sensor	\checkmark]	Modem			\checkmark		
Surface wet	ness sensor			\checkmark]	Printer					
Wind sensor	r translator				2	Zero air pu	ımp				
Temperatur	e translator]	Filter flow	pump				
Humidity se	nsor translator			\checkmark	1	Surge prote	ector				
Solar radiat	ion translator		\checkmark		١	UPS				\checkmark	
Tipping buc	ket rain gauge		\checkmark]	Lightning _I	protection device			\checkmark	
Ozone analy	zer		\checkmark		5	Shelter hea	iter		\checkmark		
Filter pack f	low controller		\checkmark		5	Shelter air	conditioner		\checkmark		
Filter pack	MFC power supply		\checkmark								
Does the	e site have the requi	red a	nd mo	st rece	nt QC docu	ments and	report forms?				
	_	Pres	ent				_	Curre	nt		
Station Log				Datavie	\\/						
SSRF		•		Datavio				\checkmark			
Site Ops Ma	nual										
HASP		[
Field Ops M	lanual	[
Calibration	Reports										
Ozone z/s/p	Control Charts	[
Preventive r	naintenance schedul										
			_ [
1 Is the s	tation log properly c	comp	leted o	luring	every site vi	sit? ☑ Da	ataview				
2 Are the current	Site Status Report 2	Forn	ns bein	ig comp	pleted and	✓ Fi	ow & observation	sections			
3 Are the sample	e chain-of-custody fo transfer to and from	orms n lab	prope ?	rly used	d to docume	nt 🗸					
4 Are ozo current	one z/s/p control cha t?	rts p	roperl	y comp	leted and		ontrol charts not u	sed			
Provide any natural or n	additional explanat nan-made, that may	ion (j affec	photoş t the r	graph o nonitor	or sketch if r ring parame	necessary) i sters:	regarding conditi	ions listed a	above, o	or any other features,	

MEV405 Technician Eric Hebert Site Visit Date 05/05/2014 Site ID Site operation procedures Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

QC Check Performed

Frequency

Multipoint Calibrations	\checkmark	Semiannually	✓
Visual Inspections	\checkmark	Weekly	\checkmark
Translator Zero/Span Tests (climatronics)	\checkmark	Weekly	\checkmark
Manual Rain Gauge Test	\checkmark	Monthly	\checkmark
Confirm Reasonableness of Current Values	\checkmark	Weekly	\checkmark
Test Surface Wetness Response	\checkmark	N/A	\checkmark

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	•
Monthly and semiannually	
Daily	
Monthly	
Daily	
Weekly	
Monthly	
N/A	
Semiannually	

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

3	Are the automatic and manual z/s/p checks monitored and
	reported? If yes, how?

✓	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:

mpliant

Compliant

F-02058-1500-S8-rev002

Fi	eld Sy	stems Data Forr	n				F-02058	-1500-S9-rev002
Sit	e ID	MEV405	Fechniciaı	Eric Hebert		Site Visit Date	05/05/2014	
	<u>Site ope</u>	ration procedures						
1	Is the fi	lter pack being changed ev	very Tues	day as scheduled?	~	Filter changed mori	nings	
2	Are the correctl	Site Status Report Forms y?	being con	npleted and filed				
3	Are dat schedul	a downloads and backups ed?	being per	formed as		No longer required		
4	Are gen	eral observations being m	ade and r	ecorded? How?	✓	SSRF		
5	Are site fashion	supplies on-hand and rep	lenished i	n a timely	✓			
6	Are san	ple flow rates recorded?	How?		✓	SSRF		
7	Are san fashion	uples sent to the lab on a re	egular sch	edule in a timely	✓			
8	Are filte and shij	ers protected from contam oping? How?	ination d	uring handling	✓	Uses bag as glove		
9	Are the operation	site conditions reported rooms manager or staff?	egularly to	o the field				
QC	Check P	erformed	Fr	equency			Compliant	
I	Multi-poi	nt MFC Calibrations	✓ Se	miannually				
I	Flow Syst	em Leak Checks	✓ We	eekly				
I	Filter Pac	k Inspection						
I	Flow Rate	e Setting Checks	🗹 We	eekly				
	visual Ch	eck of Flow Rate Rotomet	ter 🗹 We	eekly				
I	n-line Fil	ter Inspection/Replacement	nt 🗹 As	needed				
5	Sample Li	ine Check for Dirt/Water						

MEV405

F-02058-1500-S10-rev002

Site ID

Technician Eric Hebert

Site Visit Date 05/05/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Gateway	450SX4	unknown	none
DAS	Environmental Sys Corp	8816	2616	90613
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	0688001769	01564
flow rate	Tylan	FC280AV-4S	AW9403013	none
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	none
MFC power supply	Tylan	RO-32	FP9710002	none
Modem	US Robotics	56k fax modem	unknown	none
Ozone	ThermoElectron Inc	49C	0425208058	none
Ozone Standard	ThermoElectron Inc	49C	0425208055	none
Precipitation	Climatronics	100508-2	illegible	none
Printer	Hewlett Packard	842C	unknown	none
Relative Humidity	Rotronic	MP 601A	59017	none
Sample Tower	Aluma Tower	В	none	illegible
Shelter Temperature	ARS	none	none	none
Shield (10 meter)	RM Young	43532	none	none
Siting Criteria	Siting Criteria	1	None	None
Solar Radiation	Licor	LI-200	PY8978	none
Solar Radiation Translator	Climatronics	100144	392	none
Temperature	RM Young	41432VC	15106	none
Wind Direction	Climatronics	100076	2228	91024
Wind Speed	Climatronics	100075	1515	90924
Zero air pump	Werther International	PC40/4	526289	none

Site Inventory by Site Visit

Site V	Visit Date Parameter		Mfg	Owner ID	Model Number	Serial Number
CAN4	407-Eric H	lebert-05/06/2014				
1	5/6/2014	Computer	Hewlett Packard	none	6560 b	5CB1520H70
2	5/6/2014	DAS	Environmental Sys Corp	09638	8816	2523
3	5/6/2014	Elevation	Elevation	None	1	None
4	5/6/2014	F460 translator	Climatronics	none	100163	892
5	5/6/2014	Filter pack flow pump	Thomas	none	107CAB18A	07960000521
6	5/6/2014	flow rate	Mykrolis	03388	FC280SAV-4S	AW9403022
7	5/6/2014	Infrastructure	Infrastructure	none	none	none
8	5/6/2014	Mainframe	Climatronics	01340	100081	1291
9	5/6/2014	Met tower	Universal Tower	01357	unknown	none
10	5/6/2014	MFC power supply	Tylan	03678	RO-32	none
11	5/6/2014	Modem	US Robotics	none	56.6k	unknown
12	5/6/2014	Ozone	ThermoElectron Inc	none	49i A3NAA	1030745085
13	5/6/2014	Ozone Standard	ThermoElectron Inc	90606	49C	49C-61991-333
14	5/6/2014	Precipitation	Climatronics	90870	100508-2	illegible
15	5/6/2014	Printer	Hewlett Packard	none	842C	unknown
16	5/6/2014	Relative Humidity	Rotronic	none	MP 601	52065
17	5/6/2014	Sample Tower	Aluma Tower	illegible	В	none
18	5/6/2014	Shelter Temperature	ARS	none	none	none
19	5/6/2014	Shield (10 meter)	Climatronics	01197	100325	1225
20	5/6/2014	Siting Criteria	Siting Criteria	None	1	None
21	5/6/2014	Solar Radiation	Licor	none	LI-200	PY46778
22	5/6/2014	Solar Radiation Translator	Climatronics	none	100144	650
23	5/6/2014	Temperature	Climatronics	ARS110	100093	missing
24	5/6/2014	Temperature Translator	Climatronics	03628	100088-2	395
25	5/6/2014	Wind Direction	Climatronics	90900	100076	ARS1
26	5/6/2014	Wind Speed	Climatronics	90872	100075	1784
27	5/6/2014	Zero air pump	Twin Tower Engineering	none	TT70/4E	526292

DAS Data Form

13

13

0.9000

1.0000

0.8999

0.9999

DAS Time Max Error: 0.67

Mfg	Serial	Number Site	e T	echnician	Site Visit Date	Parameter	Use Desc.
Environmental	l Sys 2523	CA	N407 E	Eric Hebert	05/06/2014	DAS	Primary
Das Date: Das Time: Das Day:	5 /6 /2014 11:49:00 126	Audit Date Audit Time Audit Day	5 /6 /2014 11:48:20 126	Mfg Serial Number	Datel 4000392	Parameter Tfer Desc.	DAS Source generator (D
Low Channel	l :	High Channe	el:	Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0001	0.0	0.000	9 0.0022	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740243	Tfer Desc.	DVM
				Tfer ID	01312		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	12/28/201	3 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
5	0.0000	0.0000	0.0000	V	V	0.0000	
5	0.1000	0.1000	0.1000	V	V	0.0000	
5	0.3000	0.3000	0.3000	V	V	0.0000	
5	0.5000	0.5000	0.5001	V	V	0.0001	
5	0.7000	0.7001	0.7002	V	V	0.0001	
5	0.9000	0.9001	0.9002	V	V	0.0001	
5	1.0000	1.0001	1.0003	V	V	0.0002	
13	0.0000	0.0005	0.0027	V	V	0.0022	
13	0.1000	0.1005	0.1026	V	V	0.0021	
13	0.3000	0.2999	0.2995	V	V	-0.0004	
13	0.5000	0.4999	0.4995	V	V	-0.0004	
13	0.7000	0.6999	0.6995	V	V	-0.0004	

V

V

0.8995

0.9995

V

V

-0.0004

-0.0004

Flow Data Form

Mfg	Se	Serial Number Ta Site			Te	chnician	Site Visit l	Date Para	meter	Owner ID
Mykrolis	A	W940302	2	CAN407	Er	ic Hebert	05/06/201	4 flow	rate	03388
Mfg	Tylan					Mfg	BIOS		Parameter Flo	w Rate
SN/Owner ID	none		03678			Serial Number	131818		Tfer Desc. BIC	DS 220-H
Parameter	MFC p	power sup	ply			Tfer ID	01417			
						Slope	1	.00000 Ir	itercept	0.00000
						Cert Date	1/	8/2014 C	orrCoff	1.00000
DAS 1:			DAS 2:			Cal Factor Z	ero	-(0.01	
A Avg % Diff:	A Max	x % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale	5	5.29	
2.48%	2.58%				Rotometer R	Rotometer Reading:		3.5		
Desc.	Tes	st type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump	off	0.000	0.000	-0.02	0.0065	0.00	l/m	l/m	
primary	leak c	check	0.000	0.000	-0.02	0.0065	0.00	l/m	l/m	
primary	test pt	t 1	3.101	3.100	2.85	2.8560	3.02	l/m	l/m	-2.58%
primary	test pt	t 2	3.102	3.100	2.85	2.8560	60 3.02		l/m	-2.58%
primary	test pt	t 3	3.090	3.090	2.85	2.8560	3.02	l/m	l/m	-2.27%
Sensor Comp	onent	Leak Test	t		Conditio	on		Stat	us pass	
Sensor Comp	onent	Tubing Co	ondition		Conditio	n Good		Stat	us pass	
Sensor Comp	onent	Filter Pos	ition		Conditio	n Good		Stat	us pass	
Sensor Comp	onent	Rotomete	er Conditio	n	Conditio	Clean and dry		Stat	us pass	
Sensor Comp	onent	Moisture	Present		Conditio	n No moisture pr	resent	Stat	us pass	
Sensor Comp	Sensor Component Filter Distance				Conditio	n 5.0 cm		Stat	us pass	
Sensor Comp	onent	Filter Dep	oth		Conditio	n 0.5 cm		Stat	us pass	
Sensor Component Filter Azimuth		Conditio	n 225 deg	Stat		tus pass				
Sensor Component System Memo		Conditio	on		Stat	us pass				

Ozone Data Form

Mfg	Se	rial Number Ta	Site	Tecl			Site Visi	t Date	Parame	eter	Owner II)
ThermoElectron I	nc 10	030745085	CAN407	Er	ic Hebert		05/06/20)14	Ozone		none	
Slope: Intercept CorrCoff	0.99 -0.67 0.99	9581Slope:7417Intercept9996CorrCoff	0.00000	Mfg T 00 Serial Number 4 00 Tfer ID 0		ThermoElectron IncPa49CPS-70008-364Tf01110			rameter ozor er Desc. Ozo	ne ne primary	stan	
DAS 1: A Avg % Diff: A 2.0%	A Max	DAS 2: A Avg % 3.8%	Dif A Max	% Di	Slope Cert Da	ıte		1.00707 1/8/2014	7 Inter 4 Corr	•cept •Coff	-0.210)32)00
UseDescriptio	on:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	Unit:	PctDiffe	rence:	
primary		1	0.32	0.5	52	0.3	34	ppb				
primary		2	34.50	34.	46	5 33.1		ppb			-3.80%	
primary		3	52.85	52.	68	51.	.48	ppb			-2.28%	
primary		4	79.88	79.52		78.	78.56 ppb				-1.21%	
primary		5	115.10	114	.50	113	.60	ppb		-0.79%		
Sensor Compo	ponent Cell B Noise			Conditio	on 0.9 pp	ppb			Status	pass		
Sensor Compo	nent	t Cell B Tmp.		Condition					Status	pass		
Sensor Compo	nent	nt Fullscale Voltage		Condition 1.0028			Status			ıs pass		
Sensor Compo	nent	Inlet Filter Conditio	n	Conditio	on Clean				Status	pass]
Sensor Compo	nent	Line Loss		Conditio	Not te	sted			Status	pass]
Sensor Compo	nent	Offset		Conditio	n -0.1				Status	pass]
Sensor Compo	nent	Span		Condition 1.047				Status	pass]	
Sensor Compo	nent	Cell B Freq.		Conditio	on 76.7 k	Hz	Status			pass]
Sensor Compo	nent	System Memo		Conditio	on				Status	pass]
Sensor Compo	nent	Sample Train		Conditio	Good				Status	pass]
Sensor Compo	nent	Cell B Pressure		Conditio	on				Status	pass		
Sensor Compo	nent	Cell B Flow		Conditio	on 0.64 l	om			Status	pass		
Sensor Compo	nent	Cell A Tmp.		Conditio	on 34.3 (2			Status	pass		
Sensor Compo	nent	Cell A Pressure		Conditio	on 605 m	mHg			Status	pass		
Sensor Compo	nent	Cell A Noise		Conditio	on 1.2 pp	b			Status	pass		
Sensor Compo	onent	Cell A Freq.		Conditio	on 84.6 k	Hz			Status	pass		
Sensor Compo	nent	Cell A Flow		Conditio	on 0.66 l	om			Status	pass		
Sensor Compo	nent	Battery Backup		Conditio	n N/A				Status	pass]
Sensor Compo	nent	Zero Voltage		Conditio	n -0.000)7			Status	pass		

Wind Speed Data Form

Mfg	5	Serial Number Ta Site		Site		Technician S		Site Visit Date	Parameter	Owner I	D	
Climatronics	1	784		CAN40	7	Eric	: Hebert	05/06/2014	Wind Speed	90872		
Mfg	Clim	atronics				Γ	Mfg	RM Young	Paramet	er wind speed		
SN/Owner ID	892		none			5	Serial Number CA04013			Tfer Desc. wind speed motor (h		
Parameter	F460) translator]	Гfer ID					
Prop or Cups S	SN	1144				\$	Slope	1.000	00 Intercept	0.00	000	
Prop or Cups	Forqu	e	0.3 to		0.3		Cert Date	1/16/20	14 CorrCoff	1.00	000	
Prop Correction	Prop Correction Fact N/A											
	DAS	1:		D	AS 2:							
Low Range High Range Low Range High Range												
Abs Avg Err 0.05 0.51%												
Abs Max Er		0.14	0.8	4%								
UseDescription	: Ir	put Device	Input	RPM	Input	m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM	
primary		none	()	0.2	0	0.0	0.3		0.14		
primary		01253	5	0	1.4	0	0.0	1.4		0.02		
primary		01253	10	00	2.5	7	0.0	2.6	2.6			
primary		01253	17	70	4.2	2	0.0	4.2		0.02		
primary		01253	25	50	6.1	0	0.0	6.1	0.49%			
primary		01253	50	00	11.9	97	0.0	12.1	0.84%			
primary		01253	80	00	19.)2	0.0	19.1	0.37%			
primary		01253	20	00	47.	22	0.0	47.4	0.34%			
Sensor Comp	onent	Condition			Co	ondition	Good		Status pass			
Sensor Comp	onent	Prop or Cu	ps Condit	tion	Co	ondition	Good		Status pass			
Sensor Comp	Sensor Component Sensor Heater			Co	ondition	Functioning		Status pass				
Sensor Component Torque			Co	ondition	1		Status pass					
Sensor Component Sensor Plumb			Co	ondition	Plumb		Status pass					
Sensor Component System Memo			Co	ondition	1		Status pass					

Wind Direction Data Form

Sensor Component Vane Condition

Sensor Component System Memo

Mfg	S	erial Numbe	er Ta	Site		Тес	chnician		Site Visit	Date	Param	neter	Owner II)
Climatronics	A	ARS1		CAN407		Eri	c Hebert		05/06/20	14	Wind D	Direction	90900	
Mfg	Clima	atronics					Mfg		RM Youn	g	P	arameter	wind direction	
SN/Owner ID	892		none]		Serial Nur	nber			Т	fer Desc.	wind direction w	vheel
Domenter	E460	translator]		Tfer ID		01264					
Parameter	F400	liansialoi												
Vane SN: 35	501		C. A.	Align. de	g. tru	ie:								
VaneTorque	8	to 1	0		3	58								
												_		
							Mfg		Ushikata		P	arameter	wind direction	
							Serial Nun	nber	192034		Т	fer Desc.	transit	
							Tfer ID		01270					
							Slope			1.0000	0 Inte	ercept	0.000	000
										20/201		C . 66	1.000	000
							Cert Date		1/	30/201	4 Cor	rCoff	1.000	000
T	DAS 1	•		DA	S 2:									
-	Orient	ation Lii	nearity	r: Or	ienta	tion L	inearity:							
Abs Avg Err		1.8		1.8										
Abs Max Er		3		4										
UseDescription		TferID	Int	ut Raw	Lin	earity (Dutput V		nut Deg	Diffe	rence	Change	Frror	
primary	1	01264	111	0	Lin		0.0000	Out	359	Diffe	1	45	0	
primary		01264		45			0.0000		43		2	44	-1	
primary		01264		90		✓	0.0000		90		0	47	2	
primary		01264		135		✓	0.0000		132		3	42	-3	
primary		01264		180		✓	0.0000		181		1	49	4	
primary		01264		225		✓	0.0000		223		2	42	-3	
primary		01264		270		✓	0.0000		269		1	46	1	
primary		01264		315		✓	0.0000		314		1	45	0	
primary		01270		88			0.0000		90		2		2	
primary		01270		178			0.0000		181		3		3	
primary		01270		268			0.0000		269		1		1	
primary		01270		358			0.0000		359		1		1	
Sensor Compo	onent	Torque				Conditio	n				Status	pass		
Sensor Compo	onent	Sensor Plun	nb			Conditio	n Plumb				Status	pass]
Sensor Compo	onent	Sensor Hea	ter			Conditio	n Function	ing			Status	pass]
Sensor Compo	Sensor Component Mast		Conditio	Condition Good			Status		us pass]			
Sensor Comp	Isor Component Condition			Conditio	n Good		Status			s pass				

Condition Good

Condition

Status pass

Status pass

Temperature Data Form

Mfg	Serial Numbe	er Ta	Site	,	Techni	ician	Site V	isit Date	Param	eter	Owner ID	
Climatronics	missing		CAN407		Eric H	ebert	05/06	6/2014	Temper	ature	ARS110	
Mfg	Climatronics				Mf	g	Eutec	hnics	Pa	rameter Te	emperature	
SN/Owner ID	395	03628			Ser	rial Number	01D10	02193	Tf	er Desc. R	TD translator	
Parameter	Temperature Tran	slator			Tfe	er ID	01231					
DAS 1.	D	AS 2.			Slo	pe		1.0013	3 Inte	rcept	-0.057	31
Abs Avg Err	Abs Max Er Al	bs Avg	Err Abs	Max Er	Cer	rt Date		12/27/201	3 Cor	rCoff	1.000	00
					Mf	g	Eutechnics		Pa	rameter Te	emperature	
					Ser	rial Number	01H0060		Tfer Desc.		TD probe	
					Tfe	er ID	01230)				
					Slo	ре		1.0013	3 Inte	rcept	-0.057	31
					Cert Date		12/27/2013 Co		3 Cor	rCoff	1.000	00
0.09	0.15				L							
UseDesc.	Test type	Inp	utTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	OutputSig	nalEng	OSE Unit	Difference	
primary T	emp Low Range		0.05	0.11		0.0000		0.1		С	-0.01	
primary T	emp Mid Range		26.08	26.10	0	0.0000		26.)	С	-0.12	
primary T	emp High Range		44.52	44.52	2	0.0000		44.2	7	С	0.15	
Sensor Comp	Sensor Component Shield			Condi	ition C	Clean			Status	pass		
Sensor Comp	Sensor Component Blower			Condi	ition F	Functioning			Status	pass		
Sensor Component Blower Status Switch			Condi	Condition N/A				Status	pass			
Sensor Comp	ensor Component System Memo			Condi	Condition				Status	us pass		

Humidity Data Form

Mfg Serial Number Ta				Technician	Site Visit l	Date P	arameter	Owner ID	
Rotronic	52065	CAN	407	Eric Hebert		05/06/201	4 R	elative Humidity	none
				Mfg		Rotronic		Parameter R	elative Humidity
				Serial Nu	mber	75296		Tfer Desc. G	TL
				Tfer ID		01220			
				Slope		1	.00000	Intercept	0.00000
	DAS 1:		DAS 2:	Cert Date	e	1/	/5/2010	CorrCoff	1.00000
	Low Range	High Range	Low Range	High Range	e				
Abs Avg Err	1.7	1.0							
Abs Max Er	3.1	1.0							
UseDesc.	Test type	Device	Input RH	GTL Raw	RH (Corr. D	AS Volt	ts DAS %RH	Difference
primary	RH Low Range	GTL	32.8	0.0	32	.8	0.0000	32.5	-0.3
primary	RH Low Range	GTL	52.9	0.0	52	.9	0.0000	56.0	3.1
primary	RH High Range	GTL	93.6	0.0	93	.6	0.0000	92.6	-1.0
Sensor Com	ponent RH Filter		Con	dition Clean			S	status pass	
Sensor Com	ponent Shield		Con	dition Clean			S	status pass	
Sensor Component Blower			Con	dition Functio	ning		S	tatus pass	
Sensor Component Blower Status Switch			Con	Condition N/A				tatus pass	
Sensor Com	Sensor Component System Memo		Condition			S	tatus pass		

Solar Radiation Data Form

Mfg Serial Number Ta		r Ta Site	r	Technician S		Site Visit Date	Param	eter O	wner ID
Licor	PY46778	CAN407		Eric H	ebert	05/06/2014	Solar R	adiation	ne
Mfg	Climatronics			Mf	g	RM Young	Pa	arameter solar ra	diation
SN/Owner ID	650 I	none		Ser	rial Number		Tf	fer Desc. SR tran	sfer translat
Parameter	Solar Radiation Tra	anslator		Tfe	er ID	01240			
DAS 1:	DA	AS 2:		Slo	ре	1.0267	8 Inte	rcept	-16.91000
% Diff of Avg	%Diff of Max %	Diff of Avg %D	iff of Max	Cei	rt Date	6/14/201	4 Cor	rCoff	0.99800
				Mf	g	Licor	Pa	arameter solar ra	diation
				Ser	rial Number		Tf	fer Desc. SR tran	sfer sensor
				Tfe	er ID	01241			
				Slo	ре	1.0267	8 Inte	rcept	-16.91000
				Cei	rt Date	6/14/201	4 Cor	rCoff	0.99800
7.8%	8.4%	0.0%	0.0%	L					
UseDescription	Measure Date	MeasureTime	Tfer Ra	aw	Tfer Corr	DAS w	/m2	PctDifference	
primary	5/6/2014	12:28	1027	7	1017	1101		8.3%	
primary	5/6/2014	12:29	1032	2	1022	1107	7	8.3%	
primary	5/6/2014	12:30	1039)	1028	1114	1	8.4%	<u>_</u>
primary	5/6/2014	12:40	545		547	579		5.8%	<u>•</u>
primary	5/6/2014	12:45	889		882	948		7.5%	
Sensor Compo	onent Sensor Clea	n	Condi	ition C	Clean		Status	pass	
Sensor Compo	Sensor Leve	····	Condi	ition L	evel		Status	pass	
Sensor Compo	Properly Site	ed	Condi	ition F	Properly sited		Status	pass	
Sensor Component System Memo		Condi	ition			Status			

Precipitation Data Form

Mfg	Ser	ial Number Ta		Technician			Site Visit Date Paran			eter		Owner ID)	
Climatronics	ille	gible	CAN407		Eri	ic Hebert		05/0	06/2014	Precipita	ation		90870	
						Mfg)	Pa	ramet	er Pred	cipitation	
DAS 1:		DAS 2:				Serial Number EW			06134-50	Tf	er Des	c. 250	ml graduate	
A Avg % Dif	f: A Max	% Di A Avg %	Dif A N	Aax % Di		Tfer ID 01250			50					
6.0%	•	8.0%								_				
						Slope			1.0000	0 Inter	cept		0.000	000
						Cert Date			9/5/200	5 Corr	Coff		1.000	00
UseDasa Test time TforVolume Iteration Ti					.		DAG		E HILL	OGELI		TT •.		
UseDesc.	TimePerT	1p	Eq.Ht	DAS	eng	Eq.HtUnit	OSE Un	it Tfe	rUnits	PctDifferen				
primary	test 1 test 2	231.5	2	10 sec	_	5.00 4.60 mm			mm	mm		ml	-8.0	%
Sensor Com	ponent P	roperly Sited		Cond	lition 45 degree rule					Status	pass			
Sensor Com	ponent G	auge Drain Scree	n	Cond	itio	Not instal	led			Status	Fail			
Sensor Com	nponent F	unnel Clean		Cond	itio	n Clean				Status	pass			
Sensor Com	ponent C	Condition		Cond	itio	Good				Status	pass			
Sensor Com	nponent G	auge Screen		Cond	itio	n Installed				Status	pass			
Sensor Component Gauge Clean			Cond	itio	n Clean				Status	pass				
Sensor Component Level			Cond	itio	n Level				Status	pass				
Sensor Component Sensor Heater			Cond	itio	ition Functioning				Status	pass				
Sensor Component System Memo				Cond	itio	on				Status	pass			

Shelter Temperature Data For

chnician	Site Visit Date	Parameter	Owner ID
ic Hebert	05/06/2014	Shelter Temperatu	renone
Mfg Serial Number Tfer ID Slope Cert Date Mfg Serial Number Tfer ID Slope Cert Date	Eutechnics 01D102193 01231 1.0013 12/27/201 Eutechnics 01H0060 01230 1.0013 12/27/201	Parameter S Tfer Desc. R Intercept CorrCoff Parameter S Tfer Desc. R Intercept SorrCoff	helter Temperatur TD translator -0.05731 1.00000 helter Temperatur TD probe -0.05731 1.00000
i	hnician c Hebert Mfg Serial Number Tfer ID Slope Cert Date Mfg Serial Number Tfer ID Slope Cert Date	hnicianSite Visit Datec Hebert05/06/2014MfgEutechnicsSerial Number01D102193Tfer ID01231Slope1.0013Cert Date12/27/201MfgEutechnicsSerial Number01H0060Tfer ID01230Slope1.0013Cert Date12/27/201MfgEutechnicsSerial Number01H0060Tfer ID01230Slope1.0013Cert Date12/27/201	InnicianSite Visit DateParameterc Hebert05/06/2014Shelter TemperatuMfgEutechnicsParameter SSerial Number01D102193Tfer Desc. RTfer ID01231Tfer Desc. RSlope1.00133InterceptCert Date12/27/2013CorrCoffMfgEutechnicsParameter SSerial Number01H0060Tfer Desc. RTfer ID01230SlopeStope1.00133InterceptCert Date12/27/2013CorrCoffSlope1.00133InterceptIfer ID01230InterceptSlope1.00133InterceptCert Date12/27/2013CorrCoff

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.02	22.05	0.000	21.7	С	-0.33
primary	Temp Mid Range	20.84	20.87	0.000	20.8	С	-0.07
primary	Temp Mid Range	21.38	21.41	0.000	21.3	С	-0.15

Infrastructure Data For

Site ID	CAN407	Technician Eric Heb	Site Visit Date 05/06/2014
Shelter	Make	Shelter Model	Shelter Size
NPS		R46453	640 cuft

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

Field Systems Comments

1 Parameter: SitingCriteriaCom

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

2 Parameter: ShelterCleanNotes

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

F-02058-1500-S1-rev002

Site ID CAN407	Technician Eric Hebert	Site Visit Date 05/06	6/2014	
Site Sponsor (agency)	NPS/FPA	USGS Map	Musselman Arch	
On creating Cream	NPS	Man Scale		
Operating Group		Man Data		
AQS #	49-037-0101	Map Date] .	
Meteorological Type	Climatronics			
Air Pollutant Analyzer	Ozone, IMPROVE	QAPP Latitude		
Deposition Measurement	dry, wet	QAPP Longitude		
Land Use	woodland - mixed, desert range	QAPP Elevation Meters		
Terrain	complex	QAPP Declination		
Conforms to MLM	Marginally	QAPP Declination Date		
Site Telephone	(435) 259-4141	Audit Latitude	38.458323	
Site Address 1	Visitors Center	Audit Longitude	-109.82126	
Site Address 2	route 313	Audit Elevation	1794	
County	San Juan	Audit Declination	11.6	
City, State	Moab, UT	Present		
Zip Code	84532	Fire Extinguisher 🔽	Inspected April 2014	
Time Zone	Mountain	First Aid Kit	in vehicle	
Primary Operator		Safety Glasses		
Primary Op. Phone #		Safety Hard Hat		
Primary Op. E-mail		Climbing Belt		
Backup Operator		Security Fence		
Backup Op. Phone #		Secure Shelter		
Backup Op. E-mail		Stable Entry Step 🔽		
Shelter Working Room ✓	Make NPS Mo	odel R46453	Shelter Size 640 cuft	
Shelter Clean	Notes The shelter is in good condition, well organized and well maintained.			
Site OK	Notes			
Driving Directions From I-70, take exit 180 south on route 191. Approximately 9 miles north of Moab, turn right (west) on route 313 at the sign for Canyonlands National Park. Follow 313 west for 25 miles passing the state park and continuing straight to Canyonlands. The site is at the end of the dirt road behind the visitors center, in the maintenance area.				

CAN407

F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 05/06/2014

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

Siting Distances OK

Siting Criteria Comment

The small parking lot at the visitors center is approximately 100m to the northeast.
Fi	eld Sy	stems Data F	orm			F-02058-1500-S3-rev(
Site	e ID	CAN407	Technician	Eric Hebert		Site Visit Date	05/06/2014			
1	Are win being in	d speed and directior fluenced by obstructi	sensors sited so ons?	as to avoid						
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 preveiling wind)										
3	Are the	tower and sensors pl	umb?							
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?									
5	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	lar radiation sensor	plumb?							
7	Is it site light?	d to avoid shading, or	r any artificial or	reflected						
8	Is the ra	in gauge plumb?			✓					
9	Is it site towers,	d to avoid sheltering etc?	effects from buil	dings, trees,		45 degree rule viola	ation			
10	Is the su facing n	urface wetness sensor orth?	sited with the gr	id surface		N/A				
11	Is it inc	lined approximately	30 degrees?			N/A				

F-02058-1500-S4-rev002

Site	e ID	CAN407	Technician E	Eric Hebert		Site Visit Date	05/06/2014	
1	Do all th condition	e meterological senso n, and well maintained	rs appear to be i d?	ntact, in good				
2	Are all the reporting	he meteorological sens g data?	sors operational	online, and				
3	Are the s	shields for the temper	ature and RH se	msors clean?				
4	4 Are the aspirated motors working?							
5	Is the sol scratche	lar radiation sensor's s?	lens clean and fr	ree of				
6	Is the su	rface wetness sensor g	grid clean and ur	ndamaged?		N/A		
7	Are the s condition	sensor signal and pow n, and well maintained	er cables intact, d?	in good				
8	Are the s from the	sensor signal and pow elements and well ma	er cable connect aintained?	ions protected				

Fi	eld Sy	stems Data Fo	rm			F-02058-1500-S5-rev002
Site	e ID	CAN407	Technician	Eric Hebert		Site Visit Date 05/06/2014
	<u>Siting C</u>	riteria: Are the polluta	int analyzers an	nd deposition eq	<u>uipn</u>	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the s unrestri	ample inlets have at lea acted airflow?	ast a 270 degree	e arc of	✓	
2	Are the sample inlets 3 - 15 meters above the ground?					
3	Are the and 20 1	sample inlets > 1 meter neters from trees?	r from any maje	or obstruction,	✓	
	<u>Pollutar</u>	nt analyzers and deposi	<u>tion equipment</u>	operations and	mai	intenance
1	Do the a conditio	nalyzers and equipment on and well maintained	nt appear to be ?	in good	✓	
2	Are the reportin	analyzers and monitor ng data?	s operational, o	n-line, and	✓	
3	Describ	e ozone sample tube.				1/4 teflon by 10 meters
4	Describ	e dry dep sample tube.				3/8 teflon by 10 meters
5	Are in-li indicate	ine filters used in the or location)	zone sample line	e? (if yes		At inlet only
6	Are sam obstruct	ple lines clean, free of tions?	kinks, moisture	, and	✓	
7	Is the ze	ero air supply desiccant	unsaturated?		✓	
8	Are the	re moisture traps in the	e sample lines?			Flow line only
9	Is there clean?	a rotometer in the dry	deposition filte	r line, and is it		Clean and dry

Fi	eld Sy	stems Data Fo	orm					F-02	2058-15	00-S6-rev002
Site	e ID	CAN407	Technician	Eric Hebert		Site Visit	Date	05/06/2014	ŀ	
	DAS, se	nsor translators, and	pment operatio	ns a	nd maintenar	<u>ice</u>				
1	Do the DAS instruments appear to be in good condition and well maintained?									
2 Are all the components of the DAS operational? (printers, modem, backup, etc)					✓					
3	Do the a lightning	nalyzer and sensor sig g protection circuitry	gnal leads pass (?	through		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 grounde	DAS, sensor translato cd?	ors, and shelter	properly	✓					
7	Does the	e instrument shelter h	ave a stable pov	ver source?	✓					
8	Is the in	strument shelter temp	perature control	lled?						
9	Is the m	et tower stable and gr	ounded?			Stable			Grounded	
10	Is the sa	mple tower stable and	l grounded?							
11	Tower c	omments?								

Field	Systems Data	For	m				F-02	.058-	1500-S'	7-rev002
Site ID	CAN407		Techni	cian E	Eric Hebert	Site Visit Date	05/06/2014	L		
<u>Docu</u>	mentation									
Does	the site have the requi	red ins	strumen	t and e	<u>quipment manuals?</u>					
Wind sp Wind di Temper Relative Solar ra Surface Wind se Temper Humidi Solar ra Tipping Ozone a Filter pa Filter pa	peed sensor irection sensor rature sensor e humidity sensor adiation sensor wetness sensor ensor translator rature translator ty sensor translator adiation translator g bucket rain gauge analyzer ack flow controller ack MFC power supply		No		Data logger Data logger Strip chart Computer Modem Printer Zero air pu Filter flow Surge proto UPS Lightning p Shelter hea Shelter air	r r recorder imp pump ector protection device iter conditioner	Yes ✓ () () () () () () () () () ()	No 		
<u>Doe</u>	es the site have the requ	<u>ired a</u>	nd most	recent	t QC documents and	<u>report forms?</u>	G			
Station SSRF Site Ops HASP Field Op Calibra Ozone z Prevent	Log s Manual ps Manual tion Reports c/s/p Control Charts ive maintenance schedu	Pres [[[[[ul [ataview				nt		
1 Ist	1 Is the station log properly completed during every site visit? ✓									
2 Ar	e the Site Status Repor rrent?	t Forn	ıs being	comple	eted and V Fl	ow & observation	sections			
3 Ar sar	e the chain-of-custody b nple transfer to and fro	forms om lab	properly ?	y used 1	to document 🔽					
4 Ar	e ozone z/s/p control ch rrent?	arts p	roperly	comple	eted and 🗌 Co	ontrol charts not u	lsed			
Provide natural	Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:									

CAN407 Technician Eric Hebert Site Visit Date 05/06/2014 Site ID Site operation procedures Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

QC Check Performed

Frequency

Multipoint Calibrations	\checkmark	Semiannually
Visual Inspections	\checkmark	Weekly
Translator Zero/Span Tests (climatronics)	\checkmark	Weekly
Manual Rain Gauge Test	\checkmark	Monthly
Confirm Reasonableness of Current Values	\checkmark	Weekly
Test Surface Wetness Response	\checkmark	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	
Monthly and semiannually	
Daily	
Monthly	
Daily	
Alarm values only weekly	
Monthly	
N/A	
Weekly	
As needed	

- Do multi-point calibration gases go through the complete 1 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?

✓	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:

mpliant

\checkmark

Compliant

 \checkmark

 \checkmark

 \checkmark

 \checkmark

✓

F-02058-1500-S8-rev002

					1-02030-1300-07-10002			
Site ID CAN407 Te	chnician	Eric Hebert		Site Visit Date	05/06/2014			
Site operation procedures								
1 Is the filter pack being changed eve	ry Tuesda	ay as scheduled?	<mark>?</mark> 🗸	Filter changed vario	ous times			
2 Are the Site Status Report Forms b correctly?	eing com	pleted and filed						
3 Are data downloads and backups b scheduled?	eing perf	ormed as		No longer required				
4 Are general observations being mad	le and ree	corded? How?	✓	Dataview and SSRF	-			
5 Are site supplies on-hand and reple fashion?	nished in	a timely						
6 Are sample flow rates recorded? He	6 Are sample flow rates recorded? How?				SSRF			
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	✓	Clean gloves on and	d off			
9 Are the site conditions reported reg operations manager or staff?	ularly to	the field						
QC Check Performed	Free	quency			Compliant			
Multi-point MFC Calibrations	✓ Sem	niannually			\checkmark			
Flow System Leak Checks	✓ Wee	ekly						
Filter Pack Inspection								
Flow Rate Setting Checks	✓ Wee	ekly			\checkmark			
Visual Check of Flow Rate Rotometer	• 🗹 Wee	ekly			\checkmark			
In-line Filter Inspection/Replacement	🖌 As r	needed			\checkmark			
Sample Line Check for Dirt/Water								

CAN407

F-02058-1500-S10-rev002

Site ID

Technician Eric Hebert

Site Visit Date 05/06/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID	
Computer	Hewlett Packard	6560 b	5CB1520H70	none	
DAS	Environmental Sys Corp	8816	2523	09638	
Elevation	Elevation	1	None	None	
F460 translator	Climatronics	100163	892	none	
Filter pack flow pump	Thomas	107CAB18A	07960000521	none	
flow rate	Mykrolis	FC280SAV-4S	AW9403022	03388	
Infrastructure	Infrastructure	none	none	none	
Mainframe	Climatronics	100081	1291	01340	
Met tower	Universal Tower	unknown	none	01357	
MFC power supply	Tylan	RO-32	none	03678	
Modem	US Robotics	56.6k	unknown	none	
Ozone	ThermoElectron Inc	49i A3NAA	1030745085	none	
Ozone Standard	ThermoElectron Inc	49C	49C-61991-333	90606	
Precipitation	Climatronics	100508-2	illegible	90870	
Printer	Hewlett Packard	842C	unknown	none	
Relative Humidity	Rotronic	MP 601	52065	none	
Sample Tower	Aluma Tower	В	none	illegible	
Shelter Temperature	ARS	none	none	none	
Shield (10 meter)	Climatronics	100325	1225	01197	
Siting Criteria	Siting Criteria][1	None	None	
Solar Radiation	Licor	LI-200	PY46778	none	
Solar Radiation Translator	Climatronics	100144	650	none	
Temperature	Climatronics	100093	missing	ARS110	
Temperature Translator	Climatronics	100088-2	395	03628	
Wind Direction	Climatronics	100076	ARS1	90900	
Wind Speed	Climatronics	100075	1784	90872	
Zero air pump	Twin Tower Engineering	TT70/4E	526292	none	

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
GRB	2411-Alison	Ray-05/27/2014				
1	5/27/2014	Computer	Hewlett Packard	none	6560 b	5CB22906V0
2	5/27/2014	DAS	Environmental Sys Corp	90635	8816	2507
3	5/27/2014	Elevation	Elevation	None	1	None
4	5/27/2014	F460 translator	Climatronics	none	100163	823
5	5/27/2014	Filter pack flow pump	Thomas	none	107CA14	0000109-84D
6	5/27/2014	flow rate	Tylan	03387	FC280AV	AW9403026
7	5/27/2014	Infrastructure	Infrastructure	none	none	none
8	5/27/2014	Mainframe	Climatronics	none	100081	1378
9	5/27/2014	Mainframe power supply	Climatronics	none	101074	unknown
10	5/27/2014	Met tower	Climatronics	01358	18 inch taper	none
11	5/27/2014	MFC power supply	Tylan	03681	RO-32	FP9404004
12	5/27/2014	Modem	US Robotics	none	0701	Z4L0057C027R
13	5/27/2014	Ozone	ThermoElectron Inc	90565	49C	49C-59285-322
14	5/27/2014	Ozone Standard	ThermoElectron Inc	90570	49C	49C-59301-322
15	5/27/2014	Precipitation	Texas Electronics	none	TR-525i-HT	45484-910
16	5/27/2014	Relative Humidity	Rotronic	none	MP 601A	56082
17	5/27/2014	Sample Tower	Aluma Tower	none	В	AT-5381-F9-2
18	5/27/2014	Shelter Temperature	ARS	none	none	80
19	5/27/2014	Shield (10 meter)	Climatronics	00608	100325	illegible
20	5/27/2014	Siting Criteria	Siting Criteria	None	1	None
21	5/27/2014	Solar Radiation	Licor	none	LI-200	PY12084
22	5/27/2014	Solar Radiation Translator	RM Young	103144	70101-X	none
23	5/27/2014	Temperature	Climatronics	none	100093	illegible
24	5/27/2014	Temperature Translator	Climatronics	none	100088-2	441
25	5/27/2014	Wind Direction	Climatronics	91052	100076	4231
26	5/27/2014	Wind Speed	Climatronics	90923	100075	1489
27	5/27/2014	Zero air pump	Werther International	90722	TT70/4E	507782

DAS Data Form

9

9

0.9000

1.0000

0.9002

1.0002

DAS Time Max Error: 2.38

Mfg	Serial	Number Site	e T	echnician	Site Visit Date	Parameter	Use Desc.
Environmental	Sys 2507	GR	B411	Alison Ray	05/27/2014	DAS	Primary
Das Date:	5 /27/2014	Audit Date	5 /27/2014	Mfg	Datel	Parameter	DAS
Das Time: Das Day:	16:50:37	Audit Time Audit Day	16:53:00	Serial Number	4000392	Tfer Desc.	Source generator (D
Low Channel	:	High Channe	el:	Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0001	0.0	0.0002	2 0.0003	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740243	Tfer Desc.	DVM
				Tfer ID	01312		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	12/28/201	3 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
3	0.0000	0.0001	0.0000	V	V	-0.0001	
3	0.1000	0.1001	0.1000	V	V	-0.0001	
3	0.3000	0.3001	0.3001	V	V	0.0000	
3	0.5000	0.5002	0.5000	V	V	-0.0002	
3	0.7000	0.7002	0.7000	V	V	-0.0002	
3	0.9000	0.9002	0.9000	V	V	-0.0002	
3	1.0000	1.0002	1.0000	V	V	-0.0002	
9	0.0000	0.0001	0.0000	V	V	-0.0001	
9	0.1000	0.1001	0.1000	V	V	-0.0001	
9	0.3000	0.3001	0.3000	V	V	-0.0001	
9	0.5000	0.5001	0.5000	V	V	-0.0001	
9	0.7000	0.7002	0.7000	V	V	-0.0002	

0.8999

1.0000

V

V

V

V

-0.0003

-0.0002

Flow Data Form

Mfg	Serial Nur	nber Ta	Site	Те	chnician	Site Visit	Date Para	meter	Owner ID		
Tylan	AW94030	26	GRB411	Ali	son Ray	05/27/201	4 flow r	ate	03387		
Mfg	Tylan				Mfg	BIOS]	Parameter Flow Rate			
SN/Owner ID	FP9404004	03681			Serial Number	131818		Ifer Desc. BIC	05 220-H		
Parameter	MFC power su	pply			Tfer ID	01417					
					Slope	1	.00000 In	tercept	0.00000		
					Cert Date	1	/8/2014 C o	orrCoff	1.00000		
DAS 1:		DAS 2:			Cal Factor Z	ero	0	.32			
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale	5	.76			
2.40%	2.61%				Rotometer R	eading:		2.4			
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	E InputUnit	OutputSignall	PctDifference		
primary	pump off	0.000	0.000	-0.26	-0.2380	0.06	1/m	l/m			
primary	leak check	0.000	0.000	-0.26	-0.2380	0.06	l/m	l/m			
primary	test pt 1	3.057	3.060	2.44	2.4470	2.98	1/m	l/m	-2.61%		
primary	test pt 2	3.046	3.050	2.44	2.4470	2.98	l/m	l/m	-2.30%		
primary	test pt 3	3.052	3.050	2.44	2.4470	2.98	l/m	<u>l/m</u>	-2.30%		
Sensor Comp	nent Leak Tes	st		Conditio	n		Statu	is pass			
Sensor Comp	ment Tubing C	Condition		Conditio	n Good		Statu	Is pass			
Sensor Comp	onent Filter Po	sition		Conditio	n Good		Statu	Is pass			
Sensor Comp	onent Rotomet	er Conditio	n	Conditio	Clean and dry		Statu	Is pass			
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	resent	Statu	Is pass			
Sensor Comp	ment Filter Dis	tance		Conditio	n 4.5 cm		Statu	Is pass			
Sensor Comp	Filter De	pth		Conditio	2.0 cm		Statu	Is pass			
Sensor Comp	Filter Azi	muth		Conditio	n 335 deg		Statu	Is pass			
Sensor Comp	onent System I	Memo		Conditio	n		Statu	Is pass			

Ozone Data Form

Mfg	Serial Number	Ta Sit	te	Tee	chnician		Site Visi	t Date	Parame	eter	Owner I	D
ThermoElectron Ind	2 49C-59285-322	2 G	RB411	Ali	son Ray		05/27/20	014	Ozone		90565	
Slope: Intercept CorrCoff	0.98260 Slope -3.54543 Interv 0.99995 Corr	:	0.00000))	Mfg Serial N	lumber	ThermoE 49CPS-7	Electron I 70008-36	inc Pa	rameter oz er Desc. Oz	one	' stan
DAS 1: A Avg % Diff: A 7.8%	DA Max % Di A A 11.8%	S 2: Avg %Di	if A Max ^o	% Di	Slope Cert Da	ite		1.00707 1/8/2014	7 Inter 4 Corr	ccept Coff	-0.21	032 000
UseDescription	: ConcGrou	ıp: '	Tfer Raw:	Tfer (Corr:	Sit	te:	Site	Unit:	PctDiff	erence:	
primary	1		0.03	0.2	23	-3.	69	ppb				
primary	2		33.65	33.	62	29.	.65	ppb			-11.81%	
primary	3		51.80	51.	64	47.	.37	ppb			-8.27%	
primary	4		77.74	77.	40	73.	.03	ppb			-5.65%	
primary	5		113.08	112	.49	106	5.50	ppb			-5.32%	
Sensor Compon	ent Cell B Noise			Conditio	n 2.0 pp	b			Status	pass		
Sensor Compon	ent Cell B Tmp.			Conditio	on				Status	pass		
Sensor Compon	ent Fullscale Volt	age		Conditio	n 0.992	4			Status	pass		
Sensor Compon	ent Inlet Filter Co	ndition		Conditio	Mode	rately clea	an		Status	pass		
Sensor Compon	ent Line Loss			Conditio	Not te	sted			Status	pass		
Sensor Compon	ent Offset			Conditio	n 0.5				Status	pass		
Sensor Compon	ent Span			Conditio	n 0.991				Status	pass		
Sensor Compon	ent Cell B Freq.			Conditio	n 78.5 k	Hz			Status	pass		
Sensor Compon	ent System Mem	0		Conditio	n				Status	pass		
Sensor Compon	ent Sample Train			Conditio	n Fair				Status	pass		
Sensor Compon	ent Cell B Pressu	ire		Conditio	on				Status	pass		
Sensor Compon	ent Cell B Flow			Conditio	n 0.65 l	om			Status	pass		
Sensor Compon	ent Cell A Tmp.			Conditio	n 34.3 ()			Status	pass		
Sensor Compon	ent Cell A Pressu	ire		Conditio	n 577 m	mHg			Status	pass		
Sensor Compon	ent Cell A Noise			Conditio	n 0.6 pp	b			Status	pass		
Sensor Compon	ent Cell A Freq.			Conditio	n 85.5 k	Hz			Status	pass		
Sensor Compon	ent Cell A Flow			Conditio	n 0.70 l	om			Status	pass		
Sensor Compon	ent Battery Back	цр		Conditio	N/A				Status	pass		
Sensor Compon	ent Zero Voltage			Conditio	n -0.005	58			Status	pass		

Wind Speed Data Form

Mfg	5	Serial Number Ta Site			Т	echnician	Site Visit Date	Owner I	D		
Climatronics	1	489	GR	3411	A	Alison Ray	05/27/2014	Wind Speed	90923		
Mfg	Clim	atronics				Mfg	RM Young	Paramet	er wind speed		
SN/Owner ID	823		none			Serial Number	CA04013	Tfer Desc. wind speed motor (h			
Parameter	F460) translator				Tfer ID	01253				
Prop or Cups S	SN	2334				Slope	1.000	00 Intercept	0.00	000	
Prop or Cups	Forqu	e	0.3 to	(0.3	Cert Date	1/16/20	14 CorrCoff	1.00	000	
Prop Correctio	on Fac	t N/A									
-	DAS	1:		DAS 2:							
	Low Range High Range Low Range High Range										
Abs Avg Err 0.07 0.35%											
Abs Max Er		0.10	1.15%								
UseDescription	: Ir	put Device	Input RP	M In	put m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM	
primary		none	0		0.20	0.0	0.1		-0.06		
primary		01253	50		1.40	0.0	1.3		-0.10		
primary		01253	100		2.57	0.0	2.5		-0.03		
primary		01253	170		4.22	0.0	4.1		-0.09		
primary		01253	250		6.10	0.0	6.0	-1.15%			
primary		01253	500		11.97	0.0	12.0	0.00%			
primary		01253	800		19.02	0.0	19.0	0.05%			
primary		01253	2000		47.22	0.0	47.3	0.21%			
Sensor Comp	onent	Condition			Condit	ion Good		Status pass			
Sensor Comp	onent	Prop or Cup	s Condition		Condit	ion Good		Status pass			
Sensor Comp	onent	Sensor Hea	ter		Condit	ion Not tested		Status pass			
Sensor Comp	onent	onent Torque			Condit	ion		Status pass			
Sensor Comp	or Component Sensor Plumb			Condit	ion Plumb		Status pass				
Sensor Comp	onent	System Me	mo		Condit	ion		Status pass			

Wind Direction Data Form

Mfg	S	erial Number '	Ta Site		Tec	hnician		Site Visit	Date P	aram	eter	Owner II	D
Climatronics	4	4231 GRB411			Alis	son Ray 05/27/2014			14 W	/ind D	Direction	91052	
Mfg SN/Owner ID Parameter	Clima 823 F460	atronics nc	[2 ,	MfgRM YoungSerial NumberTfer ID01264				P T	arameter [fer Desc. [wind direction	wheel		
Vane SN: 44 VaneTorque	91 7	to 7	C. A. Align. d	<mark>eg. tru</mark> 3	ie: 60								
]	Mfg		Ushikata		P	arameter	wind direction	
					1	Serial Nun	ıber	192034		Т	fer Desc. t	ransit	
						Ffer ID		01270					
									1.00000	Inte	ercept	0.00	000
						Cert Date		1/	30/2014	Cor	rCoff	1.00	000
Abs Avg Err	DAS 1 Drient	: ation Lines 3.5 6	D arity: C 0.9 3	AS 2: prienta	tion Lin	nearity:							
UseDescription		TferID	Input Raw	Lin	earity O	utput V	Out	put Deg.	Differen	nce	Change	Error	
primary		01264	0			0.0000		351		9	46	1	
primary	_	01264	45			0.0000		35		10	44	-1	
primary	_	01264	90			0.0000		78		12	42.5	-2.5	
primary		01264	135			0.0000		124		11	46.5	1.5	
primary	_	01264	180	l		0.0000		169		10	45	0	
primary	_	01264	225	l		0.0000		215		10	40	1	
primary		01204	315	l		0.0000		305		10	43	0	
primary		01204	180			0.0000		179		10	43	1	
primary	_	01270 180				0.0000		354		6		6	
Sensor Compo	Component Torque				Condition	n			S	tatus	pass]
Sensor Compo	onent	Sensor Plumb			Condition	Plumb			S	tatus	pass		
Sensor Compo	Sensor Component Sensor Heater			Condition	ondition Not tested			S	tatus	pass			
Sensor Compo	ensor Component Mast				Condition	ondition Good				tatus	pass		

Sensor ComponentConditionGoodStatuspassSensor ComponentVane ConditionConditionGoodStatuspassSensor ComponentSystem MemoConditionStatuspass

Temperature Data Form

Mfg	Serial Number	Serial Number Ta Site			ician	Site V	isit Date	Param	eter	Owner ID	•
Climatronics	illegible	GRB4	11	Alison	Ray	05/27	/2014	Temper	ature	none	
Mfg	Climatronics			Mi	Mfg Eutechnics			Pa	rameter Te	emperature	
SN/Owner ID	441 no	one		Sei	rial Number	01D102193 Tf			er Desc. R	TD translator	
Parameter	Temperature Transl	ator		Tfe	er ID	01231					
DAS 1:	DAS	5 2:		Slo	Slope 1.00133 Intercept				rcept	-0.057	31
Abs Avg Err	Abs Max Er Abs	Avg Err	Abs Max Er	Ce	Cert Date 12/27/2013 CorrCoff				rCoff	1.000	00
				Mi	g	Eutec	hnics	Pa	rameter Te	emperature	
				Sei	rial Number	01H0060 T		Tf	Tfer Desc. RTD probe		
				Tfe	er ID	01230					
				Slo	ope		1.0013	3 Inte	rcept	-0.057	31
				Ce	rt Date		12/27/201	3 Cor	rCoff	1.000	00
0.07	0.16										
UseDesc.	Test type	InputTmpR	aw InputTr	npCorr.	OutputTmpS	Signal	OutputSig	nalEng	OSE Unit	Difference	
primary 7	Temp Low Range	0.57	0.0	63	0.0000		0.6	i	С	-0.04	
primary 7	Temp Mid Range	23.89	23.	.92	0.0000		23.	9	С	0.01	
primary 7	Temp High Range	46.18	46.	.18	0.0000		46.	3	С	0.16	
Sensor Comp	Sensor Component Shield				Condition Clean			Status	pass		
Sensor Comp	Sensor Component Blower Co				Functioning			Status	pass		
Sensor Component Blower Status Switch Con				dition 1	ion N/A			Status	pass		
Sensor Component System Memo Con					ion				pass		

Humidity Data Form

Mfg	Serial Nur	nber Ta Site		Technician		Site Visit	t Date	Param	neter	Owner ID
Rotronic	56082	GRE	3411	Alison Ray		05/27/20)14	Relativ	e Humidity	none
				Mfg		Rotronic		P	arameter Rel	ative Humidity
				Serial Nu	mber	75296		Т	fer Desc. GT	L
				Tfer ID		01220				
				Slope			1.00000) Inte	ercept	0.00000
	DAS 1:		DAS 2:	Cert Date	e		1/5/2010	O Cor	rrCoff	1.00000
	Low Range	High Range	Low Range	High Range	e					
Abs Avg Err	3.2	4.0								
Abs Max Er	4.7	4.0								
UseDesc.	Test type	Device	Input RH	GTL Raw	RH (Corr. I	DAS Vo	olts	DAS %RH	Difference
primary	RH Low Range	GTL	32.8	0.0	32	2.8	0.000	0	34.5	1.7
primary	RH Low Range	GTL	52.9	0.0	52	2.9	0.000	0	57.6	4.7
primary	RH High Range	GTL	93.6	0.0	93	5.6	0.000	0	89.6	-4.0
Sensor Com	ponent RH Filter		Con	dition Clean				Status	pass	
Sensor Com	ponent Shield		Con	dition Clean				Status	pass	
Sensor Com	ponent Blower		Con	dition Functio	ning			Status	pass	
Sensor Com	ponent Blower S	status Switch	Con	dition N/A				Status	pass	
Sensor Com	ponent System	Vemo	Con	dition				Status	pass	

Solar Radiation Data Form

Mfg	Serial Numbe	r Ta Site	T	echnician	Site Visit	Date F	Parame	eter	Own	ner ID
Licor	PY12084	GRB411	Α	lison Ray	05/27/201	4 S	Solar Ra	adiation	none)
Mfg	RM Young			Mfg	RM Young		Pa	rameter so	ılar radia	ation
SN/Owner ID	none	103144		Serial Number	•		Tf	er Desc. SF	R transfe	er translat
Parameter	Solar Radiation Tra	anslator		Tfer ID	01240					
DAS 1:	DA	AS 2:		Slope	1	.02678	Inter	rcept	-1	6.91000
% Diff of Avg	%Diff of Max %	Diff of Avg %D	iff of Max	Cert Date	6/1	4/2014	Corr	Coff		0.99800
				Mfg	Licor		Pa	rameter so	lar radia	ation
				Serial Number			Tf	er Desc. SF	R transfe	er sensor
				Tfer ID	01241					
				Slope	1	.02678	Inter	rcept	-1	6.91000
				Cert Date	6/1	4/2014	Corr	Coff		0.99800
0.4%	0.5%	0.0%	0.0%							
UseDescription	Measure Date	MeasureTime	Tfer Ray	w Tfer Co	rr D	AS w/m	n2	PctDiffere	ence	
primary	5/27/2014	10:00	995	985		986			0.1%	
primary	5/27/2014	11:00	1045	1034		1039			0.5%	
primary	5/27/2014	12:00	957	948		920		-	-3.0%	
primary	5/27/2014	13:00	842	836		842			0.7%	
Sensor Compo	nent Sensor Clea	n	Conditi	ion Clean		5	Status	pass		
Sensor Compo	nent Sensor Leve	9	Conditi	ion Level		5	Status	pass		
Sensor Compo	nent Properly Site	ed	Conditi	ion Properly sited	1	5	Status	pass		
Sensor Compo	nent System Men	าง	Conditi	ion		5	Status	pass		

Precipitation Data Form

Mfg	S	erial Number	Та	Site		Т	'ec	hnician		Site	Visit Date	Param	ete	r	Owne	r ID	
Texas Electror	nics 4	45484-910		GRB411		A	Alis	son Ray		05/2	27/2014	Precipi	tatio	on	none		
]	Mfg PMP)	Pa	ara	meter P	Precipitation	1]
DAS 1:		DAS	2:				1	Serial Nun	ıber	EW-	06134-50	Т	fer	Desc. 2	50ml gradi	uate	
A Avg % Diff	f: A Ma	x % Di A A	vg %	Dif A l	Max 9	% Di	,	Tfer ID		0125	50						
6.0%		6.0%						Slope			1.0000	0 Inte	rce	pt	0	00000	
								Cert Date			9/5/200	5 Cor	rC	off	1	00000	
UseDesc.	Test	type TferVol	ume	Iteration	Tim	ePerTip	,	Eq.Ht	DAS	eng	Eq.HtUnit	OSE U	nit	TferUn	its PctDiff	erence	
primary	test 1	231.5	5	1	1	0 sec		5.00	4.	70	mm	mm		ml		6.0%	
primary	test 2	231.5	5	2	1	0 sec		5.00	4.	70	mm	mm		ml		6.0%	
Sensor Com	iponent	Properly Sited				Condit	ioı	n 45 degree	e rule			Status	Fa	ail			
Sensor Com	ponent	Gauge Drain S	Scree	en		Condit	ioı	n Installed				Status	pa	ISS			
Sensor Com	ponent	Funnel Clean				Condit	ioı	n Clean				Status	ра	ISS			
Sensor Com	ponent	Condition				Condit	ioı	n Good				Status	pa	ISS			
Sensor Com	ponent	Gauge Screen				Condit	ioı	n Installed				Status	pa	ISS			
Sensor Com	ponent	Gauge Clean				Condit	ioı	n Clean				Status	pa	ISS			
Sensor Com	ponent	Level				Condit	ioı	n Level				Status	pa	ISS			
Sensor Com	or Component Sensor Heater Condition			Condit	ioı	on Not tested				Status	pa	ISS					
Sensor Com	or Component System Memo Conditi			ioı	n				Status	pa	ISS						

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	80	GRB411	Alison Ray	05/27/2014	Shelter Temperatu	ire none
DAS 1: Abs Avg Err Abs 1.36	DAS 2: s Max Er Abs Avg 3.28	Err Abs Max Er	Mfg Serial Number Tfer ID Slope Cert Date Mfg Serial Number Tfer ID Slope Cert Date	Eutechnics 01D102193 01231 1.0013 12/27/201 Eutechnics 01H0060 01230 1.0013 12/27/201	Parameter S Tfer Desc. F 3 Intercept 3 CorrCoff Parameter S Tfer Desc. F 3 Intercept 3 Intercept 3 CorrCoff	Shelter Temperatur RTD translator -0.05731 1.00000 Shelter Temperatur RTD probe -0.05731 1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.44	24.46	0.000	25.0	С	0.53
primary	Temp Mid Range	25.25	25.27	0.000	25.6	С	0.28
primary	Temp Mid Range	21.35	21.38	0.000	24.7	С	3.28

Infrastructure Data For

Site ID	GRB411	Technician Alison Ra	ay Site Visit Date 05/27/2014
Shelter M	ſake	Shelter Model	Shelter Size
Ekto		8810 (s/n 2652-1)	640 cuft

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

Site Visit Comments

Farameter Site	.c I	echnician	S.V. Date	Component	Mtg	Serial No.	Hazard	Problem
Temperature GRB	B411 A	Alison Ray	05/27/2014	Blower	Climatronics	3947		

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

Field Systems Comments

1 Parameter: ShelterCleanNotes

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

2 Parameter: MetOpMaintCom

The forced air aspirator for the temperature sensor shield is not functioning, resulting in inaccurate temperature measurements.

F-02058-1500-S1-rev002

Site ID	GRB411		Technician Alisor	n Ray		Site Visit	Date 05/2	7/2014		
Site Sponsor	(agency)	NPS			USG	S Map		Lehman Caves		
Operating Gr	roup	NPS			Мар	Scale				
AQS #		32-033-0	101		Мар	Map Date				
Meteorologica	al Type	Climatron	lics							
Air Pollutant	Analyzer	Ozone, IN	MPROVE		QAP	P Latitude		39.0053		
Deposition M	leasurement	dry, wet			QAP	P Longitude	e	-114.2158		
Land Use		woodland - evergreen		QAP	P Elevation	Meters	2060			
Terrain		complex	(dessert basin and mo	ountain)	QAP	P Declinatio	n			
Conforms to 3	MLM	No			QAP	P Declinatio	on Date			
Site Telephone (7		(775) 234	-7104		Audi	t Latitude				39.005121
Site Address	1	Great Bas	sin Nat. Park		Audi	t Longitude			-	114.215932
Site Address 2	2	Hwy 488			Audi	t Elevation				2058
County		White Pir	ie		Audi	t Declinatio	n	12.5		
City, State		Baker, N	V				Present			
Zip Code		89311			Fire	Extinguishe	r 🗸			
Time Zone		Pacific			First	Aid Kit				
Primary Ope	rator				Safet	y Glasses				
Primary Op.	Phone #				Safet	y Hard Hat				
Primary Op.	E-mail				Clim	bing Belt				
Backup Oper	ator				Secu	rity Fence				
Backup Op.	Phone #				Secu	re Shelter	\checkmark			
Backup Op.	E-mail				Stab	le Entry Ste	P			
Shelter Work	ting Room ☑	Make	Ekto	Μ	lodel	8810 (s/n 265	52-1)	Shelter Size	640 cuft	
Shelter Clean		Notes	The shelter is in fair	condition,	The sh	elter floor ha	s missing a	nd crumbled tiles	3.	
Site OK	\checkmark	Notes								
Driving Direc	ctions From turn le Park.	Las Vegas oft on route The site is	s travel north on Inters 487 and continue to s on the left of the roa	state 15 to Baker. T d to the r	o exit 10 Turn left resident	9 in Beaver, on 488 in Ba al and office	Utah. Travker and foll area.	vel west on 21 to ow the signs to 0	Garrison, N Great Basin	Nevada and National

GRB411

F-02058-1500-S2-rev002

Site ID

Technician Alison Ray

Site Visit Date 05/27/2014

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

Siting Distances OK

Siting Criteria Comment

Fi	eld Sy	stems Data F	orm				F-02 0	58-1	500-	S3-rev00 2
Site	e ID	GRB411	Technician	Alison Ray		Site Visit Date	05/27/2014			
1	Are win being in	d speed and direction fluenced by obstruct	n sensors sited so ions?	as to avoid						
2	Are win (i.e. win horizon tower in	d sensors mounted so d sensors should be n tally extended boom nto the prevailing wir	o as to minimize mounted atop the >2x the max dian nd)	tower effects? e tower or on a neter of the						
3	Are the	tower and sensors pl	umb?							
4	Are the avoid ra	temperature shields idiated heat sources s	pointed north or such as buildings	positioned to valls, etc?						
5	Are tem conditio surface standing	perature and RH sen ns? (i.e. ground belo and not steeply slope g water should be ave	nsors sited to avo w sensors should ed. Ridges, hollow oided)	id unnatural be natural vs, and areas of						
6	Is the so	lar radiation sensor	plumb?							
7	Is it site light?	d to avoid shading, o	r any artificial o	r reflected						
8	Is the ra	in gauge plumb?		Ν						
9	Is it site towers,	d to avoid sheltering etc?	effects from buil	dings, trees,	Z F	Rain gauge mounte	ed 3 meters fr	om met t	tower	
10	Is the su facing n	rface wetness sensor orth?	sited with the g	rid surface	Z I	N/A				
11	Is it inc	lined approximately	30 degrees?		1	N/A				
D				1 / 1 *0	L					

F-02058-1500-S4-rev002

Site	e ID	GRB411	Technician	Alison Ray		Site Visit Date	05/27/2014]
1	Do all th condition	e meterological sensor n, and well maintained	rs appear to be 1?	intact, in good	✓			
2	Are all the reporting	he meteorological sens g data?	sors operationa	l online, and	✓			
3	Are the s	shields for the tempera	ature and RH s	ensors clean?	✓			
4	Are the a	aspirated motors work	king?			Temperature blower	not functioning	
5	Is the sol scratches	ar radiation sensor's as?	lens clean and f	ree of	✓			
6	Is the su	rface wetness sensor g	grid clean and u	ndamaged?	✓	N/A		
7	Are the s condition	sensor signal and pow n, and well maintained	er cables intact 1?	, in good				
8	Are the s from the	sensor signal and pow elements and well ma	er cable connec aintained?	tions protected				

Provide any additional 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 forced air aspirator for the temperature sensor shield is not functioning, resulting in inaccurate temperature measurements.

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	ID GRB411 Technician Alison Ray		Site Visit Date 05/27/2014
	Siting Criteria: Are the pollutant analyzers and deposition e	quipi	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	d 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 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	✓	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?		
7	Is the zero air supply desiccant unsaturated?	✓	
8	Are there moisture traps in the sample lines?	✓	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry

Fi	eld Sys	stems Data Fo	orm					F-02	2058-15	00-S6-rev002
Site	e ID	GRB411	Technician	Alison Ray		Site Visi	t Date	05/27/2014	4	
	DAS, ser	nsor translators, and p	eripheral equi	pment operation	ns ai	<u>nd maintena</u>	<u>nce</u>			
1	Do the D well mai	AS instruments appeantained?	ar to be in good	l condition and	✓					
2	Are all t modem,	he components of the backup, etc)	DAS operation	al? (printers,	✓					
3	Do the a lightning	nalyzer and sensor sig g protection circuitry?	nal leads pass (through		Met sensors	only			
4	Are the swell mai	signal connections pro ntained?	tected from the	e weather and	✓					
5	Are the s	signal leads connected	to the correct	DAS channel?	✓					
6	Are the l grounde	DAS, sensor translator d?	rs, and shelter	properly	✓					
7	Does the	instrument shelter ha	we a stable pov	ver source?	✓					
8	Is the ins	strument shelter temp	erature control	lled?						
9	Is the mo	et tower stable and gro	ounded?			Stable			Grounded	
10	Is the sa	mple tower stable and	grounded?							
11	Tower co	omments?								

Field	Systems Data	Foi	rm]	F -0 2	2058-	1500-	S7-rev00	2
Site ID	GRB411		Tech	nician Alis	on Ray	Site Visit I	Date 05/2	7/2014	1			
Docu	nentation											
Does t	the site have the require	ed ins	strume	ent and equi	ipment manuals	<u>?</u>						
Wind sp Wind dif Tempera Relative Solar rad Surface Wind ser Tempera Humidit Solar rad Tipping Ozone an Filter pa	eed sensor rection sensor ature sensor humidity sensor diation sensor wetness sensor nsor translator ature translator y sensor translator diation translator bucket rain gauge nalyzer ck flow controller ck MFC power supply	Yes Y Y Y Y Y Y Y Y Y			Data logg Data logg Strip chai Compute Modem Printer Zero air p Filter flow Surge pro UPS Lightning Shelter ho Shelter ai	ger ger rt recorder r pump v pump otector g protection de eater r conditioner	evice	Yes ✓	No	N/A		
Does	s the site have the requi	red a	nd mo	<u>st recent Q</u>	C documents and	d report forms	<u>s?</u>					
<i></i>		Pres	ent				_	Curre	ent			
Station I	∠og	ľ		Dataview			_					
SSRF	Managal	Ľ	✓									
Sile Ops	Manual	Ľ		June 2000			_					
Field On	e Manual	L					_					
Calibrat	ion Reports	L L										
	e/n Control Charts	ſ					_					
Preventi	ve maintenance schedu	l [
1 Is tl	he station log properly	comp	leted o	luring ever	y site visit? 🔽	Dataview						_
2 Are	the Site Status Report rent?	Forn	ns bein	ng complete	d and 🗹							
3 Are sam	the chain-of-custody for the chain-of-custody for the second	orms m lab	prope ?	rly used to	document 🖌							
4 Are	ozone z/s/p control cha rent?	rts p	roperl	y completed	d and	Control charts r	not used					
Provide a	any additional explanat	tion (photog at the r	graph or sko	etch if necessary) regarding co	onditions	listed	above, o	or any oth	ner features,	

GRB411 Technician Alison Ray Site Visit Date 05/27/2014 Site ID Site operation procedures Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

QC Check Performed

Visual Inspections

Multipoint Calibrations

Translator Zero/Span Tests

Confirm Reasonableness of

Test Surface Wetness Respo

Manual Rain Gauge Test

Frequency

	✓	Semiannually
	\checkmark	Weekly
(climatronics)	\checkmark	Weekly
	\checkmark	Monthly
Current Values	\checkmark	Weekly
nse	\checkmark	Weekly

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	
Monthly and semiannually	
Daily	
Monthly	
Daily	
Alarm values only	
Monthly	
N/A	
As needed	

- Do multi-point calibration gases go through the complete 1 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?

✓	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:

ompliant

Compliant

 \checkmark

 \checkmark

 \checkmark

 \checkmark

✓

 \checkmark

F-02058-1500-S8-rev002

Field Systems Data Form F-02058-1500-S9-rev002 GRB411 Technician Alison Ray Site Visit Date 05/27/2014 Site ID Site operation procedures Is the filter pack being changed every Tuesday as scheduled? Filter changed morinings 1 Are the Site Status Report Forms being completed and filed Flow & observation sections 2 correctly? No longer required Are data downloads and backups being performed as 3 scheduled? ✓ SSRF Are general observations being made and recorded? How? 4 ✓ Are site supplies on-hand and replenished in a timely 5 fashion? SSRF Are sample flow rates recorded? How? 6 \checkmark Are samples sent to the lab on a regular schedule in a timely \checkmark 7 fashion? ✓ One set of gloves only Are filters protected from contamination during handling 8 and shipping? How? Are the site conditions reported regularly to the field 9 operations manager or staff? **QC Check Performed** Compliant Frequency \checkmark Semiannually **Multi-point MFC Calibrations** Monthly \square **Flow System Leak Checks Filter Pack Inspection** \checkmark ✓ Weekly **Flow Rate Setting Checks** \checkmark ✓ Weekly Visual Check of Flow Rate Rotometer ✓ As needed \checkmark **In-line Filter Inspection/Replacement** Sample Line Check for Dirt/Water

GRB411

F-02058-1500-S10-rev002

Site ID

Techr

Technician Alison Ray

Site Visit Date 05/27/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB22906V0	none
DAS	Environmental Sys Corp	8816	2507	90635
Elevation	Elevation	1	None	None
F460 translator	Climatronics	100163	823	none
Filter pack flow pump	Thomas	107CA14	0000109-84D	none
flow rate	Tylan	FC280AV	AW9403026	03387
Infrastructure	Infrastructure	none	none	none
Mainframe	Climatronics	100081	1378	none
Mainframe power supply	Climatronics	101074	unknown	none
Met tower	Climatronics	18 inch taper	none	01358
MFC power supply	Tylan	RO-32	FP9404004	03681
Modem	US Robotics	0701	Z4L0057C027R	none
Ozone	ThermoElectron Inc	49C	49C-59285-322	90565
Ozone Standard	ThermoElectron Inc	49C	49C-59301-322	90570
Precipitation	Texas Electronics	TR-525i-HT	45484-910	none
Relative Humidity	Rotronic	MP 601A	56082	none
Sample Tower	Aluma Tower	В	AT-5381-F9-2	none
Shelter Temperature	ARS	none	80	none
Shield (10 meter)	Climatronics	100325	illegible	00608
Siting Criteria	Siting Criteria][1	None	None
Solar Radiation	Licor	LI-200	PY12084	none
Solar Radiation Translator	RM Young	70101-X	none	103144
Temperature	Climatronics	100093	illegible	none
Temperature Translator	Climatronics	100088-2	441	none
Wind Direction	Climatronics	100076	4231	91052
Wind Speed	Climatronics	100075	1489	90923
Zero air pump	Werther International	TT70/4E	507782	90722

Site Inventory by Site Visit

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number	
DEN	417-Eric H						
1	6/24/2014	Computer	Gateway	none	Solo	2500251309	
2	6/24/2014	DAS	Environmental Sys Corp	90600	8816	2274	
3	6/24/2014	Elevation	Elevation	None	1	None	
4	6/24/2014	Filter pack flow pump	Thomas	none	107CAB18B	099800009754	
5	6/24/2014	Flow Rate	Tylan	90966	FC280SAV	AW9706011	
6	6/24/2014	Infrastructure	Infrastructure	none	none	none	
7	6/24/2014	Mainframe	Climatronics	none	100081	1293	
8	6/24/2014	Mainframe power supply	Climatronics	none	101074	685	
9	6/24/2014	Met tower	Climatronics	none	unknown	none	
10	6/24/2014	MFC power supply	Tylan	90967	RO-32	FP9706004	
11	6/24/2014	Modem	US Robotics	none	33.6 fax modem	unknown	
12	6/24/2014	Ozone	ThermoElectron Inc	90778	49C	49C-77033-384	
13	6/24/2014	Ozone Standard	ThermoElectron Inc	90831	49C	0520012325	
14	6/24/2014	Printer	Hewlett Packard	none	840C	unknown	
15	6/24/2014	Sample Tower	Aluma Tower	none	В	AT-71102-7I-5	
16	6/24/2014	Shelter Temperature	ARS	none	none	006	
17	6/24/2014	Shield (10 meter)	Climatronics	none	100325	2530	
18	6/24/2014	Siting Criteria	Siting Criteria	None	1	None	
19	6/24/2014	Temperature	Climatronics	none	100093	236	
20	6/24/2014	Temperature Translator	Climatronics	none	100088-2	806	
21	6/24/2014	Zero air pump	Werther International	none	PC70/4	526281	

DAS Data Form

DAS Time Max Error: 1.17

Mfg	Serial Number Site		e 1	Fechnician	cchnician Site Visit Date		Use Desc.	
Environmental Sys 2274		DE	N417	Eric Hebert	06/24/2014	DAS	Primary	
Das Date:	6 /24/2014	Audit Date	6 /24/2014	Mfg	HY	Parameter	DAS	
Das Time: Das Day:	175	Audit Time Audit Day	175	Serial Number	12010039329	Tfer Desc.	Source generator (D	
Low Channel	l:	High Chann	el:	Tfer ID	01322			
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000	
0.0001 0.0002 0.		0.000	1 0.0002	Cert Date	6/15/201	4 CorrCoff	1.00000	
				Mfg	Fluke Paramet		DAS	
				Serial Number	r 86590148 Tfer I		c. DVM	
				Tfer ID	01310			
				Slope	1.0000	0 Intercept	0.00000	
				Cert Date	12/28/201	3 CorrCoff	1.00000	
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference		
6	0.0000	0.0000	0.0001	V	V	0.0001		
6	0.1000	0.1007	0.1006	i V	V	-0.0001		
6	0.3000	0.3003	0.3004	- V	V	0.0001		
6	0.5000	0.5004	0.5005	V	V	0.0001		
6	0.7000	0.7003	0.7004	V	V	0.0001		
6	0.9000	0.9005	0.9007	v v	V	0.0002		
6	1.0000	0.9993	0.9995	V	V	0.0002		

Flow Data Form

Mfg	Serial Number Ta Site		Site	Tee	chnician	Site Visit D	ate Paran	neter	Owner ID	
Tylan	AW9706011 DEN417		Eri	ic Hebert	06/24/2014	Flow R	late	90966		
Mfg	Tylan	Tylan			Mfg	P	Parameter Flow Rate			
SN/Owner ID	FP9706004	90967			Serial Number	122974	T	Tfer Desc. BIOS 220-H		
Parameter	MFC power su	oply			Tfer ID	01416				
					Slope	00000 Int	0.00000 Intercept			
					Cert Date 1/8/2			014 CorrCoff 1.00000		
DAS 1:		DAS 2:			Cal Factor Z	ero	0.20	06		
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale	5.66	67		
1.01%	1.01%				Rotometer R	eading:	3.1	15		
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference	
primary	primary pump off 0.000 0.000		-0.21	-0.1620	0.03	l/m	l/m			
primary leak check		0.000	0.000	-0.20	-0.1618	0.03	l/m	l/m		
primary	test pt 1	2.972	2.970	2.55	2.5580	3.00	l/m	l/m	1.01%	
primary	test pt 2	2.971	2.970	2.55	2.5580	3.00	l/m	l/m	1.01%	
primary	test pt 3	2.968	2.970	2.55	2.5580	3.00	l/m	l/m	1.01%	
Sensor Comp	onent Leak Tes	st		Conditio	on		Status	pass		
Sensor Comp	onent Tubing C	ondition		Condition Good			Status	pass		
Sensor Comp	onent Filter Pos	sition		Condition Poor		Status		s Fail		
Sensor Component Rotometer Condition		n	Conditio	Condition Clean and dry			pass			
Sensor Component Moisture Present			Conditio	Condition No moisture present			tus pass			
Sensor Component Filter Distance			Conditio	lition 5.0 cm			tatus pass			
Sensor Comp	onent Filter Dep	oth		Conditio	on -1.5 cm		Status	s Fail		
Sensor Comp	onent Filter Azi	nt Filter Azimuth			n 360 deg		Status	Status pass		
Sensor Comp	onent System M	/lemo		Conditio	n See comments	Status	Status pass			

Ozone Data Form

Mfg	Serial Number Ta Site Technici		chnician	nician Site Visit Date		t Date	e Parameter		Owner I	D		
ThermoElect	tron Inc	49C-77033-384	DEN417	Er	Eric Hebert		06/24/2014		Ozone		90778	
Slope: [Intercept [CorrCoff [0 0 1	0.98709 Slope: 0.0000 0.09300 Intercept 0.0000 1.00000 CorrCoff 0.0000		0 Mfg 0 Serial Number [0 Tfer ID		ThermoElectron Inc Pa 0419606966 T 01112 T		Inc Pa	arameter ozone fer Desc. Ozone primary sta		/ stan	
DAS 1:		DAS 2:			Slope			1 0092	8 Inter		0.11	780
A Avg % D	iff: A M	ax % Di A Avg %	6Dif A Max	% Di	Slope			1.0092		rcept	0.11	780
1.1	%	1.3%			Cert Da	ite		1/8/201	4 Corr	Coff	1.00	000
UseDesc	cription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	e Unit:	PctDif	ference:	
prim	nary	1	0.22	0.	10	0.	18	ppb				
prim	nary	2	26.58	26.	.21	25.	.91	ppb			-1.14%	
prim	nary	3	49.46	48.	.88	48.	.39	ppb			-1.00%	
prim	nary	4	79.12	78.	.27	77.	.45	ppb			-1.05%	
prim	nary	5	109.10	107	.98	106	6.60	ppb			-1.28%	
Sensor Co	omnonen	t Cell B Noise		Conditio	on 0.9 pr	b			Status	pass		7
Sensor Co	omponen	t Cell B Tmp.		Conditio	on				Status	pass		
Sensor Co	omponen	t Fullscale Voltage		Conditio	on 1.000	1			Status	pass		7
Sensor Component Inlet Filter Condition			Condition Clean					Status	pass			
Sensor Component Line Loss		Conditio	on Not te	ested			Status	pass				
Sensor Component Offset			Conditio	on -0.3				Status	pass			
Sensor Co	omponen	t Span		Conditio	on 1.008				Status	pass		
Sensor Co	omponen	t Cell B Freq.		Condition 76.1 kHz				Status	pass			
Sensor Co	omponen	t System Memo		Condition				Status	pass			
Sensor Co	omponen	t Sample Train		Condition Good				Status	pass			
Sensor Co	omponen	t Cell B Pressure		Condition				Status	pass			
Sensor Co	omponen	t Cell B Flow		Condition 0.68 lpm				Status	pass			
Sensor Co	omponen	t Cell A Tmp.		Conditio	Condition 36.5 C				Status	pass		
Sensor Component Cell A Pressure			Conditio	Condition 675 mmHg				Status	pass			
Sensor Component Cell A Noise		Conditio	Condition 1.1 ppb				Status	pass				
Sensor Co	omponen	t Cell A Freq.		Conditio	Condition 92.1 kHz				Status	pass		
Sensor Co	omponen	t Cell A Flow		Conditio	ondition 0.65 lpm				Status	pass		
Sensor Co	omponen	t Battery Backup		Conditio	ion N/A				Status	pass		
Sensor Component Zero Voltage		Conditio	on -0.00	01			Status	pass				
Temperature Data Form

Mfg	5	Serial Numbe	r Ta	Site		Tec		chnician		Visit Date	Param	eter	Owner II)
Climatronics		236		DEN417		6	Eric H	Hebert	06/2	24/2014	Tempe	rature	none	
Mfg	Climatronics					Mfg		Exte	ch	Pa	arameter Te	rameter Temperature		
SN/Owner ID	806	r	ione				Se	rial Number	H23	2679	T	fer Desc. R	ſD	
Parameter	Tem	perature Trans	lator				Tf	er ID	0122	01228				
DAS 1:		DA	S 2:				Sl	ope		1.0049	6 Inte	-0.2300		009
Abs Avg Err Abs		Max Er Ab	s Avg	Err Abs Max		Er	r Cert Date			1/8/201	4 Cor	rCoff	1.000	000
0.05		0.13												
UseDesc.		Test type	Inp	utTmpRaw	Input	Tmp(Corr.	OutputTmp	Signal	Signal OutputSign		OSE Unit	Difference	
primary T	emp	Low Range		-0.07		0.16		0.000	0	0.	1	C	-0.03	
primary T	emp	Mid Range		23.12	2	23.23		0.000	0	23.	.2	C	0	
primary T	emp	High Range		46.37	4	46.37		0.000	0	46	.5	C	0.13	
Sensor Compo	onen	t Shield			C	ondit	ion	Clean			Status	pass]
Sensor Component Blower				C	Condition Functioning					Status	pass]	
Sensor Component Blower Status Switch				C	Condition N/A					Status	us pass			
Sensor Compo	onen	t System Men	0		C	Condition					Status	pass]

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	006	DEN417	Eric Hebert	06/24/2014	Shelter Temperatur	renone
DAS 1:	DAS 2:	Den Alex Mars De	Mfg	Extech	Parameter S	helter Temperatur
Abs Avg ErrAbs Max ErAbs Avg0.450.62		Err Abs Max Er	Serial Number	H232679	Tfer Desc. R	TD
			Tfer ID	01228		
		Slope	1.0049	6 Intercept	-0.23009	
			Cert Date	1/8/201	4 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.90	24.01	0.000	23.4	С	-0.62
primary	Temp Mid Range	23.64	23.75	0.000	23.4	С	-0.33
primary	Temp Mid Range	23.70	23.81	0.000	23.4	С	-0.39

Infrastructure Data For

Site ID	DEN417	Technician Eric Hel	oert Site Visit Date 06/24/2014
Shelter M	Make	Shelter Model	Shelter Size
Ekto		8814	896 cuft

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg Serial No.		Hazard	Problem
Flow Rate	DEN417	Eric Hebert	06/24/2014	Filter Position	Tylan	3168		

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 operator uses one gloved hand, and the same glove, to remove and install the filter pack. Leak checks are not performed due to the extreme cold and added stress on the quick-connect fitting.

2 Parameter: ShelterCleanNotes

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

F-02058-1500-S1-rev002

Site ID	Site ID DEN417		Technician Eric Hebert			Site Visit I	Date 06/2	24/2014		
Site Sponsor	(agency)	NPS/EP/	Ą		USGS	Мар		Healy C-4		
Operating Gr	roup	NPS			Map S	Scale				
AQS #		02-068-0	003		Map I	Date				
Meteorologic	al Type	Climatror	nics							
Air Pollutant	Analyzer	ozone, IN	IPROVE		QAPI					
Deposition Measurement		dry, wet			QAPI	• Longitude				
Land Use		woodland	d - mixed		QAPI	• Elevation	Meters			
Terrain		complex				Declination	n			
Conforms to	MLM	No			QAPI	Declination	n Date			
Site Telephon	ie	(907) 683-9638				Latitude		63.7232		
Site Address	1	mile 238	Parks Highway		Audit Longitude				-148.9676	
Site Address	2				Audit	Elevation			663	
County		Denali Bo	orough		Audit	Declination	1	19.3		
City, State		Denali Park, AK				1	Present			
Zip Code		99755			Fire F	xtinguisher				
Time Zone		Alaska Time Zone			First Aid Kit					
Primary Ope	rator				Safety Glasses					
Primary Op.	Phone #				Safety	Hard Hat				
Primary Op.	E-mail				Climb	ing Belt	\checkmark			
Backup Oper	ator				Secur	ity Fence				
Backup Op.	Phone #				Secur	e Shelter				
Backup Op.	E-mail				Stable	Entry Step				
Shelter Working Room Ma		Make	Ekto	Μ	odel 8	314		Shelter Size	896 cuft	
Shelter Clean		Notes	The shelter is i	n good conditio	n, clean,	neat, and ve	ery well or	ganized.		
Site OK	\checkmark	Notes								
Driving Direc	Driving Directions From either Anchorage or Fairbanks, take the Parks Highway (route 3) north or south respectively. Just south of the town of Healy turn west into Denali National Park. The road is well marked. Continue on the park road a few miles to the Park Headquarters. The site is approximately 100 yards up a residential road on the opposite side of the street from the headquarters parking lot.									

DEN417

F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 06/24/2014

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

Siting Distances OK

Siting Criteria Comment

Fi	eld Systems Data Form	F-02058-1500-S3-rev00						
Site	DEN417 Technician Eric Hebert	Site Visit Date 06/24/2014						
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	✓ N/A						
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	✓ N/A						
3	Are the tower and sensors plumb?	✓ N/A						
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?							
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)							
6	Is the solar radiation sensor plumb?	✓ N/A						
7	Is it sited to avoid shading, or any artificial or reflected light?	✓ N/A						
8	Is the rain gauge plumb?	✓ N/A						
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	✓ N/A						
10	Is the surface wetness sensor sited with the grid surface facing north?	✓ N/A						
11	Is it inclined approximately 30 degrees?	✓ N/A						
Pro nat	ovide any additional explanation (photograph or sketch if neco sural or man-made, that may affect the monitoring parameter	sary) regarding conditions listed above, or any other featu	ıres,					

F-02058-1500-S4-rev002

Site	e ID	DEN417	Technician	Eric Hebert		Site Visit Date 06/24/2014						
1	Do all the condition	e meterological sensor 1, and well maintained	rs appear to be 1?	intact, in good		Temperature only						
2	reporting data?											
3	3 Are the shields for the temperature and RH sensors clean?											
-	Are the aspirated motors working?					N/A						
5	scratches											
6	Is the su	rface wetness sensor g	rid clean and u	ndamaged?		N/A						
7	Are the s condition	ensor signal and pow a, and well maintained	er cables intact 1?	, in good	\checkmark							
8	Are the sensor signal and power cable connections protected from the elements and well maintained?											

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

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	DEN417 Technician Eric Hebert		Site Visit Date 06/24/2014
	Siting Criteria: Are the pollutant analyzers and deposition e	quip	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	d 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 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	✓	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?	✓	
8	Are there moisture traps in the sample lines?		
9	Is there a rotometer in the dry deposition filter line, and is it clean?	✓	Clean and dry

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

Fi	eld Sy	stems Data Fo	orm					F-02	058-15	500-S6-rev002
Site	e ID	DEN417	Technician	Eric Hebert		Site Visi	t Date 0	6/24/2014		
	DAS, se	nsor translators, and p	peripheral equi	<u>pment operatio</u>	ns and	maintena	<u>nce</u>			
1	Do the I well mai	DAS instruments appeart intained?	ar to be in good	l condition and						
2	Are all t modem,	he components of the backup, etc)	al? (printers,							
3 Do the analyzer and sensor signal leads pass through lightning protection circuitry?										
4	Are the well mai	signal connections pro intained?	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 contro	lled?						
9	Is the m	et tower stable and gr	ounded?			Stable			Grounded]
10	Is the sa	mple tower stable and	grounded?							
11	Tower c	omments?								

Provide any additional 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 Sy	stems Data F	orr	n				F-02	058-1	500-S7-rev002
Site ID	DEN417]	Fechnician	Eric Heber	t	Site Visit Date	e 06/24/2014		
Document	t <u>ation</u>								
Does the s	ite have the required	l instr	ument and	equipment	t manuals?				
	Y	es	No N/	A			Yes	No	N/A
Wind speed s	sensor]	Data logge	er		\checkmark	
Wind directi	on sensor]	Data logge	er			
Temperature	e sensor	✓]	Strip char	t recorder			
Relative hun	nidity sensor]	Computer			\checkmark	
Solar radiati	on sensor]	Modem			\checkmark	
Surface wetn	less sensor]	Printer				
Wind sensor	translator]	Zero air p	ump		\checkmark	
Temperature	e translator]	Filter flow	pump		\checkmark	
Humidity ser	nsor translator]	Surge prot	tector			\checkmark
Solar radiati	on translator]	UPS				\checkmark
Tipping buck	ket rain gauge]	Lightning	protection devic	e 🗌	\checkmark	
Ozone analyz	zer]	Shelter he	ater		\checkmark	
Filter pack fl	low controller]	Shelter air	· conditioner	\checkmark		
Filter pack M	IFC power supply]					
Does the	site have the require	ed and	d most rece	ent QC docu	uments and	report forms?			
	F	reser	nt			_	Curre	nt	
Station Log	-		Datavi	214/					
SSRF			Datavit	5 VV					
Site Ops Mai	nual								
HASP									
Field Ops Ma	anual								
Calibration I	Reports								
Ozone z/s/p (Control Charts		Datavi	///ح					
Preventive m	aintenance schedul		Datavi						
1 Is the st	ation log properly co	omple	ted during	every site v	visit? 🔽				
2 Are the current	Site Status Report F ?	orms	being com	pleted and					
3 Are the sample	chain-of-custody for transfer to and from	ms pi lab?	roperly use	d to docum	ent 🔽				
4 Are ozo current	ne z/s/p control char ?	ts pro	operly com	pleted and		ataview			
Provide any	additional explanation	on (pł	otograph	or sketch if	necessary)	regarding cond	itions listed a	above, or	any other features,

natural or man-made, that may affect the monitoring parameters:

DEN417 Technician Eric Hebert Site Visit Date 06/24/2014 Site ID Site operation procedures Site operator trained on-site by ARS employee Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

QC Check Performed

Frequency

Multipoint Calibrations	\checkmark	Semiannually	\checkmark
Visual Inspections	\checkmark	Weekly	\checkmark
Translator Zero/Span Tests (climatronics)	\checkmark	N/A	\checkmark
Manual Rain Gauge Test	\checkmark	N/A	\checkmark
Confirm Reasonableness of Current Values	\checkmark	Weekly	\checkmark
Test Surface Wetness Response	\checkmark	N/A	\checkmark

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
Monthly and semiannually	
Daily	\checkmark
Monthly	\checkmark
Daily	\checkmark
Alarm values only	\checkmark
Monthly	\checkmark
N/A	\checkmark
Semiannually	\checkmark

- Do multi-point calibration gases go through the complete 1 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?

✓	Unknown
✓	
✓	Dataview

Compliant

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

F-02058-1500-S8-rev002

Field Systems Data Form							F-02058	-1500-S9-rev002		
Sit	e ID	DEN417	echnicia	n Eric Hebert		Site Visit Date	06/24/2014			
	<u>Site ope</u>	eration procedures								
1	Is the fi	lter pack being changed eve	ery Tues	day as scheduled		Filter changed vario	ous times			
2	2 Are the Site Status Report Forms being completed and filed correctly?									
3	Are dat schedul	a downloads and backups b ed?	eing per	formed as		No longer required				
4	Are gen	eral observations being ma	de and r	ecorded? How?	✓	SSRF				
5	Are site supplies on-hand and replenished in a timely fashion?									
6	Are san	nple flow rates recorded? H	ow?		✓	SSRF				
7	Are san fashion	nples sent to the lab on a reg ?	gular sch	edule in a timely						
8	Are filte and shij	ers protected from contamin pping? How?	nation d	uring handling	✓	One set of gloves o	nly			
9	Are the operation	site conditions reported reg ons manager or staff?	gularly to	o the field						
QC	Check P	erformed	Fr	equency			Compliant			
I	Multi-poi	nt MFC Calibrations	✓ Se	miannually			\checkmark			
I	Flow Syst	em Leak Checks	✓ We	eekly			\checkmark			
I	Filter Pac	k Inspection	🖌 Me	eekly			\checkmark			
I	Flow Rate	e Setting Checks	🖌 Me	eekly			\checkmark			
	Visual Check of Flow Rate Rotometer Veekly					\checkmark				
1	n-line Fil	ter Inspection/Replacement	t 🗹 As	needed			\checkmark			
5	Sample Li	ine Check for Dirt/Water	🖌 As	needed			\checkmark			
Duor	rido onv o	ditional avalanction (nha	tograph	on chotch if nooc	CONT) recording conditi	iong listed above	an 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:

The site operator uses one gloved hand, and the same glove, to remove and install the filter pack. Leak checks are not performed due to the extreme cold and added stress on the quick-connect fitting.

DEN417

F-02058-1500-S10-rev002

Site ID

Technician Eric Hebert

Site Visit Date 06/24/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Gateway	Solo	2500251309	none
DAS	Environmental Sys Corp	8816	2274	90600
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	099800009754	none
Flow Rate	Tylan	FC280SAV	AW9706011	90966
Infrastructure	Infrastructure	none	none	none
Mainframe	Climatronics	100081	1293	none
Mainframe power supply	Climatronics	101074	685	none
Met tower	Climatronics	unknown	none	none
MFC power supply	Tylan	RO-32	FP9706004	90967
Modem	US Robotics	33.6 fax modem	unknown	none
Ozone	ThermoElectron Inc	49C	49C-77033-384	90778
Ozone Standard	ThermoElectron Inc	49C	0520012325	90831
Printer	Hewlett Packard	840C	unknown	none
Sample Tower	Aluma Tower	В	AT-71102-7I-5	none
Shelter Temperature	ARS	none	006	none
Shield (10 meter)	Climatronics	100325	2530	none
Siting Criteria	Siting Criteria][1	None	None
Temperature	Climatronics	100093	236	none
Temperature Translator	Climatronics	100088-2	806	none
Zero air pump	Werther International	PC70/4	526281	none

APPENDIX B

CASTNET Site Spot Report Forms

Data Compiled:		5/4/2016 2:07:48 PM		
SiteVisitDate	Site		Technician	
05/06/2014	CAN40	7	Eric Hebert	

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	Р	3	0.5	12	0.05	m/s	Р
2	Wind Speed max error below 5m/s in m/s	Р	3	0.5	12	0.14	m/s	Р
3	Wind Speed average % difference above 5 m/s	Р	3	5	12	0.5	%	Р
4	Wind Speed max % difference above 5 m/s	Р	3	5	12	0.8	%	Р
5	Wind Speed Torque average error	Р	3	0.5	1	0.30	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	Р	2	5	4	1.8	degrees	Р
8	Wind Direction Input Deg True max error (deg)	Р	2	5	4	3	degrees	Р
9	Wind Direction Linearity average error (deg)	Р	2	5	8	1.8	degrees	Р
10	Wind Direction Linearity max error (deg)	Р	2	5	8	4	degrees	Р
11	Wind Direction Torque average error	Р	2	20	1	9	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	3	0.09	c	Р
14	Temperature max error	Р	4	0.5	3	0.15	с	Р
15	Relative Humidity average above 85%	Р	6	10	1	1.0	%	Р
16	Relative Humidity max above 85%	Р	6	10	1	1.0	%	Р
17	Relative Humidity average below 85%	Р	6	10	2	1.7	%	Р
18	Relative Humidity max below 85%	Р	6	10	2	3.1	%	Р
19	Solar Radiation % diff of avg	Р	9	10	15	7.84	%	Р
20	Solar Radiation % diff of max STD value	Р	9	10	15	8.4	%	Р
21	Precipitation average % difference	Р	1	10	2	6.0	%	Р
22	Precipitation max % difference	Р	1	10	2	8.0	%	Р
23	Ozone Slope	Р	0	1.1	4	0.99581	unitless	Р
24	Ozone Intercept	Р	0	5	4	-0.67417	ppb	Р
25	Ozone correlation	Р	0	0.995	4	0.99996	unitless	Р
26	Ozone % difference avg	Р	1	10	4	2.0	%	Р
27	Ozone % difference max	Р	1	10	4	3.8	%	Р
28	Flow Rate average % difference	Р	10	5	8	2.48	%	Р
29	Flow Rate max % difference	Р	10	5	8	2.58	%	Р
30	DAS Time maximum error	Р	0	5	1	0.67	min	Р
31	DAS Voltage average error	Р	13	0.003	42	0.0009	V	Р
32	DAS Voltage average error	Р	5	0.003	42	0.0001	V	Р

05/06/2014 CAN407

Field Systems Comments

1 Parameter: SitingCriteriaCom

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

Parameter: ShelterCleanNotes 2

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

32 DAS Voltage average error

Data (Compiled: 5/2/2016 4:57:06 PM							
SiteV	isitDate Site Te	echnician						
04/23/2	2014 CHA467 Er	ic Hebert						
Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	Р	3	0.5	4	0.11	m/s	Р
2	Wind Speed max error below 5m/s in m/s	Р	3	0.5	4	0.15	m/s	Р
3	Wind Speed average % difference above 5 m/s	s P	3	5	4	1.1	%	Р
4	Wind Speed max % difference above 5 m/s	Р	3	5	4	2.1	%	Р
5	Wind Speed Torque average error	Р	3	0.5	1	0.35	g-cm	Р
6	Wind Speed Torque max error	Р	3	0.5	1	0.4	g-cm	Р
7	Wind Direction Input Deg True average error	(de P	2	5	4	4.8	degrees	Р
8	Wind Direction Input Deg True max error (de	g) P	2	5	4	6	degrees	Fail
9	Wind Direction Linearity average error (deg)	Р	2	5	8	2.5	degrees	Р
10	Wind Direction Linearity max error (deg)	Р	2	5	8	7	degrees	Fail
11	Wind Direction Torque average error	Р	2	20	1	11	g-cm	Р
12	Wind Direction Torque max error	Р	2	20	1	12	g-cm	Р
13	Temperature average error	Р	4	0.5	6	0.51	с	Fail
14	Temperature max error	Р	4	0.5	6	0.61	с	Fail
15	Relative Humidity average above 85%	Р	6	10	3	0.1	%	Р
16	Relative Humidity max above 85%	Р	6	10	3	0.1	%	Р
17	Relative Humidity average below 85%	Р	6	10	6	3.3	%	Р
18	Relative Humidity max below 85%	Р	6	10	6	3.5	%	Р
19	Solar Radiation % diff of avg	Р	9	10	15	11.42	%	Fail
20	Solar Radiation % diff of max STD value	Р	9	10	15	9.5	%	Р
21	Precipitation average % difference	Р	1	10	1	2.0	%	Р
22	Precipitation max % difference	Р	1	10	1	2.0	%	Р
23	Ozone Slope	Р	0	1.1	4	1.02891	unitless	Р
24	Ozone Intercept	Р	0	5	4	2.25151	ppb	Р
25	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
26	Ozone % difference avg	Р	1	10	4	6.9	%	Р
27	Ozone % difference max	Р	1	10	4	10.0	%	Fail
28	Flow Rate average % difference	Р	10	5	9	0.16	%	Р
29	Flow Rate max % difference	Р	10	5	9	0.20	%	Р
30	DAS Time maximum error	Р	0	5	1	1.23	min	Р
31	DAS Voltage average error	Р	14	0.003	56	0.0001	V	Р

Р

2

0.003

56

0.0020

P

V

04/23/2014 CHA467

Field Systems Comments

1 Parameter: SiteOpsProcedures

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

2 Parameter: SitingCriteriaCom

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

3 **Parameter:** ShelterCleanNotes

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

Data Compiled:

8/4/2014 5:50:23 PM

SiteVisitDate	Site	Technician			
04/09/2014	DCP114	Sandy Grenville			

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.01025	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.16701	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.9	%	Р
5	Ozone % difference max	Р	7	10	4	1.2	%	Р

Data Compiled:

5/4/2016 4:23:14 PM

SiteVisitDate	Site	Technician		
06/24/2014	DEN417	Eric Hebert		

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	6	0.05	с	Р
2	Temperature max error	Р	4	0.5	6	0.13	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98709	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.09300	ppb	Р
5	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
6	Ozone % difference avg	Р	1	10	4	1.1	%	Р
7	Ozone % difference max	Р	1	10	4	1.3	%	Р
8	Flow Rate average % difference	Р	9	5	4	1.01	%	Р
9	Flow Rate max % difference	Р	9	5	4	1.01	%	Р
10	DAS Time maximum error	Р	0	5	1	1.17	min	Р
11	DAS Voltage average error	Р	6	0.003	49	0.0001	V	Р

Field Performance Comments

	_		• • • · · ·		
1	Parameter:	Flow Rate	SensorComponent:	Filter Position	CommentCode 71

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

Field Systems Comments

1 Parameter: SiteOpsProcComm

The site operator uses one gloved hand, and the same glove, to remove and install the filter pack. Leak checks are not performed due to the extreme cold and added stress on the quick-connect fitting.

2 **Parameter:** ShelterCleanNotes

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

Data Compiled:	5/4/2016 3:54:42 PM
SiteVisitDate Site	Technician

05/27/2014 GRB411 Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	Р	3	0.5	4	0.07	m/s	Р
2	Wind Speed max error below 5m/s in m/s	Р	3	0.5	4	0.10	m/s	Р
3	Wind Speed average % difference above 5 m/s	Р	3	5	4	0.4	%	Р
4	Wind Speed max % difference above 5 m/s	Р	3	5	4	1.1	%	Р
5	Wind Speed Torque average error	Р	3	0.5	1	0.30	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	Р	2	5	2	3.5	degrees	Р
8	Wind Direction Input Deg True max error (deg)	Р	2	5	2	6	degrees	Fail
9	Wind Direction Linearity average error (deg)	Р	2	5	8	0.9	degrees	Р
10	Wind Direction Linearity max error (deg)	Р	2	5	8	2	degrees	Р
11	Wind Direction Torque average error	Р	2	20	1	7	g-cm	Р
12	Wind Direction Torque max error	Р	2	20	1	7	g-cm	Р
13	Temperature average error	Р	4	0.5	3	0.07	с	Р
14	Temperature max error	Р	4	0.5	3	0.16	с	Р
15	Relative Humidity average above 85%	Р	6	10	3	4.0	%	Р
16	Relative Humidity max above 85%	Р	6	10	3	4.0	%	Р
17	Relative Humidity average below 85%	Р	6	10	6	3.2	%	Р
18	Relative Humidity max below 85%	Р	6	10	6	4.7	%	Р
19	Solar Radiation % diff of avg	Р	9	10	8	0.44	%	Р
20	Solar Radiation % diff of max STD value	Р	9	10	8	0.50	%	Р
21	Precipitation average % difference	Р	1	10	2	6.0	%	Р
22	Precipitation max % difference	Р	1	10	2	6.0	%	Р
23	Ozone Slope	Р	0	1.1	4	0.98260	unitless	Р
24	Ozone Intercept	Р	0	5	4	-3.54543	ppb	Р
25	Ozone correlation	Р	0	0.995	4	0.99995	unitless	Р
26	Ozone % difference avg	Р	1	10	4	7.8	%	Р
27	Ozone % difference max	Р	1	10	4	11.8	%	Fail
28	Flow Rate average % difference	Р	10	5	8	2.4	%	Р
29	Flow Rate max % difference	Р	10	5	8	2.61	%	Р
30	DAS Time maximum error	Р	0	5	1	2.38	min	Р
31	DAS Voltage average error	Р	9	0.003	42	0.0002	v	Р
32	DAS Voltage average error	Р	3	0.003	42	0.0001	V	Р

05/27/2014 GRB411

Alison Ray

Field Performance Comments

1 Parameter: Temperature SensorComponent: Blower

CommentCode 26

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

Field Systems Comments

1 Parameter: ShelterCleanNotes

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

2 Parameter: MetOpMaintCom

The forced air aspirator for the temperature sensor shield is not functioning, resulting in inaccurate temperature measurements.

EEMS Spot Report Data Compiled: 4/17/2016 9:49:56 PM

Data Complica	-7/17/2010 999.50 1 WI	
SiteVisitDate	Site	Technician
04/08/2014	GRC474	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	Р	3	0.5	4	0.13	m/s	Р
2	Wind Speed max error below 5m/s in m/s	Р	3	0.5	4	0.30	m/s	Р
3	Wind Speed average % difference above 5 m/s	Р	3	5	4	1.4	%	Р
4	Wind Speed max % difference above 5 m/s	Р	3	5	4	2.0	%	Р
5	Wind Speed Torque average error	Р	3	0.5	1	0.40	g-cm	Р
6	Wind Speed Torque max error	Р	3	0.5	1	0.4	g-cm	Р
7	Wind Direction Input Deg True average error (de	Р	2	5	4	2.8	degrees	Р
8	Wind Direction Input Deg True max error (deg)	Р	2	5	4	4	degrees	Р
9	Wind Direction Linearity average error (deg)	Р	2	5	8	2.0	degrees	Р
10	Wind Direction Linearity max error (deg)	Р	2	5	8	4	degrees	Р
11	Wind Direction Torque average error	Р	2	20	1	12	g-cm	Р
12	Wind Direction Torque max error	Р	2	20	1	12	g-cm	Р
13	Temperature average error	Р	5	0.5	6	0.24	с	Р
14	Temperature max error	Р	5	0.5	6	0.58	с	Fail
15	Relative Humidity average above 85%	Р	6	10	4	2.6	%	Р
16	Relative Humidity max above 85%	Р	6	10	4	2.6	%	Р
17	Relative Humidity average below 85%	Р	6	10	8	0.5	%	Р
18	Relative Humidity max below 85%	Р	6	10	8	0.6	%	Р
19	Solar Radiation % diff of avg	Р	9	10	20	0.29	%	Р
20	Solar Radiation % diff of max STD value	Р	9	10	20	3.6	%	Р
21	Precipitation average % difference	Р	1	10	2	4.0	%	Р
22	Precipitation max % difference	Р	1	10	2	4.0	%	Р
23	Ozone Slope	Р	0	1.1	4	1.0291	unitless	Р
24	Ozone Intercept	Р	0	5	4	-1.89689	ppb	Р
25	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
26	Ozone % difference avg	Р	1	10	4	1.5	%	Р
27	Ozone % difference max	Р	1	10	4	3.2	%	Р
28	Flow Rate average % difference	Р	10	5	6	1.21	%	Р
29	Flow Rate max % difference	Р	10	5	6	1.32	%	Р
30	DAS Time maximum error	Р	0	5	1	1.83	min	Р
31	DAS Voltage average error	Р	9	0.003	49	0.0001	V	Р
32	DAS Voltage average error	Р	6	0.003	49	0.0003	V	Р

04/08/2014 GRC474

Technician Eric Hebert

Field Systems Comments

1 Parameter: ShelterCleanNotes

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

Data Complied:	4/10/2016 11:07:13 AM	
SiteVisitDate	Site	Technician

04/28/2014 JOT403 Eric Hebert

Wind Speed average error below 5m/s in m/s							
while speed average error below 5m/s mm/s	Р	3	0.5	8	0.05	m/s	Р
Wind Speed max error below 5m/s in m/s	Р	3	0.5	8	0.20	m/s	Р
Wind Speed average % difference above 5 m/s	Р	3	5	8	0.0	%	Р
Wind Speed max % difference above 5 m/s	Р	3	5	8	0.0	%	Р
Wind Speed Torque average error	Р	3	0.5	1	0.50	g-cm	Fail
Wind Speed Torque max error	Р	3	0.5	1	0.5	g-cm	Fail
Wind Direction Input Deg True average error (de	Р	2	5	8	1.0	degrees	Р
Wind Direction Input Deg True max error (deg)	Р	2	5	8	2	degrees	Р
Wind Direction Linearity average error (deg)	Р	2	5	16	1.5	degrees	Р
Wind Direction Linearity max error (deg)	Р	2	5	16	5	degrees	Р
Wind Direction Torque average error	Р	2	20	1	16	g-cm	Р
Wind Direction Torque max error	Р	2	20	1	18	g-cm	Р
Temperature average error	Р	5	0.5	3	0.12	c	Р
Temperature max error	Р	5	0.5	3	0.14	с	Р
Relative Humidity average above 85%	Р	6	10	2	5.0	%	Р
Relative Humidity max above 85%	Р	6	10	2	5.0	%	Р
Relative Humidity average below 85%	Р	6	10	4	1.8	%	Р
Relative Humidity max below 85%	Р	6	10	4	2.5	%	Р
Solar Radiation % diff of avg	Р	9	10	4	6.74	%	Р
Solar Radiation % diff of max STD value	Р	9	10	4	7.1	%	Р
Precipitation average % difference	Р	1	10	2	8.0	%	Р
Precipitation max % difference	Р	1	10	2	8.0	%	Р
Ozone Slope	Р	0	1.1	4	0.98081	unitless	Р
Ozone Intercept	Р	0	5	4	1.06586	ppb	Р
Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
Ozone % difference avg	Р	1	10	4	0.7	%	Р
Ozone % difference max	Р	1	10	4	1.3	%	Р
Flow Rate average % difference	Р	10	5	9	1.96	%	Р
Flow Rate max % difference	Р	10	5	9	1.96	%	Р
DAS Time maximum error	Р	0	5	1	1.67	min	Р
DAS Voltage average error	Р	9	0.003	49	0.0002	V	Р
DAS Voltage average error	Р	2	0.003	49	0.0002	V	Р
	 Wind Speed max error below 5m/s in m/s Wind Speed average % difference above 5 m/s Wind Speed Torque average error Wind Speed Torque max error Wind Speed Torque max error Wind Direction Input Deg True average error (deg) Wind Direction Linearity average error (deg) Wind Direction Torque average error (deg) Wind Direction Torque average error Wind Direction Torque average error Temperature average error Relative Humidity average above 85% Relative Humidity max above 85% Relative Humidity max below 85% Solar Radiation % diff of avg Solar Radiation % difference Precipitation max % difference Ozone Slope Ozone Intercept Ozone % difference max Flow Rate average % difference Flow Rate max % difference DAS Voltage average error 	Wind Speed max error below 5m/s in m/sPWind Speed average % difference above 5 m/sPWind Speed Torque average errorPWind Speed Torque max errorPWind Speed Torque max errorPWind Direction Input Deg True average error (deg)PWind Direction Linearity average error 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85%P610Relative Humidity average above 85%P610Relative Humidity average below 85%P610Solar Radiation % diff of avgP910Solar Radiation % differenceP110Ozone SlopeP0.11Ozone SlopeP110Ozone & difference avgP110Flow Rate average % differenceP105DAS Voltage average errorP05DAS Voltage average errorP05DAS Voltage average maxP105DAS Voltage average % differenceP105Dota SlopeP<td>Wind Speed max error below 5m/s in m/sP30.58Wind Speed average % difference above 5 m/sP358Wind Speed Torque average errorP30.51Wind Speed Torque average errorP30.51Wind Speed Torque max errorP30.51Wind Direction Input Deg True average error (deP258Wind Direction Linearity average error (deg)P2516Wind Direction Linearity max error (deg)P2516Wind Direction Torque average errorP22011Wind Direction Torque average errorP22011Wind Direction Torque average errorP50.533Temperature average errorP50.53Relative Humidity average above 85%P6102Relative Humidity average below 85%P6104Solar Radiation % diff of avgP9104Solar Radiation % diff of avgP054Ozone SlopeP01.14Ozone SlopeP10102Precipitation nax % differenceP1059Flow Rate average % differenceP1059Flow Rate average % differenceP1059Flow Rate average % differenceP1059Flow Rate average % dif</td><td>Wind Speed max error below Sm/s in m/sP30.580.20Wind Speed average % difference above 5 m/sP3580.0Wind Speed Torque average errorP30.510.50Wind Speed Torque max errorP30.510.50Wind Speed Torque max errorP30.510.50Wind Direction Input Deg True average error (deg)P25810Wind Direction Linearity average error (deg)P251615Wind Direction Linearity average errorP220116Wind Direction Torque average errorP220116Wind Direction Torque average errorP220118Temperature average errorP50.530.12Temperature max errorP50.530.14Relative Humidity average above 85%P61025.0Relative Humidity average below 85%P61041.8Relative Humidity average % differenceP11028.0Ozone SlopeP01.140.98081Ozone SlopeP01.140.98081Ozone % difference anyP11041.3Flow Rate average % differenceP11041.3Flow Rate average % differenceP1104</td><td>Wind Speed max error below 5m/s in m/sP30.580.20m/sWind Speed average % difference above 5 m/sP3580.0%Wind Speed Torque average errorP30.510.50g-cmWind Speed Torque average errorP30.510.50g-cmWind Speed Torque average error (de)P2581.0degreesWind Direction Input Deg True average error (deg)P2581.5degreesWind Direction Linearity average error (deg)P220116g-cmWind Direction Torque average errorP220118g-cmWind Direction Torque average errorP50.530.12cTemperature average errorP50.530.14cRelative Humidity average above 85%P61025.0%Relative Humidity average below 85%P61041.8%Solar Radiation % diff or avgP91046.74%Ozone SlopeP01.140.98081umilessOzone SlopeP00.541.06586ppOzone Kifference maxP105961.05Ozone Kifference maxP101047.1%Solar Radiation % differenceP1010</td></td>	Wind Speed max error below 5m/s in m/sP3Wind Speed average % difference above 5 m/sP3Wind Speed Torque average errorP3Wind Speed Torque average errorP3Wind Speed Torque max errorP3Wind 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04/28/2014 JOT403 Eric Hebert

Field Systems Comments

1 Parameter: ShelterCleanNotes

The shelter is only a few years old and is in good condition, clean and well organized.

Data Compiled:

8/5/2014 1:32:45 PM

SiteVisitDate	Site	Technician
05/31/2014	LAV410	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97835	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.93585	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	1	10	4	4.0	%	Р
5	Ozone % difference max	Р	1	10	4	5.4	%	Р

Data Compiled:	5/4/2016 1:18:40 PM
SiteVisitDate Site	Technician

05/05/2014 MEV405 Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	Р	3	0.5	8	0.04	m/s	Р
2	Wind Speed max error below 5m/s in m/s	Р	3	0.5	8	0.12	m/s	Р
3	Wind Speed average % difference above 5 m/s	Р	3	5	8	0.3	%	Р
4	Wind Speed max % difference above 5 m/s	Р	3	5	8	0.8	%	Р
5	Wind Speed Torque average error	Р	3	0.5	1	0.35	g-cm	Р
6	Wind Speed Torque max error	Р	3	0.5	1	0.4	g-cm	Р
7	Wind Direction Input Deg True average error (de	Р	2	5	8	2.8	degrees	Р
8	Wind Direction Input Deg True max error (deg)	Р	2	5	8	5	degrees	Р
9	Wind Direction Linearity average error (deg)	Р	2	5	16	2.0	degrees	Р
10	Wind Direction Linearity max error (deg)	Р	2	5	16	5	degrees	Р
11	Wind Direction Torque average error	Р	2	20	1	9	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	6	0.37	c	Р
14	Temperature max error	Р	4	0.5	6	0.64	c	Fail
15	Relative Humidity average above 85%	Р	6	10	1	0.1	%	Р
16	Relative Humidity max above 85%	Р	6	10	1	0.1	%	Р
17	Relative Humidity average below 85%	Р	б	10	2	2.1	%	Р
18	Relative Humidity max below 85%	Р	6	10	2	2.2	%	Р
19	Solar Radiation % diff of avg	Р	9	10	24	7.58	%	Р
20	Solar Radiation % diff of max STD value	Р	9	10	24	6.1	%	Р
21	Precipitation average % difference	Р	1	10	2	1.0	%	Р
22	Precipitation max % difference	Р	1	10	2	2.0	%	Р
23	Ozone Slope	Р	0	1.1	4	0.99710	unitless	Р
24	Ozone Intercept	Р	0	5	4	-2.66354	ppb	Р
25	Ozone correlation	Р	0	0.995	4	0.99983	unitless	Р
26	Ozone % difference avg	Р	1	10	4	5.9	%	Р
27	Ozone % difference max	Р	1	10	4	10.4	%	Fail
28	Flow Rate average % difference	Р	10	5	8	0.33	%	Р
29	Flow Rate max % difference	Р	10	5	8	0.66	%	Р
30	DAS Time maximum error	Р	0	5	1	1.1	min	Р
31	DAS Voltage average error	Р	10	0.003	21	0.0001	V	Р
32	DAS Voltage average error	Р	5	0.003	21	0.0002	V	Р

05/05/2014 MEV405

Eric Hebert

Field Performance Comments

1Parameter:OzoneSensorComponent:Cell A Freq.CommentCode99

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

Field Systems Comments

1 Parameter: SitingCriteriaCom

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

2 Parameter: ShelterCleanNotes

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

Data Compiled:

8/4/2014 6:03:16 PM

SiteVisitDate	Site	Technician
04/10/2014	OXF122	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.02714	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.89517	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.2	%	Р
5	Ozone % difference max	Р	7	10	4	1.7	%	Р

Data Compiled	4/17/2016 8:47:01 PM	
SiteVisitDate	Site	Technician
04/07/2014	PET427	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	Р	3	0.5	4	0.05	m/s	Р
2	Wind Speed max error below 5m/s in m/s	Р	3	0.5	4	0.20	m/s	Р
3	Wind Speed average % difference above 5 m/s	Р	3	5	4	0.0	%	Р
4	Wind Speed max % difference above 5 m/s	Р	3	5	4	0.0	%	Р
5	Wind Speed Torque average error	Р	3	0.5	1	0.35	g-cm	Р
6	Wind Speed Torque max error	Р	3	0.5	1	0.4	g-cm	Р
7	Wind Direction Input Deg True average error (de	Р	2	5	4	1.8	degrees	Р
8	Wind Direction Input Deg True max error (deg)	Р	2	5	4	3	degrees	Р
9	Wind Direction Linearity average error (deg)	Р	2	5	8	2.2	degrees	Р
10	Wind Direction Linearity max error (deg)	Р	2	5	8	5	degrees	Р
11	Wind Direction Torque average error	Р	2	20	1	18	g-cm	Р
12	Wind Direction Torque max error	Р	2	20	1	18	g-cm	Р
13	Temperature average error	Р	5	0.5	12	0.24	с	Р
14	Temperature max error	Р	5	0.5	12	0.27	с	Р
15	Relative Humidity average above 85%	Р	8	10	1	0.8	%	Р
16	Relative Humidity max above 85%	Р	8	10	1	0.8	%	Р
17	Relative Humidity average below 85%	Р	8	10	2	1.6	%	Р
18	Relative Humidity max below 85%	Р	8	10	2	1.8	%	Р
19	Solar Radiation % diff of avg	Р	9	10	10	8.35	%	Р
20	Solar Radiation % diff of max STD value	Р	9	10	10	8.9	%	Р
21	Precipitation average % difference	Р	1	10	2	1.8	%	Р
22	Precipitation max % difference	Р	1	10	2	3.2	%	Р
23	Ozone Slope	Р	0	1.1	4	1.01633	unitless	Р
24	Ozone Intercept	Р	0	5	4	1.89013	ppb	Р
25	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
26	Ozone % difference avg	Р	1	10	4	5.0	%	Р
27	Ozone % difference max	Р	1	10	4	7.2	%	Р
28	Flow Rate average % difference	Р	10	5	3	0.67	%	Р
29	Flow Rate max % difference	Р	10	5	3	1.35	%	Р
30	DAS Time maximum error	Р	0	5	1	1.33	min	Р
31	DAS Voltage average error	Р	9	0.003	42	0.0004	V	Р
32	DAS Voltage average error	Р	3	0.003	42	0.0002	V	Р

Field Performance Comments

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

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

2 Parameter: Wind Direction SensorComponent: Mast

CommentCode 155

The wind direction sensor mast is loose on the tower causing inaccurate wind direction measurement.

Field Systems Comments

1 Parameter: SiteOpsProcComm

The site operator was not available for the site audit. Reported information is from the previous site audit.

2 Parameter: DasComments

The heating and air conditioning systems run simultaneously.

3 Parameter: ShelterCleanNotes

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

Data Compiled:

8/4/2014 10:08:16 PM

SiteVisitDate	Site	Technician
05/01/2014	PIN414	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.0099	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.21975	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	1	10	4	0.7	%	Р
5	Ozone % difference max	Р	1	10	4	0.9	%	Р

Data Compiled: 8

8/4/2014 5:38:33 PM

SiteVisitDate	Site	Technician
04/08/2014	QAK172	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99571	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.51311	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.1	%	Р
5	Ozone % difference max	Р	7	10	4	1.5	%	Р
Data Compiled:

8/5/2014 2:12:03 PM

SiteVisitDate	Site	Technician
06/02/2014	SAN189	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.01684	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.10424	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.8	%	Р
5	Ozone % difference max	Р	7	10	4	1.9	%	Р

Data Compiled: 8/5/2014 1:21:11 PM

SiteV	isitDate	Site	Techr	nician				
05/30/2	0/2014 SEK430 Alison Ray							
Line	Audited	d Parameter		DAS	Ch. #	Criteria +/-	Counts	QaResult
1	Ozone Sl	ope		Р	0	1.1	4	0.99535
2	Ozone In	tercept		Р	0	5	4	-0.73418

2	Ozone Intercept	Р	0	5	4	-0.73418	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р
4	Ozone % difference avg	Р	1	10	4	2.2	%	Р
5	Ozone % difference max	Р	1	10	4	3.9	%	Р

Field Performance Comments

SensorComponent: Cell A Tmp. CommentCode 99 1 Parameter: Ozone

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

Units

unitless

Pass/Fail Р

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SiteVisitDate	Site	Technician
05/29/2014	YOS404	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.03866	unitless	Р
2	Ozone Intercept	Р	0	5	4	-1.0319	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	1	10	4	1.8	%	Р
5	Ozone % difference max	Р	1	10	4	3.1	%	Р

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

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SiteVisitDate	Site	Technician
04/08/2014	QAK172	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99571	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.51311	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.1	%	Р
5	Ozone % difference max	Р	7	10	4	1.5	%	Р

Mfg	Se	rial Number Ta	Site	Te	chnician		Site Visit	t Date	Parame	ter	Owner ID	
ThermoElectron	Inc 10	009241783	QAK172	Sa	andy Grei	nville	04/08/20	14	Ozone		000613	
Slope:	0.99	9571 Slope: 1311 Intercept	0.0000		Mfg Serial N	umber	ThermoE 49C-7310	lectron l 04-373	Inc Pa	rameter ozor er Desc. Ozo	ne transfer	
DAS 1: A Avg % Diff:	A Max	DAS 2: M Di A Avg %	Dif A Max	% Di	Tfer ID Slope	40	01100	1.00458	3 Inter	cept	-0.11484]
1.1%		1.5%			Cert Da		12	10/2010			1.00000	
UseDescripti	ion:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Sit	te:	Site	Unit:	PctDiffe	rence:	
primary		1	0.14	0.2	25	-0.	51 j	ppb			1 1 40/	
primary		2	50.07	50.	04	<u> </u>	29	ppo			-1.14%	
primary		3	50.29 81.20	50. 91	17	49.	00 01	ppo			-1.04%	
primary		4	81.29 100.62	01. 100	27	/9.	04 40	ppo			-1.4/%	
prinary	-		100.02	100	.27	<u></u>	40	ppo	~		-0.8770	
Sensor Comp	onent	Cell B Noise		Conditio	n 1.0 pp	b			Status	pass		
Sensor Comp	onent	Cell B Tmp.		Conditio	on				Status	pass		
Sensor Comp	onent	Fullscale Voltage		Conditio	n N/A				Status	pass		
Sensor Comp	onent	Inlet Filter Conditio	n	Conditio	Clean				Status	pass		
Sensor Comp	onent	Line Loss		Conditio	Not te	sted			Status	pass		
Sensor Comp	onent	Offset		Conditio	n 0.10				Status	pass		
Sensor Comp	onent	Span		Conditio	n 1.001				Status	pass		
Sensor Comp	onent	Cell B Freq.		Conditio	on 89.8 k	Hz			Status	pass		
Sensor Comp	onent	System Memo		Conditio	on				Status	pass		
Sensor Comp	onent	Sample Train		Conditio	Good				Status	pass		
Sensor Comp	onent	Cell B Pressure		Conditio	on				Status	pass		
Sensor Comp	onent	Cell B Flow		Conditio	0.72	om			Status	pass		
Sensor Comp	onent	Cell A Tmp.		Conditio	n 33.0 ()			Status	pass		
Sensor Comp	onent	Cell A Pressure		Conditio	on 696 m	mHg			Status	pass		
Sensor Comp	onent	Cell A Noise		Conditio	n 1.0 pp	b			Status	pass		
Sensor Comp	onent	Cell A Freq.		Conditio	93.4 k	Hz			Status	pass		
Sensor Comp	onent	Cell A Flow		Conditio	0.70 l	om			Status	pass		
Sensor Comp	onent	Battery Backup		Conditio	Funct	ioning			Status	pass		
Sensor Comp	onent	Zero Voltage		Conditio	n N/A				Status	pass		

Site Vi	sit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
QAK1	72-Sandy	Grenville-04/08/2014				
1	4/8/2014	DAS	Campbell	000418	CR3000	2518
2	4/8/2014	Ozone	ThermoElectron Inc	000613	49i A1NAA	1009241783
3	4/8/2014	Ozone Standard	ThermoElectron Inc	000511	49i A3NAA	0922236888
4	4/8/2014	Sample Tower	Aluma Tower	666368	В	AT-5107-E-4-8
5	4/8/2014	UPS	APC	06798	RS900	unknown
6	4/8/2014	Zero air pump	Werther International	06870	PC70/4	000814278

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SiteVisitDate	Site	Technician
04/09/2014	DCP114	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.01025	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.16701	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.9	%	Р
5	Ozone % difference max	Р	7	10	4	1.2	%	Р

Mfg	S	erial Number Ta	Site	Te	chnician		Site Visi	t Date	Parame	eter	Owner I	D
ThermoElect	tron Inc 1	009241787	DCP114	Sa	andy Gre	nville	04/09/20)14	Ozone		000615	
Slope: [Intercept [CorrCoff [1.0 -0.1 0.9	Slope:6701Intercept99998CorrCoff	0.00000)))	Mfg Serial N	Jumber	ThermoE 49C-7310	lectron 04-373	Inc Pa	rameter oz er Desc. Oz	cone zone transfe	:r
DAC 1.		DAG 2.			Tier ID		01100			F		
DAS I: A Avg % D	oiff: A Ma	DAS 2: x % Di A Avg %	Dif A Max	% Di	Slope			1.00458	B Inter	cept	-0.11	484
0.9	9%	1.3%			Cert Da	nte	12	/10/201:	3 Corr	Coff	1.00	0000
UseDesc	cription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	Unit:	PctDif	ference:	
prim	nary	1	0.05	0.1	16	-0.	24	ppb				
prim	nary	2	31.35	31.	32	31.	.71	ppb			1.25%	
prim	nary	3	50.73	50.	61	51.	.02	ppb			0.81%	
prim	nary	4	80.59	80.	33	81.	.20	ppb			1.08%	
prim	nary	5	100.86	100	.51	101	.10	ppb			0.59%	
Sensor Co	omponent	Cell B Noise		Conditio	on 0.5 pp	b			Status	pass		
Sensor Co	omponent	Cell B Tmp.		Conditio	on				Status	pass		
Sensor Co	omponent	Fullscale Voltage		Conditio	n N/A				Status	pass		
Sensor Co	omponent	Inlet Filter Condition	n	Conditio	on Clear	1			Status	pass		
Sensor Co	omponent	Line Loss		Conditio	n Not te	ested			Status	pass		
Sensor Co	omponent	Offset		Conditio	on 0.000				Status	pass		
Sensor Co	omponent	Span		Conditio	on 0.999				Status	pass		
Sensor Co	omponent	Cell B Freq.		Conditio	on 95.6 k	kHz			Status	pass		
Sensor Co	omponent	System Memo		Conditio	on				Status	pass		
Sensor Co	omponent	Sample Train		Conditio	on Good				Status	pass		
Sensor Co	omponent	Cell B Pressure		Conditio	on				Status	pass		
Sensor Co	omponent	Cell B Flow		Conditio	on 0.72 l	pm			Status	pass		
Sensor Co	omponent	Cell A Tmp.		Conditio	on 34.4 (C			Status	pass		
Sensor Co	omponent	Cell A Pressure		Conditio	on 712 m	nmHg			Status	pass		
Sensor Co	omponent	Cell A Noise		Conditio	on 0.8 pp	b			Status	pass		
Sensor Co	omponent	Cell A Freq.		Conditio	on 97.8	κHz			Status	pass		
Sensor Co	omponent	Cell A Flow		Conditio	on 0.76 l	pm			Status	pass		
Sensor Co	omponent	Battery Backup		Conditio	n N/A				Status	pass		
Sensor Co	omponent	Zero Voltage		Conditio	n N/A				Status	pass		

Site Vi	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
DCP1	14-Sandy	Grenville-04/09/2014				
1	4/9/2014	DAS	Campbell	000345	CR3000	2124
2	4/9/2014	Ozone	ThermoElectron Inc	000615	49i A1NAA	1009241787
3	4/9/2014	Ozone Standard	ThermoElectron Inc	000545	49i A3NAA	0929938241
4	4/9/2014	Sample Tower	Aluma Tower	000030	В	AT-81056-J-4
5	4/9/2014	Zero air pump	Werther International	06939	PC70/4	000829175

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SiteVisitDate	Site	Technician
04/10/2014	OXF122	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.02714	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.89517	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.2	%	Р
5	Ozone % difference max	Р	7	10	4	1.7	%	Р

Mfg	Sei	rial Number Ta	Site	Te	chnician		Site Visi	t Date	Parame	eter	Owner I	D
ThermoElectron	Inc 11	05347312	OXF122	Sa	andy Grei	nville	04/10/20)14	Ozone		000737	
Slope: 1.02714 Slope: 0.000 Intercept -0.89517 Intercept 0.000 CorrCoff 0.99999 CorrCoff 0.0000		0.0000)))	Mfg Serial N	umber	ThermoE 49C-731	ThermoElectron IncPa49C-73104-373Tf		rameter 020 er Desc. Ozo	ne one transfer	r III	
DAS 1: A Avg % Diff: 1.3%	A Max	DAS 2: % Di A Avg % 1.7%	Dif A Max	% Di	Tfer ID Slope Cert Da	ıte	01100	1.00458 /10/2013	Inter Corr	·cept ·Coff	-0.11 1.00	484 000
UseDescript	ion:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Sit	te:	Site	Unit:	PctDiffe	erence:	
primary		1	0.04	0.1	15	-0.	87	ppb				
primary		2	30.49	30.	46	30.	.39	ppb			-0.23%	
primary		3	50.58	50.	46	51.	.18	ppb			1.43%	
primary		4	82.49	82.	22	83.	.60	ppb			1.68%	
primary		5	100.39	100	.04	101	.70	ppb			1.66%	
Sensor Comp	onent	Cell B Noise		Conditio	on 0.9 kH	łz			Status	pass		
Sensor Comp	onent	Cell B Tmp.		Conditio	on				Status	pass		
Sensor Comp	onent	Fullscale Voltage		Conditio	n N/A				Status	pass		
Sensor Comp	onent	Inlet Filter Conditio	n	Conditio	on Clean				Status	pass		
Sensor Comp	onent	Line Loss		Conditio	Not te	sted			Status	pass		
Sensor Comp	onent	Offset		Conditio	on 0.50				Status	pass		
Sensor Comp	onent	Span		Conditio	n 1.023				Status	pass		
Sensor Comp	onent	Cell B Freq.		Conditio	n 103.1	kHz			Status	pass		
Sensor Comp	onent	System Memo		Conditio	on				Status	pass		
Sensor Comp	onent	Sample Train		Conditio	Good				Status	pass		
Sensor Comp	onent	Cell B Pressure		Conditio	on				Status	pass		
Sensor Comp	onent	Cell B Flow		Conditio	on 0.76 l	om			Status	pass		
Sensor Comp	onent	Cell A Tmp.		Conditio	on 35.3 ()			Status	pass		
Sensor Comp	onent	Cell A Pressure		Conditio	on 701 m	mHg			Status	pass		
Sensor Comp	onent	Cell A Noise		Conditio	on 0.8 pp	b			Status	pass		
Sensor Comp	onent	Cell A Freq.		Conditio	n 104.5	kHz			Status	pass		
Sensor Comp	onent	Cell A Flow		Conditio	on 0.70 l	om			Status	pass		
Sensor Comp	onent	Battery Backup		Conditio	Funct	ioning			Status	pass		
Sensor Comp	onent	Zero Voltage		Conditio	n N/A				Status	pass		

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
OXF	122-Sandy	Grenville-04/10/2014				
1	4/10/2014	DAS	Campbell	000425	CR3000	2528
2	4/10/2014	Ozone	ThermoElectron Inc	000737	49i A1NAA	1105347312
3	4/10/2014	Ozone Standard	ThermoElectron Inc	000686	49i A3NAA	1030244818
4	4/10/2014	Sample Tower	Aluma Tower	000018	В	AT-61152-A-H8-E
5	4/10/2014	UPS	APC	05072	RS800	unknown
6	4/10/2014	Zero air pump	Werther International	06911	PC70/4	000829167

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SiteVisitDate	Site	Technician
05/01/2014	PIN414	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.0099	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.21975	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	1	10	4	0.7	%	Р
5	Ozone % difference max	Р	1	10	4	0.9	%	Р

Mfg	Se	erial Number Ta	Site	Te	chnician		Site Visi	t Date	Parame	eter	Owner I	D
ThermoElectr	ron Inc 4	9c-74530376	PIN414	Er	ic Heberl	t	05/01/20	014	Ozone		90765	
Slope: Intercept CorrCoff	lope: 1.00990 Slope: 0.0000 atercept -0.21975 Intercept 0.0000 corrCoff 0.99999 CorrCoff 0.0000		0 0 0	Mfg Serial N Tfer ID	Number	ThermoE 49CPS-7 01110	ThermoElectron IncP:49CPS-70008-364Ti01110		arameter ozone fer Desc. Ozone primary		/ stan	
DAS 1:		DAS 2:			Slone			1 00707	7 Into		_0.21	032
A Avg % Di	ff: A Ma	x % Di A Avg %	6Dif A Max 9	% Di	Slope			1.00707		cept	-0.21	0.02
0.7%	%	1.0%			Cert Da	ate		1/8/2014	4 Corr	Coff	1.00	000
UseDesci	ription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Sit	te:	Site	Unit:	PctDiff	ference:	
prima	ary	1	0.00	0.2	20	-0.	07	ppb				
prima	ary	2	29.51	29.	51	29.	.79	ppb			0.95%	
prima	ary	3	49.14	49.	00	49.	.17	ppb			0.35%	
prima	ary	4	78.69	78.	34	78.	.72	ppb			0.49%	
prima	ary	5	107.00	106	.45	107	.40	ppb			0.89%	
Sensor Co	mponent	Cell B Noise		Conditio	on 0.7 pp	b			Status	pass		
Sensor Co	mponent	Cell B Tmp.		Conditio	on				Status	pass		
Sensor Co	mponent	Fullscale Voltage		Conditio	n 1.001	0			Status	pass		
Sensor Co	mponent	Inlet Filter Condition	n	Conditio	n Clear	1			Status	pass		
Sensor Co	mponent	Line Loss		Conditio	n Not te	ested			Status	pass		
Songon Cor		Offect		Conditio	10				Status	- 		
Sensor Col	inponent			Conditio					Status	pass		
Sensor Co	mponent	Span		Conditio	n 1.005				Status	pass		
Sensor Co	mponent	Cell B Freq.		Conditio	on 87.4 k	κHz			Status	pass		
Sensor Co	mponent	System Memo		Conditio	on				Status	pass		
Sensor Co	mponent	Sample Train		Conditio	Good				Status	pass		
Sensor Co	mponent	Cell B Pressure		Conditio	on				Status	pass		
Sensor Co	mponent	Cell B Flow		Conditio	on 0.76 l	pm			Status	pass		
Sensor Co	mponent	Cell A Tmp.		Conditio	on 40.0 (0			Status	pass		
Sensor Co	mponent	Cell A Pressure		Conditio	n 716 m	nmHg			Status	pass		
Sensor Co	mponent	Cell A Noise		Conditio	on 0.6 pp	ob			Status	pass		
Sensor Co	mponent	Cell A Freq.		Conditio	n 100.0	kHz			Status	pass		
Sensor Co	mponent	Cell A Flow		Conditio	on 0.78 l	pm			Status	pass		
Sensor Cor	mponent	Battery Backup		Conditio	Funct	ioning			Status	pass		
Sensor Cor	mponent	Zero Voltage		Conditio	n 0.000	2			Status	pass		

Site Vi	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
PIN41	4-Eric He	ebert-05/01/2014				
1	5/1/2014	DAS	Environmental Sys Corp	90612	8816	2615
2	5/1/2014	Ozone	ThermoElectron Inc	90765	49C	49c-74530376
3	5/1/2014	Ozone Standard	ThermoElectron Inc	90752	49C	49C-74532-376
4	5/1/2014	Sample Tower	Aluma Tower	928348	В	AT-5381-F9-3
5	5/1/2014	UPS	APC	none	1400RMXL	WS9848027653
6	5/1/2014	Zero air pump	Werther International	none	PC 70/4	000706555

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SiteVisitDate	Site	Technician
05/29/2014	YOS404	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.03866	unitless	Р
2	Ozone Intercept	Р	0	5	4	-1.0319	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	1	10	4	1.8	%	Р
5	Ozone % difference max	Р	1	10	4	3.1	%	Р

Mfg	1	Serial Number Ta	Site	Te	chnician		Site Visi	t Date	Parame	eter	Owner I	D
ThermoElec	tron Inc	49C-74534-376	YOS404	AI	ison Ray		05/29/20	014	Ozone		90763	
Slope: [Intercept [CorrCoff [1 -1 0	.03866 Slope: .03190 Intercept .99999 CorrCoff	0.0000 0.0000 0.0000	0	Mfg Serial N Tfer ID	Number	ThermoE 49CPS-7 01110	Electron 70008-36	Inc Pa 64 Tf	rameter oz er Desc. O	cone zone primary	/ stan
DAS 1:		DAS 2:			Slope			1 0070	7 Inter	reent	-0.21	032
A Avg % D	iff: A M	ax % Di A Avg %	%Dif A Max	% Di	Slope			1.0070			-0.21	002
1.8	3%	3.1%			Cert Da	ate		1/8/201	4 Cori	Coff	1.00	000
UseDesc	cription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	Unit:	PctDif	ference:	
prim	nary	1	0.00	0.2	20	-0.	66	ppb				
prim	nary	2	29.70	29.	.70	29.	86	ppb			0.54%	
prim	nary	3	49.65	49.	.51	50.	07	ppb			1.13%	
prim	nary	4	79.60	79.	.25	81.	21	ppb			2.47%	
prim	nary	5	109.60	109	.03	112	.40	ppb			3.09%	
Sensor Co	mponen	t Cell B Noise		Conditio	on 0.8 pp	b			Status	pass		
Sensor Co	omponen	t Cell B Tmp.		Conditio	on				Status	pass		
Sensor Co	omponen	t Fullscale Voltage		Conditio	on 1.003	6			Status	pass		
Sensor Co	omponen	t Inlet Filter Condition	on	Conditio	on Clear	1			Status	pass		
Sensor Co	omponen	t Line Loss		Conditio	on Not te	ested			Status	pass		_
Sensor Co	omponen	t Offset		Conditio	on 0.000				Status	pass		-
Sensor Co	omponen	t Span		Conditio	on 1.038				Status	pass		
Sensor Co	mponen	t Cell B Freq.		Conditio	on 104.3	kHz			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	mponen	t Cell B Flow		Conditio	0.61	pm			Status	pass		
Sensor Co	mponen			Conditio	35.7 (2 2			Status	nass		
Sensor Co	mponen			Conditio	615 m				Status	2000		
Sensor Co	omponen			Conditio		inneg			Status	pass		_
Sensor Co	omponen	t Cell A Noise		Conditio	on 0.8 pp	ob			Status	pass		
Sensor Co	omponen	t Cell A Freq.		Conditio	on 97.8 l	κHz			Status	pass		
Sensor Co	omponen	t Cell A Flow		Conditio	on 0.61 l	pm			Status	pass		
Sensor Co	omponen	t Battery Backup		Conditio	N/A				Status	pass		
Sensor Co	mponen	t Zero Voltage		Conditio	on 0.004	7			Status	pass		

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
YOS4	404-Alison	Ray-05/29/2014				
1	5/29/2014	DAS	Environmental Sys Corp	90645	8816	2558
2	5/29/2014	Ozone	ThermoElectron Inc	90763	49C	49C-74534-376
3	5/29/2014	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450190
4	5/29/2014	Sample Tower	Aluma Tower	none	В	none
5	5/29/2014	Zero air pump	Werther International	none	PC70/4	531397

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SiteV	isitDate	Site	Techr	nician				
05/30/2	2014	SEK430	Alison	Ray				
Line	Audited	d Parameter		DAS	Ch. #	Criteria +/-	Counts	QaResult
1	Ozone Sl	ope		Р	0	1.1	4	0.99535
2	Ozone In	tercept		Р	0	5	4	-0.73418

2	Ozone Intercept	Р	0	5	4	-0.73418	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р
4	Ozone % difference avg	Р	1	10	4	2.2	%	Р
5	Ozone % difference max	Р	1	10	4	3.9	%	Р

Field Performance Comments

SensorComponent: Cell A Tmp. CommentCode 99 1 Parameter: Ozone

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

Units

unitless

Pass/Fail Р

Mfg	:	Serial Number Ta	Site	Te	chnician		Site Visi	t Date	Parame	eter	Owner I	D
ThermoElec	tron Inc	0520012327	SEK430	Ali	son Ray		05/30/20	014	Ozone		90835	
Slope: Intercept CorrCoff	0 -0 0	.99535 Slope: .73418 Intercept .99997 CorrCoff	0.0000 0.0000 0.0000	0	Mfg Serial N Tfer ID	Jumber	ThermoE 49CPS-7 01110	Electron 20008-30	Inc Pa	rameter oz er Desc. Oz	one zone primary	/ stan
DAS 1:		DAS 2:			Slope			1 0070	7 Inter	cent	-0.21	032
A Avg % D 2.2	Diff: A M 2%	ax % Di A Avg % 3.9%	6Dif A Max	% Di	Cert Da	ite		1/8/201	4 Corr	Coff	1.00	000
UseDesc	cription:	ConcGroup:	Tfer Raw:	Tfer (Corr:	Si	te:	Site	Unit:	PctDif	ference:	
prin	nary	1	0.30	0.5	50	0.	17	ppb				
prin	nary	2	30.17	30.	16	28.	.98	ppb			-3.91%	
prin	nary	3	49.59	49.	45	48.	.24	ppb			-2.45%	
prin	nary	4	80.88	80.	52	79.	.24	ppb			-1.59%	
prin	nary	5	111.01	110	.43	109	0.50	ppb			-0.84%	
Sensor Co	omponen	t Cell B Noise		Conditio	n 0.8 pp	b			Status	pass		
Sensor Co	omponen	t Cell B Tmp.		Conditio	on				Status	pass		
Sensor Co	omponen	t Fullscale Voltage		Conditio	n Not te	ested			Status	pass		
Sensor Co	omponen	t Inlet Filter Condition	วท	Conditio	Mode	rately clea	an		Status	pass		
Sensor Co	omponen	t Line Loss		Conditio	n Not te	ested			Status	pass		
Sensor Co	omponen	t Offset		Conditio	n 0.2				Status	pass		
Sensor Co	omponen	t Span		Conditio	n 1.028				Status	pass		
Sensor Co	omponen	t Cell B Freq.		Conditio	n 87.7 k	κHz			Status	pass		
Sensor Co	omponen	t System Memo		Conditio	on				Status	pass		
Sensor Co	omponen	t Sample Train		Conditio	Good				Status	pass		
Sensor Co	omponen	t Cell B Pressure		Conditio	n				Status	pass		
Sensor Co	omponen	t Cell B Flow		Conditio	n 0.66 l	pm			Status	pass		
Sensor Co	omponen	t Cell A Tmp.		Conditio	n 41.0 (2			Status	Fail		
Sensor Co	omponen	t Cell A Pressure		Conditio	n 700 m	nmHg			Status	pass		
Sensor Co	omponen	t Cell A Noise		Conditio	0.8 pp	b			Status	pass		
Sensor Co	omponen	t Cell A Freq.		Conditio	n 103.2	kHz			Status	pass		
Sensor Co	omponen	t Cell A Flow		Conditio	n 0.66 l	pm			Status	pass		
Sensor Co	omponen	t Battery Backup		Conditio	N/A				Status	pass		
Sensor Co	omponen	t Zero Voltage		Conditio	n Not te	ested			Status	pass		

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
SEK4	430-Alison	Ray-05/30/2014				
1	5/30/2014	DAS	Environmental Sys Corp	90649	8816	2562
2	5/30/2014	Met tower	Aluma Tower	none	В	none
3	5/30/2014	Ozone	ThermoElectron Inc	90835	49C	0520012327
4	5/30/2014	Ozone Standard	ThermoElectron Inc	90729	49C	49C-90523-366
5	5/30/2014	Zero air pump	Werther International	none	C 70/4	000838301

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SiteVisitDate	Site	Technician
05/31/2014	LAV410	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97835	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.93585	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	1	10	4	4.0	%	Р
5	Ozone % difference max	Р	1	10	4	5.4	%	Р

Mfg	Serial Number Ta	Site	Te	chnician		Site Visi	t Date	Parame	eter	Owner I	D
ThermoElectron Inc	49C-520012-328	LAV410	AI	ison Ray		05/31/20	014	Ozone		90834	
Slope:	0.97835 Slope: 0.93585 Intercept	0.0000	0	Mfg Serial N	lumber	ThermoE 49CPS-7	Electron 70008-30	Inc Pa	rameter o er Desc. C	zone Dzone primary	/ stan
		0.0000	0	Tfer ID		01110					
DAS 1:	DAS 2:			Slope			1.0070	7 Inter	rcept	-0.21	032
A Avg % Diff: A N 4.0%	Iax % Di A Avg % 5.4%	6Dif A Max	% Di	Cert Da	ite		1/8/201	4 Corr	Coff	1.00	000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Sit	te:	Site	Unit:	PctDi	fference:	
primary	1	0.25	0.4	45	-0.	36	ppb				
primary	2	31.89	31.	.87	30.	16	ppb			-5.37%	
primary	3	50.32	50.	.17	47.	92	ppb			-4.48%	
primary	4	79.81	79.	.45	76.	97	ppb			-3.12%	
primary	5	110.28	109	9.71	106	.40	ppb			-3.02%	
Sensor Compone	nt Cell B Noise		Conditio	on 0.7 pp	b			Status	pass		
Sensor Compone	nt Cell B Tmp.		Conditio	on				Status	pass		
Sensor Compone	nt Fullscale Voltage		Conditio	on 0.997	4			Status	pass		
Sensor Compone	nt Inlet Filter Condition	งท	Conditio	on Clean	1			Status	pass		
Sensor Compone	nt Line Loss		Conditio	on Not te	sted			Status	pass		
Sensor Compone	nt Offset		Conditio	on 0.000				Status	pass		
Sensor Compone	nt Span		Conditio	on 0.992				Status	pass		
Sensor Compone	nt Cell B Freq.		Conditio	on 81.0 k	κHz			Status	pass		
Sensor Compone	nt System Memo		Conditio	on				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 0.64 l	pm			Status	pass		
Sensor Compone	nt Cell A Tmp.		Conditio	on 36.1 (2			Status	pass		
Sensor Compone	nt Cell A Pressure		Conditio	on 607 m	nmHg			Status	pass		
Sensor Compone	nt Cell A Noise		Conditio	on 0.7 pp	b			Status	pass		
Sensor Compone	nt Cell A Freq.		Conditio	on 81.9 k	κHz			Status	pass		
Sensor Compone	nt Cell A Flow		Conditio	on 0.70 l	pm			Status	pass		
Sensor Compone	nt Battery Backup		Conditio	on N/A				Status	pass		
Sensor Compone	nt Zero Voltage		Conditio	on 0.000				Status	pass		

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
LAV4	410-Alison	Ray-05/31/2014				
1	5/31/2014	DAS	Environmental Sys Corp	90535	8816	2026
2	5/31/2014	Ozone	ThermoElectron Inc	90834	49C	49C-520012-328
3	5/31/2014	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1030745083
4	5/31/2014	Sample Tower	Aluma Tower	923314	В	AT-5324-F6-O
5	5/31/2014	Zero air pump	Werther International	none	C 70/4	000847660

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SiteVisitDate	Site	Technician
06/02/2014	SAN189	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.01684	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.10424	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.8	%	Р
5	Ozone % difference max	Р	7	10	4	1.9	%	Р

Mfg	Se	rial Number Ta	Site	Te	chnician		Site Visi	t Date	Parame	ter	Owner ID	
ThermoElectron Ir	nc 11	05347311	SAN189	Sa	andy Grer	nville	06/02/20)14	Ozone		000740	
Slope:	1.01	684Slope:0424Intercept0000G	0.0000	2	Mfg Serial N	umber	ThermoE 49C-7310	lectron 04-373	Inc Pa	rameter ozoi er Desc. Ozo	ne transfer	
CorrCoff	0.95	CorrCoff	0.0000	J	Tfer ID		01100					
DAS 1:		DAS 2:			Slope			1.00458	3 Inter	cept	-0.1148	4
A Avg % Diff: A 1.8%	Max	2.0% A Avg %	bDif A Max	% Di	Cert Da	te	12	/10/2013	3 Corr	Coff	1.0000	0
UseDescriptio	on:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	Unit:	PctDiffe	rence:	
primary		1	0.09	0.2	20	0.4	45	ppb				
primary		2 30.25		30.22		30.80 pp		ppb		1.92%		
primary		3	51.37	51.25		52.00 pr		opb		1.46%		
primary		4	79.82	79.	.57	80.	80.96 ppb			1.75%		
primary		5	101.47	101	.12	103	.09	ppb			1.95%	
Sensor Compo	nent	Cell B Noise		Conditio	on 0.3 pp	b			Status	pass		
Sensor Compo	nent	Cell B Tmp.		Conditio	on				Status	pass		
Sensor Compo	nent	Fullscale Voltage		Conditio	on N/A				Status	pass		
Sensor Compo	nent	Inlet Filter Conditio	n	Conditio	on Clean				Status	pass		
Sensor Compo	nent	Line Loss		Conditio	on Not te	sted			Status	pass		
Sensor Compo	nent	Offset		Conditio	on -0.10				Status	pass		
Sensor Compo	nent	Span		Conditio	on 1.005				Status	pass		
Sensor Compo	nent	Cell B Freq.		Conditio	on 90.9 k	Hz			Status	pass		
Sensor Compo	nent	System Memo		Conditio	on				Status	pass		
Sensor Compo	nent	Sample Train		Conditio	on Good				Status	pass		
Sensor Compo	nent	Cell B Pressure		Conditio	on				Status	pass		
Sensor Compo	nent	Cell B Flow		Conditio	on 0.63 l	om			Status	pass		
Sensor Compo	nent	Cell A Tmp.		Conditio	on 34.4 ()			Status	pass		
Sensor Compo	nent	Cell A Pressure		Conditio	on 692 m	imHg			Status	pass		
Sensor Compo	nent	Cell A Noise		Conditio	on 0.5 pp	b			Status	pass		
Sensor Compo	nent	Cell A Freq.		Conditio	on 106.9	kHz			Status	pass		
Sensor Compo	nent	Cell A Flow		Conditio	on 0.65 l	om			Status	pass		
Sensor Compo	nent	Battery Backup		Conditio	N/A				Status	pass		
Sensor Compo	nent	Zero Voltage		Conditio	on N/A				Status	pass		

Site V	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number			
SAN189-Sandy Grenville-06/02/2014									
1	6/2/2014	DAS	Campbell	000360	CR3000	2138			
2	6/2/2014	Ozone	ThermoElectron Inc	000740	49i A1NAA	1105347311			
3	6/2/2014	Ozone Standard	ThermoElectron Inc	000367	49i A3NAA	0726124683			
4	6/2/2014	Sample Tower	Aluma Tower	000207	В	none			
5	6/2/2014	Zero air pump	Werther International	06875	C 70/4	000814272			