2019 – 2nd Quarter Report Support for Conducting Systems & Performance Audits of Clean Air Status and Trends Network (CASTNET) Sites and National Atmospheric Deposition Program (NADP) Monitoring Stations - II EPA Contract No. EP-W-18-005

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List of Acronyms and Abbreviations

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

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. Total deposition is assessed using the NADP's Total Deposition Hybrid Method (TDEP; EPA, 2015c; Schwede and Lear, 2014), which combines data from established ambient monitoring networks and chemical-transport models. To estimate dry deposition, ambient measurement data from CASTNET and other networks were merged with dry deposition rates and flux output from the Community Multiscale Air Quality (CMAQ) modeling system.

As of June 2019, the network is comprised of 95 active rural sampling sites across the United States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Environment and Climate Change Canada (ECCC), Bureau of Land Management – Wyoming State Office (BLM-WSO) and several independent partners. Wood is responsible for operating the EPA and ECCC sponsored sites, and Air Resource Specialist, Inc. (ARS) is responsible for operating the NPS and BLM-WSO 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. Two EPA sponsored sites that are operated by Wood continue to operate meteorological sensors. Those sites are BEL116 and BVL130. PND165 and four sites sponsored by BLM-WSO also operate meteorological sensors. The NPS operates meteorological sensors at many of their air quality monitoring sites. No meteorological sensors other than temperature were audited during this reporting period.

Some or all of the additional monitored variables, NOy, CO, and SO₂ have been added to the EPA sponsored sites BVL130, HWF187, PND165, PNF126, GRS420, MAC426, and ROM206. None of those variables were audited during this reporting period.

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	\leq ±10.0% RH	
Solar Radiation	Accuracy	Compared to WRR traceable standard	$\leq \pm 10.0\%$ of daytime average	
Surface Wetness	Response	Distilled water spray mist	Positive response	
Surface Wetness	Sensitivity	1% decade resistance	N/A	
Temperature	Accuracy	Comparison to 3 NIST measured baths (~ 0° C, ambient, ~ full-scale)	\leq \pm 0.5° C	
Temperature Difference	Accuracy	Comparison to station temperature sensor	\leq \pm 0.50° C	
Shelter Temperature	Accuracy	Comparison to station temperature sensor	$\leq \pm 2.0^{\circ} \mathrm{C}$	
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	$\leq \pm 5^{\circ}$ mean absolute error	
Wind Direction	Response Threshold	Starting torque tested with torque gauge	< 10 g-cm Climatronics; < 20 g-cm R.M. Young	

 Table 1. Performance Audit Challenge and Acceptance Criteria

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Wind Speed	Wind SpeedAccuracyShaft rotational speed generated and measured with certified synchronous motor		$\leq \pm 0.5$ mps below 5.0 mps input; $\leq \pm 5.0\%$ of input at or above 5.0 mps
Wind Speed	Starting Threshold	Starting torque tested with torque gauge	< 0.5 g-cm
Mass Flow Controller	Flow Rate	Comparison with Primary Standard	$\leq \pm 5.0\%$ of designated rate
Ozone	Slope	Linear regression of multi-	$0.9000 \le m \le 1.1000$
Ozone	Intercept	point test gas concentration as	-5.0 ppb \leq b \leq 5.0 ppb
Ozone	Correlation Coefficient	measured with a certified transfer standard	$0.9950 \le r$
Ozone	Percent Difference	Comparison with Level 2 standard concentration	$\leq \pm 15.1\%$ of test gas concentration and $\leq \pm 0.003$ ppm actual difference
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 2019

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 2019. The locations and dates of the site visits for complete audits are presented in Table 2.

Side ID	<u>Audit Type</u>	<u>Sponsor</u>	<u>Site Visit Date</u>	Station Name	
CVL151	FSA	EPA	4/13/2019	Coffeeville	
CVL151	O ₃ PE	EPA	4/13/2019	Coffeeville	
CVL151	Flow	EPA	4/13/2019	Coffeeville	
CHE185	FSA	EPA/tribal	4/15/2019	Cherokee Nation	
CHE185	O ₃ PE	EPA/tribal	4/15/2019	Cherokee Nation	
CHE185	Flow	EPA/tribal	4/15/2019	Cherokee Nation	
CAD150	FSA	EPA	4/16/2019	Caddo Valley	
CAD150	O ₃ PE	EPA	4/16/2019	Caddo Valley	
CAD150	Flow	EPA	4/16/2019	Caddo Valley	
LAV410	FSA	NPS	5/7/2019	Lassen Volcanic NP	
LAV410	O ₃ PE	NPS	5/7/2019	Lassen Volcanic NP	
LAV410	Flow	NPS	5/7/2019	Lassen Volcanic NP	
PIN414	FSA	NPS	5/8/2019	Pinnacles NM	
PIN414	O ₃ PE	NPS	5/8/2019	Pinnacles NM	
PIN414	Flow	NPS	5/8/2019	Pinnacles NM	

Table 2. Site Audit Visits

Side ID	<u>Audit Type</u>	<u>Sponsor</u>	Site Visit Date	Station Name	
YOS404	FSA	NPS	5/13/2019	Yosemite NP – Turtleback Dome	
YOS404	O ₃ PE	NPS	5/13/2019	Yosemite NP – Turtleback Dome	
YOS404	Flow	NPS	5/13/2019	Yosemite NP – Turtleback Dome	
SEK430	FSA	NPS	5/14/2019	Sequoia NP – Ash Mountain	
SEK430	O ₃ PE	NPS	5/14/2019	Sequoia NP – Ash Mountain	
SEK430	Flow	NPS	5/14/2019	Sequoia NP – Ash Mountain	
ROM406	FSA	NPS	6/6/2019	Rocky Mtn NP	
ROM406	O ₃ PE	NPS	6/6/2019	Rocky Mtn NP	
ROM406	Flow	NPS	6/6/2019	Rocky Mtn NP	
ROM206	FSA	EPA	6/11/2019	Rocky Mtn NP	
ROM206	O ₃ PE	EPA	6/11/2019	Rocky Mtn NP	
ROM206	Flow	EPA	6/11/2019	Rocky Mtn NP	
CND125	FSA	EPA	6/14/2019	Candor	
CND125	Flow	EPA	6/14/2019	Candor	
WSP144	FSA	EPA	6/17/2019	Washington's Crossing State Park	
WSP144	O ₃ PE	EPA	6/17/2019	Washington's Crossing State Park	
WSP144	Flow	EPA	6/17/2019	Washington's Crossing State Park	

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) pollutant Performance Evaluations (PE).

Side ID	<u>PE Audit Type</u>	<u>Sponsor</u>	Site Visit Date	Station Name
PET427	O ₃	NPS	4/8/2019	Petrified Forest NP
GRC474	O3	NPS	4/9/2019	Grand Canyon NP
CHA467	O3	NPS	4/11/2019	Chiricahua NM
SND152	O3	EPA	4/27/2019	Sand Mountain
ESP127	O3	EPA	4/28/2019	Edgar Evins
SAL133	O3	EPA	5/8/2019	Salamonie Reservoir
COW137	O ₃	EPA	6/13/2019	Coweeta

Table 3. TTP Pollutant PE Visits

1.4 Audit Results

The observations and results of the systems and performance audits are included in Appendix A, *CASTNET 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, *CASTNET Site Spot Report Forms*. The Ozone PE results and observations are included in Appendix C, *CASTNET Ozone Performance Evaluation Forms*.

2.0 NADP Quarterly Report

2.1 Introduction

The National Atmospheric Deposition Program (NADP) operates three precipitation chemistry networks and two atmospheric concentration networks. The National Trends Network (NTN) has been measuring acidic precipitation since 1978. The network currently has more than 250 sites. The Atmospheric Integrated Research Monitoring Network (AIRMoN) began operation in 1992 and currently measures event based precipitation events at 3 sites. The Mercury Deposition Network (MDN) measures total mercury in precipitation samples from more than 120 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 (PO) operates and administers the three precipitation chemistry networks (NTN, MDN and AIRMoN), two atmospheric concentration networks (AMNet and AMoN), two analytical laboratories, the Wisconsin State Lab of Hygiene (WSLH) located at the University of Wisconsin in Madison and the Mercury Analytical Laboratory (HAL) located at Frontier Global Sciences), and the network equipment depot (NED). The HAL is currently being transitioned to the WSLH.

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 NADP Sites Visited Second Quarter 2019

This report presents the NADP sites surveyed during the Second quarter (April through June) of 2019. The station names and dates of the surveys are presented in Table 4.

<u>Side ID</u>	Network	Visit Date	Station Name	
AZ98	AMoN	4/11/2019	Chiricahua	
OK99	AMoN	4/15/2019	Stilwell	
OK05	MDN	4/15/2019	Hugo	
OK97	MDN	4/15/2019	Tuskahoma	
MS30	AMoN	4/16/2019	Coffeeville	
AL99	AMoN	4/27/2019	Sand Mountain Research & Extension Center	
TN07	AMoN	4/28/2019	Edgar Evins	
IN20	AMoN	5/8/2019	Roush Lake	
CA44	AMoN	5/13/2019	Yosemite NP - Turtleback Dome	
CA83	AMoN	5/14/2019	Sequoia NP - Ash Mountain	
WI31	NTN	5/17/2019	Devil's Lake	
MN27	MDN/NTN	5/20/2019	Lamberton	
MN01	NTN	5/21/2019	Cedar Creek	
NC25	AMoN	6/13/2019	Coweeta	
NC26	MDN	6/17/2019	Candor	
NJ98	AMoN	6/17/2019	Washington Crossing CASTNET	
NC26	AMoN	6/17/2019	Candor	
NJ30	MDN	6/19/2019	New Brunswick	
WY06	AMoN	6/30/2019	Pinedale	

Table 4. Sites Surveyed – Second Quarter 2019

2.4 Survey Results

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

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

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

APPENDIX A

CASTNET Audit Report Forms

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number				
CVL	CVL151-Sandy Grenville-04/13/2019									
1	4/13/2019	Computer	Dell	07033	Inspiron 15	Unknown				
2	4/13/2019	DAS	Campbell	000410	CR3000	2508				
3	4/13/2019	Elevation	Elevation	None	1	None				
4	4/13/2019	Filter pack flow pump	Thomas	04282	107CAB18B	129800010140				
5	4/13/2019	Flow Rate	Арех	000858	AXMC105LPMDPCV	illegible				
6	4/13/2019	Infrastructure	Infrastructure	none	none	none				
7	4/13/2019	Modem	Raven	06462	V42221	0808338333				
8	4/13/2019	Ozone	ThermoElectron Inc	000737	49i A1NAA	1105347312				
9	4/13/2019	Ozone Standard	ThermoElectron Inc	000464	49i A3NAA	0622717858				
10	4/13/2019	Sample Tower	Aluma Tower	03540	A	none				
11	4/13/2019	Shelter Temperature	Campbell	none	107-L	none				
12	4/13/2019	Siting Criteria	Siting Criteria	None	1	None				
13	4/13/2019	Temperature	RM Young	04447	41342	4545				
14	4/13/2019	Zero air pump	Werther International	06867	C 70/4	000814279				

DAS Data Form

0 DAS Time Max Error:

Mfg	Serial Nu	umber Site	7	Fechnician	Site Visit Date	Parameter	Use Desc.
Campbell	2508	CVI	L151	Sandy Grenville	04/13/2019	DAS	Primary
Das Date:	4 /13/2019	Audit Date	4 /13/2019	Mfg	Datel	Parameter	DAS
Das Time:	17:29:42	Audit Time	17:29:42	Serial Number	15510194	Tfer Desc	Source generator (D
Das Day:	103	Audit Day _	103				
Low Channel	:	High Channe	el:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0001	0.0002	2 0.0001	0.0002	Cert Date	2/13/201	2 CorrCoff	1.00000
				Cert Date			
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/25/201	9 CorrCoff	1.00000
Channel	Input I	OVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000) V	V	0.0000	
7	0.1000	0.0999	0.0999) V	V	0.0000	
7	0.3000	0.2997	0.2997	7 V	V	0.0000	
7	0.5000	0.4996	0.4996		V	0.0000	
7	0.7000	0.6996	0.6995	5 V	V	-0.0001	
7	0.9000	0.8994	0.8993	3 V	V	-0.0001	
7	1.0000	0.9993	0.9991	l V	V	-0.0002	

Flow Data Form

Mfg	Serial Nu	mber Ta	Site	Тес	chnician	Site Visit I	Date Paran	neter	Owner ID	
Арех	illegible		CVL151	Sa	ndy Grenville	04/13/2019	Flow F	Rate	000858	
				Mfg BIOS Serial Number			Parameter Flo			
					Tfer ID	01414	01414			
					Slope	0.	99332 Int	ercept	0.00935	
					Cert Date	2/8	8/2019 <mark>Co</mark>	rrCoff	0.99999	
DAS 1: DAS 2:				L	Cal Factor Z	ero	-0.	04		
_	A Max % Di	A Avg %	bDif A Max	x % Di	Cal Factor F	ull Scale	0.	96		
1.32%	1.32%				Rotometer R	eading:	1	.5		
Desc.	Test type	Input l/n	n Input Corr_	MfcDisp.	OutputSignal	Signal Output S E Inp		OutputSignal	I PctDifference	
primary	pump off	0.000	0.000	0.02	0.000	-0.04	l/m	l/m		
primary	leak check	0.000	0.000	0.01	0.000	-0.10	l/m	l/m		
primary	test pt 1	1.524	1.520	1.55	0.000	1.50	l/m	l/m	-1.32%	
primary	test pt 2	1.524	1.520	1.55	0.000	1.50	l/m	l/m	-1.32%	
primary	test pt 3	1.524	1.520	1.55	0.000	1.50	l/m	l/m	-1.32%	
Sensor Comp	ponent Leak Te	st		Conditio	n		Statu	s pass		
Sensor Comp	ponent Tubing	Condition		Conditio	n Good	Good		s pass		
Sensor Comp	ponent Filter Po	sition		Conditio	n Good		Statu	s pass		
	onent Rotome		on		n Clean and dry		Statu	s pass		
	ponent Moisture				n No moisture p	resent		s pass		
	ponent Filter Di				n 5.0 cm			s pass		
	ponent Filter De				n 0.5 cm			s pass		
	ponent Filter Az			Conditio	n 300 deg		Statu	s pass		
Sensor Comp	onent System	Memo		Conditio	n		Statu	s pass		

Ozone Data Form

Mfg	S	Serial Number	r Ta Site	Т	echnician	Site Visit Date	Parameter	Owner ID	
ThermoElectr	ron Inc	1105347312	CVL15		Sandy Grenville	04/13/2019	Ozone	000737	
Slope: Intercept CorrCoff	0.	98143 Slope 14908 Inter 99990 Corr	cept	D.00000 D.00000 D.00000	Mfg Serial Number Tfer ID	ThermoElectron 1180030022 01114	sc. Ozone primary stan		
DAS 1: A Avg % Dif			AS 2: Avg %Dif A	Max % Di	Slope Cert Date	1.0029 9/7/201		0.10980	
UseDescrip primary primary	7	ConcGroup 1 2	Tfer Raw 0.41 14.89	Tfer Corr 0.29 14.73	0.10 14.46	Site Unit ppb ppb	RelPerDif	AbsDif -0.19 -0.27	
primary primary primary	7	3 4 5	35.24 70.10 111.90	35.02 69.78 111.46	34.65 69.62 108.90	ppb ppb ppb	-1.06 -0.23 -2.32		
	-	t Sample Train		Condi	tion Good		StatuspassStatuspass		
Sensor Component Inlet Filter Condition			ondition	Condi	tion Clean		Status pass		
Sensor Component Battery Backup			up	Condi	tion N/A		Status pass		
Sensor Cor	mponen	t Offset		Condi	tion -0.30		Status pass		
Sensor Cor	mponen	t Span		Condi	tion 1.019		Status pass		
Sensor Cor	mponen	t Zero Voltage	•	Condi	tion N/A		Status pass		
Sensor Cor	mponen	t Fullscale Vol	tage	Condi	tion N/A		Status pass		
Sensor Cor	mponen	t Cell A Freq.		Condi	tion 94.0 kHz		Status pass		
Sensor Cor	mponen	t Cell A Noise		Condi	tion 0.6 ppb		Status pass		
Sensor Cor	mponen	t Cell A Flow		Condi	tion 0.69 lpm		Status pass		
Sensor Cor	mponen	t Cell A Press	ure	Condi	tion 702.3 mmHg		Status pass		
Sensor Cor	mponen	t Cell A Tmp.		Condi	tion 30.5 C		Status pass		
Sensor Cor	Sensor Component Cell B Freq.			Condi	tion 95.1 kHz		Status pass		
Sensor Cor	Sensor Component Cell B Noise C			Condi	tion 0.8 ppb		Status pass		
Sensor Cor	Sensor Component Cell B Flow Cond			Condi	tion 0.00 lpm		Status Fail		
Sensor Cor	mponen	t Cell B Press	ure	Condi	tion 702.3 mmHg		Status pass		
Sensor Cor	mponen	t Cell B Tmp.		Condi	tion N/A		Status pass		
Sensor Cor	mponen	t Line Loss		Condi	tion Not tested		Status pass		
Sensor Cor	mponen	t System Men	10	Condi	tion		Status pass		

Temperature Data Form

Mfg	Serial Number Ta	Site		Technician		Site V	isit Date	Param	eter	Owner ID	
RM Young	4545	CVL151		Sandy	Grenville	04/13	3/2019	Temper	ature	04447	
				Mfg		Extec	h	Pa	arameter Temperature		
				Serial Number		H232734 T		Tf	fer Desc. RTD		
				Tfer ID		01227	7				
DAS 1:	AS 1: DAS 2:			Slope		1.00733 Inte		ercept 0.1449]	
			Max Er	x Er Cert Date			2/12/201	9 Cor	rCoff	1.00000	
0.05	0.08										
UseDesc.	Test type In	putTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Temp	b Low Range	0.37	0.22	2	0.000	0.000		2	С	-0.03	
primary Temp	o Mid Range	24.73	24.4	1	0.000		24.4		С	-0.05	
primary Temp	High Range	48.86	48.3	6	0.000		48.	3	С	-0.08	
Sensor Compone	Sensor Component Shield			ition C	Clean			Status	pass		
Sensor Component Blower			Cond	Condition N/A				Status	pass		
Sensor Component Blower Status Switch			Cond	ition 🛚	N/A	Status		pass			
Sensor Compone	nt System Memo		Cond	Condition				Status	s pass		

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CVL151	Sandy Grenville	04/13/2019	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	lter Temperatur
Abs Avg ErrAb0.11	os Max Er Abs Avg 0.16	Err Abs Max Er	Serial Number	H232734	Tfer Desc. RTE	D
			Tfer ID	01227		
			Slope	1.0073	3 Intercept	0.14497
			Cert Date	2/12/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.43	22.12	0.000	22.0	С	-0.09
primary	Temp Mid Range	22.95	22.64	0.000	22.5	С	-0.16
primary	Temp Mid Range	22.91	22.60	0.000	22.5	С	-0.08
Sensor Component System Memo			Condition			pass	

Infrastructure Data For

Site ID	CVL151	Technician Sandy	Grenville Site Visit Date 04/13/2019
Shelter M	Make	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	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Fair	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Fair	Status	pass
Sensor Component	Shelter Roof	Condition	Poor	Status	Fail
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	Date Component Mfg		Serial No.	Hazard	Problem
Ozone	CVL151	Sandy Grenville		Cell B Flow	ThermoElectron	3879		
This analyzer diagnostic								

Field Systems Comments

1 Parameter: DasComments

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

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

The shelter is somewhat cluttered. The shelter roof is still leaking and the walls are rotten at the seams and corners. The shelter is in poor condition and has deteriorated further since the previous audit visit.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID CVL151		Technician Sandy G	Grenville	e Site Visit Date 04/13/2019				
Site Sponsor (agency)	EPA		US	GS Map		Coker Lake		
Operating Group		- USFS	Ma	p Scale				
AQS #	28-161	-9991	Ma	p Date				
Meteorological Type	Climat	onics						
Air Pollutant Analyze	r Ozone		OA	PP Latitude		34.0028		
Deposition Measurem		t		PP Longitude		-89.7989		
Land Use		nd - evergreen		PP Elevation		134		
Terrain		-		PP Declination		0.2		
		ally		PP Declination		2/22/2006		
Site Telephone	(662) 6	23-7334		dit Latitude			34.002747	
Site Address 1	. ,	Road 809		dit Longitude		-89.799183		
Site Address 2		gbee National Forest		dit Elevation			138	
County	Yalobu			dit Declination		-0.95		
City, State	Tillatok	a, MS			Present			
Zip Code	38961		Fir	e Extinguisher		New in 2015		
Time Zone	Centra	l		st Aid Kit				
Primary Operator			Sat	ety Glasses				
Primary Op. Phone #				ety Hard Hat				
Primary Op. E-mail				, mbing Belt				
Backup Operator				urity Fence				
Backup Op. Phone #				ure Shelter				
Backup Op. E-mail			Sta	ble Entry Step				
Shelter Working Roor	n ☑ Make	Ekto	Model	8810		Shelter Size	640 cuft	
Shelter Clean	✓ Notes	The shelter is somewhat seams and corners. The audit visit.						
Site OK	✓ Notes							
F	orest Service	te 55 take exit 220 east on e sign for the Yalobusha C ty turn left on forest service ntinue approximately 0.3 n	ounty Work e road 802.	Center and Jam Continue approx	nie L. Whit ximately 1	ter Plant Material	s Center. Immediately	

Field Systems Data Form

CVL151

F-02058-1500-S2-rev002

Site ID

Tecl

Technician Sandy Grenville

Site Visit Date 04/13/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		
Major industrial complex	10 to 20 km		
City > 50,000 population	40 km		
City 10,000 to 50,000 population	10 km		
City 1,000 to 10,000 population	5 km		
Major highway, airport or rail yard	2 km		\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		
Tree line	50 m	17 m	
Obstacles to wind	10 times obstacle height		

Siting Distances OK

Siting Criteria Comment

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

Fie	eld Systems Data Form		F-02058-1500-S3-rev002
Site	CVL151 Technician Sandy Grenville		Site Visit Date 04/13/2019
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?		N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A
3	Are the tower and sensors plumb?		N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	✓	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)		
6	Is the solar radiation sensor plumb?	✓	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	✓	N/A
8	Is the rain gauge plumb?		N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?		N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	✓	N/A
11	Is it inclined approximately 30 degrees?	✓	N/A

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

Field Systems Data Form F-02058-1500-S4-rev002 Site ID CVL151 Technician Sandy Grenville Site Visit Date 04/13/2019 ✓ Temperature only 1 Do all the meterological sensors appear to be intact, in good condition, and well maintained? ✓ Temperature only 2 Are all the meteorological sensors operational online, and reporting data? ✓ Are the shields for the temperature and RH sensors clean? 3 \checkmark N/A Are the aspirated motors working? 4 ✓ N/A Is the solar radiation sensor's lens clean and free of 5 scratches? ✓ N/A Is the surface wetness sensor grid clean and undamaged? 6

- 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?

Provide any additional 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-02058-1500-S5-rev002	*
Site	e ID	CVL151	Technician	Sandy Grenville		Site Visit Date 04/13/2019	
	Siting C	criteria: Are the pollut	ant analyzers a	nd deposition eq	<u>uipr</u>	oment sited in accordance with 40 CFR 58, Appendix E	
1		cample inlets have at le	east a 270 degre	e arc of	✓		
2	Are the	sample inlets 3 - 15 mo	eters above the	ground?	✓		_
3		sample inlets > 1 mete meters from trees?	er from any maj	jor obstruction,		17 meters	_
	<u>Pollutar</u>	nt analyzers and depos	ition equipmen	t operations and	ma	<u>aintenance</u>	
1		analyzers and equipme on and well maintained		e in good	✓		
2	Are the reportin	analyzers and monitor ng data?	rs operational, (on-line, and			
3	Describ	e ozone sample tube.				1/4 teflon by 12 meters	_
4	Describ	e dry dep sample tube.				3/8 teflon by 12 meters	
5		ine filters used in the o location)	zone sample lir	ne? (if yes	✓	At inlet only	_
6	Are sam obstruct	ple lines clean, free of tions?	'kinks, moistur	e, and	✓	Moisture in tubing only	
7	Is the ze	ero air supply desiccan	t unsaturated?		✓		
8	Are the	re moisture traps in th	e sample lines?		✓	Flow line only	_
9	Is there clean?	a rotometer in the dry	v deposition filt	er line, and is it		Clean and dry	_

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

Field Systems Data Form						F-02058-1500-S6-rev002			
Site	e ID	CVL151	Technician	Sandy Grenville	!	Site Visit Date	04/13/2019	9	
	<u>DAS, se</u>	ensor translators, and	peripheral equi	pment operatio	ns a	nd maintenance			
1	Do the well ma	DAS instruments appe aintained?	ear to be in good	l condition and	✓				
2		the components of the , backup, etc)	DAS operation	al? (printers,	✓				
3		analyzer and sensor sing protection circuitry		through	✓	Met sensors only			
4		signal connections pro aintained?	otected from the	e weather and	✓				
5	Are the	signal leads connected	l to the correct]	DAS channel?	✓				
6	Are the ground	e DAS, sensor translate ed?	ors, and shelter	properly	✓				
7	Does th	e instrument shelter h	ave a stable pov	ver source?	✓				
8	Is the in	nstrument shelter temp	perature control	lled?	✓				
9	Is the n	net tower stable and gr	ounded?			Stable		Grounded	
10	Is the s	ample tower stable and	l grounded?						
11	Tower	comments?				Met tower removed	Ł		

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

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

Field Sy	stems Data	Foi	m				F-02	2058-	1500-	S7-rev002
Site ID	CVL151		Techni	cian	Sandy Grenville	Site Visit Date	04/13/2019)		
Documen	tation									
Does the s	ite have the requir	ed ins	strument	and	equipment manuals?	•				
		Yes	No	N/	A		Yes	No	N/A	
Wind speed	sensor			✓	Data logg	er		\checkmark		
Wind directi	on sensor			✓	Data logg	er			\checkmark	
Temperatur	e sensor		\checkmark		Strip chai	rt recorder			\checkmark	
Relative hun	nidity sensor			✓	Computer	r		\checkmark		
Solar radiati	on sensor			✓	Modem			\checkmark		
Surface wetr	iess sensor				Printer					
Wind sensor	translator				Zero air p	oump		\checkmark		
Temperatur	e translator				Filter flov			\checkmark		
-	nsor translator				Surge pro					
-	on translator				UPS					
	ket rain gauge					protection device				
Ozone analy					Shelter he	•				
•					~					
-	low controller				Snelter al	r conditioner		V		
Filter pack N	IFC power supply	· [_]		V						
Does the	site have the requ	ired a	nd most	rece	nt QC documents and	<u>l report forms?</u>				
		Pres	ent				Curre	ent		

	I I Coeffe		Curre
Station Log			
SSRF	\checkmark		
Site Ops Manual	\checkmark	June 2007	
HASP	\checkmark	Feb 2014	\checkmark
Field Ops Manual		Feb 2014	
Calibration Reports	\checkmark		
Ozone z/s/p Control Charts			
Preventive maintenance schedu			

1

2

3

4

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

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

Field Systems Data Form

Site	ID CVL151 Technician Sandy Grenville	 Site Visit Date 04/13/2019
1	Site operation procedures Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	Trained by previous operator
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	
3	Is the site visited regularly on the required Tuesday schedule?	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	

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

	Frequency	Compliant
\checkmark	Semiannually	\checkmark
✓	Weekly	\checkmark
		\checkmark
\checkmark	N/A	\checkmark
\checkmark	N/A	\checkmark
\checkmark	N/A	\checkmark
		✓ Semiannually ✓ Weekly ✓ N/A ✓ N/A

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	\checkmark	Semiannually	
Automatic Zero/Span Tests	\checkmark	Daily	\checkmark
Manual Zero/Span Tests			
Automatic Precision Level Tests	\checkmark	Daily	
Manual Precision Level Test			
Analyzer Diagnostics Tests	\checkmark	Weekly	
In-line Filter Replacement (at inlet)	\checkmark	Every 2 weeks	
In-line Filter Replacement (at analyze		N/A	
Sample Line Check for Dirt/Water	\checkmark	Weekly	
Zero Air Desiccant Check	\checkmark	Weekly	\checkmark
1 Do multi-point calibration gases go throu	igh the	complete	

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

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

	Unknown	
✓		
✓	Logbook, call-in	

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

F-02058-1500-S8-rev002

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S9-rev00				
Sit	Site ID CVL151 Tech		Technician	hnician Sandy Grenville		Site Visit Date	04/13/2019			
	<u>Site ope</u>	eration procedures								
1	Is the fi	lter pack being change	d every Tuesd	lay as scheduled		Filter changed morr	nings			
2	Are the correctl	Site Status Report For y?	ms being com	pleted and filed						
3	Are dat schedul	a downloads and backt ed?	ups being perf	formed as		No longer required				
4	Are general observations being made and recorded? How?				✓	SSRF, logbook				
5	Are site fashion	supplies on-hand and ?	replenished ir	n a timely						
6	Are san	nple flow rates recorde	d? How?		✓	SSRF, call-in				
7	Are san fashion'	nples sent to the lab on ?	a regular scho	edule in a timely						
8		ers protected from cont pping? How?	tamination du	ring handling	✓	Clean gloves on and	d off			
9		site conditions reporte ons manager or staff?	d regularly to	the field						
QC	Check P	erformed	Fre	equency			Compliant			
I	Multi-poi	nt MFC Calibrations	✓ Ser	miannually			\checkmark			
I	Flow Syst	em Leak Checks	✓ We	ekly			\checkmark			
Filter Pack Inspection										
Flow Rate Setting Checks Weekly		ekly			\checkmark					
	Visual Ch	eck of Flow Rate Roto	meter 🗹 We	ekly			\checkmark			
Ι	n-line Fil	ter Inspection/Replace	ment 🗹 Ser	niannually			\checkmark			
5	Sample Li	ine Check for Dirt/Wat	ter 🗹 We	ekly			\checkmark			
	de energi	dditional annianation	(mhataananha	walaatah if waaa	~~~~	.)				

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Provide any additional 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

CVL151

F-02058-1500-S10-rev002

Site ID

Techr

Technician Sandy Grenville

Site Visit Date 04/13/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07033
DAS	Campbell	CR3000	2508	000410
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	129800010140	04282
Flow Rate	Арех	AXMC105LPMDPC	illegible	000858
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V42221	0808338333	06462
Ozone	ThermoElectron Inc	49i A1NAA	1105347312	000737
Ozone Standard	ThermoElectron Inc	49i A3NAA	0622717858	000464
Sample Tower	Aluma Tower	A	none	03540
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	4545	04447
Zero air pump	Werther International	C 70/4	000814279	06867

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number		
CH	CHE185-Sandy Grenville-04/15/2019							
1	4/15/2019	DAS	Environmental Sys Corp	120283	8832	A0382		
2	4/15/2019	Elevation	Elevation	None	1	None		
3	4/15/2019	Filter pack flow pump	Thomas	00498	107CAB18	0000110		
4	4/15/2019	Flow Rate	Apex	000641	AXMC105LPMDPCV	116		
5	4/15/2019	Infrastructure	Infrastructure	none	none	none		
6	4/15/2019	Met tower	Universal Tower	03662	unknown	none		
7	4/15/2019	Modem	US Robotics	05624	unknown	unknown		
8	4/15/2019	Modem	Raven	06984	H4222-C	0808685382		
9	4/15/2019	Ozone	Ecotech	87161	EC9810B	10-0064		
10	4/15/2019	Sample Tower	Aluma Tower	000054	В	AT-81213-T12		
11	4/15/2019	Shelter Temperature	unknown	none	none	015		
12	4/15/2019	Shield (10 meter)	RM Young	04620	Aspirated 43408	none		
13	4/15/2019	Siting Criteria	Siting Criteria	None	1	None		
14	4/15/2019	Temperature	RM Young	05047	41342VC	9682		
15	4/15/2019	Zero air pump	Ecotech	none	8301LC	01-0658		

DAS Data Form

DAS Time Max Error: 0.15

Mfg	Serial N	lumber Site	T	echnician	Site Visit Date	Parameter	Use Desc.
Environmental	l Sys A0382	CHE	185	Sandy Grenville	04/15/2019	DAS	Primary
Das Date:	4 /15/2019	Audit Date	4 /15/2019	Mfg	Datel	Parameter	DAS
Das Time:	18:15:00 105	Audit Time	18:15:09 105	Serial Number	15510194	Tfer Desc.	Source generator (D
Das Day:		Audit Day _		Tfer ID	01320]	
Low Channel		High Channel			01020		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	D Intercept	0.00000
0.0020	0.003	0.0020	0.0030	Cert Date	2/13/2012	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	
				wing	Tuke		
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	D Intercept	0.00000
				Cert Date	1/25/201	9 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
6	0.0000	0.0000	-0.0029	V	V	-0.0029	
6	0.1000	0.1000	0.0971	V	V	-0.0029	
6	0.3000	0.2998	0.2968		V	-0.0030	
6	0.5000	0.4997	0.4984		V	-0.0013	
6	0.7000	0.6996	0.6982		V	-0.0014	
6	0.9000	0.8995	0.8981		V	-0.0014	
6	1.0000	0.9993	0.9979	V	V	-0.0014	

Flow Data Form

Mfg	Serial Nu	nber Ta	Site	Тес	chnician	Site Visit I	Date Paran	neter	Owner ID
Арех	116		CHE185	Sa	ndy Grenville	04/15/2019	Flow F	Rate	000641
					Mfg Serial Number	BIOS		Parameter Flo	
					Tfer ID	01414		_	
					Slope	0.	99332 Int	ercept	0.00935
					Cert Date	2/8	3/2019 Co	rrCoff	0.99999
DAS 1:		L	Cal Factor Z	ero		0			
A Avg % Diff:		A Avg %	bDif A Max	x % Di	Cal Factor F	ull Scale	5.0		
2.05%	2.16%				Rotometer R	eading:	1	.5	
Desc.	Test type	Input l/n	n Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignal	I PctDifference
primary	pump off	0.000	0.000	0.00	0.0000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.0000	0.00	l/m	l/m	
primary	test pt 1	1.531	1.530	1.50	0.0000	1.50	l/m	l/m	-2.03%
primary	test pt 2	1.534	1.530	1.50	0.0000	1.50	l/m	l/m	-1.96%
primary	test pt 3	1.530	1.530	1.50	0.0000	1.50	l/m	l/m	-2.16%
Sensor Component Leak Test			Conditio	n		Status	Status pass		
Sensor Component Tubing Co		Condition	ion Con		Good		Status	Status pass	
Sensor Component Filter Pos		sition	on Co		n Good	Good		Status pass	
Sensor Component Rotometer (er Conditio	ion Condit		Clean and dry		Statu	pass	
Sensor Component Moisture Presen		Present	Conditi		No moisture present		Statu	pass	
Sensor Component Filter Distance			Condition 4.0 cm			Status pass			
Sensor Component Filter Depth			Conditio	ndition 0.3 cm		Status pass			
Sensor Component Filter Azimuth			Conditio	n 315 deg	Statu	Status pass			
Sensor Comp	onent System	Memo		Conditio	n		Statu	pass	

Ozone Data Form

Mfg		Serial Numbe	r Ta Site	7	Fechnician	Site Visit Date	Parameter	Owner ID	
Ecotech		10-0064	CHE18	5	Sandy Grenville	04/15/2019	Ozone	87161	
Slope: [Intercept [CorrCoff]	C		rcept	0.00000 0.00000 0.00000	Mfg Serial Number Tfer ID	ThermoElectron 1180030022 01114		er ozone	
DAS 1:		DA	AS 2:		Slope	1.0029	0.10980		
			Max % Di		9/7/201	1.00000			
0.0)%	0.0%			Cert Date	9/1/201	8 CorrCoff	1.00000	
UseDescri	ption	ConcGroup	Tfer Raw	Tfer Corr		Site Unit	RelPerDif	AbsDif	
primar	y	1	0.58	0.46	0.27	ppb		-0.19	
primar	•	2	14.98	14.82	15.00	ppb		0.18	
primar	•	3	36.21	35.99	35.95	ppb	-0.11		
primar	•	4	69.81	69.49	69.03	ppb	-0.66		
primar		5	112.20	111.76	110.70	ppb	-0.95		
Sensor Co	omponer	nt Sample Trai	n	Cond	ition Good		Status pass		
Sensor Co	omponei	nt 22.5 degree	rule	Cond	ition		Status pass		
Sensor Co	Sensor Component Inle		Inlet Filter Condition Con		ition Clean		Status pass	s pass	
Sensor Component		nt Battery Back	kup	Cond	ition Functioning		Status pass	Status pass	
Sensor Co	Sensor Component			Cond	ition 0.2676		Status pass		
Sensor Co	Sensor Component			Cond	ition 0.947		Status pass		
Sensor Co	Sensor Component		9	Cond	ition N/A		Status pass		
Sensor Co	omponei	nt Fullscale Vo	Itage	Cond	ition N/A		Status pass		
Sensor Co	Sensor Component			Cond	ition N/A		Status pass		
Sensor Co	omponei	t Cell A Noise	,	Cond	tion 1.0 ppb		Status pass		
Sensor Co	omponei	t Cell A Flow		Cond	ition 0.49 lpm		Status pass		
Sensor Co	Sensor Component		Cell A Pressure		ion 705.5 mmHg		Status pass		
Sensor Co	Sensor Component Cell A Tmp.			Cond	ition 34.1 C		Status pass	s pass	
Sensor Co	Sensor Component Cell B Freq.			Cond	ition N/A		Status pass	pass	
Sensor Co	Sensor Component Cell B Noise		,	Cond	ition N/A		Status pass		
Sensor Co	omponei	t Cell B Flow		Cond	ition N/A		Status pass		
Sensor Co	Sensor Component Cell B Pressure		sure	Cond	ition N/A		Status pass		
Sensor Component Cell B Tmp.			Cond	ition N/A	Status pass				
Sensor Component Line Loss		Cond	tion Not tested		Status pass				
Sensor Co	Sensor Component		System Memo (ition		Status pass		

Temperature Data Form

Mfg	Serial Number T	'a Site	1	Techni	Technician		isit Date	Param	eter	Owner ID	
RM Young	9682	CHE185		Sandy Grenville		04/15	5/2019	Temper	rature	05047	
			Mfg		Extec	h	Pa	arameter Temperature			
				Serial Number		H232734 Tf		fer Desc. RTD			
				Tfer ID		01227	7				
DAS 1: DAS 2:				Slo	pe		1.0073	3 Inte	ercept 0.1449		97
Abs Avg Err Abs Max Er Abs Avg Err			Abs Max Er		Cert Date		2/12/2019 Corr		rrCoff 1.00000		00
0.39	0.57										
UseDesc.	Test type	InputTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Tem	p Low Range	0.30	0.15	5	0.0000		0.2	2	С	0.08	
primary Tem	p Mid Range	25.49	25.1	6	0.0000		24.	6	С	-0.57	
primary Tem	p High Range	48.22	47.7	3	0.0000		47.	2	С	-0.51	
Sensor Compone	ent Shield		Cond	ition C	Clean			Status	pass		
Sensor Component Blower			Cond	Condition Functioning				Status	pass		
Sensor Component Blower Status Switch			Cond	Condition N/A				Status	pass		
Sensor Component System Memo				Condition				Status	pass		

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
unknown	015	CHE185	Sandy Grenville	04/15/2019	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	lter Temperatur
Abs Avg Err Al 0.26	Abs Avg Err Abs Max Er Abs Avg Err Abs Max Er 0.26 0.33 Image: Comparison of the second s		Serial Number	H232734	Tfer Desc. RTE)
			Tfer ID	01227		
			Slope	1.0073	3 Intercept	0.14497
			Cert Date	2/12/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.03	23.71	0.000	24.0	С	0.33
primary	Temp Mid Range	24.88	24.56	0.000	24.4	С	-0.17
primary	Temp Mid Range	25.11	24.78	0.000	25.1	С	0.27
Sensor Component System Memo			Condition		Status	pass	

Infrastructure Data For

Site ID	CHE185	Technician	Sandy Grenville	Site Visit Date 04/15/2019
Shelter	Make	Shelter Model	Shelt	lter Size
Shelter (One	8128	768 0	cuft

Sensor Component	Sample Tower Type	Condition	Туре В	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	Fair	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	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	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: SiteOpsProcComm

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

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

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

F-02058-1500-S1-rev002

Site ID CHE185	Technician Sandy Grenville	e Site Visit Date 04/1	5/2019		
			• •• •• •• •		
Site Sponsor (agency)	EPA	USGS Map	Stilwell West		
Operating Group	Cherokee Nation OES	Map Scale			
AQS #		Map Date			
Meteorological Type	R.M. Young				
Air Pollutant Analyzer	Ozone, NOy, ammonia	QAPP Latitude	35.7507		
Deposition Measurement	dry, Hg, passive ammonia	QAPP Longitude	-94.6700		
Land Use	agriculture, pasture	QAPP Elevation Meters	299		
Terrain	rolling	QAPP Declination	3.25		
Conforms to MLM	Marginally	QAPP Declination Date	9/16/2005		
Site Telephone	(918) 696-5604	Audit Latitude	35.750786		
Site Address 1	Cherry Tree	Audit Longitude	-94.669789		
Site Address 2	Dahlonegah School	Audit Elevation	305		
County	Adair	Audit Declination	2		
City, State	Stilwell, OK	Present			
Zip Code	74960	Fire Extinguisher 🗹	New in 2015		
Time Zone	Central	First Aid Kit			
Primary Operator		Safety Glasses			
Primary Op. Phone #		Safety Hard Hat 🗹			
Primary Op. E-mail		Climbing Belt			
Backup Operator		Security Fence			
Backup Op. Phone #		Secure Shelter			
Backup Op. E-mail		Stable Entry Step 🔽			
Shelter Working Room ✓	Make Shelter One M	odel 8128	Shelter Size 768 cuft		
Shelter Clean	Notes The shelter is in very good cor	ndition, clean, neat, and well org	ganized.		
Site OK	Notes				
miles	interstate 40 take exit 311 and go north o south of Stilwell turn left (west) on an unr negah school. Continue to the end of the	narked road. There is a sign fo	r Cherry Tree Baptist Church and		

CHE185

F-02058-1500-S2-rev002

Site ID

Technician Sandy Grenville

Site Visit Date 04/15/2019

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		
City 1,000 to 10,000 population	5 km		
Major highway, airport or rail yard	2 km		
Secondary road, heavily traveled	500 m		
Secondary road, lightly traveled	200 m		
Feedlot operations	500 m		
Intensive agricultural ops (including aerial spraying)	500 m		\checkmark
Limited agricultural operations	200 m		\checkmark
Large parking lot	200 m		
Small parking lot	100 m		
Tree line	50 m		
Obstacles to wind	10 times obstacle height		

Siting Distances OK

Siting Criteria Comment

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

Field Systems Data Form							F-02058	8-1500-S3-rev002
Site	e ID	CHE185	Technician	Sandy Grenville		Site Visit Date	04/15/2019	
1	1 Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?			as to avoid				
2	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 t	tower and sensors plur	mb?					
4		temperature shields po diated heat sources su						
5	condition surface a	perature and RH sense ns? (i.e. ground below and not steeply sloped water should be avoid	sensors should . Ridges, hollov	be natural				
6	Is the sol	lar radiation sensor pl	umb?					
7	Is it sited light?	d to avoid shading, or a	any artificial o	r reflected				
8	Is the rai	in gauge plumb?						
9	Is it sited towers, e	d to avoid sheltering ef etc?	ffects from buil	dings, trees,	☑ 4	5 degree rule viol	ation	
10	Is the sur facing no	rface wetness sensor s orth?	ited with the g	id surface				
11	Is it incl	lined approximately 3	0 degrees?					

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

Field Systems Data Form F-02058-1500-S4-rev002 Site Visit Date 04/15/2019 CHE185 Technician Sandy Grenville Do all the meterological sensors appear to be intact, in go

	condition, and well maintained?		
2	Are all the meteorological sensors operational online, and reporting data?		Те
3	Are the shields for the temperature and RH sensors clean?		
4	Are the aspirated motors working?		
5	Is the solar radiation sensor's lens clean and free of scratches?	✓	N/A
6	Is the surface wetness sensor grid clean and undamaged?	\checkmark	N//

7 Are the sensor signal and power cables intact, in good condition, and well maintained?

Site ID

1

Are the sensor signal and power cable connections protec 8 from the elements and well maintained?

od	✓	Temperature only
l	✓	Temperature only
?	✓	
	✓	
	✓	N/A
	✓	N/A
	✓	N/A
ted	✓	

Provide any additional 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	ield Systems Data Form					F-02058-1500-S5-rev002
Site	e ID	CHE185	Technician	Sandy Grenville		Site Visit Date 04/15/2019
	Siting C	criteria: Are the pollut	ant analyzers a	nd deposition eq	<u>uipn</u>	oment 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	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?					
	<u>Pollutar</u>	nt analyzers and depos	sition equipmen	t operations and	mai	aintenance
1		analyzers and equipmon and well maintained		e in good	✓	
2	Are the reportin	analyzers and monito ng data?	rs operational, o	on-line, and	✓	
3	Describe	e ozone sample tube.				1/4 teflon by 15 meters
4	Describe	e dry dep sample tube				3/8 teflon by 10 meters
5		ine filters used in the o location)	ozone sample lir	ne? (if yes		At inlet and analyzer
6	Are sam obstruct	ple lines clean, free of tions?	f kinks, moistur	e, and	✓	
7	Is the ze	ero air supply desiccar	nt unsaturated?		✓	
8	Are the	re moisture traps in th	e sample lines?			
9	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 Systems Data Form		F-0 2	2058-15	00-S6-rev002	
Site	e ID CHE185 Technician Sandy Grenville)	Site Visit Date	04/15/2019	9	
	DAS, sensor translators, and peripheral equipment operation	ons a	<u>nd maintenance</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	Are the signal connections protected from the weather and well maintained?	✓				
5	Are the signal leads connected to the correct DAS channel?	✓				
6	Are the DAS, sensor translators, and shelter properly grounded?	✓				
7	Does the instrument shelter have a stable power source?	✓				
8	Is the instrument shelter temperature controlled?	✓				
9	Is the met tower stable and grounded?		Stable		Grounded	
10	Is the sample tower stable and grounded?					
11	Tower comments?					

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

Field Systems Data	F-02	058-	1500-S7-rev002				
Site ID CHE185		Techn	ician Sano	dy Grenville Site Visit Date 0	4/15/2019		
Documentation							
Does the site have the requi	ired ins	strumen	<u>t and equi</u>	<u>pment manuals?</u>			
Wind speed sensor Wind direction sensor Temperature sensor Relative humidity sensor Solar radiation sensor Surface wetness sensor Wind sensor translator Temperature translator Humidity sensor translator Solar radiation translator Tipping bucket rain gauge Ozone analyzer Filter pack flow controller	Yes		N/A V V V V V V V V V V V V V V V V V V V	Data logger Data logger Strip chart recorder Computer Modem Printer Zero air pump Filter flow pump Surge protector UPS Lightning protection device Shelter heater Shelter air conditioner	Yes ✓		N/A □ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
Filter pack MFC power supply	•			C documents and report forms?			
Does the site have the req	uired a Pres		t recent Q	<u>C documents and report forms?</u>	Curren	nt	
Station Log SSRF Site Ops Manual HASP Field Ops Manual Calibration Reports Ozone z/s/p Control Charts Preventive maintenance sched	9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		ct 2011 ov 2011		y y y 		

- **1** Is the station log properly completed during every site visit? ✓
- 2 Are the Site Status Report Forms being completed and current?
- 3 Are the chain-of-custody forms properly used to document sample transfer to and from lab?
- 4 Are ozone z/s/p control charts properly completed and current?

Control charts not used

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

 \checkmark

Site	CHE185 Technician Sandy Grenville	Site Visit Date 04/15/2019	
1	Site operation procedures Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?		
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?		
3	Is the site visited regularly on the required Tuesday schedule?		
4	Are the standard CASTNET operational procedures being flollowed by the site operator?		
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)		

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

QC Check P	erformed
------------	----------

Frequency

Multipoint Calibrations	\checkmark	Semiannually	\checkmark
Visual Inspections	\checkmark	Weekly	\checkmark
Translator Zero/Span Tests (climatronics)		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?

OC	Check	Perf	formed
VΥ	Chicch	1	ormeu

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 ✓ ✓ Quarterly \checkmark \checkmark Daily ✓ ✓ Every 2 weeks ✓ \checkmark \checkmark Every 2 weeks ✓ ✓ Weekly ✓ ✓ Monthly \checkmark \checkmark Monthly \checkmark \checkmark Weekly ✓ ✓ 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?

SSRF, Cherokee Nation CNEP data system

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

✓

✓

Compliant

Compliant

F-02058-1500-S8-rev002

Field Systems Data Form							F-02058-1500-S9-rev00				
Site	e ID	CHE185	Technic	an	Sandy Grenville		Site Visit Date	04/15/2019			
	Site ope	ration procedures									
1	Is the fil	ter pack being changed o	esda	ay as scheduled?		Filter changed mor	inings				
2 Are the Site Status Report Forms being completed and filed correctly?											
3	Are data schedule	a downloads and backup ed?	s being p	erf	ormed as		No longer required				
4	Are gen	eral observations being n	nade and	re	corded? How?	✓	SSRF, logbook				
5	Are site fashion?	supplies on-hand and re	plenished	l in	a timely	✓					
6	Are sam	ple flow rates recorded?	How?			✓	SSRF, call-in				
7	Are sam fashion?	ples sent to the lab on a p	regular s	che	dule in a timely						
8		ers protected from contar oping? How?	mination	du	ring handling		Clean gloves on ar	nd off			
9		site conditions reported a ons manager or staff?	regularly	to	the field						
QC	Check Po	erformed	I	re	quency			Compliant			
N	/Iulti-poir	nt MFC Calibrations	✓ :	Sem	niannually						
F	Flow System Leak Checks										
F	Filter Pack Inspection										
F	Flow Rate Setting Checks										
V	Visual Check of Flow Rate Rotometer Weekly							\checkmark			
I	n-line Fil	ter Inspection/Replaceme	ent 🗹 🛛	∖s r	leeded			\checkmark			
S	ample Li	ne Check for Dirt/Water	· 🗸 🗸	Vee	ekly			\checkmark			
Prov	ide anv a	dditional explanation (p)	hotogran	h o	r sketch if neces	sarv) regarding condit	ions listed ab	ove. or a	ny 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 is well maintained and operated. Very good sample change out procedures are being used by the site operator.

CHE185

F-02058-1500-S10-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 04/15/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Environmental Sys Corp	8832	A0382	120283
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	0000110	00498
Flow Rate	Apex	AXMC105LPMDPC	116	000641
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	03662
Modem	Raven	H4222-C	0808685382	06984
Modem	US Robotics	unknown	unknown	05624
Ozone	Ecotech	EC9810B	10-0064	87161
Sample Tower	Aluma Tower	В	AT-81213-T12	000054
Shelter Temperature	unknown	none	015	none
Shield (10 meter)	RM Young	Aspirated 43408	none	04620
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	9682	05047
Zero air pump	Ecotech	8301LC	01-0658	none

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number						
CAI	CAD150-Sandy Grenville-04/16/2019											
1	4/16/2019	Computer	Dell	07029	Inspiron 15	Unknown						
2	4/16/2019	DAS	Campbell	000421	CR3000	2530						
3	4/16/2019	Elevation	Elevation	None	1	None						
4	4/16/2019	Filter pack flow pump	Thomas	00462	107CA110	09883403-01-4						
5	4/16/2019	Flow Rate	Арех	000597	AXMC105LPMDPCV	illegible						
6	4/16/2019	Infrastructure	Infrastructure	none	none	none						
7	4/16/2019	Modem	Digi	07195	LRS4	unknown						
8	4/16/2019	Ozone	ThermoElectron Inc	000624	49i A1NAA	1009241792						
9	4/16/2019	Ozone Standard	ThermoElectron Inc	000495	49i A3NAA	0622717849						
10	4/16/2019	Sample Tower	Aluma Tower	03538	A	none						
11	4/16/2019	Shelter Temperature	Campbell	none	107-L	none						
12	4/16/2019	Siting Criteria	Siting Criteria	None	1	None						
13	4/16/2019	Temperature	RM Young	04682	41342VC	9699						
14	4/16/2019	Zero air pump	Werther International	06914	C 70/4	000829156						

DAS Data Form

DAS Time Max Error:

0

Mfg	Serial N	umber Site	Т	echnician	Site Visit Date	Parameter	Use Desc.
Campbell	2530	CAD	9150	Sandy Grenville	04/16/2019	DAS	Primary
Das Date:	4 /16/2019 10:03:42	Audit Date	4 /16/2019 10:03:42	Mfg	Datel	Parameter	DAS
Das Day:	10.03.42	Audit Day	10.00.42	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Channe		High Channel		Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.000	0.000	1 0.0000	0.0001	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/25/201	9 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	V	V	0.0000	
7	0.1000	0.0999	0.0999	V	V	0.0000	
7	0.3000	0.2998	0.2997	V	V	-0.0001	
7	0.5000	0.4996	0.4996	V	V	0.0000	
7	0.7000	0.6995	0.6995	V	V	0.0000	
7	0.9000	0.8994	0.8994		V	0.0000	
7	1.0000	0.9993	0.9992	V	V	-0.0001	

Flow Data Form

Mfg	Serial Nur	nber Ta	Site	Тес	chnician	Site Visit I	Date Paran	neter	Owner ID
Apex	illegible		CAD150	Sa	indy Grenville	04/16/2019	9 Flow F	Rate	000597
					Mfg Serial Number Tfer ID	BIOS 01414	1	Parameter Flo	
					Slope	0.	99332 Int	ercept	0.00935
					Cert Date	2/	8/2019 Co	rrCoff	0.99999
DAS 1: A Avg % Diff: 1.32%	A Max % Di 1.32%	DAS 2: A Avg %	6Dif A Max	« % Di	Cal Factor Z Cal Factor F Rotometer R	ull Scale	-0.0 0.9		
Desc.	Test type	Input l/n	n Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignal	I PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	-0.01	l/m	l/m	
primary	test pt 1	1.518	1.520	1.54	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 2	1.517	1.520	1.54	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 3	1.519	1.520	1.54	0.000	1.50	l/m	l/m	-1.32%
Sensor Comp	onent Leak Te	st		Conditio	n		Statu	s pass	
Sensor Comp	onent Tubing C	Condition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Filter Po	sition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Rotomet	er Conditio	on	Conditio	Clean and dry		Statu	s pass	
Sensor Comp	onent Moisture	Present		Conditio	No moisture p	resent	Statu	s pass	
Sensor Comp	onent Filter Dis	stance		Conditio	n 4.0 cm		Statu	s pass	
Sensor Comp	onent Filter De	pth		Conditio	n 1.5 cm		Statu	s pass	
Sensor Comp	onent Filter Az	imuth		Conditio	270 deg		Statu	s pass	
Sensor Comp	onent System	Memo		Conditio	n		Statu	s pass	

Ozone Data Form

Mfg		Serial Numbe	r Ta Site	ן	Fechnician	Site Visit Date	Parameter	Owner ID
ThermoElec	ctron Inc	1009241792	CAD15	D	Sandy Grenville	04/16/2019	Ozone	000624
Slope: Intercept CorrCoff	-1		rcept	0.00000 0.00000 0.00000	Mfg Serial Number Tfer ID	ThermoElectron 1180030022 01114		er ozone c. Ozone primary stan
DAS 1:		DA	AS 2:		Slope	1.0029	0 Intercept	0.10980
A Avg % D			Avg %Dif A	Max % Di	Cert Date	9/7/201		1.00000
0.0	0%	0.0%			Cert Date	0/11201		1.00000
UseDescri	-	ConcGroup	Tfer Raw	Tfer Corr		Site Unit	RelPerDif	AbsDif
prima	-	1	0.48	0.36	-1.78	ppb		-2.14
prima	-	2	14.80	14.64	12.98	ppb		-1.66
prima	•	3	35.77	35.55	34.93	ppb	-1.76	
prima		4	69.50	69.18	66.90	ppb	-3.35	
prima	ry	5	113.56	113.12	110.20	ppb	-2.62	
Sensor C	omponei	nt Sample Trai	n	Condi	tion Good		Status pass	
Sensor C	omponer	nt 22.5 degree	rule	Condi	tion		Status pass	
Sensor C	omponei	nt Inlet Filter C	ondition	Condi	tion Dirty		Status Fail	
Sensor C	omponer	nt Battery Back	kup	Condi	tion N/A		Status pass	
Sensor Co	omponei	nt Offset		Condi	tion 0.20	n 0.20		
Sensor C	omponei	nt Span		Condi	tion 1.037	n 1.037		
Sensor C	omponei	nt Zero Voltage	9	Condi	tion N/A		Status pass	
Sensor C	omponei	nt Fullscale Vo	Itage	Condi	tion N/A		Status pass	
Sensor C	omponei	nt Cell A Freq.		Condi	tion 115.7 kHz		Status pass	
Sensor C	omponer	nt Cell A Noise	9	Condi	tion 0.9 ppb		Status pass	
Sensor C	omponei	t Cell A Flow		Condi	tion 0.69 lpm		Status pass	
Sensor C	omponei	nt Cell A Press	sure	Condi	tion 727.9 mmHg		Status pass	
Sensor C	omponer	nt Cell A Tmp.		Condi	tion 33.6 C		Status pass	
Sensor C	omponer	nt Cell B Freq.		Condi	tion 98.1 kHz		Status pass	
Sensor C	omponer	nt Cell B Noise	•	Condi	tion 0.8 ppb		Status pass	
Sensor C	omponer	t Cell B Flow		Condi	tion 0.71 lpm		Status pass	
Sensor C	omponei	nt Cell B Press	sure	Condi	tion 728.5 mmHg		Status pass	
Sensor C	omponei	nt Cell B Tmp.		Condi	tion N/A		Status pass	
Sensor C	omponer	nt Line Loss		Condi	tion Not tested		Status pass	
Sensor C	omponei	nt System Mer	no	Condi	tion		Status pass	

Temperature Data Form

Mfg	Serial Number 7	Fa Site	1	Technician S		Site V	isit Date/	Param	eter	Owner ID
RM Young	9699	CAD150		Sandy	Grenville	04/16	6/2019	Temper	rature	04682
				Mfg		Extec	Extech Pa		arameter Te	emperature
				Ser	ial Number	H232	H232734 Tf		fer Desc. R	٢D
				Tfer ID		01227	7			
DAS 1: DAS 2:				Slo	ре		1.00733 Intercept			0.14497
			Max Er	Cert Date		2/12/2019 Corr		rCoff	1.00000	
0.08	0.16									
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal OutputSigna		gnalEng	OSE Unit	Difference
primary	Temp Low Range	0.36	0.21		0.000		0.3	3	С	0.05
primary '	Temp Mid Range	25.64	25.31		0.000		25.3		С	-0.03
primary 7	Temp High Range	47.65	47.16		0.000		47.	0	С	-0.16
Sensor Comj	ponent Shield		Condi	tion C	Clean			Status	pass	
Sensor Comj	ponent Blower	Condi	tion N	I/A			Status	pass		
Sensor Comj	ponent Blower Status	Condi	tion N	I/A			Status	pass		
Sensor Comj	ponent System Memo		Condi	Condition				Status	pass	

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CAD150	Sandy Grenville	04/16/2019	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	Iter Temperatur
Abs Avg Err Ab			Serial Number	H232734	Tfer Desc. RTD)
			Tfer ID	01227		
			Slope	1.0073	3 Intercept	0.14497
			Cert Date	2/12/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.30	23.98	0.000	24.3	С	0.31
primary	Temp Mid Range	24.71	24.39	0.000	24.7	С	0.31
primary	Temp Mid Range	25.50	25.17	0.000	25.4	С	0.2
Sensor Con	nponent System Memo)	Condition	Status pass			

Infrastructure Data For

Site II	CAD150	Technician Sandy	Grenville Site Visit Date 04/16/2019
Sh	elter Make	Shelter Model	Shelter Size
Ekt	to	8810	640 cuft

Sensor Component	Sample Tower Type	Condition	Туре В	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Fair	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Fair	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.	Hazaro	Problem
Ozone Ozone inlet filter dirty	CAD150	Sandy Grenville	04/16/2019	Inlet Filter Condit	ThermoElectron	3512		

Field Systems Comments

1 Parameter: SiteOpsProcedures

The ozone analyzer sample train filter is replaced and the system is leak tested monthly.

2 Parameter: ShelterCleanNotes

Some shelter floor tiles are cracked and there is indication of insect damage below the heater.

F-02058-1500-S1-rev002

Site ID	CAD150			Technician	Sandy Gre	enville	Site Visit Date 04/1		6/2019		
		г					Nacan				
Site Sponsor	(agency)		EPA				USGS Map		Caddo Valley		
Operating Gr	oup		Ouachita	Baptist Univers	sity		Map Scale				
AQS #		[Map Date					
Meteorological Type			Climatror	nics							
Air Pollutant Analyzer		r [Ozone			QAPP Latitude		34.1792			
Deposition M	easureme	ent	dry, wet			QAPP Longitude		-93.0989			
Land Use		[woodland - mixed			QAPP Elevation M	Meters	71			
Terrain			gently rolling			QAPP Declination	ı	2.3			
Conforms to MLM			Marginally			QAPP Declination	n Date	12/28/2004			
Site Telephone			(870) 246-0030			Audit Latitude		34.179278			
Site Address 1			DeGray F	Regulating Dam	l		Audit Longitude				-93.098755
Site Address 2			Route 39	0			Audit Elevation				78
County			Clark				Audit Declination		1.3		
City, State			Arkadelp	hia, AR			F	Present			
Zip Code			71923			Fire Extinguisher		New in 2015			
Time Zone			Central			First Aid Kit					
Primary Ope	rator	[Safety Glasses				
Primary Op.	Phone #	[Safety Hard Hat				
Primary Op.	E-mail	[Climbing Belt				
Backup Oper	ator	[Security Fence				
Backup Op.	Phone #	[Secure Shelter				
Backup Op.	E-mail	[Stable Entry Step	✓			
Shelter Work	ing Roon		Make	Ekto		M	odel 8810		Shelter Size	640 cuft	
Shelter Clean	l		Notes Some shelter floor tiles are c				cked and there is ind	ication of	insect damage be	elow the hea	ater.
Site OK			Notes								
Driving Direc	Driving Directions From Interstate 30 in Arkadelphia take exit 78 and turn west on route 7. Go south on Lower Dam Pike, route 390, immediately west of the interstate. This road runs parallel to the interstate for approximately 1/2 mile and then turns west. Continue for approximately 1 mile, the site will be on the left just before the dam.										

CAD150

F-02058-1500-S2-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 04/16/2019

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		
City 10,000 to 50,000 population	10 km		
City 1,000 to 10,000 population	5 km		
Major highway, airport or rail yard	2 km		
Secondary road, heavily traveled	500 m		
Secondary road, lightly traveled	200 m		
Feedlot operations	500 m		
Intensive agricultural ops (including aerial spraying)	500 m		
Limited agricultural operations	200 m		
Large parking lot	200 m		
Small parking lot	100 m		
Tree line	50 m	30m	
Obstacles to wind	10 times obstacle height		

Siting Distances OK

Siting Criteria Comment

Fi	eld Systems Data Form	F-02058-1500-S3-rev002					
Site	CAD150 Technician Sandy Grenville		Site Visit Date 04/16/2019				
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	ovide any additional explanation (photograph or sketch if nece	ssar	y) 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:

Field Systems Data Form F-02058-1500-S4-rev002 Site Visit Date 04/16/2019 Site ID CAD150 Technician Sandy Grenville ✓ Temperature only Do all the meterological sensors appear to be intact, in good condition, and well maintained? ✓ Temperature only Are all the meteorological sensors operational online, and reporting data?

1

2

3	Are the shields for the temperature and RH sensors clean?	✓	
4	Are the aspirated motors working?		N/A
5	Is the solar radiation sensor's lens clean and free of scratches?		N/A
6	Is the surface wetness sensor grid clean and undamaged?	✓	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?		N/A
8	Are the sensor signal and power cable connections protected from the elements and well maintained?		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:

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev002
Site	e ID	CAD150	Technician	Sandy Grenville		Site Visit Date 04/16/2019
	Siting C	Criteria: Are the pollut	ant analyzers a	nd deposition eq	<u>uipn</u>	ment sited in accordance with 40 CFR 58, Appendix E
1		sample inlets have at le icted airflow?	east a 270 degre	e arc of		
2	Are the	sample inlets 3 - 15 m	eters above the	ground?	✓	
3		sample inlets > 1 meters from trees?	er from any maj	or obstruction,		
	<u>Polluta</u>	nt analyzers and depos	sition equipmen	t operations and	mai	<u>intenance</u>
1	Do the analyzers and equipment appear to be in good condition and well maintained?					
2	Are the analyzers and monitors operational, on-line, and reporting data?					
3	Describ	e ozone sample tube.				1/4 teflon by 12 meters
4	Describ	e dry dep sample tube	•			3/8 teflon by 12 meters
5		ine filters used in the o e location)	ozone sample lin	e? (if yes		At inlet only
6	Are san obstruc	nple lines clean, free of tions?	f kinks, moistur	e, 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	er line, and is it		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-02058-1500-S6-rev002					
Site	e ID	CAD150	Technician	Sandy Grenville	!	Site Visit Date	04/16/2019				
	DAS, se	nsor translators, and	peripheral equi	pment operatio	ns ai	nd maintenance					
1		DAS instruments appe intained?	ar to be in good	l condition and							
2		he components of the backup, etc)	DAS operation	al? (printers,	✓						
3		nalyzer and sensor sig g protection circuitry		through		Met sensors only					
4		signal connections pro intained?	otected from the	e weather and							
5	Are the signal leads connected to the correct DAS channel?				✓						
6	Are the grounde	DAS, sensor translato ed?	ors, and shelter	properly		Shelter not grounde	d				
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?				G	Frounded			
10	Is the sa	mple tower stable and	l grounded?								
11	Tower c	comments?				Sample tower is sta	ble but not gr	ounded. M	et tower removed		

Provide any additional 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 S	ystems Data	Fo	rm				F-02	2058-	-1500-S7-rev00
Site ID	CAD150		Tech	nician	Sandy Grenville	Site Visit Date 0	4/16/2019	9	
Docume	ntation								
Does the	site have the requir	ed in	strum	ent and	l equipment manuals?	-			
		Yes	No	N/ .	/A		Yes	No	N/A
Wind speed	sensor			✓	Data logg	er		\checkmark	
Wind direct	tion sensor			\checkmark	Data logg	er			
Temperatu	re sensor		✓		Strip char	rt recorder			\checkmark
Relative hu	midity sensor			\checkmark	Computer	t	\checkmark		
Solar radia	tion sensor				Modem			✓	
Surface wet	mess sensor				Printer				
Wind senso	r translator				Zero air p	oump	\checkmark		
Temperatu	re translator			\checkmark	Filter flow	v pump		\checkmark	
Humidity se	ensor translator			\checkmark	Surge pro	tector			
Solar radia	tion translator			\checkmark	UPS				
Tipping bu	cket rain gauge				Lightning	protection device			
Ozone anal	yzer	\checkmark			Shelter he	eater		\checkmark	
Filter pack	flow controller	\checkmark			Shelter ai	r conditioner			
Filter pack	MFC power supply			\checkmark					
Does th	<u>e site have the requi</u>	ired a	nd mo	ost rece	ent QC documents and	<u>l report forms?</u>			
		Pres	ent				Curre	ent	
Station Log		-	✓				\checkmark		
SSRF		ŀ	✓	L					
Site Ops Ma	anual	[
HASP		[✓	2016			\checkmark		

2

Field Ops Manual Calibration Reports Ozone z/s/p Control Charts

Preventive maintenance schedul

1 Is the station log properly completed during every site visit?

✓

✓

Oct 2014

- 2 Are the Site Status Report Forms being completed and current?
- 3 Are the chain-of-custody forms properly used to document sample transfer to and from lab?
- 4 Are ozone z/s/p control charts properly completed and current?

Control charts not used

✓

✓

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

✓

Site	ID CAD150 Technician Sandy Grenville	le Site Visit Date 04/16/2019
1	Site operation procedures Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	ıg 🗆
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	
3	Is the site visited regularly on the required Tuesday schedule?	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	m 🗹

Are regular operational QA/QC checks performed on meteorological 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		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		Frequency	Compliant
Multi-point Calibrations	\checkmark	Semiannually	
Automatic Zero/Span Tests	\checkmark	Daily	\checkmark
Manual Zero/Span Tests			\checkmark
Automatic Precision Level Tests	\checkmark	Daily	
Manual Precision Level Test			
Analyzer Diagnostics Tests	\checkmark	Weekly	
In-line Filter Replacement (at inlet)	\checkmark	Monthly	\checkmark
In-line Filter Replacement (at analyze		N/A	\checkmark
Sample Line Check for Dirt/Water	\checkmark	Weekly	\checkmark
Zero Air Desiccant Check	\checkmark	Weekly	\checkmark
1 Do multi-point calibration gases go the	ough the		

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

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

	OTIKIOWI
\checkmark	
\checkmark	Call-in only

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

The ozone analyzer sample train filter is replaced and the system is leak tested monthly.

F-02058-1500-S8-rev002

						500-S9-rev002	
Site ID CAD150	Technician	Sandy Grenville	!	Site Visit Date	04/16/2019		
Site operation procedures							
1 Is the filter pack being changed	every Tuesda	y as scheduled?	∕	Filter changed mori	nings		
2 Are the Site Status Report Form correctly?	ns being comp	oleted and filed					
3 Are data downloads and backup scheduled?	ps being perfo	ormed as		No longer required			
Are general observations being made and recorded? How?			✓	SSRF			
5 Are site supplies on-hand and replenished in a timely fashion?							
6 Are sample flow rates recorded	Are sample flow rates recorded? How?			SSRF, logbook, call-in			
7 Are samples sent to the lab on a fashion?	ı regular sche	dule in a timely					
8 Are filters protected from conta and shipping? How?	mination dur	ing handling	✓	Clean gloves on and	d off		
9 Are the site conditions reported operations manager or staff?	l regularly to t	the field					
QC Check Performed	Freq	luency			Compliant		
Multi-point MFC Calibrations	✓ Sem	iannually					
Flow System Leak Checks	✓ Wee	kly					
Filter Pack Inspection							
Flow Rate Setting Checks	Flow Rate Setting Checks Weekly						
Visual Check of Flow Rate Rotometer Veekly							
In-line Filter Inspection/Replacen	nent 🗹 Sem	iannually			\checkmark		
Sample Line Check for Dirt/Wate	er 🗹 Wee	kly					

_

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

CAD150

F-02058-1500-S10-rev002

Techr

Technician Sandy Grenville

Site Visit Date 04/16/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07029
DAS	Campbell	CR3000	2530	000421
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	09883403-01-4	00462
Flow Rate	Арех	AXMC105LPMDPC	illegible	000597
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LRS4	unknown	07195
Ozone	ThermoElectron Inc	49i A1NAA	1009241792	000624
Ozone Standard	ThermoElectron Inc	49i A3NAA	0622717849	000495
Sample Tower	Aluma Tower	A	none	03538
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	9699	04682
Zero air pump	Werther International	C 70/4	000829156	06914

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
LAV	V410-Martin	Valvur-05/07/2019				
1	5/7/2019	Computer	Hewlett Packard	none	unknown	5CB1520H6L
2	5/7/2019	DAS	Environmental Sys Corp	90535	8816	2026
3	5/7/2019	Elevation	Elevation	None	1	None
4	5/7/2019	Filter pack flow pump	Thomas	none	107CA18B	081700057768
5	5/7/2019	Flow Rate	Alicat	none	MC-10SLPM-D-PCV	134657
6	5/7/2019	Infrastructure	Infrastructure	none	none	none
7	5/7/2019	Mainframe	Climatronics	none	100081	1377
8	5/7/2019	Mainframe power supply	Climatronics	none	101074	858
9	5/7/2019	Met tower	Rohn	none	unknown	none
10	5/7/2019	Modem	US Robotics	none	56k	unknown
11	5/7/2019	Ozone	ThermoElectron Inc	90834	49C	49C-520012-328
12	5/7/2019	Ozone Standard	ThermoElectron Inc	90567	49C	49C-59283-322
13	5/7/2019	Sample Tower	Aluma Tower	923314	В	AT-5324-F6-O
14	5/7/2019	Shelter Temperature	DRI	none	Unknown	Unknown
15	5/7/2019	Shield (2 meter)	Climatronics	01199	100325	1290
16	5/7/2019	Siting Criteria	Siting Criteria	None	1	None
17	5/7/2019	Temperature Translator	Climatronics	03629	100088-2	398
18	5/7/2019	Temperature2meter	Climatronics	03794	100093	ARS101
19	5/7/2019	Zero air pump	Werther International	none	PC70/4	847660

DAS Data Form

DAS Time Max Error: 1.45

Mfg	Serial N	umber Site]	Fechnician	Site Visit Date	Parameter	Use Desc.
Environmental	Sys 2026	LA	V410	Martin Valvur	05/07/2019	DAS	Primary
Das Date: Das Time: Das Day:	5 /7 /2019 07:23:30 127	Audit Date Audit Time Audit Day	5 /7 /2019 07:22:03 127	Mfg Serial Number	HY 12010039329	Parameter Tfer Desc.	DAS Source generator (D
Low Channel: Avg Diff:		High Channe Avg Diff:		Tfer ID	01322		0.00000
0.0001				Slope Cert Date	6/15/201	F.	1.00000
				Mfg	Fluke 95740243	Parameter	
				Serial Number Tfer ID	01312	Tfer Desc.	DVM
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/25/201	9 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
13	0.0000	-0.0005	-0.0003	3 V	V	0.0002	
13	0.1000	0.1005	0.1005		V	0.0000	
13	0.3000	0.2998	0.2996		V	-0.0002	
13	0.5000	0.4996	0.4990		V	0.0000	
13	0.7000	0.7002	0.6998		V	-0.0004	
13	0.9000	0.8999	0.9000	-	V	0.0001	
13	1.0000	1.0002	1.000	1 V	V	-0.0001	

Flow Data Form

Mfg	Seria	l Number Tag	Site	Te	chnician	Site Visit	Date Parar	neter	Owner ID	
Alicat	licat 134657 LAV410		Ma	Martin Valvur		19 Flow F	Rate	none		
					Mfg	BIOS		Parameter F		
					Serial Number	122974	[Ffer Desc. B	IOS 220-H	
					Tfer ID	01416				
					Slope		1.00178 Int	ercept	0.00161	
				Cert Date 7/13/2018 Corr				rrCoff	1.00000	
DAS 1:		DAS 2:		I	Cal Factor Z	lero	-0.0	008		
A Avg % Diff:	A Max %	b Dif A Avg %	Diff A Max	x % Dif	Cal Factor F	ull Scale	5	.05		
0.29%	0	.43%			Rotometer R	eading:	3	.55		
Desc.	Test t	ype Input l/n	n Input Corr	MfcDisp.	OutputSignal	Output S	E InputUnit	OutputSigna	all PctDifference	
primary	pump of	f 0.000	0.000	0.00	0.0000	0.01	l/m	l/m		
primary	leak cheo	ck 0.000	0.000	0.01	0.0000	0.01	l/m	l/m		
primary	test pt 1	3.022	3.020	2.98	0.0000	3.02	l/m	l/m	-0.13%	
primary	test pt 2	3.023	3.020	2.97	0.0000	3.01	l/m	l/m	-0.43%	
primary	test pt 3	3.027	3.020	2.98	0.0000	3.01	l/m	l/m	-0.30%	
Sensor Comj	ponent Lea	ak Test		Conditio	on		Statu	is pass		
Sensor Comj	oonent Tu	bing Condition		Conditio	on Good	Status pass		is pass		
Sensor Comj	ponent Filt	er Position	Cond		on Fair		Statu	I <mark>s</mark> pass		
Sensor Comj	ponent Ro	tometer Conditio	'n	Conditio	Clean and dry	n Clean and dry		I <mark>s</mark> pass		
Sensor Comj	ponent Mc	isture Present		Conditio	on No moisture p	n No moisture present		I <mark>s</mark> pass		
Sensor Component Filter Distance			Conditio	Condition 6.0 cm			is pass			
Sensor Component Filter Depth		Conditio	on 0.0 cm	Statu	is pass					
Sensor Comj	ponent Filt	er Azimuth		Conditio	dition 90 deg			Status pass		
Sensor Com	ponent Sy	stem Memo		Conditio	on		Statu	l <mark>s</mark> pass		

Ozone Data Form

Mfg		Serial Numbe	r Tag Site		Тес	chnician	Site Visit Date	Parame	ter	Owner ID
ThermoElec	tron Inc	49C-520012-3	28 LAV41	0	Ma	artin Valvur	05/07/2019	Ozone 90834		
Intercept Intercept		0.00000 0.00000 0.00000		Mfg Serial Number Tfer ID	ThermoElectron 49CPS-70008-3 01110			r ozone		
DAS 1:		DA	AS 2:			Slope	1.001	51 Inter	cept	0.00666
	Diff: A M	ax % Dif A 0.0%	Avg %Diff A	A Max % Di	f	Cert Date	10/30/20	18 Corr	Coff	1.00000
0.	0%	0.0%								
UseDescr	•	ConcGroup	Tfer Raw	Tfer Co	orr	Site	Site Unit	RelPer	Dif	AbsDif
prima	•	1	0.14	0.13		0.37	ppb			0.24
prima		2	13.33	13.30		12.02	ppb			-1.28
prima		3	35.86	35.79		33.32	ppb		-7.15	
prima		4	64.83	64.72		62.84	ppb		-2.95	
prima		5	114.13	113.9		111.40	ppb		-2.26	
Sensor C	omponer	nt Sample Trai	า	Con	ditio	n Good		Status	pass	
Sensor C	omponer	nt 22.5 degree	rule	Con	ditio	n		Status	Fail	
Sensor C	omponer	nt Inlet Filter C	ondition	Con	ditio	n Clean		Status	pass	
Sensor C	omponer	nt Battery Back	ир	Con	ditio	n N/A		Status	pass	
Sensor C	omponer	nt Offset		Con	ditio	n 0.000		Status	pass	
Sensor C	omponer	<mark>nt</mark> Span		Con	ditio	n 1.006		Status	pass	
Sensor C	omponer	nt Zero Voltage	•	Con	Condition -0.0003			Status	pass	
Sensor C	omponer	nt Fullscale Vo	tage	Con	ditio	n 0.9999	Status pass			
Sensor C	omponer	nt Cell A Freq.		Con	ditio	on 66.9 kHz		Status pass		
Sensor C	omponer	t Cell A Noise		Con	ditio	on 0.5 ppb	Status pass		pass	
Sensor C	omponer	t Cell A Flow		Con	ditio	n 0.65 lpm		Status	pass	
Sensor C	omponer	nt Cell A Press	ure	Con	ditio	n 609.1 mmHg		Status	pass	
Sensor C	omponer	t Cell A Tmp.		Con	ditio	34.8 C		Status	pass	
Sensor C	omponer	nt Cell B Freq.		Con	ditio	n 84.8 kHz		Status	pass	
	-	t Cell B Noise		Con	ditio	on 0.4 ppb		Status	pass	
Sensor Component Cell B Flow		Con	ditio	on 0.59 lpm		Status	pass			
Sensor C	Sensor Component Cell B Pressure		Con	ditio	on 608.8 mmHg		Status	pass		
Sensor C	omponer	t Cell B Tmp.			ondition N/A			Status		
Sensor C	omponer	nt Line Loss		Con	ditio	Not tested		Status	pass	
Sensor C	omponer	nt System Men	10	Con	ditio	n		Status	pass	

2 Meter Temperature Data Form

0 1		D		•			
1 9	0		TT	tο	101	ncc	٦
Cal	IU.	$\mathbf{\nu}$	11	IC.		uuu	2

Mfg		Serial Numbo	er Tag	Site		I	[echnici	echnician		sit Date	Paramete	er	Owner ID
Climatronics		ARS101		LAV410			Martin V	alvur	05/07/2	2019	Temperat	ure2meter	03794
Mfg	Clin	natronics					Mfg		Fluke		Para	meter Tem	perature
SN/Owner ID	Owner ID 398 03629					Seria	l Number	3275143	3	Tfer	Desc. RTD		
Parameter:	er: Temperature Translator					Tfer	ID	01229					
DAS 1:		D	AS 2:				Slope	2		0.9998	9 Interc	ept	-0.00649
Abs Avg Err Abs Max Err Abs Avg Err Abs M		os Max	x Err	Cert Date		1/23/2019 CorrCo		off	1.00000				
0.06		0.13					L						
UseDescription		Test type	Input	TmpRaw	Input	TmpCo	orrected	OutputTn	npSignal	OutputS	SignalEng	OSE Unit	Difference
primary	Ter	np Low Rang		0.18		0.19		0.0000	0.15C		С	-0.04	
primary	Ter	np Mid Range	,	26.82			26.8	3	0.0000	26.70C		С	-0.13
primary	Te	mp High Rang		47.00			47.0	1	0.0000	00 47.03 C		С	0.02
Sensor Comp	oner	t Properly Site	ed			Condi	tion Pro	perly sited		Status pass		ass	
Sensor Comp	oner	t Shield				Condi	tion Cle	an			Status pa	ass	
Sensor Component Blower			Condi	tion No	t functioning	9		Status Fa	ail				
Sensor Component Blower Status Switch			Condition N/A		Status pass								
Sensor Component System Memo			Condition See comments				Status pass						

Shelter Temperature Data For

Mfg	fg Serial Number Tag Site T		Technician	Site Visit Date	Parameter	Owner ID
DRI	Unknown	known LAV410 I		05/07/2019	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter She	lter Temperature
Abs Avg Err Ab			Serial Number	3275143	Tfer Desc. RTD)
			Tfer ID	01229		
			Slope	0.9998	9 Intercept	-0.00649
			Cert Date	1/23/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	20.36	20.37	0.000	21.8	С	1.44
primary	Temp Mid Range	23.80	23.81	0.000	22.1	С	-1.75
primary	Temp Mid Range	21.94	21.95	0.000	22.1	С	0.17
Sensor Con	nponent System Memo	1	Condition		Status	pass	

Infrastructure Data For

Site ID	LAV410	Technician Martin	Valvur Site Visit Date 05/07/2019
Shelter M	lake	Shelter Model	Shelter Size
			1150 cuft
A STATE OF A			

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	Signs of wear	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.	Hazaro	Problem
Temperature2meter The forced-air blower for	LAV410 or the shield is r	Martin Valvur not functioning.	05/07/2019	Blower	Climatronics	4323		
Temperature2meter The sensor signal cables	LAV410 s are showing si	Martin Valvur gns of wear.	05/07/2019	System Memo	Climatronics	4323		

Field Systems Comments

1 Parameter: SiteOpsProcedures

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

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

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

4 Parameter: PollAnalyzerCom

Trees violate the ozone sample inlet siting criteria.

5 Parameter: MetOpMaintCom

The temperature sensor signal cable has deteriorated and is in need of replacement. The aspirated motor for temperature sensor is not functioning and the temperature measurement data quality are affected.

F-02058-1500-S1-rev002

Site ID LAV	/410		Technician	Martin Valvur	Site Vis	it Date 05/0	7/2019	
Site Spanson (age)	n (r.)	NPS			USGS Map		Manzanita Lake	
Site Sponsor (age					-			
Operating Group		NPS			Map Scale			
AQS #		06-065-10)04		Map Date			
Meteorological Ty	ype	Climatron	ics					
Air Pollutant Ana	alyzer	Ozone, IMPROVE			QAPP Latitud	e	40.5403	
Deposition Measu	irement	dry, wet			QAPP Longitude -121.5764			
Land Use		woodland - evergreen			QAPP Elevation	on Meters	1756	
Terrain		complex			QAPP Declina	tion		
Conforms to MLM	М	Marginally	/		QAPP Declina	tion Date		
Site Telephone		(530) 335	-7214		Audit Latitude	•		40.539991
Site Address 1		38050 Hw	/y 36E		Audit Longitu	de		-121.576462
Site Address 2					Audit Elevatio	n		1755
County		Shasta			Audit Declinat	ion	14.5	
City, State		Mineral, C	CA			Present		
Zip Code		96063			Fire Extinguis	her 🗹	Inspected April 2	2017
Time Zone		Pacific			First Aid Kit			
Primary Operator	r				Safety Glasses			
Primary Op. Pho	one #				Safety Hard H	at 🗸		
Primary Op. E-m	ail				Climbing Belt			
Backup Operator	•				Security Fence			
Backup Op. Pho	ne #				Secure Shelter	\checkmark		
Backup Op. E-m	ail				Stable Entry S	teps✓		
Shelter Working	Room 🗹	Make		M	odel		Shelter Size	1150 cuft
Shelter Clean	\checkmark	Notes	The inside equ	ipment is locate	d in room within th	ne fire station	, clean, neat, and	d organized.
Site OK	\checkmark	Notes						
Driving Direction	onto ro	oute 89. T the fire st	urn right at the	first road into th		maintenance	area. Take the f	4 and 89, turn right first left, the site is nate controlled

LAV410

F-02058-1500-S2-rev002

Site ID

Technician Martin Valvur

Site Visit Date 05/07/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		
Major industrial complex	10 to 20 km		
City > 50,000 population	40 km		
City 10,000 to 50,000 population	10 km		
City 1,000 to 10,000 population	5 km		
Major highway, airport or rail yard	2 km		
Secondary road, heavily traveled	500 m		
Secondary road, lightly traveled	200 m		
Feedlot operations	500 m		\checkmark
Intensive agricultural ops (including aerial spraying)	500 m		\checkmark
Limited agricultural operations	200 m		\checkmark
Large parking lot	200 m		
Small parking lot	100 m	25 m	
Tree line	50 m	10 m	
Obstacles to wind	10 times obstacle height		

Siting Distances OK

Siting Criteria Comment

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

Fie	eld Sys	stems Data Fo	orm				F-0205	58-15	500-S3	-rev002
Site	e ID	LAV410	Technician	Martin Valvur		Site Visit Date 0	5/07/2019			
1		l speed and direction luenced by obstructio		as to avoid	✓	N/A				
2	(i.e. wind horizont	l sensors mounted so l sensors should be m ally extended boom > to the prevailing wind	ounted atop the 2x the max diam	e tower or on a		N/A				
3	Are the t	ower and sensors plu	mb?		✓	N/A				
4		emperature shields p diated heat sources su			✓					
5	condition surface a	perature and RH sens ns? (i.e. ground below and not steeply sloped water should be avoi	sensors should . Ridges, hollov	be natural						
6	Is the sol	ar radiation sensor p	lumb?			N/A				
7	Is it sited	l to avoid shading, or	any artificial o	r reflected light?	✓	N/A				
8	Is the rai	in gauge plumb?			✓	N/A				
9	Is it sited towers, e	l to avoid sheltering e .tc?	ffects from bui	dings, trees,	✓	N/A				
10	Is the sur facing no	rface wetness sensor s orth?	sited with the g	rid surface		N/A				
11	Is it incl	ined approximately 3	0 degrees?			N/A				

F-02058-1500-S4-rev002

Site	e ID	LAV410	Technician	Martin Valvur		Site Visit Date	05/07/2019	
1		e meterological senso n, and well maintained		intact, in good		N/A		
2	Are all the reporting	he meteorological sens g data?	sors operational	l online, and	✓	N/A		
3	Are the s	shields for the temper	ature and RH s	ensors clean?	✓			
4	Are the a	aspirated motors worl	king?			Not functioning		
5	Is the sol scratches	lar radiation sensor's s?	lens clean and f	ree of	✓	N/A		
6	Is the su	rface wetness sensor g	rid clean and u	ndamaged?	✓	N/A		
7		sensor signal and pow n, and well maintained		, in good		Signs of wear		
8		sensor signal and pow e elements and well ma		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 temperature sensor signal cable has deteriorated and is in need of replacement. The aspirated motor for temperature sensor is not functioning and the temperature measurement data quality are affected.

Fi	eld Sy	stems Data Fo	orm				8-1500-85-rev002	
Site	e ID	LAV410	Technician M	artin Valvur		Site Visit Date	05/07/2019	
	Siting C	Criteria: Are the pollut	ant analyzers and	deposition equ	<u>uipr</u>	nent sited in accord	dance with 40 C	FR 58, Appendix E
1		sample inlets have at le icted airflow?	east a 270 degree a	arc of	✓			
2	Are the	sample inlets 3 - 15 mo	eters above the gr	ound?	✓			
3		sample inlets > 1 mete meters from trees?	r from any major	· obstruction,		< 10 meters		
	<u>Polluta</u>	nt analyzers and depos	ition equipment o	perations and	mai	intenance		
1		analyzers and equipme on and well maintained		ı good	✓			
2		analyzers and moniton 1g data?	rs operational, on	-line, and	✓			
3	Describ	e ozone sample tube.				1/4 teflon by 10 me	ters	
4	Describ	e dry dep sample tube.				3/8 teflon by 10 me	ters	
5		ine filters used in the o location)	zone sample line	? (if yes	✓	At inlet only		
6	Are san obstruc	nple lines clean, free of tions?	kinks, moisture,	and				
7	Is the ze	ero air supply desiccan	t unsaturated?		✓			
8	Are the	re moisture traps in th	e sample lines?		✓	Flow line only		
9	Is there clean?	a rotometer in the dry	deposition filter	line, and is it		Clean and dry		

Trees violate the ozone sample inlet siting criteria.

Fi	eld Sy	stems Data Fo	orm				F-0 2	2058-15	00-S6-rev002
Site	e ID	LAV410	Technician	Martin Valvur		Site Visit D	ate 05/07/201	9	
	<u>DAS, se</u>	nsor translators, and g	peripheral equi	<u>pment operatio</u>	<u>ns and</u>	maintenance	2		
1		DAS instruments appe intained?	ar to be in good	l condition and					
2		the components of the backup, etc)	DAS operation	al? (printers,					
3		nalyzer and sensor sig g protection circuitry?		through					
4		signal connections pro intained?	otected from the	e weather and					
5	Are the	signal leads connected	to the correct	DAS channel?					
6	Are the grounde	DAS, sensor translato ed?	rs, and shelter	properly					
7	Does the	e instrument shelter ha	ave a stable pov	ver source?					
8	Is the in	strument shelter temp	erature control	lled?					
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	l grounded?						
11	Tower o	comments?							

Field S	Systems Data F	orn	1				F-0 2	2058-	1500-S7-rev002
Site ID	LAV410	Т	echnician	Martin Valv	ur	Site Visit Date	05/07/201	9	
<u>Docum</u>	<u>entation</u>								
Does th	e site have the required	instr	ument and	equipment	<u>manuals?</u>				
Wind dire Temperat Relative h Solar radi Surface w Wind sens Temperat Humidity Solar radi Tipping b Ozone ana Filter pac	ed sensor				Data logger Strip chart Computer Modem Printer Zero air pu Filter flow p Surge prote UPS Lightning p Shelter hea	recorder mp pump ector orotection device ter	Yes ✓ □ ✓ □ □ □ □ □ □ □ □ □ □ □ □ □	No 	N/A V V V V U V V V V V V V U U V V V U U V V U U V V U
-					ments and	report forms?			
Documentation Does the site have the required instrument and equipment manuals? Yes No N/A Yes No N/A Wind speed sensor Image: Computer instrument and equipment manuals? Wind direction sensor Image: Computer instrument and equipment manuals? Wind direction sensor Image: Computer instrument and equipment manuals? Relative humidity sensor Image: Computer instrument and equipment manuals? Solar radiation sensor Image: Computer instrument and equipment manuals? Surface wetness sensor Image: Computer instrument and equipment manuals? Wind sensor translator Image: Computer instrument and equipment manuals? Wind sensor translator Image: Computer instrument and equipment manuals? Wind sensor translator Image: Computer instrument and equipment manuals? Wind sensor translator Image: Computer instrument and equipment manuals? Surge protector Image: Computer instrument and equipment manuals? Solar radiation translator Image: Computer instrument and equipment manuals? Solar radiation translator Image: Computer instrument and equipment and equipm									
SSRF Site Ops M HASP Field Ops Calibratio Ozone z/s/ Preventive	og Manual Manual on Reports /p Control Charts e maintenance schedule	 > ><	DataVie	12 rent					
2 Are t	he Site Status Report Fo	•		·					
Does the site have the required instrument and equipment manuals? Yes No NA Yes No NA Wind speed sensor Image: Strip chart recorder Image: Strip chart recorder									
						egarding condition	ons listed	above, o	or any other features,

LAV410 Technician Martin Valvur Site Visit Date 05/07/2019 Site ID Site operation procedures Informal training provided by ARS during maintenance visits 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? ✓ 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 Performe	ed
-------------------	----

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 \checkmark \checkmark Semiannually \checkmark \checkmark Daily \checkmark \checkmark Not performed \checkmark ✓ Daily \checkmark \checkmark Not performed \checkmark ✓ Alarm values only ✓ \checkmark Monthly \checkmark ✓ N/A \square
- 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:

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

Compliant

Compliant

F-02058-1500-S8-rev002

Site ID AV410 Technician Martin Valvur Site Visit Date 05/07/2019 Site operation procedures 1 Is the filter pack being changed every Tuesday as scheduled? Filter changed between 11:00 and 13:00 2 Are the Site Status Report Forms being completed and filed correctly? Filter changed between 11:00 and 13:00 3 Are data downloads and backups being performed as scheduled? No longer required 4 Are general observations being made and recorded? How? SSRF, dataview 5 Are site supplies on-hand and replenished in a timely fashion? SSRF 7 Are samples sent to the lab on a regular schedule in a timely fashion? SSRF 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? Compliant	Fi	eld Sy	stems Data Form			F-02058-1500-S9-rev002			
1 Is the filter pack being changed every Tuesday as scheduled? 2 Are the Site Status Report Forms being completed and filed 3 Are data downloads and backups being performed as scheduled? 4 Are general observations being made and recorded? How? 5 Are site supplies on-hand and replenished in a timely fashion? 6 Are sample flow rates recorded? How? 7 Are samples sent to the lab on a regular schedule in a timely fashion? 8 Are filters protected from contamination during handling and shipping? How? 9 Are the site conditions reported regularly to the field operations manager or staff?	Sit	e ID	LAV410 Tec	hnician Martin Valvur		Site Visit Date 05/07/2019			
 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? 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? 9 Are the site conditions reported regularly to the field operations manager or staff? Compliant 		<u>Site ope</u>	ration procedures						
 a Are data downloads and backups being performed as scheduled? A Are general observations being made and recorded? How? SSRF, dataview SSRF, dataview Are site supplies on-hand and replenished in a timely fashion? Are sample flow rates recorded? How? SSRF Are samples sent to the lab on a regular schedule in a timely fashion? Are filters protected from contamination during handling and shipping? How? Are the site conditions reported regularly to the field operations manager or staff? Clean gloves on and off 	1	Is the fi	lter pack being changed ever	y Tuesday as scheduled?		Filter changed between 11:00 and 13:00			
scheduled? 4 Are general observations being made and recorded? How? 5 Are site supplies on-hand and replenished in a timely fashion? 6 Are sample flow rates recorded? How? 7 Are samples sent to the lab on a regular schedule in a timely fashion? 8 Are filters protected from contamination during handling and shipping? How? 9 Are the site conditions reported regularly to the field operations manager or staff? Clean gloves on and off	2			ing completed and filed	✓				
 Are site supplies on-hand and replenished in a timely fashion? Are sample flow rates recorded? How? SSRF Are samples sent to the lab on a regular schedule in a timely fashion? Are filters protected from contamination during handling and shipping? How? Are the site conditions reported regularly to the field operations manager or staff? QC Check Performed Frequency Compliant 	3			ing performed as		No longer required			
 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? 9 Are the site conditions reported regularly to the field operations manager or staff? 9 Check Performed Frequency Compliant 	4	Are gen	eral observations being mad	e and recorded? How?		SSRF, dataview			
 Are samples sent to the lab on a regular schedule in a timely fashion? Are filters protected from contamination during handling and shipping? How? Are the site conditions reported regularly to the field operations manager or staff? Clean gloves on and off 	5			ished in a timely					
 8 Are filters protected from contamination during handling and shipping? How? 9 Are the site conditions reported regularly to the field operations manager or staff? 9 Check Performed Frequency Compliant 	6				✓	SSRF			
 and shipping? How? 9 Are the site conditions reported regularly to the field operations manager or staff? QC Check Performed Frequency Compliant 	7			ılar schedule in a timely					
Operations manager or staff? QC Check Performed Frequency Compliant	8			ation during handling		Clean gloves on and off			
	9			llarly to the field					
Multi-point MFC Calibrations	QC	Check P	erformed	Frequency		Compliant			
	I	Multi-poin	nt MFC Calibrations	Semiannually					
Flow System Leak Checks Weekly	1	Flow Syste	em Leak Checks	✓ Weekly					
Filter Pack Inspection	1	Filter Pac	k Inspection						
Flow Rate Setting Checks Weekly	I	Flow Rate	Setting Checks	✓ Weekly					
Visual Check of Flow Rate Rotometer Veekly		Visual Ch	eck of Flow Rate Rotometer	✓ Weekly					
In-line Filter Inspection/Replacement Veekly	I	In-line Fil	ter Inspection/Replacement	✓ Weekly					
Sample Line Check for Dirt/Water	\$	Sample Li	ne Check for Dirt/Water	Weekly					

LAV410

F-02058-1500-S10-rev002

Site ID

Techn

Technician Martin Valvur

Site Visit Date 05/07/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	unknown	5CB1520H6L	none
DAS	Environmental Sys Corp	8816	2026	90535
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18B	081700057768	none
Flow Rate	Alicat	MC-10SLPM-D-PCV	134657	none
Infrastructure	Infrastructure	none	none	none
Mainframe	Climatronics	100081	1377	none
Mainframe power supply	Climatronics	101074	858	none
Met tower	Rohn	unknown	none	none
Modem	US Robotics	56k	unknown	none
Ozone	ThermoElectron Inc	49C	49C-520012-328	90834
Ozone Standard	ThermoElectron Inc	49C	49C-59283-322	90567
Sample Tower	Aluma Tower	B	AT-5324-F6-O	923314
Shelter Temperature	DRI	Unknown	Unknown	none
Shield (2 meter)	Climatronics	100325	1290	01199
Siting Criteria	Siting Criteria]1	None	None
Temperature Translator	Climatronics	100088-2	398	03629
Temperature2meter	Climatronics	100093	ARS101	03794
Zero air pump	Werther International	PC70/4	847660	none

Site Inventory by Site Visit

Site V	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number				
PIN4	PIN414-Martin Valvur-05/08/2019									
1	5/8/2019	Computer	Hewlett Packard	none	8460 elitebook	CNU13607G				
2	5/8/2019	DAS	Environmental Sys Corp	90612	8816	2615				
3	5/8/2019	Elevation	Elevation	None	1	None				
4	5/8/2019	Filter pack flow pump	Thomas	none	107CAB18	0000158				
5	5/8/2019	Flow Rate	Alicat	none	Unknown	Unknown				
6	5/8/2019	Infrastructure	Infrastructure	none	none	none				
7	5/8/2019	Modem	Hughesnet	none	Unknown	Unknown				
8	5/8/2019	Ozone	ThermoElectron Inc	90765	49C	49c-74530376				
9	5/8/2019	Ozone Standard	ThermoElectron Inc	none	49C	0425208055				
10	5/8/2019	Sample Tower	Aluma Tower	928348	В	AT-5381-F9-3				
11	5/8/2019	Shelter Temperature	ARS	none	none	none				
12	5/8/2019	Siting Criteria	Siting Criteria	None	1	None				
13	5/8/2019	Temperature Translator	Climatronics	none	100088-2	397				
14	5/8/2019	Temperature2meter	Climatronics	none	100093	missing				

DAS Data Form

DAS Time Max Error: 0.95

Mfg	Serial N	umber Site	Т	Fechnician	Site Visit Date	Parameter	Use Desc.
Environmental	Sys 2615	PIN4	14	Martin Valvur	05/08/2019	DAS	Primary
Das Date: Das Time: Das Day:	5 /8 /2019 13:20:03 128	Audit Date Audit Time Audit Day	5 /8 /2019 13:21:00 128	Mfg Serial Number	HY 12010039329	Parameter Tfer Desc.	DAS Source generator (D
Low Channel: Avg Diff:	Max Diff:	High Channel: Avg Diff:	Max Diff:	Tfer ID Slope	01322	0 Intercept	0.00000
0.0002	0.000	5 0.0002	0.0005	Cert Date	6/15/201	4 CorrCoff	1.00000
				Mfg	Fluke	Parameter	
				Serial Number Tfer ID	95740243 01312	Tfer Desc.	DVM
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/25/201	9 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
15	0.0000	0.0000	0.0000) V	V	0.0000	
15	0.1000	0.1002	0.1002		V	0.0000	
15	0.3000	0.2990	0.2991		V	0.0001	
15	0.5000	0.5009	0.5014		V	0.0005	
15	0.7000	0.6994	0.6995		V	0.0001	
15	0.9000	0.8997	0.9002		V	0.0005	
15	1.0000	0.9999	1.0004	l V	V	0.0005	

Flow Data Form

Mfg Serial Number Tag Site			Site	Te	chnician	Site Visi	t Date Para	meter	Owner ID	
Alicat Unknown PIN414		Ma	Martin Valvur)19 Flow	Rate	none			
					Mfg Serial Number			Parameter Flo Tfer Desc. Blo		
					Tfer ID Slope Cert Date	01416]	tercept prrCoff	0.00161	
DAS 1: DAS 2: A Avg % Diff: A Max % Dif A Avg % Diff 1.22% 1.41%			a % Dif	Cal Factor Zero % Dif Cal Factor Full Scale Rotometer Reading:			0.058 4.964 3.15			
Desc. Test type Input l/m Input Corr		MfcDisp.	. OutputSignal	Output S	E InputUnit	OutputSignal	I PctDifference			
primary	pump off	0.000	0.000	0.00	0.0000	0.11	l/m	l/m		
primary	leak check	0.000	0.000	0.01	0.0000	0.12	l/m	l/m		
primary	test pt 1	2.976	2.970	3.01	0.0000	3.01	l/m	l/m	1.41%	
primary	test pt 2	2.982	2.980	3.01	0.0000	3.01	l/m	l/m	0.97%	
primary	test pt 3	2.979	2.970	3.01	0.0000	3.01	l/m	l/m	1.28%	
Sensor Comj	ponent Leak Tes	st		Conditio	Condition			18 pass		
Sensor Com	ponent Tubing C	Condition		Conditio	Condition Good			<mark>IS</mark> pass		
Sensor Comj	ponent Filter Pos	sition		Conditio	Condition Good			18 pass		
Sensor Comj	ponent Rotomet	er Conditior	า	Conditio	ndition Clean and dry			18 pass		
Sensor Component Moisture Present		Conditio	ndition No moisture present			18 pass				
Sensor Component Filter Distance		Conditio	ition 5.5 cm			18 pass				
Sensor Component Filter Depth			0.5 cm		18 pass					
	ponent Filter Azi			Conditio	on 260 deg		Statu	Status pass		
Sensor Com	ponent System N	Memo		Conditio	0 n		Statu	<mark>is</mark> pass		

Ozone Data Form

Mfg	\$	Serial Number	r Tag Site		Technician	Site Vis	sit Date Pai	ameter	Owner ID	
ThermoElec	tron Inc	49c-74530376	PIN414		Martin Valvur	05/08/2	2019 Ozo	one	90765	
Slope: Intercept CorrCoff:	-0	.00749 Slope .27178 Inter .99999 Corr	cept ().00000).00000).00000	Mfg Serial Nui Tfer ID		DElectron Inc	Paramete Tfer Desc	r ozone Ozone primary stan	
DAS 1:		DA	AS 2:		Slope		1.00151	Intercept	0.00666	
			Avg %Diff A	Max % Dif	Cert Date		10/30/2018	CorrCoff	1.00000	
0.	0%	0.0%								
UseDescr	iption	ConcGroup	Tfer Raw	Tfer Cor			Unit Re	elPerDif	AbsDif	
prima	•	1	0.40	0.39	0.3				-0.06	
prima		2	15.06	15.03	14.7				-0.33	
prima		3	35.03	34.97	35.0			0.26		
prima		4	65.31	65.20	65.1			-0.15		
prima	•	5	110.05	109.87	110.	50 ppb		0.66		
Sensor C	omponen	t Sample Train	ו	Conc	lition Good		Sta	atus pass		
Sensor C	omponen	t 22.5 degree	rule	Cond	lition		Sta	atus pass		
Sensor C	omponen	t Inlet Filter Co	ondition	Conc	lition Clean		Sta	atus pass		
Sensor C	omponen	t Battery Back	up	Cond	lition N/A		Sta	atus pass		
Sensor C	omponen	t Offset		Conc	Condition -0.2			Status pass		
Sensor C	omponen	it Span		Conc	ndition 0.999			Status pass		
Sensor C	omponen	t Zero Voltage	•	Conc	lition -0.0020		Sta	atus pass		
Sensor C	omponen	t Fullscale Vol	tage	Conc	dition 0.9980			atus pass		
Sensor C	omponen	t Cell A Freq.		Conc	dition 64.9 kHz			Status pass		
Sensor C	omponen	t Cell A Noise		Conc	dition 0.4 ppb			atus pass		
Sensor C	omponen	t Cell A Flow		Cond	ondition 0.77 lpm			atus pass		
Sensor C	omponen	t Cell A Press	ure	Conc	lition 709.9 m	nHg	Sta	atus pass		
Sensor C	omponen	t Cell A Tmp.		Conc	lition 29.2 C		Sta	atus pass		
Sensor C	omponen	t Cell B Freq.		Conc	lition 64.9 kHz			atus pass		
	_	t Cell B Noise		Conc	lition 0.5 ppb		Sta	atus pass		
Sensor C	omponen	t Cell B Flow			lition 0.80 lpm			atus pass		
Sensor C	omponen	t Cell B Press	ure	Conc	lition 709.2 m	mHg	Sta	atus pass		
	•	t Cell B Tmp.			lition N/A			atus pass		
Sensor C	omponen	t Line Loss		Conc	lition Not teste	d	Sta	atus pass		
Sensor C	omponen	t System Mem	10	Conc	lition		Sta	atus pass		

2 Meter Temperature Data Form

~		T				
1 0		11	Ηž	01	in	00
Ca	IU.			CI	СП	UC

Mfg	Serial Number	r Tag Site		Technicia	n	Site Vis	it Date	Paramete	er	Owner ID
Climatronics	missing	PIN414		Martin Va	llvur	05/08/2	019	Temperati	ure2meter	none
Mfg	Climatronics]	Mfg		Fluke		Para	meter Tem	perature
SN/Owner ID	397 r	none		Serial	Number	3275143	3	Tfer	Desc. RTD	
Parameter:	Temperature Trans	slator		Tfer I	D	01229]		
DAS 1:	DA	AS 2:		Slope			0.99989	Interco	ept	-0.00649
Abs Avg Err	Abs Max Err Ab	os Avg Err Ab	os Max Err	Cert I	Date		1/23/2019	CorrC	off	1.00000
0.15	0.31									
UseDescription	Test type	InputTmpRaw	InputTmpC	Corrected	OutputTm	pSignal	OutputS	ignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.23		0.24		0.0000		0.22	С	-0.02
primary	Temp Mid Range	24.80		24.81		0.0000		24.69	С	-0.12
primary	Temp High Rang	48.40		48.41		0.0000		48.10	С	-0.31
Sensor Comp	onent Properly Site	d	Cond	l <mark>ition</mark> Prop	perly sited			Status pa	ass	
Sensor Comp	onent Shield		Cond	l <mark>ition</mark> Clea	an			Status pa	ass	
Sensor Comp	onent Blower		Cond	lition Fun	ctioning			Status pa	ass	
Sensor Comp	onent Blower Statu	s Switch	Cond	l <mark>ition</mark> N/A				Status pa	ass	
Sensor Comp	onent System Mem	10	Cond	lition				Status pa	ass	

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	PIN414	Martin Valvur	05/08/2019	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter She	Iter Temperature
Abs Avg Err Abs	s Max Err Abs Avg 0.74	Err Abs Max Err	Serial Number	3275143	Tfer Desc. RTD)
	L		Tfer ID	01229		
			Slope	0.9998	9 Intercept	-0.00649
			Cert Date	1/23/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.90	24.91	0.000	25.7	С	0.74
primary	Temp Mid Range	27.55	27.56	0.000	27.9	С	0.29
primary	Temp Mid Range	28.52	28.53	0.000	27.8	С	-0.71
Sensor Con	nponent System Memo	1	Condition		Status	pass	

Infrastructure Data For

Site ID	PIN414	Technician Martin V	Site Visit Date 05/08/2019
Shelter M	Make	Shelter Model	Shelter Size
Alan pre-	fab	s/n 861168 1808	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	Fair	Status	pass
Sensor Component Shelter Door	Condition	Good	Status	pass
Sensor Component Shelter Roof	Condition	Good	Status	pass
Sensor Component Shelter Floor	Condition	Fair	Status	pass
Sensor Component Signal Cable	Condition	Good	Status	pass
Sensor Component Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component Sample Train	Condition	Good	Status	pass

Field Systems Comments

1 Parameter: SiteOpsProcedures

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

2 Parameter: ShelterCleanNotes

The lighting has been repaired. The shelter has been cleaned and organized.

3 Parameter: MetOpMaintCom

The temperature sensor signal cable is deteriorating.

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Site ID PIN414	Technician Martin Valvur	Site Visit Date 05/08	3/2019
Site Sponsor (agency)	NPS	USGS Map	North Chalone Peak
Operating Group	NPS	Map Scale	
AQS#	06-069-0003	Map Date	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMPROVE	QAPP Latitude	36.4850
Deposition Measurement	dry, wet	QAPP Longitude	-121.1556
Land Use	woodland - scrub		335
Terrain	complex	QAPP Declination	
Conforms to MLM	Marginally	QAPP Declination Date	
Site Telephone	(831) 389-4586	Audit Latitude	36.483235
Site Address 1	5000 Hwy 146	Audit Longitude	-121.156876
Site Address 2		Audit Elevation	317
County	San Benito		13.5
City, State	Paicines, CA		
	95043	Present Fire Extinguisher ☑	Inspected May 2017
Zip Code	Pacific		
Time Zone			
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 Steps ☑	
Shelter Working Room	Make Alan pre-fab Mo	odel s/n 861168 1808	Shelter Size 512 cuft
	Notes The lighting has been repaired.	The shelter has been cleaned	and organized.
	Notes		
west o	Hollister proceed south on route 25 to hig n 146 and continue to the fee station. Le ne road on the right up a hill.		

PIN414

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Site ID

Technician Martin Valvur

Site Visit Date 05/08/2019

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		
Major highway, airport or rail yard	2 km		
Secondary road, heavily traveled	500 m		
Secondary road, lightly traveled	200 m		\checkmark
Feedlot operations	500 m		
Intensive agricultural ops (including aerial spraying)	500 m		\checkmark
Limited agricultural operations	200 m		\checkmark
Large parking lot	200 m		
Small parking lot	100 m		
Tree line	50 m		
Obstacles to wind	10 times obstacle height		

Siting Distances OK

Siting Criteria Comment

Site ID PIN414 Technician Martin Valvur Site Visit Date 05/08/2019 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	002
 Are wind speed and direction sensors sted 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) 	
(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? 🗹 N/A	
8 Is the rain gauge plumb?	
 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?	
11 Is it inclined approximately 30 degrees? N/A 	

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Site	e ID	PIN414	Technician	Martin Valvur		Site Visit Date	05/08/2019]
1		e meterological senso n, and well maintaine		intact, in good				
2	Are all t reportin	he meteorological sen g data?	sors operationa	l online, and	✓			
3	Are the	shields for the temper	ature and RH s	ensors clean?	✓			
4	Are the	aspirated motors wor	king?		✓			
5	Is the so scratche	lar radiation sensor's s?	lens clean and f	free of	✓	N/A		
6	Is the su	rface wetness sensor g	grid clean and u	ndamaged?	✓	N/A		
7		sensor signal and pow n, and well maintaine		, in good		Signs of wear		
8		sensor signal and pow elements and well ma		tions protected	✓			
		1.1*4*114*		1 / 1 *0				

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

The temperature sensor signal cable is deteriorating.

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Sit	e ID PIN414 Technician Martin Valvur		Site Visit Date 05/08/2019
	Siting Criteria: Are the pollutant analyzers and deposition e	quipı	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 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	✓	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?		
8	Are there moisture traps in the sample lines?		
9	Is there a rotometer in the dry deposition filter line, and is it clean?	✓	Clean and dry

Fi	Field Systems Data Form					F-02058-1500-S6-rev002				
Site	e ID	PIN414	Technician	Martin Valvur		Site Visit Da	ate 05/08/2019	9		
	DAS, se	ensor translators, and j	peripheral equi	pment operation	<u>15 ai</u>	<u>ıd maintenance</u>				
1		DAS instruments appe intained?	ear to be in good	l condition and						
2		the components of the , backup, etc)	DAS operation	al? (printers,	✓					
3		analyzer and sensor signs of the sensor signs and sensor signs are sensor signs and sensor signs are sensor signs and sensor signs are sensor sensor signs are se		through	✓	Met sensors only	у			
4		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 ground	DAS, sensor translato ed?	ors, and shelter	properly	✓					
7	Does th	e instrument shelter h	ave a stable pov	ver source?	✓					
8	Is the in	nstrument shelter temp	oerature contro	lled?						
9	Is the n	net tower stable and gr	ounded?			Stable ✓		Grounded		
10	Is the sa	ample tower stable and	l grounded?							
11	Tower	comments?								

Fie	eld Sy	stems Data	Fo	rm					F-02	058-	-1500-	-S7-rev00	2
Site	e ID	PIN414		Tec	hnician	Martin Valvu	r	Site Visit Date	05/08/2019				
D	ocument	ation											
D	oes the s	ite have the requir	ed in	strun	ient and	equipment n	nanuals?						
			Yes	No				-	Yes	No	N/A		
Win	d speed s	sensor]	D	ata logg	er					
Win	d directi	on sensor				D	ata logg	er			\checkmark		
Tem	peraturo	e sensor		✓		S	trip char	rt recorder					
Rela	ative hun	nidity sensor]	C	Computer	r		\checkmark			
Sola	r radiati	on sensor]	N	lodem			\checkmark			
Surf	face wetn	ess sensor				Р	rinter				\checkmark		
Win	d sensor	translator				Z	ero air p	oump					
Tem	perature	e translator				F	ilter flow	v pump					
Hun	nidity sei	isor translator]	S	urge pro	otector			\checkmark		
Sola	r radiati	on translator]	U	PS				\checkmark		
Тір	oing bucl	ket rain gauge		\checkmark]	L	ightning	protection device			\checkmark		
Ozo	ne analy:	zer	✓]	S	helter he	eater		\checkmark			
Filte	er pack fl	ow controller		\checkmark]	S	helter ai	r conditioner	\checkmark				
Filte	er pack M	IFC power supply		\checkmark									
	Does the	site have the requi	ired a	and m	lost rece	nt QC docun	nents and	d report forms?					
			Pres	sent					Currer	ıt			
Stat	ion Log			✓	DataVie	ew2			\checkmark				
SSR	F								\checkmark				
Site	Ops Ma	nual			Jan 200)6			\checkmark				
HAS	SP												
Field	d Ops M	anual											
Cali	bration l	Reports		\checkmark									
Ozo	ne z/s/p (Control Charts											
Prev	ventive m	aintenance schedu	le										
1	Is the st	ation log properly	comp	oleted	during	every site vis	it? ☑	Dataview checklists					
2	Are the current	Site Status Report ?	Form	ns be	ing comj	oleted and	F	Flow section only					
3		chain-of-custody fo transfer to and from			erly used	d to documen	it 🗹						
4	Are ozo current	ne z/s/p control cha ?	arts p	orope	rly comp	leted and		Control charts not u	sed				
		additional explana an-made, that may) regarding condit	ions listed a	bove,	or any ot	her features,	

PIN414 Site Visit Date 05/08/2019 Site ID Technician Martin Valvur Site operation procedures Trained by previous operator, ARS provides updates 1 Has the site operator attended a formal CASTNET training semiannually 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? ✓ 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
Multipoint Calibrations
Visual Inspections
Translator Zero/Span Tests (climatronics)
Manual Rain Gauge Test

Test Surface Wetness Response

Confirm Reasonableness of Current Values

	Frequency	Compliant
\checkmark	Semiannually	\checkmark
\checkmark	Weekly	\checkmark
\checkmark	Weekly	\checkmark
\checkmark	Monthly	\checkmark
✓	Weekly	\checkmark
	N/A	\checkmark

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

V V

OC	Check	Perform	ned
χv	Check		neu

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	
Semiannually	
Daily	
Every 2 weeks	
Daily	
As needed	
Alarm values only	
Every 2 weeks	
N/A	
Weekly	
Weekly	

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

✓	Datalogger only

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

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

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mpliant

Site ID PIN414 Technician Martin Valvur Site Visit Date 05/08/2019				
Site operation procedures				
1 Is the filter pack being changed every Tuesday as scheduled? ✓ Filter changed mornings 90%				
2 Are the Site Status Report Forms being completed and filed ✓ correctly?				
3 Are data downloads and backups being performed as scheduled?				
4 Are general observations being made and recorded? How? ✓ SSRF and dataview checklists				
5 Are site supplies on-hand and replenished in a timely fashion?				
6 Are sample flow rates recorded? How?	SSRF			
7 Are samples sent to the lab on a regular schedule in a timely fashion?				
8 Are filters protected from contamination during handling and shipping? How?				
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 Weekly				
Filter Pack Inspection				
Flow Rate Setting Checks				
Visual Check of Flow Rate Rotometer 🔽 Weekly				
In-line Filter Inspection/Replacement 🗹 As needed				
Sample Line Check for Dirt/Water Veekly				

PIN414

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Techn

Technician Martin Valvur

Site Visit Date 05/08/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	8460 elitebook	CNU13607G	none
DAS	Environmental Sys Corp	8816	2615	90612
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	0000158	none
Flow Rate	Alicat	Unknown	Unknown	none
Infrastructure	Infrastructure	none	none	none
Modem	Hughesnet	Unknown	Unknown	none
Ozone	ThermoElectron Inc	49C	49c-74530376	90765
Ozone Standard	ThermoElectron Inc	49C	0425208055	none
Sample Tower	Aluma Tower	B	AT-5381-F9-3	928348
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature Translator	Climatronics	100088-2	397	none
Temperature2meter	Climatronics	100093	missing	none

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
YOS	404-Martin	n Valvur-05/13/2019				
1	5/13/2019	DAS	Environmental Sys Corp	90645	8816	2558
2	5/13/2019	Elevation	Elevation	None	1	None
3	5/13/2019	Filter pack flow pump	Thomas	none	107CAB18	081700057763
4	5/13/2019	Flow Rate	Alicat	none	Unknown	150929
5	5/13/2019	Infrastructure	Infrastructure	none	none	none
6	5/13/2019	Met tower	unknown	none	unknown	none
7	5/13/2019	Modem	Sierra wireless	none	unknown	LA82610183001005
8	5/13/2019	Ozone	ThermoElectron Inc	90763	49C	49C-74534-376
9	5/13/2019	Ozone Standard	ThermoElectron Inc	90524	49C	49C-58308-318
10	5/13/2019	Sample Tower	Aluma Tower	none	В	none
11	5/13/2019	Shelter Temperature	ARS	none	none	none
12	5/13/2019	Siting Criteria	Siting Criteria	None	1	None
13	5/13/2019	Temperature2meter	RM Young	none	41342	18748
14	5/13/2019	Zero air pump	Werther International	none	PC70/4	531397

DAS Data Form

DAS Time Max Error: 0.92

Mfg	Serial Nu	mber Site	Т	echnician	Site Visit Date	Parameter	Use Desc.
Environmental S	Sys 2558	YOS	404	Martin Valvur	05/13/2019	DAS	Primary
Das Date:	5 /13/2019	Audit Date	5 /13/2019	Mfg	HY	Parameter	DAS
Das Time: Das Day:	08:12:45 133	Audit Time Audit Day	08:11:50 133	Serial Number	12010039329	Tfer Desc.	Source generator (D
Low Channel:		High Channel	:	Tfer ID	01322		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0001	0.0003	0.0001	0.0003	Cert Date	6/15/201	4 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	1/25/201	9 CorrCoff	1.00000
Channel	Input D	OVM Output	DAS Output	InputUnit	OutputUnit	Difference	
2	0.0000	0.0001	0.0003	V	V	0.0002	
2	0.1000	0.0998	0.0999	V	V	0.0001	
2	0.3000	0.2998	0.2995	i V	V	-0.0003	
2	0.5000	0.5000	0.4998	V	V	-0.0002	
2	0.7000	0.7000	0.6999	V	V	-0.0001	
2	0.9000	0.8998	0.8997	V V	V	-0.0001	
2	1.0000	0.9999	0.9999) V	V	0.0000	

Flow Data Form

Mfg	Serial Num	ıber Tag	Site	Te	Technician S		it Date	Param	neter	Owner ID
Alicat	150929		YOS404	Ma	artin Valvur	05/13/2	019	Flow R	ate	none
					Mfg	BIOS		Р	arameter Flo	ow Rate
					Serial Number	122974		Т	fer Desc. Bl	OS 220-H
					Tfer ID	01416				
					Slope		1.00178	B Inte	ercept	0.00161
					Cert Date		7/13/2018	B Cor	rrCoff	1.00000
DAS 1:		DAS 2:		l	Cal Factor Z	lero		-0.03	34	
A Avg % Diff:	A Max % Dif	A Avg %	Diff A Max	x % Dif	Cal Factor F	ull Scale			5	
0.14%	0.23%				Rotometer R	eading:		3	9.3	
Desc.	Test type	Input l/m	n Input Corr	MfcDisp.	. OutputSignal	Output S	SE Inpu	tUnit	OutputSignal	II PctDifference
primary	pump off	0.000	0.000	0.05	0.0000	0.06	1/	m	l/m	
primary	leak check	0.000	0.000	0.02	0.0000	0.03	1/	m	l/m	
primary	test pt 1	3.007	3.000	3.01	0.0000	2.99	1/	'n	l/m	-0.23%
primary	test pt 2	2.998	2.990	3.01	0.0000	3.00	1/	'n	l/m	0.17%
primary	test pt 3	3.009	3.000	3.01	0.0000	3.00	1/	'n	l/m	-0.03%
Sensor Com	<mark>ponent</mark> Leak Tes	t		Conditio	ondition			Status pass		
Sensor Com	ponent Tubing C	ondition		Conditio	on Good			Status	pass	
Sensor Com	ponent Filter Pos	ition		Conditio	on Good			Status	s pass	
Sensor Com	ponent Rotomete	er Conditio	n	Conditio	on Clean and dry			Status	s pass	
Sensor Com	ponent Moisture	Present		Conditio	on No moisture p	resent		Status	pass	
Sensor Component Filter Distance				Conditio	ition 3.0 cm			Status	pass	
Sensor Component Filter Depth				Conditio	ion 1.0 cm			Status	pass	
Sensor Component Filter Azimuth					ion 280 deg			Status pass		
Sensor Com	ponent System M	/lemo		Conditio	on			Status	s pass	

Ozone Data Form

Mfg	:	Serial Number	r Tag Site		Technician	Site Visit Date	Parameter	Owner ID	
ThermoElec	ctron Inc	49C-74534-37	6 YOS404	1	Martin Valvur	05/13/2019	Ozone	90763	
Slope: Intercept CorrCoff:	Intercept -0.42535 Intercept 0.00000		0.0000	Mfg Serial Number Tfer ID	ThermoElectror 49CPS-70008-3 01110		er ozone c. Ozone primary stan		
		ax % Dif A	AS 2: Avg %Diff A	Max % Dif	Slope Cert Date	1.001		0.00666	
0.	0%	0.0%			Cert Date	10/30/20	to correon	1.00000	
UseDescr prima prima	ry	ConcGroup 1 2	Tfer Raw -0.03 15.05	Tfer Cor -0.03 15.02	r Site 0.18 14.42	Site Unit ppb ppb	RelPerDif	AbsDif 0.21 -0.6	
prima prima	ry	<u>3</u> 4	<u>35.02</u> 65.02	34.96 64.91	34.53 65.34	ppb ppb ppb	-1.24 0.66	-0.0	
prima	ry	5	112.35	112.17	113.40	ppb	1.09		
Sensor C	omponen	t Sample Train	า	Cond	lition Good		Status pass		
Sensor C	omponer	t 22.5 degree	rule	Cond	lition		Status pass		
Sensor C	omponen	t Inlet Filter Co	ondition	Cond	lition Clean		Status pass		
Sensor C	omponen	t Battery Back	up	Cond	lition N/A		Status pass		
Sensor C	omponen	t Offset		Cond	lition 0.3		Status pass		
Sensor C	omponer	<mark>it</mark> Span		Cond	lition 0.994		Status pass		
Sensor C	omponen	t Zero Voltage	•	Cond	lition 0.0008		Status pass		
Sensor C	omponer	t Fullscale Vol	tage	Cond	lition 1.0003		Status pass		
Sensor C	omponer	t Cell A Freq.		Cond	lition 85.8 kHz		Status pass		
Sensor C	omponer	t Cell A Noise		Cond	lition 0.4 ppb		Status pass		
Sensor C	omponer	t Cell A Flow		Cond	lition 0.62 lpm		Status pass		
Sensor C	omponer	t Cell A Press	ure	Cond	lition 619.4 mmHg		Status pass		
Sensor C	omponer	t Cell A Tmp.		Cond	lition 33.2 C		Status pass		
Sensor C	omponer	t Cell B Freq.		Cond	lition 76.4 kHz		Status pass		
Sensor Component Cell B Noise			Cond	lition 0.6 ppb		Status pass			
Sensor Component Cell B Flow			Cond	lition 0.62 lpm		Status pass			
Sensor C	omponer	t Cell B Press	ure	Cond	lition 618.9 mmHg		Status pass		
Sensor C	omponer	t Cell B Tmp.		Conc	lition N/A		Status pass		
Sensor Component Line Loss			Conc	lition Not tested		Status pass			
Sensor C	omponer	t System Mem	10	Cond	lition		Status pass		

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number	r Tag Site	Т	Fechnician		Site Vis	it Date	Paramete	er	Owner ID
RM Young	18748	YOS404	ſ	Martin Va	alvur	05/13/2	019	Temperati	ure2meter	none
					Number	Fluke 3275143 01229	3		meter Tem Desc. RTD	
DAS 1: DAS 2: Abs Avg Err Abs Max Err Abs Avg Err Abs Max		os Max Err	Slope		0.99989 Interco 1/23/2019 CorrC		•			
0.15	0.24									
UseDescription	Test type	InputTmpRaw	InputTmpCo	orrected	OutputTm	pSignal	OutputS	ignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.22		0.23		0.0000		-0.01	С	-0.24
primary	Temp Mid Range	23.59		23.60		0.0000		23.52	С	-0.08
primary	Temp High Rang	46.64		46.65		0.0000		46.53	С	-0.12
Sensor Compo	nent Properly Site	d	Condi	tion Prop	perly sited	Status pass				
Sensor Compo	nent Shield		Condi	tion Clea	an			Status pa	ass	
Sensor Component Blower			Condi	Condition Functioning			Status pass			
Sensor Component Blower Status Switch			Condi	Condition N/A			Status pass			
Sensor Compo	nent System Mem	10	Condi	Condition				Status pass		

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	YOS404	Martin Valvur	05/13/2019	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter She	Iter Temperature
Abs Avg Err Ab	s Max Err Abs Avg 2.31	Err Abs Max Err	Serial Number	3275143	Tfer Desc. RTD)
·, ·			Tfer ID	01229		
			Slope	0.9998	9 Intercept	-0.00649
			Cert Date	1/23/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	21.80	21.81	0.000	23.1	С	1.31
primary	Temp Mid Range	21.90	21.91	0.000	23.1	С	1.21
primary	Temp Mid Range	21.50	21.51	0.000	23.8	С	2.31
Sensor Component System Memo			Condition	Status pas			

Infrastructure Data For

Site ID	YOS404	Technician Martin V	alvur Site Visit Date 05/13/2019
Shelter	Make	Shelter Model	Shelter Size
Ekto		8812 (s/n 3515-2)	768 cuft
10 Jacob Roberts			

Sensor Component Sample	e Tower Type	Condition	Туре В	Status	pass
Sensor Component Condui	t	Condition	Good	Status	pass
Sensor Component Met To	wer	Condition	Good	Status	pass
Sensor Component Moistur	re Trap	Condition	Installed	Status	pass
Sensor Component Power	Cables	Condition	Good	Status	pass
Sensor Component Shelter	Temp Control	Condition	Functioning	Status	pass
Sensor Component Rotome	eter	Condition	Installed	Status	pass
Sensor Component Sample	e 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	Poor	Status	Fail
Sensor Component Shelter	Floor	Condition	Good	Status	pass
Sensor Component Signal	Cable	Condition	Good	Status	pass
Sensor Component Tubing	Туре	Condition	3/8 teflon	Status	pass
Sensor Component Sample	e Train	Condition	Good	Status	pass

Field Systems Comments

1 Parameter: ShelterCleanNotes

The site is neat, clean, and well organized. The shelter roof is leaking and is currently covered with a tarp.

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Site ID YOS404	Technician Martin Valvur	Site Visit Date 05/1	3/2019
Site Sponsor (agency)	NPS	USGS Map	El Capitan
Operating Group	NPS	Map Scale	
AQS #	06-043-0003	Map Date	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, CO, NOx, IMPROVE	QAPP Latitude	37.7133
Deposition Measurement	dry	QAPP Longitude	-119.7061
Land Use	mountain top, woodland - evergreen	QAPP Elevation Meters	1605
Terrain	complex	QAPP Declination	
Conforms to MLM	Marginally	QAPP Declination Date	
Site Telephone	(209) 372-4411	Audit Latitude	37.713251
Site Address 1	Turtleback Dome	Audit Longitude	-119.706196
Site Address 2		Audit Elevation	1599
County	Mariposa	Audit Declination	13.5
City, State	Yosemite National Park, CA	Present	
Zip Code	95389	Fire Extinguisher	Not present
Time Zone	Pacific	First Aid Kit	
Primary Operator		Safety Glasses	Not present
Primary Op. Phone #		Safety Hard Hat	Not present
Primary Op. E-mail		Climbing Belt	
Backup Operator		Security Fence	
Backup Op. Phone #		Secure Shelter	
Backup Op. E-mail		Stable Entry Steps	
Shelter Working Room	Make Ekto Mo	odel 8812 (s/n 3515-2)	Shelter Size 768 cuft
Shelter Clean	Notes The site is neat, clean, and we tarp.	ll organized. The shelter roof is	s leaking and is currently covered with a
Site OK	Notes		
	Mariposa take route 140 into Yosemite. F		
appro	arough the tunnel. Approximately one mile ximately 1/2 mile past the gate to the com ards on the path behind the station.		

YOS404

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Site ID

Technician Martin Valvur

Site Visit Date 05/13/2019

Potential Interferent	Minimum Distance From Measurement	Distance	Pass =
	Apparatus		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

Fie	eld Sy	stems Data Fo	orm				F-0205	58-15	500-S3	-rev002
Site	e ID	YOS404	Technician	Martin Valvur		Site Visit Date 05	5/13/2019			
1		d speed and direction fluenced by obstructio		as to avoid	✓	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 plu	mb?		✓	N/A				
4		temperature shields p diated heat sources su		positioned to	✓					
5	conditio surface	perature and RH sens ns? (i.e. ground below and not steeply sloped s water should be avoi	sensors should . Ridges, hollov	be natural		N/A				
6	Is the so	lar radiation sensor p	lumb?			N/A				
7	Is it site	d to avoid shading, or	any artificial o	r reflected light?	✓	N/A				
8	Is the ra	in gauge plumb?			✓	N/A				
9	Is it site towers,	d to avoid sheltering e etc?	ffects from bui	dings, trees,	✓	N/A				
10	Is the su facing n	rface wetness sensor s orth?	sited with the g	rid surface		N/A				
11	Is it inc	lined approximately 3	0 degrees?			N/A				

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Sit	e ID	YOS404	Technician	Martin Valvur		Site Visit Date	05/13/2019]
1	condition	e meterological senso 1, and well maintained	1?					
2	2 Are all the meteorological sensors operational online, and reporting data?							
3	3 Are the shields for the temperature and RH sensors clean?							
4	Are the aspirated motors working?							
5	Is the sol scratches	ar radiation sensor's s?	lens clean and f	ree of	✓	N/A		
6	Is the su	rface wetness sensor g	grid clean and u	ndamaged?	✓	N/A		
7		ensor signal and pow 1, and well maintained		, in good				
8		ensor signal and pow elements and well ma		tions protected				

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-85-rev002
Sit	e ID	YOS404	Technician M	artin Valvur		Site Visit Date 05/13/2019
	<u>Siting C</u>	riteria: Are the pollut	ant analyzers and	deposition equ	<u>iipn</u>	pment sited in accordance with 40 CFR 58, Appendix E
1		ample inlets have at lo cted airflow?	east a 270 degree a	arc of		
2	Are the	sample inlets 3 - 15 m	eters above the gr	ound?	✓	
3		sample inlets > 1 meten neters from trees?	er from any major	• obstruction,	✓	
	<u>Pollutan</u>	t analyzers and depos	sition equipment o	perations and	mai	aintenance
1		nalyzers and equipme n and well maintained		ı good	✓	
2	Are the reportin	analyzers and monito g data?	rs operational, on	-line, and	✓	
3	Describe	e ozone sample tube.				1/4 teflon by 10 meters
4	Describe	e dry dep sample tube	•			3/8 teflon by 10 meters
5		ine filters used in the o location)	ozone sample line?	? (if yes	✓	At inlet only
6	Are sam obstruct	ple lines clean, free of tions?	f kinks, moisture,	and	✓	
7	Is the ze	ro air supply desiccar	nt unsaturated?		✓	
8	Are then	re moisture traps in th	e sample lines?		✓	
9	Is there clean?	a rotometer in the dry	y deposition filter	line, and is it		Clean and dry

Field Systems Data Form							F-0 2	2058-15	00-S6-rev002
Site	e ID	YOS404	Technician	Martin Valvur		Site Visit Dat	te 05/13/201	9	
	DAS, se	nsor translators, and j	peripheral equi	pment operation	<u>ns ai</u>	nd maintenance			
1		DAS instruments appe intained?	ar to be in good	l condition and					
2		he components of the backup, etc)	DAS operation	al? (printers,	✓				
3		nalyzer and sensor sig g protection circuitry		through	✓	Met sensors only			
4		signal connections pro intained?	otected from the	e weather and	✓				
5	Are the	signal leads connected	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	oerature contro	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?							

Fiel	ld Sy	stems Data	Fo	rm					F-02	2058-	-1500-8	57-rev002
Site I	ID	YOS404		Tecl	hnician	Martin Valvur		Site Visit Date	5/13/2019)		
De		ation										
	cument					•	1.0					
Do	es the si	te have the require					<u>uals?</u>			NT		
Wind	speed s		Yes	No			logge	r	Yes	No	N/A	
	•	on sensor					logge					
	oerature		✓					recorder			\checkmark	
-		idity sensor				Com				\checkmark		
		on sensor				Mode	-			\checkmark		
Surfa	ce wetn	ess sensor				Print	er					
Wind	sensor	translator				Zero	air pu	ımp		\checkmark		
Temp	oerature	translator					-	pump		\checkmark		
-		sor translator					e prot					
	-	on translator				UPS	•				\checkmark	
Тіррі	ng buck	et rain gauge			\checkmark	Light	ning _l	protection device				
Ozon	e analyz	er	✓			Shelt	er hea	iter		\checkmark		
Filter	pack fl	ow controller	✓			Shelt	er air	conditioner		\checkmark		
Filter	pack M	IFC power supply			\checkmark							
D	oes the	site have the requi	red a	and m	<u>ost recen</u>	it QC document	s and	report forms?				
_		-		sent					Curre	ent		
Statio	on Log			\checkmark	DataVie	w2			\checkmark			
SSRF				\checkmark					\checkmark			
Site C)ps Man	ual		✓	Jan 200	6			\checkmark			
HASI	P											
Field	Ops Ma	nual										
Calib	ration F	Reports		\checkmark								
Ozon	e z/s/p C	Control Charts										
Preve	entive m	aintenance schedu	le									
1 I	ls the sta	ation log properly of	comj	pleted	during e	every site visit?	✓ Date	ataview				
	Are the scurrent?	Site Status Report	Fori	ns bei	ng comp	leted and	✓ FI	ow section only				
		chain-of-custody fo ransfer to and from			erly used	to document						
	Are ozoi current?	ne z/s/p control cha	rts p	oroper	ly compl	leted and		ontrol charts not use	ed			
		additional explanation an-made, that may						regarding conditio	ns listed	above,	or any othe	er features,
1												

Site ID YOS404 Technician Martin Valvur Site Visit Date 05/13/2019 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	Compliant
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	N/A	\checkmark
Test Surface Wetness Response	\checkmark	N/A	\checkmark

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

QC Check Performed		Frequency	Compliant					
Multi-point Calibrations	\checkmark	Semiannually						
Automatic Zero/Span Tests	\checkmark	Daily	\checkmark					
Manual Zero/Span Tests			\checkmark					
Automatic Precision Level Tests	\checkmark	Daily	\checkmark					
Manual Precision Level Test								
Analyzer Diagnostics Tests	\checkmark	Alarm values only						
In-line Filter Replacement (at inlet)	\checkmark	Monthly	\checkmark					
In-line Filter Replacement (at analyze		N/A	\checkmark					
Sample Line Check for Dirt/Water	\checkmark	Weekly	\checkmark					
Zero Air Desiccant Check	\checkmark	Weekly	\checkmark					
1 Do multi-point calibration gases go through the complete								

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

3	Are the	automatic and	manual z/s/p	checks	monitored and	l
	reporte	d? 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:

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Field Systems Data	Form
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Site	ID	YOS404	Technician	Martin Valvur		Site Visit Date	05/13/2019	
	Site ope	eration procedures						
1	Is the fi	lter pack being changed	every Tuesd	ay as scheduled?		Filter changed morn	ings	
2	Are the correct	Site Status Report Form ly?	s being com	pleted and filed		Flow section only		
3	•					No longer required		
4					✓	SSRF, dataview		
5	Are site supplies on-hand and replenished in a timely fashion?							
6	Are sample flow rates recorded? How?					SSRF		
7	Are san fashion	nples sent to the lab on a ?	regular sche	edule in a timely				
8		ers protected from contai pping? How?	mination du	ring handling	✓	Clean gloves on and	loff	
9		site conditions reported ons manager or staff?	regularly to	the field				
QC	Check P	erformed	Fre	quency			Compliant	
N	Iulti-poi	nt MFC Calibrations	✓ Sen	niannually				
F	low Syst	em Leak Checks	✓ Wee	ekly				
	•	k Inspection	✓ Wee	ekly				
		e Setting Checks	✓ Wee	ekly				
		eck of Flow Rate Rotom	eter 🗹 Wee	ekly				
I	1-line Fi	lter Inspection/Replacem	ent 🗹 Mor	nthly				
	Sample Line Check for Dirt/Water							

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

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YOS404

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~ • ·	
Site	ID
Site	IV

Techn

Technician Martin Valvur

Site Visit Date 05/13/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Environmental Sys Corp	8816	2558	90645
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	081700057763	none
Flow Rate	Alicat	Unknown	150929	none
Infrastructure	Infrastructure	none	none	none
Met tower	unknown	unknown	none	none
Modem	Sierra wireless	unknown	LA82610183001005	none
Ozone	ThermoElectron Inc	49C	49C-74534-376	90763
Ozone Standard	ThermoElectron Inc	49C	49C-58308-318	90524
Sample Tower	Aluma Tower	В	none	none
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	18748	none
Zero air pump	Werther International	PC70/4	531397	none

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number				
SEK	SEK430-Martin Valvur-05/14/2019									
1	5/14/2019	Computer	Hewlett Packard	none	6560 b	5CB1520H7P				
2	5/14/2019	DAS	Environmental Sys Corp	90649	8816	2562				
3	5/14/2019	Elevation	Elevation	None	1	None				
4	5/14/2019	Filter pack flow pump	Thomas	none	107CAB18	120000014367				
5	5/14/2019	flow rate	Tylan	03384	FC280AV	AW9403014				
6	5/14/2019	Infrastructure	Infrastructure	none	none	none				
7	5/14/2019	Met tower	Aluma Tower	none	В	none				
8	5/14/2019	MFC power supply	Tylan	03679	RO-32	FP9403015				
9	5/14/2019	Modem	US Robotics	none	56k	unknown				
10	5/14/2019	Ozone	ThermoElectron Inc	90715	49C	49C-66829-354				
11	5/14/2019	Ozone Standard	ThermoElectron Inc	90752	49C	49C-74532-376				
12	5/14/2019	Shelter Temperature	ARS	none	none	none				
13	5/14/2019	Shield (2 meter)	RM Young	none	Aspirated 43408	none				
14	5/14/2019	Siting Criteria	Siting Criteria	None	1	None				
15	5/14/2019	Temperature Translator	RM Young	00819	41406-X	063143				
16	5/14/2019	Temperature2meter	RM Young	none	41342	8472				
17	5/14/2019	Zero air pump	Werther International	none	C 70/4	000838301				

DAS Data Form

DAS Time Max Error: 1.9

Mfg	Serial Nur	mber Site	Т	echnician	Site Visit Date	Parameter	Use Desc.
Environmental S	Sys 2562	SEK	(430	Martin Valvur	05/14/2019	DAS	Primary
	5 /14/2019	Audit Date	5 /14/2019	Mfg	HY	Parameter	DAS
Das Time: Das Day:	09:00:54 134	Audit Time Audit Day	08:59:00 134	Serial Number	12010039329	Tfer Desc.	Source generator (D
Low Channel:		High Channel		Tfer ID	01322]	
0	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0003	0.0008	0.0003	0.0008	Cert Date	6/15/201	4 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	1/25/201	9 CorrCoff	1.00000
Channel	Input D'	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
12	0.0000	-0.0004	-0.0004	V	V	0.0000	
12	0.1000	0.0995	0.0995	S V	V	0.0000	
12	0.3000	0.3000	0.3002	2 V	V	0.0002	
12	0.5000	0.4995	0.5001	V	V	0.0006	
12	0.7000	0.6999	0.7002	V	V	0.0003	
12	0.9000	0.9008	0.9012		V	0.0004	
12	1.0000	1.0003	1.0011	V	V	0.0008	

Flow Data Form

Mfg	Se	erial Nun	nber Tag S	Site	Tee	Technician		t Date Pa	rameter	Owner ID	
Tylan	A	W940301	4	SEK430	Ма	artin Valvur	05/14/20)19 flov	v rate	03384	
Mfg	Tylan					Mfg	Mfg BIOS		Parameter	low Rate	
SN/Owner ID	FP94	03015	03679			Serial Number	122974		Tfer Desc.	3IOS 220-H	
Parameter:	MFC	power sup	oply			Tfer ID	01416				
						Slope		1.00178	Intercept	0.00161	
						Cert Date	7	/13/2018	CorrCoff	1.00000	
DAS 1:			DAS 2:		L	Cal Factor Z	ero		0.099		
A Avg % Diff:	A Max	x % Dif	A Avg %	Diff A Max	: % Dif	Cal Factor F	ull Scale		5.53		
1.23%		1.44%				Rotometer R	eading:		3.1		
Desc.	Te	st type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S	E InputUr	nit OutputSign	all PctDifference	
primary	pump	off	0.000	0.000	-0.07	0.0000	0.05	l/m	l/m		
primary	leak c	heck	0.000	0.000	-0.07	0.0000	0.05	l/m	l/m		
primary	test p	t 1	3.050	3.040	2.48	0.0000	3.01	l/m	l/m	-1.12%	
primary	test pt		3.060	3.050	2.48	0.0000	3.01	l/m	l/m	-1.44%	
primary	test p	t 3	3.050	3.040	2.48	0.0000	3.01	l/m	l/m	-1.12%	
Sensor Comp	onent	Leak Tes	t		Conditio	on		St	Status pass		
Sensor Comp	onent	Tubing C	ondition		Conditio	Good		St	Status pass		
Sensor Comp	onent	Filter Pos	sition		Conditio	n Poor		St	atus fail		
Sensor Comp	onent	Rotomete	er Conditior	ı	Conditio	Clean and dry		St	atus pass		
Sensor Comp	onent	Moisture	Present		Conditio	n No moisture p	resent	St	atus pass		
Sensor Comp	onent	Filter Dist	tance		Conditio	n 5.0 cm		St	Status pass		
Sensor Comp	onent	Filter Dep	oth		Conditio	n -1.5 cm		St	Status fail		
Sensor Comp	onent	Filter Aziı	muth		Conditio	n 315 deg		St	Status pass		
Sensor Comp	onent	System N	lemo		Conditio	on		St	atus pass		

Ozone Data Form

Mfg		Serial Numbe	r Tag Site		Те	chnician	Site Visit Date	Parame	eter	Owner ID
ThermoElect	ron Inc	49C-66829-35	4 SEK430)	Ma	artin Valvur	05/14/2019	Ozone		90715
Slope: [Intercept [CorrCoff: [ercept 0.10304 Intercept 0.00000		0.00000		Mfg Serial Number Tfer ID	ThermoElectron 49CPS-70008-3 01110			ozone Ozone primary stan	
DAS 1: A Avg % Di 0.0		DA 1ax % Dif A A 0.0%	AS 2: Avg %Diff A	Max % D	if	Slope Cert Date	1.001		-	0.00666
UseDescrip primar primar primar primar primar	y y y y	ConcGroup 1 2 3 4 5	Tfer Raw 0.11 14.48 36.34 65.64 110.38	Tfer C 0.10 14.4 36.2 65.5 110.2) 5 7 3	Site 0.46 13.86 34.99 62.75 106.30	Site Unit ppb ppb ppb ppb ppb	RelPer	Dif -3.59 -4.33 -3.6	AbsDif 0.36 -0.59
Sensor Co	ompone	<mark>nt</mark> Sample Trai	n	Co	nditio	on Good		Status	pass	
				Co		tion Status pass tion Clean Status pass				
Sensor Component Battery Backup			Co	nditio	on N/A		Status	pass		
Sensor Co	ompone	nt Offset		Co	nditio	on -0.1		Status	pass	
Sensor Co	mpone	<mark>nt</mark> Span		Co	nditio	on 0.982		Status	pass	
Sensor Co	mpone	<mark>nt</mark> Zero Voltage	;	Co	nditio	dition -0.0007			pass	
Sensor Co	ompone	nt Fullscale Vo	ltage	Co	nditio	on 0.9997	Status	pass		
Sensor Co	mpone	nt Cell A Freq.		Co	nditio	on 90.1 kHz		Status pass		
Sensor Co	mpone	nt Cell A Noise		Co	nditio	0.7 ppb		Status	pass	
	-	nt Cell A Flow		Co	nditio	0.73 lpm		Status	L	
	-	nt Cell A Press	ure			on 706.0 mmHg		Status		
		nt Cell A Tmp.		Co	nditio	on 34.6 C		Status	pass	
Sensor Co	ompone	nt Cell B Freq.				on 92.0 kHz		Status		
Sensor Co	mpone	nt Cell B Noise		Co	nditio	on 0.5 ppb		Status	pass	
Sensor Component Cell B Flow					on 0.73 lpm		Status			
		nt Cell B Press	ure	Co	nditio	on 705.4 mmHg		Status	pass	
	•	nt Cell B Tmp.				on N/A		Status		
	•	nt Line Loss							pass	
	•	nt System Men	10		nditio			Status	L	
	1								L	

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Numbe	er Tag Site	T	Technician		Site Vis	it Date	Paramete	r	Owner ID
RM Young	8472	SEK430		Martin Valvur		05/14/2	019	Temperati	ure2meter	none
Mfg	RM Young			Mfg	Mfg Fluke			Para	meter Tem	perature
SN/Owner ID	063143	63143 00819		Serial	Number	3275143	3	Tfer	Desc. RTD	
Parameter:	Temperature Tran	Temperature Translator		Tfer I	D	01229]		
DAS 1:	D	AS 2:		Slope			0.99989	Interco	ept	-0.00649
	Abs Max Err A		os Max Err	Cert I	Date		1/23/2019	CorrC	off	1.00000
0.23	0.37									
UseDescription	Test type	InputTmpRaw	InputTmpCo	orrected	OutputTm	pSignal	OutputSi	ignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.21		0.22		0.0000	-0.04		С	-0.26
primary	Temp Mid Range	22.65		22.66		0.0000	22.59		С	-0.07
primary	Temp High Rang	46.82		46.83		0.0000	46.46		С	-0.37
Sensor Comp	onent Properly Site	ed	Condi	tion Prop	perly sited			Status pa	ass	
Sensor Comp	onent Shield		Condi	tion Clea	an			Status pa	ass	
Sensor Component Blower			Condi	tion Fun	ctioning			Status pa	ass	
Sensor Component Blower Status Switch			Condi	Condition N/A Status pass						
Sensor Comp	onent System Mer	no	Condi	ndition Status pass						

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	SEK430	Martin Valvur	05/14/2019	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter She	Iter Temperature
Abs Avg Err Ab	s Max Err Abs Avg Err Abs Max Err 0.46		Serial Number	3275143	Tfer Desc. RTD)
· ·			Tfer ID	01229		
			Slope	0.9998	9 Intercept	-0.00649
			Cert Date	1/23/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	21.18	21.19	0.000	21.7	С	0.46
primary	Temp Mid Range	22.02	22.03	0.000	22.3	С	0.3
primary	Temp Mid Range	23.10	23.11	0.000	23.2	С	0.12
Sensor Component System Memo			Condition	Status pass			

Infrastructure Data For

Site ID	SEK430	Technician	Martin Valvur	Site Visit Date	05/14/2019
Shelter N	lake	Shelter Model	1	Shelter Size	
Alan pre-f	ab	s/n 861166 1808	3	512 cuft	
				1995 2015 XS 2019 VI (1997 XS 2019 XS 2	

Sensor Component Sample Tower Type	Condition	Туре В	Status	pass
Sensor Component Conduit	Condition	Good	Status	pass
Sensor Component Met Tower	Condition	N/A	Status	pass
Sensor Component Moisture Trap	Condition	Installed	Status	pass
Sensor Component Power Cables	Condition	Good	Status	pass
Sensor Component 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	Good	Status	pass
Sensor Component Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component Sample Train	Condition	Good	Status	pass

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Site ID SEK430	Technician Martin Valvur	Site Visit Date 05/14	4/2019				
		USCE Mar	Case Mountain				
Site Sponsor (agency)	NPS	USGS Map					
Operating Group	NPS	Map Scale					
AQS #	06-107-0009	Map Date					
Meteorological Type	R.M. Young						
Air Pollutant Analyzer	Ozone, IMPROVE, BAM	QAPP Latitude					
Deposition Measurement	dry	QAPP Longitude					
Land Use	woodland - mixed	QAPP Elevation Meters					
Terrain	complex	QAPP Declination					
Conforms to MLM	Marginally	QAPP Declination Date					
Site Telephone		Audit Latitude	36.489469				
Site Address 1	Southern Sierra Research Center	Audit Longitude	-118.829153				
Site Address 2	Highway 198	Audit Elevation	510				
County	Tulare	Audit Declination	13.1				
City, State	Sequoia National Park, CA	Present					
Zip Code	93262	Fire Extinguisher Inspected May 2015					
Time Zone	Pacific	First Aid Kit					
Primary Operator		Safety Glasses					
Primary Op. Phone #		Safety Hard Hat					
Primary Op. E-mail		Climbing Belt					
Backup Operator		Security Fence					
Backup Op. Phone #		Secure Shelter					
Backup Op. E-mail		Stable Entry Steps ✓					
Shelter Working Room	Make Alan pre-fab M	odel s/n 861166 1808	Shelter Size 512 cuft				
Shelter Clean	Notes The shelter is aging but is in fa	ir condition and kept clean, nea	it, and well organized.				
Site OK	Notes						
Driving Directions From highway 99 take 198 east through Three Rivers. Continue approximately 7 miles to the entrance to Sequoia National Park. Less than one mile past the Fee both, take the first paved road to the right at the Southern Sierra Research Center. The site is on the hill behind the center.							

SEK430

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Site ID

Technician Martin Valvur

Site Visit Date 05/14/2019

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

Siting Distances OK

Siting Criteria Comment

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

Fi	eld Systems Data Form		F-02058-1500-S3-rev002				
Site	e ID SEK430 Technician Martin Valvur		Site Visit Date 05/14/2019				
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)		Ν/Α				
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?		2 meter temperature shield pointing south				
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas o 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 ligh	t? ⊻	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				

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Site	e ID	SEK430	Technician	Martin Valvur		Site Visit Date 05/14/2019
1	condition	e meterological senso 1, and well maintained he meteorological sens	d?		>	
3	reporting	<u> </u>	-			
4	4 Are the aspirated motors working?]
5	5 Is the solar radiation sensor's lens clean and free of scratches?					N/A
6	5 Is the surface wetness sensor grid clean and undamaged?					N/A
7	7 Are the sensor signal and power cables intact, in good condition, and well maintained?					Signs of wear
8		ensor signal and pow elements and well ma		tions protected		

F1	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev002				
Site	e ID	SEK430	Technician	Martin Valvur		Site Visit Date 05/14/2019				
	<u>Siting C</u>	riteria: Are the pollut	ant analyzers a	nd deposition eq	uipr	nent sited in accordance with 40 CFR 58, Appendix E				
1		ample inlets have at le cted airflow?	ast a 270 degre	e arc of	✓					
2	Are the sample inlets 3 - 15 meters above the ground?									
3		sample inlets > 1 mete neters from trees?	r from any maj	jor obstruction,		Trees within 10 meters				
	Pollutant analyzers and deposition equipment operations and maintenance									
1	Do the analyzers and equipment appear to be in good condition and well maintained?									
2	Are the analyzers and monitors operational, on-line, and reporting data?									
3	Describe	e ozone sample tube.				1/4 teflon by 16 meters				
4	Describe	e dry dep sample tube.				3/8 teflon by 15 meters				
5		ine filters used in the o location)	zone sample lir	ne? (if yes		At inlet only				
6	Are sam obstruct	ple lines clean, free of tions?	kinks, moistur	e, and	✓					
7	Is the ze	ro air supply desiccan	t unsaturated?		✓					
8	Are then	re moisture traps in th	e 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:

The filter pack sample tubing has been spliced with tygon tubing about 5 meters above the ground. The tygon tubing is brown and beginning to deteriorate.

Fi	eld Sy	vstems Data Fo	orm			F-02058-1500-S6-rev002				
Site	e ID	SEK430	Technician	Martin Valvur		Site Visit	t Date 05/14/201	9		
	DAS, se	ensor translators, and g	peripheral equi	<u>pment operatio</u>	<u>ns ar</u>	id maintenar	<u>ice</u>			
1		DAS instruments appe intained?	ar to be in good	l condition and	✓					
2		the components of the , backup, etc)	DAS operation	al? (printers,	✓					
3		analyzer and sensor sig g protection circuitry?		through						
4		signal connections pro intained?	otected from the	e weather and	✓					
5	Are the	signal leads connected	to the correct	DAS channel?	✓					
6	Are the ground	DAS, sensor translato ed?	rs, and shelter	properly		The shelter g	round may not be	adequate		
7	Does th	e instrument shelter ha	ave a stable pov	ver source?						
8	Is the ir	nstrument shelter temp	erature control	lled?	\checkmark					
9	Is the m	net tower stable and gr	ounded?			Stable		Grounded		
10	Is the sa	ample tower stable and	l grounded?							
11	Tower	comments?					sors are mounted		e tower.	

Fie	eld Sy	stems Data	Foi	rm					F-02	058-	1500-S7-rev00	2
Site	ID	SEK430		Tecl	nnician	Martin Valv	ur	Site Visit Date	05/14/2019			
D	Documentation Does the site have the required instrument and equipment manuals? ind speed sensor W Data logger ind direction sensor W Data logger ind direction sensor W Data logger ind direction sensor W Data logger W ind direction sensor W Data logger W ind vector sensor W Data logger W iatro humidity sensor W Computer W iatro humidity sensor W Printer W W ind sensor translator W Y Zero air pump W W ind sensor translator W UPS W W Imata logger W Imata logger ind translator W UPS W W Imata logger Imata logger Imata logger <											
		SEK430 Technician Martin Valvur Site Visit Date 05/14/2019 ation te have the required instrument and equipment manuals? ensor Yes No in sensor Yes No idity sensor Yes id										
_									Yes	No	N/A	
Win	d speed s			_			Data logge	r				
Win	d directio	on sensor			\checkmark		Data logge	r			\checkmark	
Tem	perature	sensor		\checkmark			Strip chart	recorder			\checkmark	
Rela	tive hum	idity sensor			\checkmark		Computer			\checkmark		
Sola	r radiatio	on sensor			\checkmark		Modem			\checkmark		
Surf	ace wetn	ess sensor			\checkmark		Printer				\checkmark	
Win	d sensor	translator			\checkmark		Zero air pı	ımp				
Tem	perature	translator			\checkmark		Filter flow	pump				
Hum	nidity sen	sor translator			\checkmark		Surge prot	ector			\checkmark	
Sola	r radiatio	on translator			\checkmark		UPS				\checkmark	
Tipp	ing buck	et rain gauge			\checkmark		Lightning	protection device			\checkmark	
Ozoi	ne analyz	ær	✓				Shelter hea	ater		\checkmark		
Filte	r pack fl	ow controller		\checkmark			Shelter air	conditioner	\checkmark			
Filte	r pack M	IFC power supply		\checkmark								
]	Does the	site have the requi	ired a	nd m	ost rece	<u>nt QC docu</u>	ments and	<u>report forms?</u>				
			Pres	ent					Currer	it		
Stati	ion Log		[✓	DataVie	ew2			\checkmark			
SSR	F		[✓					\checkmark			
Site	Ops Man	nual	[✓	Jan 200)6			\checkmark			
HAS	SP		[
Field	l Ops Ma	nual	[
Calil	bration F	Reports	[✓								
Ozoi	ne z/s/p C	Control Charts	[
Prev	entive m	aintenance schedu	le [
1	Is the sta	ation log properly	comp	leted	during	every site v	isit? 🔽 D	ataview				
2	Are the scurrent?	· · · · · · · · · · · · · · · · · · ·	Forn	ns bei	ng comp	pleted and	∨ S:	SRFs are reviewe	d before sen	ding		
3					erly used	d to docume	ent 🔽					
4	Are ozor current?		arts p	roper	ly comp	leted and		ontrol charts not u	sed			
		additional explana an-made, that may						regarding condit	ions listed a	bove, c	or any other features,	

SEK430 Technician Martin Valvur Site Visit Date 05/14/2019 Site ID Site operation procedures Trained by previous operator 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	Compliant
Multipoint Calibrations	\checkmark	Semiannually	\checkmark
Visual Inspections	\checkmark	Weekly	\checkmark
Translator Zero/Span Tests (climatronics)		N/A	\checkmark
Manual Rain Gauge Test	\checkmark	N/A	\checkmark
Confirm Reasonableness of Current Values	\checkmark	N/A	\checkmark
Test Surface Wetness Response	\checkmark	N/A	\checkmark

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

00	Check	Performed
VU.	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	Со
Semiannually	
Daily	
Daily	
As needed	
Alarm values only	
Every 2 weeks	
N/A	
Weekly	
Weekly	

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

✓	Unknown
✓	
✓	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

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Sit	e ID	SEK430	Technician	Martin Valvur		Site Visit Date	05/14/2019			
	<u>Site oper</u>	ration procedures								
1	Is the fil	ter pack being change	d every Tuesda	y as scheduled?	✓	Filter changed morin	ings			
2 Are the Site Status Report Forms being completed and filed correctly?						Flow and observation sections only				
3	Are data schedule	downloads and backt d?	ups being perfo	ormed as		No longer required				
4	Are gene	eral observations being	g made and rec	orded? How?		SSRF				
5	Are site fashion?	supplies on-hand and	replenished in	a timely	✓					
6	Are sam	ple flow rates recorded	d? How?		✓	SSRF				
7	Are sam fashion?	ples sent to the lab on	a regular schee	dule in a timely	✓					
8		rs protected from cont ping? How?	tamination dur	ing handling	✓	Clean gloves on and	l off			
9		site conditions reporte ns manager or staff?	d regularly to t	the field						
QC	Check Pe	erformed	Freq	luency			Compliant			
I	Multi-poin	t MFC Calibrations	✓ Sem	iannually						
I	Flow Syste	em Leak Checks	✓ Wee	kly						
I	Filter Pacl	Inspection								
1	Flow Rate	Setting Checks	✓ Wee	kly						
	visual Cho	eck of Flow Rate Roto	meter 🗹 Wee	kly						
1	n-line Filt	ter Inspection/Replace	ment 🗹 As n	eeded						
5	Sample Li	ne Check for Dirt/Wat	ter 🗹 Wee	kly						

SEK430

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Site ID

Tech

Technician Martin Valvur

Site Visit Date 05/14/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB1520H7P	none
DAS	Environmental Sys Corp	8816	2562	90649
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	120000014367	none
flow rate	Tylan	FC280AV	AW9403014	03384
Infrastructure	Infrastructure	none	none	none
Met tower	Aluma Tower	В	none	none
MFC power supply	Tylan	RO-32	FP9403015	03679
Modem	US Robotics	56k	unknown	none
Ozone	ThermoElectron Inc	49C	49C-66829-354	90715
Ozone Standard	ThermoElectron Inc	49C	49C-74532-376	90752
Shelter Temperature	ARS	none	none	none
Shield (2 meter)	RM Young	Aspirated 43408	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature Translator	RM Young	41406-X	063143	00819
Temperature2meter	RM Young	41342	8472	none
Zero air pump	Werther International	C 70/4	000838301	none

Site Inventory by Site Visit

Site V	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number					
ROM4	ROM406-Martin Valvur-06/06/2019										
1	6/6/2019	Computer	Hewlett Packard	none	6730b	USH01700BR					
2	6/6/2019	DAS	Environmental Sys Corp	90535	8816	2025					
3	6/6/2019	Elevation	Elevation	None	1	None					
4	6/6/2019	flow rate	Tylan	03393	FC280AV	AW9403024					
5	6/6/2019	Infrastructure	Infrastructure	none	none	none					
6	6/6/2019	Met tower	Rohn	none	unknown	none					
7	6/6/2019	MFC power supply	Tylan	none	RO-32	illegible					
8	6/6/2019	Ozone	ThermoElectron Inc	none	49i A3NAA	0733726103					
9	6/6/2019	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460008					
10	6/6/2019	Sample Tower	Aluma Tower	illegible	В	none					
11	6/6/2019	Shelter Temperature	ARS	none	unknown	051					
12	6/6/2019	Shield (2 meter)	RM Young	none	unknown	none					
13	6/6/2019	Siting Criteria	Siting Criteria	None	1	None					
14	6/6/2019	Temperature2meter	RM Young	none	41342	17079					
15	6/6/2019	Zero air pump	Werther International	none	PC70/4	585590					

DAS Time Max Error:

1.00000

1/25/2019 CorrCoff

Intercept

0

0.00000

1.00000

DAS Data Form

Mfg	Serial Nun	nber Site	r	Fechnician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2025	ROM	1406	Martin Valvur	06/06/2019	DAS	Primary
	/6 /2019	Audit Date	6 /6 /2019	Mfg	HY	Parameter	DAS
Das Time: Das Day:)8:24:00 157	Audit Time Audit Day	08:25:15 157	Serial Number	12010039329	Tfer Desc.	Source generator (D
Low Channel:		High Channel:	:	Tfer ID	01322		
8	ax Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0000	0.0000	0.0000	0.0000	Cert Date	6/15/201	4 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740243	Tfer Desc.	DVM
				Tfer ID	01312		

Slope

Cert Date

Flow Data Form

Mfg	S	erial Nun	nber Tag S	Site	Te	chnician	Site Visit	Date Paran	neter	Owner ID
Tylan	A	W940302	24	ROM406	Ma	artin Valvur	06/06/20	19 flow ra	ite	03393
Mfg Tylan				Mfg	BIOS	I	Parameter Flo	ow Rate		
SN/Owner ID	illegib	le	none			Serial Number	122974	1	fer Desc. Bl	OS 220-H
Parameter:						Tfer ID	01416			
						Slope		1.00178 Int	ercept	0.00161
						Cert Date	7.	/13/2018 Co	rrCoff	1.00000
DAS 1:			DAS 2:			Cal Factor Z	ero	0.0	66	
A Avg % Diff:	A Ma	x % Dif	A Avg %l	Diff A Max	x % Dif	Cal Factor F	ull Scale	5.4	65	
1.67%		2.00%				Rotometer R	eading:	;	3.7	
Desc.	Те	st type	Input l/m	Input Corr	MfcDisp.	. OutputSignal	Output S	E InputUnit	OutputSignal	I PctDifference
primary	pump	off	0.000	0.000	-0.06	0.0000	0.08	l/m	l/m	
primary	leak o	check	0.000	0.000	-0.05	0.0000	0.09	l/m	l/m	
primary	test p	t 1	3.010	3.000	3.02	0.0000	2.94	l/m	l/m	-2.00%
primary	test p	t 2	3.010	3.000	3.02	0.0000	2.94	l/m	l/m	-2.00%
primary	test p	t 3	3.010	3.000	3.02	0.0000	2.97	l/m	l/m	-1.00%
Sensor Comp	onent	Leak Tes	st		Conditio	on		Statu	s pass	
Sensor Comp	onent	Tubing C	ondition		Conditio	Condition Good			s pass	
Sensor Comp	onent	Filter Pos	sition		Conditio	on Good		Statu	s pass	
Sensor Comp	onent	Rotomete	er Condition	1	Conditio	on Clean and dry		Status pa		
Sensor Comp	onent	Moisture	Present		Conditio	on No moisture p	resent	Statu	s pass	
Sensor Component Filter Distance		Conditio	Condition 5.0 cm		Status		s pass			
Sensor Comp	onent	Filter Dep	oth		Conditio	on 1.5 cm		Statu	s pass	
Sensor Comp	onent	Filter Azi	muth		Conditio	on 180 deg	Statu	s pass		
Sensor Comp	onent	System N	/lemo		Conditio	on		Statu	s pass	

Ozone Data Form

Mfg		Serial Numbe	r Tag Site	,	Technic	ian	Site Visit Date	Parameter	Owner ID
ThermoElec	tron Inc	0733726103	ROM40	06	Martin \	/alvur	06/06/2019	Ozone	none
Slope: Intercept CorrCoff:	ntercept -1.15458 Intercept 0.00000		Mfg Seri Tfer	al Number	ThermoElectron 49CPS-70008-3 01110		eter ozone		
_	Diff: A N	DA 1ax % Dif A 2 0.0%	AS 2: Avg %Diff A	Max % Dif	Slop Cert	e t Date	1.001	*	
UseDescri primar primar primar primar	ry ry ry ry	ConcGroup 1 2 3 4	Tfer Raw 0.08 14.75 38.10 65.50	Tfer Cor 0.07 14.72 38.03 65.39	r	Site -0.93 12.86 35.82 62.74	Site Unit ppb ppb ppb ppb	RelPerDif -5.9 -4.1	14
primar Sensor C		5 nt Sample Train	111.29 n	111.11 Cond	lition G	106.80 ood	ppb	-3.9 Status pase	
Sensor C	ompone	nt 22.5 degree	rule	Cond	lition			Status pass	s
	-	nt Inlet Filter C			lition CI	ean		Status pas	
Sensor C	ompone	nt Battery Back	up		lition N/			Status pase	S
Sensor C	ompone	nt Offset		Cond	lition -0	.2		Status pase	S
Sensor C	ompone	nt Span		Cond	lition 0.	990		Status pas	S
Sensor C	ompone	nt Zero Voltage	;		ndition -0.0007			Status pas	s
Sensor C	ompone	nt Fullscale Vo	ltage		lition 0.9995			Status pas	s
Sensor C	ompone	nt Cell A Freq.			L	30.8 kHz		Status pas	s
	•	nt Cell A Noise			lition 2.			Status pas	
	-	nt Cell A Flow			lition 0.			Status pas	
		nt Cell A Press	ure			10.5 mmHg		Status pas	
	•	nt Cell A Tmp.			lition 40			Status pas	
	-	nt Cell B Freq.			lition 82			Status pas	
	-	nt Cell B Noise			lition 2.			Status pass	
				lition 0.			Status pas		
Sensor Component Cell B Pressure					39.9 mmHg		Status pas		
	•	nt Cell B Tmp.			lition N/			Status pas	
Sensor Component Line Loss					ot tested		Status pase		
	-	nt System Men	10	Cond				Status pas	
Sensor C	ompone								-

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number	Tag Site	Т	Technician		Site Vis	it Date	Paramete	er	Owner ID
RM Young	17079	ROM406	I	Martin Valv		06/06/2	019	Temperati	ure2meter	none
				Mfg		Fluke		Para	meter Tem	perature
				Serial	Number	3275143	3	Tfer	Desc. RTD	
				Tfer I	D	01229]		
DAS 1:	DA	S 2:		Slope			0.99989	Interco	ept	-0.00649
Abs Avg Err A	bs Max Err Ab	s Avg Err Ab	s Max Err	Cert I	Date		1/23/2019	9 CorrC	off	1.00000
0.22	0.33									
UseDescription	Test type	InputTmpRaw	InputTmpCo	orrected	OutputTm	pSignal	OutputS	ignalEng	OSE Unit	Difference
primary	Femp Low Rang	0.14		0.15		0.0000		0.23	С	0.08
primary	Гетр Mid Range	23.43		23.44		0.0000		23.77	С	0.33
primary	Гетр High Rang	48.70		48.71		0.0000		48.96	С	0.25
Sensor Compor	ent Properly Sited	d	Condi	Condition Properly sited			Status pass			
Sensor Compor	ent Shield		Condi	tion Clea	an			Status pa	ass	
Sensor Compor	ent Blower		Condi	tion Fun	ctioning			Status pa	ass	
Sensor Compor	ent Blower Status	s Switch	Condi	tion N/A				Status pa	ass	
Sensor Compor	tent System Mem	0	Condi	tion				Status pa	ass	

Shelter Temperature Data For

Mfg	Serial Number Ta	g Site		Technician	Site Visit Date	Parameter	Owner ID
ARS	051	RON	M406	Martin Valvur	06/06/2019	Shelter Temperature	none
DAS 1:	DAS 2			Mfg	Fluke	Parameter She	Iter Temperature
Abs Avg ErrAb2.00	2.98	g Err	Abs Max Err	Serial Number	3275143	Tfer Desc. RTD)
				Tfer ID	01229		
				Slope	0.9998	9 Intercept	-0.00649
				Cert Date	1/23/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	21.91	21.92	0.000	24.9	С	2.98
primary	Temp Mid Range	22.69	22.70	0.000	24.4	С	1.74
primary	Temp Mid Range	23.30	23.31	0.000	24.6	С	1.27
Sensor Cor	nponent System Memo)	Condition	Status pass			

Infrastructure Data For

Site ID	ROM406	Technician Martin V	alvur Site Visit Date 06/06/2019
Shelter	Make	Shelter Model	Shelter Size
Ekto		8814 (s/n 3062-1)	896 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	Good	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.	Hazaro	Problem
DAS Some of the DAS chann	ROM406 els are damaged	Martin Valvur and not functioning	06/06/2019 . Sensors are be	System Memo eing measured on w	Environmental S vorking channels.	2025		

Field Systems Comments

1 Parameter: DasComments

Only RH, temperature, and AMoN are mounted on the meteorological tower at approximately 2 meters.

2 Parameter: ShelterCleanNotes

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

3 Parameter: MetSensorComme

The recorded temperature is being measured at 2.5 meters above the ground and < 1 foot above the AMoN enclosure and facing south.

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Site ID ROM406	Technician Martin Valvur	Site Visit Date 06/0	6/2019				
Site Sponsor (agency)	NPS	USGS Map	Longs Peak				
Operating Group	NPS	Map Scale					
AQS #	08-069-0007	Map Date					
Meteorological Type	R.M. Young						
Air Pollutant Analyzer	Ozone, IMPROVE	QAPP Latitude	40.2778				
Deposition Measurement	dry	QAPP Longitude	-105.5453				
Land Use	woodland - mixed	QAPP Elevation Meters	2743				
Terrain	complex	QAPP Declination					
Conforms to MLM	Marginally	QAPP Declination Date					
Site Telephone	(970) 586-8520	Audit Latitude	40.278129				
Site Address 1	High Peak Camp	Audit Longitude	-105.545635				
Site Address 2	Route 7	Audit Elevation	2742				
County	Larimer	Audit Declination	9.0				
City, State	Estes Park, CO	Present					
Zip Code	80517	Fire Extinguisher 🗹	Inspected June 2013				
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 Steps					
Shelter Working Room	Make Ekto Mo	odel 8814 (s/n 3062-1)	Shelter Size 896 cuft				
Shelter Clean	Notes The shelter is clean, neat, orga	nized, and well maintained.					
Site OK	Notes						
Driving Directions From Estes Park take route 7 south approximately 8.5 miles. Turn right onto Preservation Road (dirt road) at the sign for High Peak Camp operated by the Salvation Army. The site is approximately 100 meters on the left.							

ROM406

F-02058-1500-S2-rev002

Site ID

Technician Martin Valvur

Site Visit Date 06/06/2019

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

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S3-rev002				
Site	te ID ROM406 Technician Martin Valvur		Martin Valvur		Site Visit Date 06/06/2019					
1		d speed and direction fluenced by obstructio		as to avoid	✓	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)				e tower or on a		N/A				
3						✓ N/A				
4	4 Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?					South				
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 p	lumb?		✓	N/A				
7	Is it site	d to avoid shading, or	any artificial o	r reflected light?	▶ ✓ N/A					
8	Is the ra	in gauge plumb?			✓	N/A				
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?				✓	N/A				
10	Is the su facing n	rface wetness sensor s orth?	sited with the g	rid surface	✓	N/A				
11	Is it inc	lined approximately 3	0 degrees?		✓	N/A				

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

The recorded temperature is being measured at 2.5 meters above the ground and < 1 foot above the AMoN enclosure and facing south.

F-02058-1500-S4-rev002

Site	e ID	ROM406	Technician	Martin Valvur		Site Visit Date	06/06/2019	
 Do all the meterological sensors appear to be intact, in good condition, and well maintained? Are all the meteorological sensors operational online, and reporting data? Are the shields for the temperature and RH sensors clean? Are the aspirated motors working? 								
5					 	N/A		
0	scratches							
6	Is the surface wetness sensor grid clean and undamaged?				\checkmark	N/A		
7		sensor signal and pow 1, and well maintained		, in good	✓			
8		ensor signal and pow elements and well ma		tions protected	✓			

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Sit	e ID ROM406 Technician Martin Valvur		Site Visit Date 06/06/2019
	Siting Criteria: Are the pollutant analyzers and deposition ed	quipr	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 10 meters
4	Describe dry dep sample tube.		3/8 teflon by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)		At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?		
7	Is the zero air supply desiccant unsaturated?	✓	
8	Are there moisture traps in the sample lines?	✓	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	✓	Clean and dry

Field Systems Data Form							F-02	058-15	00-S6-rev002	
Site	e ID	ROM406	Technician	Martin Valvur		Site Visit	Date 06	/06/2019		
	DAS, se	nsor translators, and g	eripheral equi	pment operation	<u>ns and</u>	maintenan	<u>ice</u>			
1		DAS instruments appeant appeant appeart ap	ar to be in good	l condition and						
2		he components of the backup, etc)	DAS operation	al? (printers,						
3		nalyzer and sensor sig g protection circuitry?	· •	through						
4		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	properly						
7	Does the	e instrument shelter ha	ive a stable pov	ver source?						
8	Is the in	strument shelter temp	erature control	lled?						
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?								

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

Only RH, temperature, and AMoN are mounted on the meteorological tower at approximately 2 meters.

Fie	ld Syste	ms Data	Fo	rm					F	-02	058-	1500-	-S7-re	ev002
Site	ID RO	M406		Tech	nician	Martin Valvur		Site Visit Da	<mark>te</mark> 06/06/	2019				
De	ocumentatio	<u>n</u>												
De	oes the site h	ave the require	ed in	strum	ent and	equipment mar	<u>1uals?</u>							
Wind Temj Relat Solar Surfa Wind Temj Hum Solar Tipp Ozon	I speed sense I direction se perature sen tive humidity radiation se ace wetness s I sensor tran perature tran idity sensor radiation tr ing bucket ra- te analyzer r pack flow c	or ensor sor y sensor ensor ensor eslator nslator translator ranslator ain gauge	Yes		N/2 Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	Data Data Strij Con Mod Prin Zero Filte Surg UPS Ligh Shel	iputer lem ter air pu er flow ge proto itning p ter hea	r recorder Imp pump ector protection devi	¥€ □ □ □ □ □ □ □ □ □ □ □ □ □					
Filte	r pack MFC	power supply	✓											
I	Does the site	<u>have the requi</u>	red a	und mo	ost recei	nt QC documen	ts and	<u>report forms?</u>						
			Pres	sent					С	urrer	ıt			
SSRI Site O HAS Field Calik Ozon	Ops Manual P Ops Manua oration Repo te z/s/p Cont	rts rol Charts			DataVie	ew2				 > ><				
Prev	entive maint	enance schedu	le											
1	Is the statior	log properly (comp	oleted	luring o	every site visit?	✔ Da	ataview						
	Are the Site current?	Status Report	Form	ns beir	ıg comp	pleted and	✓ Flo	ow and observa	ation secti	ons				
		n-of-custody fo sfer to and from			rly used	d to document								
	Are ozone z/ current?	s/p control cha	rts p	roper	y comp	leted and		ontrol charts no	t used					
						or sketch if nece ring parameters		regarding conc	ditions lis	ted a	bove, (or any ot	her feat	ires,

Site ID ROM406 Technician Martin Valvur Site Visit Date 06/06/2019 Site operation procedures Trained by previous opertator 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	Compliant
Multipoint Calibrations	\checkmark	N/A	
Visual Inspections	\checkmark	N/A	\checkmark
Translator Zero/Span Tests (climatronics)	\checkmark	N/A	\checkmark
Manual Rain Gauge Test	\checkmark	N/A	\checkmark
Confirm Reasonableness of Current Values	\checkmark	N/A	\checkmark
Test Surface Wetness Response	\checkmark	N/A	\checkmark

✓ \checkmark \checkmark \checkmark

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

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 analyz
Sample Line Check for Dirt/Water
Zero Air Desiccant Check

ent (at inlet)		Every 2 weeks
ent (at analyze	\checkmark	N/A
Dirt/Water	\checkmark	Weekly
ck	\checkmark	Semiannually
ration gases go thro	ugh the	complete 🗸

Frequency

- 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?

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

✓

✓

Dataview

Compliant

Monthly and semiannually	\checkmark
Daily	\checkmark
Every 2 weeks	\checkmark
Daily	\checkmark
	\checkmark
	\checkmark
Every 2 weeks	\checkmark
N/A	\checkmark
Weekly	\checkmark

L.

F-02058-1500-S8-rev002

Field Systems Data Form F-02058-1500-S9-rev002 ROM406 Technician Martin Valvur Site Visit Date 06/06/2019 Site ID Site operation procedures Is the filter pack being changed every Tuesday as scheduled? Filter changed mornings 1 Are the Site Status Report Forms being completed and filed 2 correctly? no longer required 3 Are data downloads and backups being performed as 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 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? **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 Semiannually \checkmark **In-line Filter Inspection/Replacement** \checkmark ✓ Weekly

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

Sample Line Check for Dirt/Water

ROM406

F-02058-1500-S10-rev002

Techr

Technician Martin Valvur

Site Visit Date 06/06/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6730b	USH01700BR	none
DAS	Environmental Sys Corp	8816	2025	90535
Elevation	Elevation	1	None	None
flow rate	Tylan	FC280AV	AW9403024	03393
Infrastructure	Infrastructure	none	none	none
Met tower	Rohn	unknown	none	none
MFC power supply	Tylan	RO-32	illegible	none
Ozone	ThermoElectron Inc	49i A3NAA	0733726103	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	CM08460008	none
Sample Tower	Aluma Tower	В	none	illegible
Shelter Temperature	ARS	unknown	051	none
Shield (2 meter)	RM Young	unknown	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	17079	none
Zero air pump	Werther International	PC70/4	585590	none

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
RO	M206-Marti	n Valvur-06/11/2019				
1	6/11/2019	Computer	Dell	07068	Inspiron 15	Unknown
2	6/11/2019	DAS	Campbell	000405	CR3000	2522
3	6/11/2019	Dilution system	Teledyne	000790	T700U	110
4	6/11/2019	Elevation	Elevation	None	1	None
5	6/11/2019	Filter pack flow pump	Thomas	04986	107CA18	040400022185
6	6/11/2019	Flow Rate	Арех	000598	AXMC105LPMDPCV	unknown
7	6/11/2019	Infrastructure	Infrastructure	none	none	none
8	6/11/2019	Modem	Raven	06477	H4222-C	0808311292
9	6/11/2019	Noy	Teledyne	000798	T200U	103
10	6/11/2019	Ozone	ThermoElectron Inc	000676	49i A1NAA	1030244794
11	6/11/2019	Ozone Standard	ThermoElectron Inc	000514	49i A3NAA	0922236892
12	6/11/2019	Sample Tower	Aluma Tower	000810	С	Unknowm
13	6/11/2019	Shelter Temperature	Campbell	none	107-L	none
14	6/11/2019	Siting Criteria	Siting Criteria	None	1	None
15	6/11/2019	Temperature	RM Young	06309	41342	12534
16	6/11/2019	Zero air pump	Werther International	06917	PC70/4	000829166
17	6/11/2019	Zero air system	Teledyne	000777	701H	607

DAS Data Form

1.0000

0.9997

7

DAS Time Max Error:

0

-0.0002

V

Mfg	Serial Nu	umber Site	Т	echnician	Site Visit Date	Parameter	Use Desc.
Campbell	2522	ROM	206	Martin Valvur	06/11/2019	DAS	Primary
Das Date: Das Time: Das Day: Das Day: Das Day: Day: Low Channel:	6 /11/2019 13:16:00 162	Audit Date Audit Time Audit Day High Channel:	6 /11/2019 13:16:00 162	Mfg Serial Number Tfer ID	HY 12010039329 01322	Parameter Tfer Desc.	DAS Source generator (D
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0002	0.000	5 0.0002	0.0005	Cert Date	6/15/201	4 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	1/25/201	9 CorrCoff	1.00000
Channel	Input I	OVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.0002	-0.0005	V	V	-0.0003	
7	0.1000	0.1000	0.0999	V	V	-0.0001	
7	0.3000	0.2997	0.2997		V	0.0000	
7	0.5000	0.4999	0.4997		V	-0.0002	
7	0.7000	0.7002	0.6997		V	-0.0005	
7	0.9000	0.9000	0.8997	V V	V	-0.0003	

0.9995

V

Flow Data Form

Mfg	Serial Num	iber Tag	Site	Те	chnician	Site Visit Dat		Paran	ieter	Owner ID
Apex	unknown		ROM206	Ma	artin Valvur	06/11/2	2019	Flow R	ate	000598
					Mfg	BIOS		P	arameter Flo	w Rate
					Serial Number	122974		Т	fer Desc. BIC)S 220-H
					Tfer ID	01416				
					Slope		1.0017	'8 Int	ercept	0.00161
					Cert Date		7/13/201	8 Co	rrCoff	1.00000
DAS 1:		DAS 2:		L	Cal Factor Z	lero			0	
A Avg % Diff:	A Max % Dif	A Avg %	Diff A Max	x % Dif	Cal Factor F	ull Scale			0	
1.32%	1.32%				Rotometer R	eading:		3.	85	
Desc.	Test type	Input l/m	n Input Corr	MfcDisp.	OutputSignal	Output S	S E Inp	utUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.01]	/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.00]	/m	l/m	
primary	test pt 1	3.050	3.040	3.07	0.000	3.00]	/m	l/m	-1.32%
primary	test pt 2	3.050	3.040	3.07	0.000	3.00]	/m	l/m	-1.32%
primary	test pt 3	3.052	3.040	3.07	0.000	3.00]	/m	l/m	-1.32%
Sensor Comp	oonent Leak Tes	t		Conditio)n			Statu	s pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good			Statu	s pass	
Sensor Comp	oonent Filter Pos	ition		Conditio	n Good			Statu	s pass	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	Clean and dry			Statu	s pass	
Sensor Comp	oonent Moisture	Present		Conditio	n No moisture p	resent		Statu	s pass	
Sensor Comp	oonent Filter Dist	ance		Conditio	ion 4.5 cm			Status pass		
Sensor Comp	oonent Filter Dep	oth		Conditio	n 1.0 cm			Status pass		
Sensor Comp	oonent Filter Azir	muth		Conditio	<mark>on</mark> 225 deg			Status pass		
Sensor Com	oonent System M	lemo		Conditio	on 🗌			Statu	s pass	

Ozone Data Form

Mfg	Serial Numbe	r Tag Site	Т	echnician	Site Visit Date	Parameter	Owner ID
ThermoElectron In	c 1030244794	ROM20	6 N	lartin Valvur	06/11/2019	Ozone	000676
Slope: Intercept CorrCoff:	1.00644 Slop -0.90695 Inter 0.99996 Corr	cept ().00000).00000).00000	Mfg Serial Number Tfer ID	ThermoElectron 49CPS-70008-3 01110		er ozone Ozone primary stan
DAS 1:		AS 2:	M 0/ D.C	Slope	1.001	51 Intercept	0.00666
A Avg % Diff: A 0.0%	Max % Dif A 0.0%	Avg %Diff A	Max % Dif	Cert Date	10/30/20	18 CorrCoff	1.00000
UseDescription primary primary primary primary primary	ConcGroup 1 2 3 4 5	Tfer Raw 0.17 14.98 36.96 63.87 116.38	Tfer Corr 0.16 14.95 36.89 63.76 116.19	Site -0.23 13.94 35.69 63.31 116.20	Site Unit ppb ppb ppb ppb ppb	RelPerDif -3.31 -0.71 0.01	AbsDif -0.39 -1.01
Sensor Compor	tent Sample Trai	n	Condit	ion Good		Status pass	
Sensor Compor	ent 22.5 degree	rule	Condit	ion		Status pass	
Sensor Compor	ent Inlet Filter C	ondition	Condit	ion Clean		Status pass	
Sensor Compor	ent Battery Back	up	Condit	ion N/A		Status pass	
Sensor Compor	ent Offset		Condit	ion 0.1		Status pass	
Sensor Compor	tent Span		Condit	ion 1.006		Status pass	
Sensor Compor	ent Zero Voltage	;	Condit	ion N/A		Status pass	
Sensor Compor	rent Fullscale Vo	ltage	Condit	ion N/A		Status pass	
Sensor Compor	ent Cell A Freq.		Condit	ion 90.8 kHz		Status pass	
Sensor Compor	tent Cell A Noise		Condit	ion 0.7 ppb		Status pass	
Sensor Compor			Condit	ion 0.51 lpm		Status pass	
	tent Cell A Press	ure		ion 521.2 mmHg		Status pass	
Sensor Compor				ion 33.0 C		Status pass	
Sensor Compor				ion 102.7 kHz		Status pass	
Sensor Compor				ion 0.6 ppb		Status pass	
Sensor Compor				ion 0.52 lpm		Status pass	
	tent Cell B Press	ure		ion 520.9 mmHg		Status pass	
Sensor Compor				ion N/A		Status pass	
Sensor Compor				ion Not tested			
	ient System Men	10	Condit			Status pass Status pass	
Sensor Compon						Status pass	

Temperature Data Form

Mfg	Serial Number	Tag Site	Т	Technician S		Site V	isit Date	isit Date Parame		Owner ID	
RM Young	12534	ROM206	Ν	Martin	Valvur	06/11	/2019	Temper	ature	06309	
				Mfg FI		Fluke		Pa	rameter Te	mperature	
				Ser	ial Number	32751	43	Tf	er Desc. R	D	
				Tfer ID		01229					
DAS 1: DAS 2:				Slo	ре	0.99989 Intercept		rcept	-0.00649		
Abs Avg Err Abs Max Err Abs Avg Err Abs Ma				x Err Cert Date			1/23/201	9 Cor	rCoff	1.00000	
0.10	0.15										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSignalEng		OSE Unit	Difference	
primary	Temp Low Range	0.04	0.05		0.000		0.0)	С	-0.06	
primary	Temp Mid Range	24.03	24.04		0.000		23.		С	-0.1	
primary	Temp High Range	45.99	46.00		0.000		45.	9	С	-0.15	
Sensor Com	ponent Shield		Condit	tion C	Clean			Status	pass		
Sensor Component Blower			Condit	Condition N/A				Status	s pass		
Sensor Component Blower Status Switch				Condition N/A				Status	s pass		
Sensor Component System Memo				Condition				Status	s pass		

Shelter Temperature Data For

Mfg Serial Number Tag Site T		Technician	Site Visit Date	Parameter	Owner ID	
Campbell	none ROM206		Martin Valvur	06/11/2019	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter She	Iter Temperature
Abs Avg Err Abs 1.00	s Max Err Abs Avg 1.49	Err Abs Max Err	Serial Number	3275143	Tfer Desc. RTD)
			Tfer ID	01229		
			Slope	0.9998	9 Intercept	-0.00649
			Cert Date	1/23/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference	
primary	Temp Mid Range	21.93	21.94	0.000	23.4	С	1.46	
primary	Temp Mid Range	21.45	21.46	0.000	23.0	С	1.49	
primary	Temp Mid Range	24.22	24.23	0.000	24.2	С	-0.04	
Sensor Component System Memo			Condition	Status pass				

Infrastructure Data For

Site ID	ROM206	Technician Martin V	alvur Site Visit Date 06/11/2019
Shelter	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2182-1)	640 cuft

Sensor Component Sample Tower Type	Condition	Туре В	Status	pass
Sensor Component Conduit	Condition	Good	Status	pass
Sensor Component Met Tower	Condition	N/A	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	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 clean, neat, and well organized. There are signs of previous roof leaks, but they have been repaired. The floor and counter top have been replaced.

2 Parameter: MetSensorComme

The temperature sensor has been removed from the met tower and mounted in a naturally aspirated shield on the sample tower, facing south and over the shelter roof.

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Site ID ROM206	Technician Martin Valvur	Site Visit Date 06/1	1/2019						
Site Sponsor (agency)	EPA	USGS Map	Longs Peak						
		Map Scale							
Operating Group	private	-							
AQS #	08-069-9991	Map Date							
Meteorological Type	R.M. Young								
Air Pollutant Analyzer	Ozone, IMPROVE	QAPP Latitude	40.2778						
Deposition Measurement	dry	QAPP Longitude	-105.5453						
Land Use	woodland - mixed	QAPP Elevation Meters	2743						
Terrain	complex	QAPP Declination	10.3						
Conforms to MLM	Marginally	QAPP Declination Date	2/22/2006						
Site Telephone	(970) 586-2598	Audit Latitude	40.278129						
Site Address 1	High Peak Camp	Audit Longitude	-105.545635						
Site Address 2	Route 7	Audit Elevation	2742						
County	Larimer	Audit Declination	9.0						
City, State	Estes Park, CO	Present							
Zip Code	80517	Fire Extinguisher 🔽	New in 2015						
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 Steps ☑							
Shelter Working Room	Make Ekto M	odel 8810 (s/n 2182-1)	Shelter Size 640 cuft						
Shelter Clean	Notes The shelter is clean, neat, and been repaired. The floor and c		ns of previous roof leaks, but they have						
Site OK	Notes	• •							

ROM206

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Site ID

Technician Martin Valvur

Site Visit Date 06/11/2019

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

Fi	eld Sy	stems Data Fo	orm			500-S3	-rev002			
Site	e ID	ROM206	Technician	Martin Valvur		Site Visit Date	06/11/2019]	
1		d speed and direction fluenced by obstructio		as to avoid	✓	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 plu		✓	N/A					
4		temperature shields p diated heat sources su		South						
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 p	lumb?		✓	N/A				
7	Is it site	d to avoid shading, or	any artificial o	r reflected light?	✓	N/A				
8	Is the ra	in gauge plumb?			✓	N/A				
9	Is it site towers,	d to avoid sheltering e etc?	ffects from buil	dings, trees,	✓	N/A				
10	Is the su facing n	rface wetness sensor s orth?	ited with the gr	rid surface	✓	N/A				
11	Is it inc	lined approximately 3	0 degrees?		✓	N/A				

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

The temperature sensor has been removed from the met tower and mounted in a naturally aspirated shield on the sample tower, facing south and over the shelter roof.

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Site	e ID	ROM206	Technician	Martin Valvur		Site Visit Date 06/11/2019
1 2 3	condition Are all th reporting	e meterological sensor 1, and well maintained he meteorological sens g data? shields for the tempera	1?	l online, and		Temperature only Temperature only
4	Are the a	aspirated motors worl	king?		✓	N/A
5	Is the sol scratche	ar radiation sensor's s?	lens clean and f	ree of		N/A
6	Is the su	rface wetness sensor g	grid clean and u	ndamaged?		N/A
7		sensor signal and pow 1, and well maintained		, in good		
8		ensor signal and pow elements and well ma		tions protected		

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Sit	e ID ROM206 Technician Martin Valvur		Site Visit Date 06/11/2019
	Siting Criteria: Are the pollutant analyzers and deposition ed	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 Sy	stems Data Fo	orm			F-02058-1500-S6-rev002			
Site	e ID	ROM206	Technician	Martin Valvur		Site Visit Date	e 06/11/2019	9	
	DAS, sei	<u>isor translators, and j</u>	peripheral equi	pment operation	<u>ns ar</u>	<u>id maintenance</u>			
1	Do the D well mai	AS instruments appe ntained?	ar to be in good	l condition and					
2		he components of the backup, etc)	DAS operation	al? (printers,	✓				
3		nalyzer and sensor sig g protection circuitry?		through		Temperature only			
4		signal connections pro ntained?	otected from the	e weather and	✓				
5	Are the	signal leads connected	to the correct	DAS channel?	✓				
6	Are the grounde	DAS, sensor translato d?	rs, and shelter	properly	✓				
7	Does the	instrument shelter ha	ave a stable pov	ver source?	✓				
8	Is the in	strument shelter temp	perature contro	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 Sy	stems Data	Foi	rm				F-02	058-	1500-	S7-rev	002
Site ID	ROM206		Technic	cian	Martin Valvur	Site Visit Date	06/11/2019				
Document	ation										
Does the s	ite have the requir	ed ins	<u>strument</u>	and	equipment manuals?						
Solar radiati	sensor on sensor e sensor hidity sensor on sensor ess sensor translator e translator hsor translator on translator	Yes □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □			Data loggeData loggeStrip charComputerModemPrinterZero air pFilter flowSurge productsUPS	er t recorder ump pump tector	Yes				
Tipping bucket rain gaugeImage: Image of the sector of the se		✓	Lightning protection device Shelter heater Shelter air conditioner								
Does the	site have the requi	red a		rece	nt QC documents and	l report forms?	Curre	at			

Р	resent		Current
Station Log	\checkmark		\checkmark
SSRF	\checkmark		\checkmark
Site Ops Manual	\checkmark	Feb 2014	\checkmark
HASP	\checkmark	Feb 2014	\checkmark
Field Ops Manual			
Calibration Reports	\checkmark		\checkmark
Ozone z/s/p Control Charts			
Preventive maintenance schedule	\checkmark		\checkmark

1

2

3

4

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

Site	ID	ROM206	Technician	Martin Valvur		Site Visit Date 06/11/2019
1	Has the	<u>ration procedures</u> site operator attende If yes, when and who		TNET training		Trained by previous operator
2		backup operator atte course? If yes, when				Trained by site operator
3	Is the site schedule	e visited regularly on ?	the required T u	ıesday	✓	
4		tandard CASTNET of by the site operator?	• •	cedures being	✓	
5		e operator(s) knowled ired site activities? (in			✓	

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

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

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

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

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

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

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

Unknown
SSRF, logbook, call-in

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

✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓

Compliant

F-02058-1500-S8-rev002

F-02058-1500-S9-rev002 **Field Systems Data Form** ROM206 Technician Martin Valvur Site Visit Date 06/11/2019 Site ID Site operation procedures Is the filter pack being changed every Tuesday as scheduled? Filter changed evenings 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, logbook Are general observations being made and recorded? How? 4 ✓ Are site supplies on-hand and replenished in a timely 5 fashion? SSRF, logbook, call-in Are sample flow rates recorded? How? 6 \checkmark Are samples sent to the lab on a regular schedule in a timely 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** Frequency Compliant Semiannually Multi-point MEC Calibrations

Multi-point MIFC Calibrations		
Flow System Leak Checks	✓ Weekly	\checkmark
Filter Pack Inspection		
Flow Rate Setting Checks	✓ Weekly	
Visual Check of Flow Rate Rotometer	✓ Weekly	
In-line Filter Inspection/Replacement	Semiannually	
Sample Line Check for Dirt/Water	✓ Weekly	\checkmark

ROM206

F-02058-1500-S10-rev002

Site ID

Techn

Technician Martin Valvur

Site Visit Date 06/11/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07068
DAS	Campbell	CR3000	2522	000405
Dilution system	Teledyne	T700U	110	000790
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	040400022185	04986
Flow Rate	Apex	AXMC105LPMDPC	unknown	000598
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4222-C	0808311292	06477
Noy	Teledyne	T200U	103	000798
Ozone	ThermoElectron Inc	49i A1NAA	1030244794	000676
Ozone Standard	ThermoElectron Inc	49i A3NAA	0922236892	000514
Sample Tower	Aluma Tower	С	Unknowm	000810
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	12534	06309
Zero air pump	Werther International	PC70/4	000829166	06917
Zero air system	Teledyne	701H	607	000777

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number		
CNL	CND125-Sandy Grenville-06/14/2019							
1	6/14/2019	Computer	Dell	07015	Inspiron 15	BQ3MC12		
2	6/14/2019	DAS	Campbell	000499	CR3000	3816		
3	6/14/2019	Elevation	Elevation	None	1	None		
4	6/14/2019	Filter pack flow pump	Thomas	01235	107CA18	illegible		
5	6/14/2019	Flow Rate	Арех	000838	AXMC105LPMDPCV	54781		
6	6/14/2019	Infrastructure	Infrastructure	none	none	none		
7	6/14/2019	Modem	Campbell	06346	COM220	1513		
8	6/14/2019	Ozone	ThermoElectron Inc	000692	49i A1NAA	1030244803		
9	6/14/2019	Ozone Standard	ThermoElectron Inc	000376	49i A3NAA	0726124693		
10	6/14/2019	Sample Tower	Aluma Tower	03495	A	none		
11	6/14/2019	Shelter Temperature	Campbell	none	107-L	none		
12	6/14/2019	Siting Criteria	Siting Criteria	None	1	None		
13	6/14/2019	Temperature	RM Young	06402	41342VC	14035		
14	6/14/2019	Zero air pump	Werther International	06868	C 70/4	000814284		

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial N	Number Site	e 7	Fechnician	Site Visit Date	Parameter	Use Desc.
Campbell	3816	CN	ND125	Sandy Grenville	06/14/2019	DAS	Primary
Das Date:	6 /14/2019 19:07:08	Audit Date Audit Time		Mfg	Datel	Parameter	DAS
Das Day:	165	Audit Day	165	Serial Number	4000392	Tfer Desc.	Source generator (D
Low Channel	:	High Chann	el:	Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0001	0.00	0.000	0.0001	Cert Date	1/22/201	5 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	86590148	Tfer Desc.	DVM
				Tfer ID	01310		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/25/201	9 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	0 V	V	0.0000	
7	0.1000	0.1000			V	0.0000	
7	0.3000	0.3003			V	-0.0001	
7	0.5000	0.5002			V	-0.0001	
7	0.7000	0.7002			V	-0.0001	
7	0.9000	0.9003			V	-0.0001	
7	1.0000	1.0001	1.0000	0 V	V	-0.0001	

Flow Data Form

Mfg	Serial Num	ıber Tag	Site	Тес	chnician	hnician Site Visit Date		Param	ieter	Owner ID
Apex	54781		CND125	Sa	ndy Grenville	06/14/2	2019	Flow Rate		000838
					Mfg	BIOS		Parameter		ow Rate
					Serial Number			Tfer Desc.		OS 530-H
					Tfer ID	01414				
									F	
					Slope	0.993		32 Inte	ercept	0.00935
				Cert Date 2/8/			2/8/20	19 Cor	rCoff	0.99999
DAS 1: DAS 2:				L	Cal Factor Z	ero		-0.0)2	
A Avg % Diff:	A Max % Dif	A Avg %	Diff A Max	x % Dif	Cal Factor F	ull Scale		1.(01	
0.22%	0.67%				Rotometer R	eading:		1.5		
Desc.	Test type	Input l/m	n Input Corr	MfcDisp.	OutputSignal	Output S	SE Inp	utUnit	OutputSignal	II PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.02		l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.00		l/m	l/m	
primary	test pt 1	1.504	1.500	1.48	0.000	1.50		l/m		0.00%
primary	test pt 2	1.504	1.500	1.48	0.000	1.50		l/m	l/m	0.00%
primary	test pt 3	1.501	1.500	1.47	0.000	1.49		l/m	l/m	-0.67%
Sensor Com	<mark>ponent</mark> Leak Tes	t		Conditio	ition			Status pass		
Sensor Comj	ponent Tubing C	ondition		Conditio	Good			Status	pass	
Sensor Com	ponent Filter Pos	ition		Conditio	Good			Status	pass	
Sensor Comj	ponent Rotomete	er Conditio	n	Conditio	Clean and dry			Status	pass	
Sensor Comj	ponent Moisture	Present		Conditio	n See comments	3		Status	pass	
Sensor Comj	ponent Filter Dist	tance		Conditio	tion 4.0 cm			Status pass		
Sensor Component Filter Depth			Conditio	on 2.0 cm			Status pass			
Sensor Component Filter Azimuth				Conditio	on 180 deg			Status pass		
Sensor Com	ponent System M	lemo		Conditio	tion			Status pass		

Temperature Data Form

Mfg	Serial Number	Tag Site	1	Technician		Site V	isit Date	Param	eter	Owner ID	
RM Young	14035	CND125		Sandy	Grenville	06/14/	/2019	Temper	ature	06402	
				Mfg		Extech	1	Pa	rameter Te	mperature	
				Serial Number		H2326	H232679 Tf		er Desc. R	D	
				Tfe	er ID	01228					
DAS 1: DAS 2:				Slo	ре	1.00909 Intercept		rcept	-0.11036		
Abs Avg Err Abs Max Err Abs Avg Err Abs Ma			Max Err	x Err Cert Date			2/12/201	9 Cor	rCoff	1.00000	
0.57	1.01			<u> </u>							
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	Signal OutputSignalEng		OSE Unit	Difference	
primary Ten	np Low Range	-0.03	0.08		0.000		0.4	1	С	0.35	
primary Ten	np Mid Range	24.87	24.76	5	0.000		25.	8	С	1.01	
primary Ten	np High Range	48.22	47.89)	0.000		47.	5	С	-0.35	
Sensor Compon	ent Shield		Condi	tion C	Clean			Status	pass		
Sensor Component Blower			Condi	Condition N/A				Status	s pass		
Sensor Component Blower Status Switch				Condition N/A				Status	s pass		
Sensor Compon	ent System Memo		Condi	Condition				Status	tatus pass		

Shelter Temperature Data For

Mfg	Serial Number Tag Site T		Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CND125	Sandy Grenville	06/14/2019	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	Iter Temperature
Abs Avg Err Ab			Serial Number	H232679	Tfer Desc. RTD)
			Tfer ID	01228		
			Slope	1.0090	9 Intercept	-0.11036
			Cert Date	2/12/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.99	23.88	0.000	25.0	С	1.07
primary	Temp Mid Range	26.27	26.14	0.000	27.0	С	0.9
primary	Temp Mid Range	25.41	25.29	0.000	26.4	С	1.13
Sensor Cor	nponent System Memo	1	Condition	Status pass			

Infrastructure Data For

Site ID	CND125	Technician Sandy (Grenville Site Visit Date 06/14/2019
Shelter	Make	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	N/A	Status	pass
Sensor Component Moisture Trap	Condition	Installed	Status	pass
Sensor Component Power Cables	Condition	Good	Status	pass
Sensor Component Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component Rotometer	Condition	Installed	Status	pass
Sensor Component Sample Tower	Condition	Fair	Status	pass
Sensor Component Shelter Condition	Condition	Fair	Status	pass
Sensor Component Shelter Door	Condition	Good	Status	pass
Sensor Component Shelter Roof	Condition	Fair	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	CND125	Sandy Grenville	06/14/2019	Moisture Present	Apex	3900				
There is moisture present in the dry deposition sample train inside the shelter.										

Field Systems Comments

1 Parameter: SitingCriteriaCom

The land owner maintains a pine tree forest on the property within 50 meters of the site. The trees were planted just before the site was installed in 1990 and may or may not be harvested in the future.

2 Parameter: ShelterCleanNotes

The shelter is well clean and well organized. There are signs of insect infestation on floor.

3 Parameter: MetOpMaintCom

The temperature sensor is mounted on the sample tower in a naturally aspirated shield.

Field Systems	Data Form	

F-02058-1500-S1-rev002

Site ID CND125	Technician Sandy Grenville	ville Site Visit Date 06/14/2019						
		USCS Mar						
Site Sponsor (agency)	EPA	USGS Map						
Operating Group	private	Map Scale						
AQS #	37-123-9991	Map Date						
Meteorological Type	Claytronic							
Air Pollutant Analyzer	Ozone	QAPP Latitude						
Deposition Measurement	dry, Hg, PM2.5, PM10	QAPP Longitude						
Land Use	woodland	QAPP Elevation Meters						
Terrain	rolling	QAPP Declination						
Conforms to MLM	Marginally	QAPP Declination Date						
Site Telephone		Audit Latitude	35.26333					
Site Address 1	136 Perry Drive	Audit Longitude	-79.83754					
Site Address 2		Audit Elevation	172					
County	Montgomery	Audit Declination	-8					
City, State	Candor, NC	Present						
Zip Code	27229	Fire Extinguisher 🔽	New in 2015					
Time Zone	Eastern	First Aid Kit						
Primary Operator		Safety Glasses 🔽						
Primary Op. Phone #		Safety Hard Hat 🔽						
Primary Op. E-mail		Climbing Belt						
Backup Operator		Security Fence						
Backup Op. Phone #		Secure Shelter						
Backup Op. E-mail		Stable Entry Steps ✓						
Shelter Working Room	Make Ekto M	odel 8810	Shelter Size 640 cuft					
Shelter Clean	Notes The shelter is well clean and w	ell organized. There are signs	of insect infestation on floor.					
Site OK	Notes							
Site OK Image: Notes Driving Directions From Greensboro take Hwy 220 (future I-73) south to Candor. Exit at 211 west to Candor. At the traffic light turn left (south) onto 220 south and 731 west. Continue approximately 1.3 miles which will take you out of town. Bear right onto 731 west at the split. Take an immediate right onto McCallum Rd. (there is a sign for E-KU-SUMEE at the intersection). Continue approximately 5.4 miles to Perry Drive which is on the left. Turn left onto the gravel road and follow it to the end. The site is behind the house, drive around the grapevines on the left.								

CND125

F-02058-1500-S2-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 06/14/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		
Major industrial complex	10 to 20 km		
City > 50,000 population	40 km		
City 10,000 to 50,000 population	10 km		
City 1,000 to 10,000 population	5 km		
Major highway, airport or rail yard	2 km		
Secondary road, heavily traveled	500 m		
Secondary road, lightly traveled	200 m		\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		
Tree line	50 m	40 m	
Obstacles to wind	10 times obstacle height		

Siting Distances OK

Siting Criteria Comment

The land owner maintains a pine tree forest on the property within 50 meters of the site. The trees were planted just before the site was installed in 1990 and may or may not be harvested in the future.

Fie	eld Sy	stems Data Fo	orm		F-02058-1500-S3-rev002					8-rev002
Site	e ID	CND125	Technician	Sandy Grenville		Site Visit Date	06/14/2019			
1		d speed and direction fluenced by obstructio		as to avoid		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 plu	mb?		✓	N/A				
4		temperature shields p diated heat sources su			✓					
5	conditio surface a	perature and RH sens ns? (i.e. ground below and not steeply sloped swater should be avoi	sensors should . Ridges, hollov	be natural						
6	Is the so	lar radiation sensor p	lumb?		✓	N/A				
7	Is it site	l to avoid shading, or	any artificial o	r reflected light?	✓	N/A				
8	Is the ra	in gauge plumb?				N/A				
9	Is it sited towers, o	l to avoid sheltering e etc?	ffects from bui	ldings, trees,	✓	N/A				
10	Is the su facing n	rface wetness sensor s orth?	ited with the g	rid surface		N/A				
11	Is it inc	lined approximately 3	0 degrees?			N/A				

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Site	e ID	CND125	Technician	Sandy Grenville		Site Visit Date	06/14/2019]
1		e meterological senso n, and well maintained		intact, in good	✓			
2	Are all t reportin	he meteorological sens g data?	sors operational	l online, and	✓			
3	Are the shields for the temperature and RH sensors clean?							
4	4 Are the aspirated motors working?					N/A		
5	5 Is the solar radiation sensor's lens clean and free of scratches?				✓	N/A		
6	Is the su	rface wetness sensor g	grid clean and u	ndamaged?	✓	N/A		
7	7 Are the sensor signal and power cables intact, in good condition, and well maintained?					N/A		
8		sensor signal and pow e elements and well ma		tions protected	✓	N/A		

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

The temperature sensor is mounted on the sample tower in a naturally aspirated shield.

Fi	eld Systems Data Form		F-02058-1500-85-rev002
Site	CND125 Technician Sandy Grenville		Site Visit Date 06/14/2019
	Siting Criteria: Are the pollutant analyzers and deposition eq	<u>uipr</u>	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	mai	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?	✓	Moisture in tubing only
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		F-02058-1500-S6-rev002				
Site	e ID	CND125	Technician Sandy Grenville)	Site Visit D	ate 06/14/2019	9	
	DAS, se	ensor translators, and	peripheral equipment operatio	ns a	nd maintenance			
1	Do the l well ma	DAS instruments appo intained?	ear to be in good condition and	✓				
2 Are all the components of the DAS operational? (printers, modem, backup, etc)			✓					
3		analyzer and sensor si og protection circuitry	gnal leads pass through ?	✓	Temperature on	ly		
4		signal connections pr intained?	otected from the weather and	✓				
5	Are the	signal leads connected	d to the correct DAS channel?	✓				
6	Are the ground		ors, and shelter properly	✓				
7	Does the	e instrument shelter h	ave a stable power source?					
8	Is the in	nstrument shelter temj	perature controlled?	✓				
9	Is the m	iet tower stable and gi	rounded?		Stable		Grounded	
10	Is the sa	ample tower stable and	d grounded?					
11	Tower o	comments?						

Field Systems Data Form						-1500- S7-rev 002
Site ID CND125		Fechnician	Sandy Grenville Site Visit Date	06/14/2019)	
Documentation						
Does the site have the n	required inst	rument and o	equipment manuals?			
Wind speed sensor Wind direction sensor Temperature sensor Relative humidity sensor Solar radiation sensor Surface wetness sensor Wind sensor translator Temperature translator Humidity sensor translator Solar radiation translator Tipping bucket rain gaug Ozone analyzer Filter pack flow controlle	Yes	No N/A Image: Second		Yes □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □		
Filter pack MFC power s	upply 🗌					
Does the site have the	required an	<u>d most recen</u>	t QC documents and report forms?			
	Presei	nt		Curre	ent	
Station Log SSRF	 					
Sike Ops Manual HASP Field Ops Manual	v v v	Oct 2016 Feb 201	4	 ✓ ✓ ✓ ✓ 		
Calibration Reports	\checkmark			\checkmark		
Ozone z/s/p Control Char	·ts					
Preventive maintenance s	chedule					
1 Is the station log pro	perly comple	ted during e	very site visit? 🔽			

- 2 Are the Site Status Report Forms being completed and current?
- 3 Are the chain-of-custody forms properly used to document sample transfer to and from lab?
- 4 Are ozone z/s/p control charts properly completed and current?

Control charts not used

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

✓

Site	ID	CND125	Technician	Sandy Grenville	Site Visit Date	06/14/2019	
	<u>Site ope</u>	ration procedures					
1		site operator attended If yes, when and who		TNET training 🔽			
2		backup operator atter course? If yes, when a					
3	Is the site schedule	e visited regularly on t ?	he required T	iesday 🗸			
4		tandard CASTNET of by the site operator?	perational pro	cedures being			
5		e operator(s) knowledg red site activities? (inc					

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

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

	riequency	CO
✓	Semiannually	
✓	Daily	
✓	As needed	
✓	Daily	
\checkmark	As needed	
\checkmark	Weekly	
\checkmark	Every 2 weeks	
	N/A	
✓	Weekly	
✓	Weekly	

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

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

Unknown ✓ ✓ SSRF, logbook, call-in

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

Compliant

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Fie	eld Sys	stems Data Fo	rm		F-02058-1500-S					59-rev002	
Site	e ID	CND125	Technician	Sandy Grenville		Site Visit Date	06/14/2019				
	<u>Site oper</u>	ration procedures									
1	Is the filt	ter pack being changed	every Tuesda	ay as scheduled?		Filter changed morn	ings				
2	Are the S correctly	Site Status Report Form /?	ns being comp	pleted and filed							
3	Are data schedule	downloads and backu d?	ps being perfo	ormed as		No longer required					
4	Are gene	eral observations being	made and rec	corded? How?	✓	SSRF, logbook					
5	Are site s fashion?	supplies on-hand and r	eplenished in	a timely							
6	Are sam	ple flow rates recorded	? How?			SSRF, logbook, call	-in				
7	Are sam	ples sent to the lab on a	a regular sche	dule in a timely	\checkmark						

✓

Clean gloves on and off

- fashion? ✓ Are filters protected from contamination during handling 8
- and shipping? How?
- 9 Are the site conditions reported regularly to the field operations manager or staff?

QC Check Performed

7

Frequency

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

CND125

F-02058-1500-S10-rev002

Tech

Technician Sandy Grenville

Site Visit Date 06/14/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	BQ3MC12	07015
DAS	Campbell	CR3000	3816	000499
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	illegible	01235
Flow Rate	Арех	AXMC105LPMDPC	54781	000838
Infrastructure	Infrastructure	none	none	none
Modem	Campbell	COM220	1513	06346
Ozone	ThermoElectron Inc	49i A1NAA	1030244803	000692
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124693	000376
Sample Tower	Aluma Tower	A	none	03495
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	14035	06402
Zero air pump	Werther International	C 70/4	000814284	06868

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
WSF	2144-Korey	Devins-06/17/2019				
1	6/17/2019	Computer	Dell	07037	Inspiron 15	Unknown
2	6/17/2019	DAS	Campbell	000430	CR3000	2525
3	6/17/2019	Elevation	Elevation	None	1	None
4	6/17/2019	Filter pack flow pump	Thomas	06021	107CAB18B	060400022648
5	6/17/2019	Flow Rate	Арех	000639	AXMC105LPMDPCV	54780
6	6/17/2019	Infrastructure	Infrastructure	none	none	none
7	6/17/2019	Modem	Digi	07196	LR54	unknown
8	6/17/2019	Ozone	ThermoElectron Inc	000734	49i A1NAA	1105347317
9	6/17/2019	Ozone Standard	ThermoElectron Inc	000543	49i A3NAA	0929938240
10	6/17/2019	Sample Tower	Aluma Tower	000126	В	none
11	6/17/2019	Shelter Temperature	Campbell	none	107-L	none
12	6/17/2019	Siting Criteria	Siting Criteria	None	1	None
13	6/17/2019	Temperature	RM Young	06387	41342VC	13960
14	6/17/2019	Zero air pump	Werther International	06880	C 70/4	000814273

DAS Data Form

DAS Time Max Error: 0.08

Mfg	Serial N	lumber Site	T	Fechnician	Site Visit Date	Parameter	Use Desc.
Campbell	2525	WS	P144	Korey Devins	06/17/2019	DAS	Primary
	6 /17/2019	Audit Date	6 /17/2019	Mfg	Datel	Parameter	DAS
Das Time: Das Day:	13:58:00 168	Audit Time Audit Day	13:58:05 168	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Channel:		High Channe	el:	Tfer ID	01320	7	
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	Intercept	0.00000
0.0001	0.00	0.000	1 0.0002	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	Intercept	0.00000
				Cert Date	1/25/201	9 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000) V	V	0.0000	
7	0.1000	0.0999	0.0999) V	V	0.0000	
7	0.3000	0.2997	0.2997	7 V	V	0.0000	
7	0.5000	0.4996	0.4995		V	-0.0001	
7	0.7000	0.6995	0.6994		V	-0.0001	
7	0.9000	0.8994	0.8992		V	-0.0002	
7	1.0000	0.9993	0.9991	l V	V	-0.0002	

Flow Data Form

Mfg	Serial Num	iber Tag	Site	Тес	chnician	hnician Site Visit Date		Param	ieter	Owner ID
Арех	54780		WSP144	Ko	rey Devins	06/17/2	2019	Flow R	ate	000639
					Mfg	BIOS		Р	arameter Flo	w Rate
					Serial Number	148613		Т	fer Desc. BIC	DS 220-H
					Tfer ID	01421				
							4.000			0.00000
					Slope		1.0000	JO Inte	ercept	0.00000
Cert Date 3/4/2019 Corr					rCoff	1.00000				
DAS 1:		DAS 2:		L	Cal Factor Z	lero		0.0	01	
A Avg % Diff:	A Max % Dif	A Avg %	Diff A Max	x % Dif	Cal Factor F	ull Scale		1.(02	
0.45%	1.35%				Rotometer R	eading:		1	.5	
Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S	S E Inp	utUnit	OutputSignal	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	0.02		l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.01		l/m	l/m	
primary	test pt 1	1.497	1.500	1.48	0.000	1.50		l/m	l/m	0.00%
primary	test pt 2	1.498	1.500	1.49	0.000	1.50		l/m	l/m	0.00%
primary	test pt 3	1.483	1.480	1.48	0.000	1.50		l/m	l/m	1.35%
Sensor Com	p <mark>onent</mark> Leak Tes	t		Conditio	on			Status	pass	
Sensor Comj	ponent Tubing C	ondition		Conditio	Good			Status	pass	
Sensor Comj	ponent Filter Pos	ition		Conditio	n Good			Status pass		
Sensor Comj	ponent Rotomete	er Conditio	n	Conditio	Clean and dry			Status	pass	
Sensor Com	ponent Moisture	Present		Conditio	n See comments	5		Status pass		
Sensor Component Filter Distance			Conditio	ion 2.0 cm			Status pass			
Sensor Component Filter Depth			Conditio	2.5 cm			Status pass			
Sensor Component Filter Azimuth				Conditio	n 180 deg			Status pass		
Sensor Com	ponent System M	lemo		Conditio	on			Status pass		

Ozone Data Form

Mfg		Serial Number	r Tag Site		Tecl	hnician	Site Visit Date	Parame	eter	Owner ID
ThermoElec	ctron Inc	1105347317	WSP14	4	Kor	ey Devins	06/17/2019	Ozone		000734
Slope: Intercept CorrCoff:	-0	I.01500 Slope 0.94684 Inter I.00000 Corr	cept	0.00000 0.00000 0.00000	5	Mfg Serial Number Ffer ID	ThermoElectron 1180030022 01114			ozone Ozone primary stan
	Diff: A M	DA [ax % Dif A A 0.0%]	Avg %Diff A	Max % Dif		Slope Cert Date	1.0029 9/7/20		•	0.10980
UseDescr prima prima prima prima prima	ry ry ry ry ry ry	ConcGroup 1 2 3 4 5	Tfer Raw 0.20 15.27 35.82 66.81 110.76	Tfer Cor 0.08 15.11 35.60 66.50 110.33		35.21 66.64 111.00	Site Unit ppb ppb ppb ppb ppb	RelPer	-1.1 0.21 0.61	AbsDif -0.85 -0.89
Sensor C	omponer	nt Sample Train 1 22.5 degree 1 Inlet Filter Co	rule	Cond	litio	n Good n n Clean		Status Status Status	pass	
	omponer	nt Battery Back		Cond	litio	n Clean n N/A n 0.000		Status Status Status	pass	
Sensor C	omponer			Cond	litio	n 1.021 n N/A		Status Status	pass	
Sensor C	omponei	nt Fullscale Vol		Cond	litio	n N/A		Status	pass	
	•	nt Cell A Freq. nt Cell A Noise				n 101.4 kHz n 0.8 ppb		Status pass Status pass		
		nt Cell A Flow	ure			n 0.72 lpm n 727.4 mmHg		Status Status	L	
	•	t Cell A Tmp.				n 36.7 C		Status		
	•	nt Cell B Freq. nt Cell B Noise				n 91.5 kHz n 0.6 ppb		Status Status		
	-	nt Cell B Flow	ure			n 0.70 lpm n 728.0 mmHg		Status Status		
Sensor C	omponer	nt Cell B Tmp.		Cond	litio	n N/A		Status	pass	
	•	nt Line Loss nt System Mem	10	Cond		n Not tested		Status Status		

Temperature Data Form

Mfg	Serial Number	Tag Site	Т	echni	chnician		isit Date	Paramo	eter	Owner ID	
RM Young	13960	WSP144	ŀ	Korey	Devins	06/17	/2019	Temper	ature	06387	
				Mf	g	Extech	Extech Pa		rameter Te	mperature	
				Ser	ial Number	H2327	34	Tf	fer Desc. RTD		
				Tfe	er ID	01227					
DAS 1: DAS 2:				Slo	ре		1.00733 Interce		rcept	cept 0.14497	
Abs Avg Err Abs Max Err Abs Avg Err Abs Ma			Max Err	x Err Cert Date			2/12/201	9 Cori	rCoff	1.00000	
0.11	0.20										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Te	emp Low Range	0.14	0.00		0.000		-0.	1	С	-0.07	
· · ·	emp Mid Range	25.45	25.12		0.000	25.1		С	-0.07		
primary Te	emp High Range	50.04	49.53		0.000		49.	3	С	-0.2	
Sensor Compo	onent Shield		Condi	tion C	Clean			Status	pass		
Sensor Component Blower			Condi	Condition N/A				Status	us pass		
Sensor Component Blower Status Switch				Condition N/A				Status pass			
Sensor Compo	onent System Memo		Condi	Condition				Status pass			

Shelter Temperature Data For

Mfg	Serial Number Tag Site Te		Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	WSP144	Korey Devins	06/17/2019	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	Iter Temperature
Abs Avg Err Ab			Serial Number	H232734	Tfer Desc. RTD)
			Tfer ID	01227		
			Slope	1.0073	3 Intercept	0.14497
			Cert Date	2/12/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.88	26.54	0.000	26.5	С	-0.08
primary	Temp Mid Range	28.63	28.28	0.000	28.0	С	-0.31
primary	Temp Mid Range	25.84	25.51	0.000	25.8	С	0.24
Sensor Cor	nponent System Memo)	Condition	on Status pass			

Infrastructure Data For

Site ID	WSP144	Technician Korey	Devins Site Visit Date 06/17/2019
Shel	ter Make	Shelter Model	Shelter Size
Ekto		8810	640 cuft
AND INCOME.			

Sensor Component Sample Tower Type	Condition	Туре А	Status	pass
Sensor Component Conduit	Condition	N/A	Status	pass
Sensor Component Met Tower	Condition	N/A	Status	pass
Sensor Component Moisture Trap	Condition	Installed	Status	pass
Sensor Component Power Cables	Condition	Good	Status	pass
Sensor Component Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component Rotometer	Condition	Installed	Status	pass
Sensor Component Sample Tower	Condition	Fair	Status	pass
Sensor Component Shelter Condition	Condition	Fair	Status	pass
Sensor Component Shelter Door	Condition	Good	Status	pass
Sensor Component Shelter Roof	Condition	Fair	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.	Hazaro	Problem			
Flow Rate	WSP144	Korey Devins	06/17/2019	Moisture Present	Apex	3875					
The filter sample tubing has drops of moisture in low sections outside the shelter.											

Field Systems Comments

1 Parameter: SiteOpsProcedures

Ozone sample line leak-checks are conducted every two weeks.

2 Parameter: SitingCriteriaCom

The city of Trenton, estimated population greater than 85,000, is within 20 km of the site.

3 Parameter: ShelterCleanNotes

The shelter is in fair condition, clean, very neat, and well organized but beginning to show signs of wear. There is a small leak in the roof near the DAS.

F-02058-1500-S1-rev002

Site ID WSP144	Technician Korey Devins	Site Visit Date 06/17	7/2019					
Site Spanson (agapar)	EPA	USGS Map	Pennington					
Site Sponsor (agency)								
Operating Group	NJDEP / WCRC	Map Scale						
AQS #	34-021-9991	Map Date						
Meteorological Type	R.M. Young							
Air Pollutant Analyzer	Ozone	QAPP Latitude						
Deposition Measurement	dry, PM2.5, PM10	QAPP Longitude						
Land Use	woodland, urban agriculture	QAPP Elevation Meters						
Terrain	rolling	QAPP Declination						
Conforms to MLM	Marginally	QAPP Declination Date						
Site Telephone		Audit Latitude	40.312303					
Site Address 1	WCRC-FA	Audit Longitude	-74.872663					
Site Address 2	Church Rd.	Audit Elevation	59					
County	Mercer	Audit Declination	-12.5					
City, State	Titusville, NJ	Present						
Zip Code	08560	Fire Extinguisher 🔽	dated 2015					
Time Zone	Eastern	First Aid Kit						
Primary Operator		Safety Glasses						
Primary Op. Phone #		Safety Hard Hat 🗹						
Primary Op. E-mail		Climbing Belt						
Backup Operator		Security Fence						
Backup Op. Phone #		Secure Shelter						
Backup Op. E-mail		Stable Entry Steps ✓						
Shelter Working Room	Make Ekto M	odel 8810	Shelter Size 640 cuft					
Shelter Clean	Notes The shelter is in fair condition, wear. There is a small leak in	clean, very neat, and well organ the roof near the DAS	nized but beginning to show signs of					
Site OK	Notes							
Priving Directions From Philadelphia take I-95 north. Cross the Delaware River into New Jersey and take the first exit, route 29 north, just over the bridge. Continue approximately 4 miles through the traffic light at the intersection of 546 and through the park. Turn right onto Church road at the traffic light. Continue approximately 0.5 miles to the gate for the WCRC-FA on the right. The combination to the lock is 1903. Continue through the gate up the gravel road to the top of the hill and turn right along the edge of the field. Follow the gravel road to the site in the chain-link fenced area.								

WSP144

F-02058-1500-S2-rev002

Site ID

Technician Korey Devins

Site Visit Date 06/17/2019

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	20 km	
City 10,000 to 50,000 population	10 km		
City 1,000 to 10,000 population	5 km		\checkmark
Major highway, airport or rail yard	2 km		
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		
Small parking lot	100 m		\checkmark
Tree line	50 m		\checkmark
Obstacles to wind	10 times obstacle height		

Siting Distances OK

Siting Criteria Comment

The city of Trenton, estimated population greater than 85,000, is within 20 km of the site.

Fi	eld Sy	stems Data Fo	orm				F-02058	8-15	500-S.	3-rev002
Site	e ID	WSP144	Technician	Korey Devins		Site Visit Date	06/17/2019			
1		d speed and direction fluenced by obstructio		as to avoid	✓	N/A				
2	(i.e. wind horizont	d sensors mounted so d sensors should be m tally extended boom > to the prevailing wind	ounted atop the 2x the max dia	e tower or on a		N/A				
3	Are the	tower and sensors plu	mb?		✓	N/A				
4		temperature shields p diated heat sources su								
5	conditio surface	perature and RH sens ns? (i.e. ground below and not steeply sloped g water should be avoi	sensors should . Ridges, hollow	be natural						
6	Is the so	lar radiation sensor p	lumb?		✓	N/A				
7	Is it site	d to avoid shading, or	any artificial o	r reflected light?		N/A				
8	Is the ra	in gauge plumb?			✓	N/A				
9	Is it site towers,	d to avoid sheltering e etc?	ffects from bui	ldings, trees,		N/A				
10	Is the su facing n	rface wetness sensor s orth?	ited with the g	rid surface		N/A				
11	Is it inc	lined approximately 3	0 degrees?			N/A				

F-02058-1500-S4-rev002

Site	e ID	WSP144	Technician	Korey Devins		Site Visit Date	06/17/2019	
1 2 3	condition Are all th reporting Are the s	hields for the tempera	1? sors operationa ature and RH s	l online, and	> > >			
4	Are the a	spirated motors worl	king?		✓			
5	Is the sol scratches	ar radiation sensor's	lens clean and f	free of		N/A		
6	Is the su	rface wetness sensor g	grid clean and u	indamaged?	✓	N/A		
7	condition	ensor signal and pow 1, and well maintained ensor signal and pow	1?					
0		elements and well ma		protected				

Field Systems Data Form						F-02058-1500-S5-rev002
Site	e ID	WSP144	Technician	Korey Devins		Site Visit Date 06/17/2019
	<u>Siting C</u>	Criteria: Are the pollut	ant analyzers ar	<u>1d deposition eq</u>	<u>uipn</u>	nent sited in accordance with 40 CFR 58, Appendix E
1		sample inlets have at le icted airflow?	east a 270 degree	e arc of	✓	
2	Are the	sample inlets 3 - 15 m	eters above the	ground?	✓	
3		sample inlets > 1 mete meters from trees?	er from any maj	or obstruction,		
	<u>Pollutar</u>	nt analyzers and depos	ition equipment	operations and	mai	ntenance
1		analyzers and equipme on and well maintained		in good	✓	
2	Are the reportin	analyzers and monitoning data?	rs operational, o	on-line, and	✓	
3	Describ	e ozone sample tube.				1/4 teflon by 12 meters
4	Describ	e dry dep sample tube.				3/8 teflon by 12 meters
5		ine filters used in the o location)	ozone sample lin	e? (if yes		At inlet only
6	Are sam obstruct	ple lines clean, free of tions?	'kinks, moisture	e, and		Moisture in tubing only
7	Is the ze	ero air supply desiccan	it unsaturated?		✓	
8	Are the	re moisture traps in th	e sample lines?		✓	Flow line only
9	Is there clean?	a rotometer in the dry	v deposition filte	r line, and is it		Clean and dry

Fi	eld Sy	stems Data Fo	orm				F-02	058-15	00-S6-rev002
Site	e ID	WSP144	Technician	Korey Devins		Site Visit Date	06/17/2019		
	DAS, se	nsor translators, and j	peripheral equi	pment operation	ns ai	nd maintenance			
1		DAS instruments appe intained?	ar to be in good	l condition and					
2		he components of the backup, etc)	DAS operation	al? (printers,	✓				
3		nalyzer and sensor sig g protection circuitry?		through	✓	Temperature only			
4		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?	rs, and shelter	properly	✓				
7	Does the	e instrument shelter ha	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?				Met tower removed		<u> </u>	

Field Systems Data H	orm			F-02	058-	1500-S7-rev002
Site ID WSP144	Tec	hnician Korey	Devins Site Visit Date 0	6/17/2019		
Documentation						
Does the site have the required			<u>nent manuals?</u>			
Wind speed sensorWind direction sensorTemperature sensorRelative humidity sensorSolar radiation sensorSurface wetness sensorWind sensor translatorTemperature translatorHumidity sensor translatorSolar radiation translatorTipping bucket rain gaugeOzone analyzerFilter pack flow controller			Data logger Data logger Strip chart recorder Computer Modem Printer Zero air pump Filter flow pump Surge protector UPS Lightning protection device Shelter heater Shelter air conditioner	Yes □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	No V V V V V V V V V	N/A V V V V V V V V V V V V V V V V V V
			documents and report forms?			
	ed and m Present	lost recent QC	documents and report forms?	Curre	nt	
Station Log SSRF Site Ops Manual HASP Field Ops Manual Calibration Reports Ozone z/s/p Control Charts Preventive maintenance schedule	Y Y Y Y	Oct 2011 Oct 2011				

- 1 Is the station log properly completed during every site visit?
- 2 Are the Site Status Report Forms being completed and current?
- 3 Are the chain-of-custody forms properly used to document sample transfer to and from lab?
- 4 Are ozone z/s/p control charts properly completed and current?

Control charts not used

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

 \checkmark

WSP144 Technician Korey Devins 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 \checkmark 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	Compliant
Multipoint Calibrations	\checkmark	N/A	\checkmark
Visual Inspections	\checkmark	N/A	
Translator Zero/Span Tests (climatronics)		N/A	\checkmark
Manual Rain Gauge Test	\checkmark	N/A	\checkmark
Confirm Reasonableness of Current Values	✓	N/A	\checkmark
Test Surface Wetness Response	\checkmark	N/A	\checkmark

✓

 \checkmark

✓

 \square

✓

 \checkmark

 \square

 \checkmark

 \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

- 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?

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

Ozone sample line leak-checks are conducted every two weeks.

Frequency ✓ Semiannually \checkmark Daily \checkmark ✓ Daily \checkmark ✓ Weekly ✓ Every 2 weeks \checkmark N/A \checkmark Weekly \checkmark Weekly

	Unknown
✓	
✓	SSRF, logbook, call-in

Compliant

F-02058-1500-S8-rev002

Site Visit Date	06/17/2019

Field Systems Data Form F-02058-1500-S9-rev002 WSP144 Technician Korey Devins Site Visit Date 06/17/2019 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 2 correctly? No longer required 3 Are data downloads and backups being performed as scheduled? SSRF, logbook Are general observations being made and recorded? How? 4 \checkmark Are site supplies on-hand and replenished in a timely 5 fashion? SSRF, logbook, call-in 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? **QC Check Performed** Compliant Frequency \checkmark Semiannually **Multi-point MFC Calibrations** ✓ Weekly ✓ **Flow System Leak Checks** ✓ Weekly \checkmark **Filter Pack Inspection** ✓ Weekly \checkmark **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:

 \checkmark

 \checkmark

 \checkmark

✓ Weekly

✓ Weekly

Semiannually

Visual Check of Flow Rate Rotometer

In-line Filter Inspection/Replacement

Sample Line Check for Dirt/Water

WSP144

F-02058-1500-S10-rev002

Site 1	D
~	

Technic

Technician Korey Devins

Site Visit Date 06/17/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07037
DAS	Campbell	CR3000	2525	000430
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	060400022648	06021
Flow Rate	Арех	AXMC105LPMDPC	54780	000639
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07196
Ozone	ThermoElectron Inc	49i A1NAA	1105347317	000734
Ozone Standard	ThermoElectron Inc	49i A3NAA	0929938240	000543
Sample Tower	Aluma Tower	В	none	000126
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	13960	06387
Zero air pump	Werther International	C 70/4	000814273	06880

APPENDIX B

CASTNET Site Spot Report Forms

Data Compiled: 4/25/2019 10:19:21 AM

SiteVisitDate Site Technician

04/16/2019 CAD150 Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	6	0.08	с	Р
2	Temperature max error	Р	4	0.5	6	0.16	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98939	unitless	Р
4	Ozone Intercept	Р	0	5	4	-1.43004	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99988	unitless	Р
6	Ozone % difference avg	Р	7	10	4	4.7	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	-2.14	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-1.66	ppb	Fail
9	Flow Rate average % difference	Р	10	5	3	1.32	%	Р
10	Flow Rate max % difference	Р	10	5	3	1.32	%	Р
11	DAS Voltage average error	Р	7	0.003	70	0.0000	V	Р
12	Shelter Temperature average error	Р	5	2	12	0.27	с	Р
13	Shelter Temperature max error	Р	5	2	12	0.31	c	Р

Field Performance Comments

1	Parameter: Ozone	SensorComponent:	Inlet Filter Conditi	CommentCode 91	
	Ozone inlet filter dirty				

Field Systems Comments

1 Parameter: SiteOpsProcedures

The ozone analyzer sample train filter is replaced and the system is leak tested monthly.

2 Parameter: ShelterCleanNotes

Some shelter floor tiles are cracked and there is indication of insect damage below the heater.

Data Compiled: 4/26/2019 7:58:22 AM

SiteVisitDateSiteTechnician04/11/2019CHA467Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97661	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.55123	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99994	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.9	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	1.26	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.37	ppb	Р

Data Compiled: 4/25/2019 9:51:08 AM

SiteVisitDate Site Technician

04/15/2019 CHE185 Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	9	0.39	с	Р
2	Temperature max error	Р	4	0.5	9	0.57	с	Fail
3	Ozone Slope	Р	0	1.1	4	0.99049	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.12824	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.7	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	-0.19	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	0.18	ppb	Р
9	Flow Rate average % difference	Р	10	5	6	2.05	%	Р
10	Flow Rate max % difference	Р	10	5	6	2.16	%	Р
11	DAS Voltage average error	Р	6	0.003	21	0.0020	V	Р
12	Shelter Temperature average error	Р	5	2	18	0.26	с	Р
13	Shelter Temperature max error	Р	5	2	18	0.33	c	Р

Field Systems Comments

1 Parameter: SiteOpsProcComm

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

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

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

Data Compiled: 7/14/2019 11:54:33

SiteVisitDate Site Technician 06/14/2019 CND125 Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	12	0.57	с	Fail
2	Temperature max error	Р	4	0.5	12	1.01	с	Fail
3	Flow Rate average % difference	Р	10	5	6	0.22	%	Р
4	Flow Rate max % difference	Р	10	5	6	0.67	%	Р
5	DAS Voltage average error	Р	7	0.003	63	0.0001	V	Р
6	Shelter Temperature average error	Р	5	2	18	1.03	с	Р
7	Shelter Temperature max error	Р	5	2	18	1.13	с	Р

06/14/2019 CND125

Technician

Sandy Grenville

Field Performance Comments

1 Parameter: Flow Rate SensorComponent: Moisture Present CommentCode: 204

There is moisture present in the dry deposition sample train inside the shelter.

Field Systems Comments

1 Parameter: SitingCriteriaCom

The land owner maintains a pine tree forest on the property within 50 meters of the site. The trees were planted just before the site was installed in 1990 and may or may not be harvested in the future.

2 Parameter: ShelterCleanNotes

The shelter is well clean and well organized. There are signs of insect infestation on floor.

3 Parameter: MetOpMaintCom

The temperature sensor is mounted on the sample tower in a naturally aspirated shield.

Data Compiled: 7/14/2019 11:17:11

SiteVisitDateSiteTechnician06/13/2019COW137Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.96767	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.17821	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99958	unitless	Р
4	Ozone % difference avg	Р	7	10	4	5.0	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	1.91	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-1.28	ppb	Р

Data Compiled: 4/24/2019 7:52:03 AM

SiteVisitDate Site Technician

04/13/2019 CVL151 Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	6	0.05	c	Р
2	Temperature max error	Р	4	0.5	6	0.08	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98143	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.14908	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99990	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.4	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	-0.19	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-0.27	ppb	Р
9	Flow Rate average % difference	Р	10	5	2	1.32	%	Р
10	Flow Rate max % difference	Р	10	5	2	1.32	%	Р
11	DAS Voltage average error	Р	7	0.003	70	0.0001	V	Р
12	Shelter Temperature average error	Р	5	2	12	0.11	c	Р
13	Shelter Temperature max error	Р	5	2	12	0.16	с	Р

04/13/2019 CVL151

Technician Sandy Grenville

Field Performance Comments

1	Parameter:	Ozone	SensorComponent:	Cell B Flow
---	------------	-------	------------------	-------------

CommentCode 99

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

Field Systems Comments

1 Parameter: DasComments

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

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

The shelter is somewhat cluttered. The shelter roof is still leaking and the walls are rotten at the seams and corners. The shelter is in poor condition and has deteriorated further since the previous audit visit.

Data Compiled: 7/12/2019 14:41:22

SiteVisitDateSiteTechnician04/28/2019ESP127Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.01038	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.61174	ppb	Р
3	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.3	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	-0.56	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.58	ppb	Р

Data Compiled: 4/26/2019 7:50:36 AM

SiteVisitDateSiteTechnician04/09/2019GRC474Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99520	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.13062	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99996	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.3	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	0.24	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.48	ppb	Р

Data Compiled: 7/13/2019 10:50:54

SiteVisitDate Site Technician

05/07/2019 LAV410 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.06	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.13	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98111	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.72695	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99986	unitless	Р
6	Ozone % difference avg	Р	7	10	4	5.4	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	0.24	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-1.28	ppb	Р
9	Flow Rate average % difference	Р	10	5	2	0.29	%	Р
10	Flow Rate max % difference	Р	10	5	2	0.43	%	Р
11	DAS Voltage average error	Р	13	0.003	56	0.0001	V	Р
12	Shelter Temperature average error	Р	5	2	6	1.12	с	Р
13	Shelter Temperature max error	Р	5	2	6	1.75	c	Р

Field Performance Comments

1	Parameter:	Temperature2meter	SensorComponent:	Blower	CommentCode: 26
	The forced-air	blower for the shield is	not functioning.		
2	Parameter:	Temperature2meter	SensorComponent:	System Memo	CommentCode: 4

The sensor signal cables are showing signs of wear.

Field Systems Comments

1 Parameter: SiteOpsProcedures

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

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

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

4 Parameter: PollAnalyzerCom

Trees violate the ozone sample inlet siting criteria.

5 Parameter: MetOpMaintCom

The temperature sensor signal cable has deteriorated and is in need of replacement. The aspirated motor for temperature sensor is not functioning and the temperature measurement data quality are affected.

Data Compiled: 4/26/2019 7:51:42 AM

SiteVisitDateSiteTechnician04/08/2019PET427Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.98967	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.11093	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.6	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	0.03	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.38	ppb	Р

Data Compiled: 7/13/2019 12:21:47

SiteVisitDate Site Technician

05/08/2019 PIN414 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.15	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.31	с	Р
3	Ozone Slope	Р	0	1.1	4	1.00749	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.27178	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.8	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	-0.06	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-0.33	ppb	Р
9	Flow Rate average % difference	Р	10	5	3	1.22	%	Р
10	Flow Rate max % difference	Р	10	5	3	1.41	%	Р
11	DAS Voltage average error	Р	15	0.003	63	0.0002	V	Р
12	Shelter Temperature average error	Р	5	2	18	0.58	с	Р
13	Shelter Temperature max error	Р	5	2	18	0.74	c	Р

Field Systems Comments

1 Parameter: SiteOpsProcedures

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

2 Parameter: ShelterCleanNotes

The lighting has been repaired. The shelter has been cleaned and organized.

3 Parameter: MetOpMaintCom

The temperature sensor signal cable is deteriorating.

Data Compiled:

7/13/2019 16:28:49

SiteVisitDate Site Technician

06/11/2019 ROM206 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	3	0.10	с	Р
2	Temperature max error	Р	4	0.5	3	0.15	с	Р
3	Ozone Slope	Р	0	1.1	4	1.00644	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.90695	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99996	unitless	Р
6	Ozone % difference avg	Р	7	10	4	2.7	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	-0.39	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-1.01	ppb	Р
9	Flow Rate average % difference	Р	10	5	9	1.32	%	Р
10	Flow Rate max % difference	Р	10	5	9	1.32	%	Р
11	DAS Voltage average error	Р	7	0.003	56	0.0002	V	Р
12	Shelter Temperature average error	Р	5	2	18	1.00	с	Р
13	Shelter Temperature max error	Р	5	2	18	1.49	c	Р

Field Systems Comments

1 Parameter: ShelterCleanNotes

The shelter is clean, neat, and well organized. There are signs of previous roof leaks, but they have been repaired. The floor and counter top have been replaced.

2 Parameter: MetSensorComme

The temperature sensor has been removed from the met tower and mounted in a naturally aspirated shield on the sample tower, facing south and over the shelter roof.

Data Compiled: 7/13/2019 15:10:45

SiteVisitDate Site Technician

06/06/2019 ROM406 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.22	c	Р
2	Temperature2meter max error	Р	5	0.5	3	0.33	с	Р
3	Ozone Slope	Р	0	1.1	4	0.97271	unitless	Р
4	Ozone Intercept	Р	0	5	4	-1.15458	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	6.6	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	-1.00	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-1.86	ppb	Fail
9	Flow Rate average % difference	Р	10	5	10	1.67	%	Р
10	Flow Rate max % difference	Р	10	5	10	2.00	%	Р
11	Shelter Temperature average error	Р	5	2	9	2.00	с	Р
12	Shelter Temperature max error	Р	5	2	9	2.98	с	Fail

Technician

06/06/2019 ROM406

Martin Valvur

Field Performance Comments

1	Parameter: D	AS	SensorComponent:	System Memo	CommentCode: 11
	Some of the DAS	channels are damaged	and not functioning. Ser	nsors are being measured	on working channels.

Field Systems Comments

1 Parameter: DasComments

Only RH, temperature, and AMoN are mounted on the meteorological tower at approximately 2 meters.

2 Parameter: ShelterCleanNotes

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

3 Parameter: MetSensorComme

The recorded temperature is being measured at 2.5 meters above the ground and < 1 foot above the AMoN enclosure and facing south.

Data Compiled: 7/13/2019 14:27:50

SiteVisitDate Site Technician

05/14/2019 SEK430 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.23	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.37	с	Р
3	Ozone Slope	Р	0	1.1	4	0.96157	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.10304	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
6	Ozone % difference avg	Р	7	10	4	3.8	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	0.36	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-0.59	ppb	Р
9	Flow Rate average % difference	Р	10	5	10	1.23	%	Р
10	Flow Rate max % difference	Р	10	5	10	1.44	%	Р
11	DAS Voltage average error	Р	12	0.003	56	0.0003	V	Р
12	Shelter Temperature average error	Р	5	2	18	0.29	с	Р
13	Shelter Temperature max error	Р	5	2	18	0.46	c	Р

Field Systems Comments

1 Parameter: SitingCriteriaCom

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

2 **Parameter:** ShelterCleanNotes

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

3 Parameter: PollAnalyzerCom

The filter pack sample tubing has been spliced with tygon tubing about 5 meters above the ground. The tygon tubing is brown and beginning to deteriorate.

Data Compiled: 7/12/2019 14:29:08

SiteVisitDateSiteTechnician04/27/2019SND152Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99028	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.99572	ppb	Р
3	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
4	Ozone % difference avg	Р	7	10	4	4.0	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	-0.95	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-1.14	ppb	Р

Data Compiled:

d: 7/14/2019 12:28:38

SiteVisitDate Site Technician

06/17/2019 WSP144 Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	12	0.11	с	Р
2	Temperature max error	Р	4	0.5	12	0.20	с	Р
3	Ozone Slope	Р	0	1.1	4	1.015	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.94684	ppb	Р
5	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
6	Ozone % difference avg	Р	7	10	4	2.0	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	-0.85	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-0.89	ppb	Р
9	Flow Rate average % difference	Р	10	5	6	0.45	%	Р
10	Flow Rate max % difference	Р	10	5	6	1.35	%	Р
11	DAS Voltage average error	Р	7	0.003	70	0.0001	V	Р
12	Shelter Temperature average error	Р	5	2	18	0.21	с	Р
13	Shelter Temperature max error	Р	5	2	18	0.31	c	Р

06/17/2019 WSP144

Technician

Korey Devins

Field Performance Comments

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

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

Field Systems Comments

1 Parameter: SiteOpsProcedures

Ozone sample line leak-checks are conducted every two weeks.

2 Parameter: SitingCriteriaCom

The city of Trenton, estimated population greater than 85,000, is within 20 km of the site.

3 Parameter: ShelterCleanNotes

The shelter is in fair condition, clean, very neat, and well organized but beginning to show signs of wear. There is a small leak in the roof near the DAS.

Data Compiled: 7/13/2019 13:06:11

SiteVisitDate Site Technician

05/13/2019 YOS404 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.15	c	Р
2	Temperature2meter max error	Р	5	0.5	3	0.24	с	Р
3	Ozone Slope	Р	0	1.1	4	1.01307	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.42535	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99995	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.7	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	0.21	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-0.6	ppb	Р
9	Flow Rate average % difference	Р	10	5	2	0.14	%	Р
10	Flow Rate max % difference	Р	10	5	2	0.23	%	Р
11	DAS Voltage average error	Р	2	0.003	49	0.0001	V	Р
12	Shelter Temperature average error	Р	5	2	18	1.61	с	Р
13	Shelter Temperature max error	Р	5	2	18	2.31	с	Fail

Field Systems Comments

1 Parameter: ShelterCleanNotes

The site is neat, clean, and well organized. The shelter roof is leaking and is currently covered with a tarp.

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

Site Inventory by Site Visit

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
GRC	474-Martii	n Valvur-04/09/2019				
1	4/9/2019	DAS	Environmental Sys Corp	90602	8816	2270
2	4/9/2019	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943902
3	4/9/2019	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450191
4	4/9/2019	Zero air pump	Werther International	none	PC70/4	531380

Ozone Data Form

Mfg		Serial Numbe	r Ta Site	Т	echnician	Site Visit Date	Parameter	Owner ID
ThermoElec	ctron Inc	1023943902	GRC47	4	Martin Valvur	04/09/2019	Ozone	none
Slope: Intercept CorrCoff	-(rcept ().00000).00000).00000	Mfg Serial Number Tfer ID	ThermoElectron 49CPS-70008-30 01110		ser ozone sc. Ozone primary stan
DAS 1:		DA	AS 2:		Slope	1.0015	1 Intercept	0.00666
A Avg % D			Avg %Dif A	Max % Di	Cert Date	10/30/201		1.00000
0.0	0%	0.0%			Cert Date	10/00/201		1.00000
UseDescri	-	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
prima		1	0.04	0.03	0.27	ppb		0.24
prima		2	16.00	15.96	15.48	ppb		-0.48
prima	•	3	36.33	36.26	36.13	ppb	-0.36	
prima		4	64.38	64.27	63.26	ppb	-1.58	
prima	ry	5	116.48	116.29	115.90	ppb	-0.34	
Sensor Co	ompone	nt Sample Trai	n	Condit	Good		Status pass	
Sensor C	ompone	nt 22.5 degree	rule	Condit	tion		Status pass	
Sensor C	ompone	nt Inlet Filter C	ondition	Condit	tion Clean		Status pass	
Sensor Co	ompone	nt Battery Back	kup	Condit	tion N/A		Status pass	
Sensor Co	ompone	nt Offset		Condit	tion -0.1		Status pass	
Sensor Co	ompone	nt Span		Condit	tion 1.013		Status pass	
Sensor Co	ompone	nt Zero Voltage	e	Condit	tion 0.0001		Status pass	
Sensor C	ompone	nt Fullscale Vo	ltage	Condit	tion 1.000		Status pass	
Sensor Ce	ompone	nt Cell A Freq.		Condit	tion 65.7 kHz		Status pass	
Sensor Ce	ompone	nt Cell A Noise	•	Condit	0.5 ppb		Status pass	
Sensor Co	ompone	nt Cell A Flow		Condit	tion 0.69 lpm		Status pass	
Sensor Ce	ompone	nt Cell A Press	sure	Condit	tion 592.1 mmHg		Status pass	
Sensor Co	ompone	nt Cell A Tmp.		Condit	tion 36.2 C		Status pass	
Sensor Co	ompone	nt Cell B Freq.		Condit	tion 60.5 kHz		Status pass	
Sensor Co	ompone	nt Cell B Noise	•	Condit	tion 0.4 ppb		Status pass	
Sensor Co	ompone	nt Cell B Flow		Condit	tion 0.70 lpm		Status pass	
Sensor Co	ompone	nt Cell B Press	ure	Condit	tion 591.5 mmHg		Status pass	
Sensor C	ompone	nt Cell B Tmp.		Condit	tion N/A		Status pass	
Sensor Co	ompone	nt Line Loss		Condit	tion Not tested		Status pass	
Sensor C	ompone	nt System Men	no	Condit	tion		Status pass	

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number	
CHA	.467-Martii	n Valvur-04/11/2019					
1	4/11/2019	DAS	Environmental Sys Corp	90611	8816	2613	
2	4/11/2019	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460007	
3	4/11/2019	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460051	
4	4/11/2019	Zero air pump	Werther International	none	PC70/4	000665785	

Ozone Data Form

Mfg		Serial Numbe	r Ta Site	Т	echnician	Site Visit Date	Parameter	Owner ID
ThermoElec	tron Inc	CM08460007	CHA46	7	Martin Valvur	04/11/2019	Ozone	none
Slope: Intercept CorrCoff	(rcept	0.00000 0.00000 0.00000	Mfg Serial Number Tfer ID	ThermoElectron 49CPS-70008-30 01110		er ozone c. Ozone primary stan
DAS 1:		DA	AS 2:		Slope	1.0015	1 Intercept	0.00666
A Avg % D			Avg %Dif A	Max % Di	Cert Date	10/30/201	-	1.00000
0.0	0%	0.0%			Cert Date	10/00/201		1.00000
UseDescri	-	ConcGroup	Tfer Raw	Tfer Corr		Site Unit	RelPerDif	AbsDif
prima	-	1	0.06	0.05	1.31	ppb		1.26
prima	-	2	15.22	15.19	14.82	ppb		-0.37
prima	•	3	35.31	35.25	34.54	ppb	-2.03	
prima		4	64.58	64.47	63.71	ppb	-1.19	
prima	ry	5	117.64	117.45	115.35	ppb	-1.8	
Sensor Ce	omponei	nt Sample Trai	n	Condi	tion Good		Status pass	
Sensor C	omponer	nt 22.5 degree	rule	Condi	tion		Status pass	
Sensor C	omponei	nt Inlet Filter C	ondition	Condi	tion Clean		Status pass	
Sensor Co	omponei	nt Battery Back	kup	Condi	tion N/A		Status pass	
Sensor Co	omponei	nt Offset		Condi	tion -1.1		Status pass	
Sensor Co	omponei	nt Span		Condi	tion 1.024		Status pass	
Sensor Co	omponei	nt Zero Voltage	e	Condi	tion 0.0006		Status pass	
Sensor Ce	omponei	nt Fullscale Vo	Itage	Condi	tion 1.0006	Status pass		
Sensor Ce	omponei	nt Cell A Freq.		Condi	tion 89.9 kHz		Status pass	
Sensor Ce	omponei	nt Cell A Noise	•	Condi	tion 1.5 ppb		Status pass	
Sensor Co	omponei	t Cell A Flow		Condi	tion 0.73 lpm		Status pass	
Sensor Ce	omponei	nt Cell A Press	sure	Condi	tion 615.4 mmHg		Status pass	
Sensor Co	omponei	nt Cell A Tmp.		Condi	tion 31.6 C		Status pass	
Sensor Co	omponer	nt Cell B Freq.		Condi	tion 94.2 kHz		Status pass	
Sensor Co	omponei	t Cell B Noise	•	Condi	tion 1.5 ppb		Status pass	
Sensor Co	omponer	t Cell B Flow		Condi	tion 0.68 lpm		Status pass	
Sensor Co	omponer	nt Cell B Press	ure	Condi	tion 625.1 mmHg		Status pass	
Sensor Component Cell B Tmp.			Condi	tion N/A		Status pass		
Sensor Co	omponei	nt Line Loss		Condi	tion Not tested		Status pass	
Sensor Co	omponer	nt System Mer	no	Condi	tion		Status pass	

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
SND.	152-Korey	Devins-04/27/2019				
1	4/27/2019	DAS	Campbell	000357	CR3000	2135
2	4/27/2019	Ozone	ThermoElectron Inc	000743	49i A1NAA	1105347321
3	4/27/2019	Ozone Standard	ThermoElectron Inc	000704	49i A3NAA	1030244816
4	4/27/2019	Zero air pump	Werther International	06900	PC70/4	000821894

Ozone Data Form

Mfg		Serial Number	r Tag Site		Тес	chnician	Site Visit Date	Parame	eter	Owner ID
ThermoElec	tron Inc	1105347321	SND15	52	Ko	rey Devins	04/27/2019	Ozone		000743
Slope: Intercept CorrCoff:	-(0.99028 Slope 0.99572 Inter 1.00000 Corr		0.00000 0.00000 0.00000		Mfg Serial Number Tfer ID	ThermoElectron 1180030022 01114			er ozone Ozone primary stan
	Diff: A N 0%	DA Iax % Dif A A 0.0%	AS 2: Avg %Diff A	A Max % Dif	f	Slope Cert Date	1.0029 9/7/20		-	0.10980
UseDescr prima prima prima prima	ry ry ry ry ry ry	ConcGroup 1 2 3 4 5	Tfer Raw 0.42 15.10 36.22 65.10 109.84	Tfer Co 0.30 14.94 36.00 64.80 109.41		Site -0.65 13.80 34.62 63.11 107.40	Site Unit ppb ppb ppb ppb ppb	RelPer	Dif -3.91 -2.64 -1.85	AbsDif -0.95 -1.14
Sensor C	ompone	nt Sample Trail	า	Con	ditio	n Good		Status	pass	
Sensor C	ompone	nt 22.5 degree	rule	Con	ditio	on		Status	pass	
Sensor C	ompone	nt Inlet Filter Co	ondition	Con	ditio	n Clean		Status	pass	
Sensor C	ompone	nt Battery Back	up	Con	ditio	n N/A		Status	pass	
Sensor C	ompone	nt Offset		Con	ditio	n 0.40		Status	pass	
Sensor C	-					n 1.004		Status		
	•									
	•	nt Zero Voltage				n N/A		Status	L	
Sensor C	ompone	nt Fullscale Vol	tage			n N/A		Status	pass	
Sensor C	ompone	nt Cell A Freq.		Con	ditio	n 85.8 kHz		Status	pass	
Sensor C	ompone	nt Cell A Noise		Con	ditio	n 0.9 ppb		Status	pass	
Sensor C	ompone	nt Cell A Flow		Con	ditio	n 0.65 lpm		Status	pass	
Sensor C	ompone	nt Cell A Press	ure	Con	ditio	on 695.9 mmHg		Status	pass	
Sensor C	ompone	nt Cell A Tmp.		Con	ditio	n 34.8 C		Status	pass	
Sensor C	ompone	nt Cell B Freq.		Con	ditio	n 80.8 kHz		Status	pass	
Sensor C	ompone	nt Cell B Noise		Con	ditio	n 1.1 ppb		Status	pass	
	_	nt Cell B Flow				0.68 lpm		Status	r	
	-	nt Cell B Press	ure			n 696.2 mmHg		Status		
	•	nt Cell B Tmp.				n N/A		Status	L	
	•	nt Line Loss				n Not tested		Status		
	-	nt System Men	10		ditio			Status		
	mpone				artit			Status	L	

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ESPI	127-Korey	Devins-04/28/2019				
1	4/28/2019	DAS	Campbell	000352	CR3000	2130
2	4/28/2019	Ozone	ThermoElectron Inc	000695	49i A1NAA	1030244801
3	4/28/2019	Ozone Standard	ThermoElectron Inc	000327	49i A3NAA	0622717852
4	4/28/2019	Zero air pump	Werther International	06874	C 70/4	000815256

Ozone Data Form

Mfg		Serial Numbe	r Tag Site	r	Techni	cian	Site Visit Date	Parame	eter	Owner ID
ThermoElec	tron Inc	1030244801	ESP12	.7	Korey I	Devins	04/28/2019	Ozone		000695
Slope: Intercept CorrCoff:	-0	.01038 Slop 0.61174 Inter .00000 Corr		0.00000 0.00000 0.00000	Mfg Seri Tfe	ial Number	ThermoElectron 1180030022 01114		ramete er Desc	r ozone Ozone primary stan
	oiff: A M	DA ax % Dif A 0.0%	AS 2: Avg %Diff A	A Max % Dif	Sloj Cer	pe rt Date	9/7/20		•	0.10980
						~!			510	
UseDescri		ConcGroup	Tfer Raw 0.52	0.40	r	Site -0.16	Site Unit ppb	RelPer	Dif	AbsDif -0.56
prima	•	2	14.95	14.79		14.21	ppb			-0.58
prima		3	34.52	34.31		34.07	ppb		-0.7	0.00
primai		4	67.53	67.22		67.43	ppb		0.31	
prima		5	108.98	108.55		109.00	ppb		0.41	
Sensor C	omponer	nt Sample Trai	n	Cond	l ition G	lood		Status	pass	
Sensor C	omponer	t 22.5 degree	rule	Cond	lition			Status	pass	
Sensor C	omponer	nt Inlet Filter C	ondition	Cond	lition M	loderately cle	an	Status	pass	
Sensor C	omponer	t Battery Back	up	Cond	lition N	/A		Status	pass	
Sensor Co	omponer	nt Offset		Cond	lition -C).2		Status	pass	
Sensor Co	omponer	nt Span		Cond	lition 1	.027		Status	pass	
Sensor C	omponer	t Zero Voltage	;	Cond	l ition N	/A		Status	pass	
Sensor C	omponer	t Fullscale Vo	ltage	Cond	lition N	/A		Status	pass	
Sensor C	omponer	t Cell A Freq.		Cond	lition 1	09.2 kHz		Status	Pass	
Sensor C	omponer	t Cell A Noise		Cond	ition 5	.6 ppb		Status	Fail	
Sensor C	omponer	t Cell A Flow		Cond	ition 0	.69 lpm		Status	pass	
Sensor C	omponer	t Cell A Press	ure	Cond	lition 6	95.3 mmHg		Status	pass	
Sensor C	omponer	t Cell A Tmp.		Cond	lition 3	4.0 C		Status	pass	
Sensor C	omponer	t Cell B Freq.		Cond	lition 9	5.0 kHz		Status	pass	
Sensor C	omponer	t Cell B Noise		Cond	lition 2	.5 ppb		Status	pass	
Sensor C	omponer	t Cell B Flow		Cond	lition 0	.68 lpm		Status	pass	
Sensor C	omponer	t Cell B Press	ure	Cond	ition 6	95.9 mmHg		Status	pass	
Sensor C	omponer	t Cell B Tmp.		Cond	lition N	/A		Status	pass	
Sensor C	omponer	t Line Loss		Cond	lition N	ot tested		Status	pass	
Sensor C	omponer	nt System Men	าด	Cond	lition			Status	pass	

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
COW	V137-Sandy	v Grenville-06/13/2019				
1	6/13/2019	DAS	Campbell	000401	CR3000	2529
2	6/13/2019	Ozone	ThermoElectron Inc	000726	49i A1NAA	1105347314
3	6/13/2019	Ozone Standard	ThermoElectron Inc	000441	49i A3NAA	CM08200017
4	6/13/2019	Zero air pump	Werther International	06940	C 70/4	000821897

Ozone Data Form

Mfg		Serial Number	r Tag Site		Tec	hnician	Site Visit Date	Parame	eter	Owner ID
ThermoElec	ctron Inc	1105347314	COW1	37	Sai	ndy Grenville	06/13/2019	Ozone		000726
Slope: Intercept CorrCoff:	(0.96767 Slope 0.17821 Inter 0.99958 Corr		0.00000 0.00000 0.00000	1	Mfg Serial Number Tfer ID	ThermoElectron 1180930075 01115			r ozone Ozone primary stan
DAS 1:			AS 2:			Slope	1.0080	00 Inter	cept	-0.40210
	0%	Iax % Dif A / 0.0%	Avg %Diff A	A Max % Dif		Cert Date	3/26/20	19 Corr	Coff	1.00000
UseDescr prima prima prima	ry ry	ConcGroup 1 2 3	Tfer Raw 0.80 15.43 36.10	Tfer Con 1.19 15.70 36.21	rr	Site 3.10 14.42 34.20	Site Unit ppb ppb ppb	RelPer	Dif -5.71	AbsDif 1.91 -1.28
prima prima		4 5	68.10 112.10	67.95 111.60)	65.30 109.00	ppb ppb		-3.98 -2.36	
Sensor C	ompone	nt Sample Trair	ı	Cone	ditio	n Good		Status	pass	
Sensor C	ompone	nt 22.5 degree	rule	Cone	ditio	n		Status	pass	
Sensor C	ompone	nt Inlet Filter Co	ondition	Cond	ditio	n Clean		Status	pass	
Sensor C	ompone	nt Battery Back	up	Cone	ditio	n N/A		Status	pass	
Sensor C	ompone	nt Offset		Cond	ditio	n 0.20		Status	pass	
Sensor C	ompone	nt Span		Cond	ditio	n 1.020		Status	pass	
Sensor C	ompone	nt Zero Voltage	•	Cond	ditio	n N/A		Status	pass	
Sensor C	ompone	nt Fullscale Vol	tage	Cond	ditio	n N/A		Status	pass	
Sensor C	ompone	nt Cell A Freq.		Cond	ditio	n 116.5 kHz		Status	pass	
Sensor C	ompone	nt Cell A Noise		Cond	ditio	n 0.8 ppb		Status	pass	
Sensor C	ompone	nt Cell A Flow		Cond	ditio	n 0.67 lpm		Status	pass	
Sensor C	ompone	nt Cell A Press	ure	Cond	ditio	n 670.5 mmHg		Status	pass	
Sensor C	ompone	nt Cell A Tmp.		Cond	ditio	on 35.4 C		Status	pass	
Sensor C	ompone	nt Cell B Freq.		Cond	ditio	on 93.9 kHz		Status	pass	
Sensor C	ompone	nt Cell B Noise		Cond	ditio	n 0.8 ppb		Status	pass	
Sensor C	ompone	nt Cell B Flow		Cond	ditio	n 0.67 lpm		Status	pass	
Sensor C	ompone	nt Cell B Press	ure	Cone	ditio	on 671.1 mmHg		Status	pass	
Sensor C	ompone	nt Cell B Tmp.		Cond	ditio	n N/A		Status	pass	
Sensor C	ompone	nt Line Loss		Cond	ditio	n Not tested		Status	pass	
Sensor C	ompone	nt System Merr	10	Cond	ditio	n		Status	pass	

Site Inventory by Site Visit

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
PET4	27-Martin	n Valvur-04/08/2019				
1	4/8/2019	DAS	Environmental Sys Corp	90641	8816	2526
2	4/8/2019	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460048
3	4/8/2019	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1211052489
4	4/8/2019	Zero air pump	Werther International	none	PC 70/4	531382

Ozone Data Form

Mfg		Serial Numbe	r Ta Site	1	echnician	Site Visit Date	Parameter	Owner ID
ThermoElec	ctron Inc	CM08460048	PET427	·	Martin Valvur	04/08/2019	Ozone	none
Slope: Intercept CorrCoff	-(rcept (0.00000 0.00000 0.00000	Mfg Serial Number Tfer ID	ThermoElectron 49CPS-70008-30 01110		er ozone c. Ozone primary stan
DAS 1:		DA	AS 2:		Slope	1.0015	1 Intercept	0.00666
A Avg % D			Avg %Dif A	Max % Di	Cert Date	10/30/201		1.00000
0.0	0%	0.0%			Cert Date	10/00/201		1.00000
UseDescri	-	ConcGroup	Tfer Raw	Tfer Corr		Site Unit	RelPerDif	AbsDif
prima		1	0.07	0.06	0.09	ppb		0.03
prima		2	15.00	14.97	14.59	ppb		-0.38
prima	•	3	37.80	37.73	36.84	ppb	-2.39	
prima		4	63.46	63.35	63.07	ppb	-0.44	
prima	ry	5	117.03	116.84	115.40	ppb	-1.24	
Sensor Ce	ompone	nt Sample Trai	n	Condi	tion Good		Status pass	
Sensor C	ompone	nt 22.5 degree	rule	Condi	tion		Status pass	
Sensor C	ompone	nt Inlet Filter C	ondition	Condi	tion Clean		Status pass	
Sensor Co	ompone	nt Battery Back	kup	Condi	tion N/A		Status pass	
Sensor Co	ompone	nt Offset		Condi	tion 0.1		Status pass	
Sensor Co	ompone	nt Span		Condi	tion 0.997		Status pass	
Sensor Co	ompone	nt Zero Voltage	e	Condi	tion 0.0001		Status pass	
Sensor Ce	ompone	nt Fullscale Vo	ltage	Condi	tion 1.000	Status pass		
Sensor Ce	omponei	nt Cell A Freq.		Condi	tion 101.1 kHz		Status pass	
Sensor Ce	ompone	nt Cell A Noise	•	Condi	tion 0.6 ppb		Status pass	
Sensor Co	omponei	nt Cell A Flow		Condi	tion 0.67 lpm		Status pass	
Sensor Ce	ompone	nt Cell A Press	sure	Condi	tion 615.3 mmHg		Status pass	
Sensor Ce	ompone	nt Cell A Tmp.		Condi	tion 31.9 C		Status pass	
Sensor Co	ompone	nt Cell B Freq.		Condi	tion 100.5 kHz		Status pass	
Sensor Ce	Sensor Component Cell B Noise		•	Condi	tion 0.6 ppb		Status pass	
Sensor Co	ompone	nt Cell B Flow		Condi	tion 0.66 lpm		Status pass	
Sensor Co	ompone	nt Cell B Press	ure	Condi	tion 615.0 mmHg		Status pass	
Sensor Component Cell B Tmp.			Condi	tion N/A		Status pass		
Sensor Co	ompone	nt Line Loss		Condi	tion Not tested		Status pass	
Sensor C	ompone	nt System Men	no	Condi	tion		Status pass	