2017 – 2nd Quarter Report Support for Conducting Systems & Performance Audits of CASTNET Sites and NADP Monitoring Stations

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Prepared for:

U. S. Environmental Protection Agency

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List of Acronyms and Abbreviations

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

1.0 CASTNET Quarterly Report

1.1 Introduction

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

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

CASTNET pollutant flux estimates are calculated as the aggregate product of weekly measured chemical concentrations and model-estimated deposition velocities. Currently, the Community Multi-scale Air Quality (CMAQ) Model is used to derive deposition velocity estimates.

As of June 2017, the network is comprised of 95 active rural sampling sites across the Untied States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Environment Canada, Bureau of Land Management (BLM) and several independent partners. AMEC Foster Wheeler (AMEC) is responsible for operating the EPA and Environment Canada sponsored sites, and Air Resource Specialist, Inc. (ARS) is responsible for operating the NPS and BLM sponsored sites.

1.2 Project Objectives

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

Performance audits verify that all evaluated variables are consistent with the accuracy goals as defined in the CASTNET Quality Assurance Project Plan (QAPP). The parameter specific accuracy goals are presented in Table 1. Only four EPA sponsored sites that are operated by AMEC continue to operate meteorological sensors. Those sites are BEL116, BVL30, CHE185, and PAL190. Five new sites in WY sponsored by EPA and operated by the BLM/ARS also

operate meteorological sensors and are BAS601, NEC602, BUF603, FOR604, and SHE604. The NPS added a new site at Chaco Culture National Historical Park (CHC432) which also monitors meteorological variables. The meteorological sensors at sites CHE185 and CHC432 were audited during the station audits performed in second quarter 2017.

Some or all of the additional monitored variables, NOy, CO, and SO_2 have been added to the EPA sponsored sites BVL130, HWF187, PND165, PNF126, GRS420, MAC426, ROM206, and BEL116. None of those variables were audited during second quarter 2017.

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Precipitation	Response	10 manual tips	1 DAS count per tip
Precipitation	Accuracy	2 introductions of known amounts of water	$\leq \pm 10.0\%$ of input amount
Relative Humidity	Accuracy	Compared to reference instrument or standard solution	≤±10.0% RH
Solar Radiation	Accuracy	Compared to WRR traceable standard	$\leq \pm 10.0\%$ of daytime average
Surface Wetness	Response	Distilled water spray mist	Positive response
Surface Wetness	Sensitivity	1% decade resistance	N/A
Temperature	Accuracy	Comparison to 3 NIST measured baths (~ 0° C, ambient, ~ full-scale)	$\leq \pm 0.5^{\circ} \mathrm{C}$
Temperature Difference	Accuracy	Comparison to station temperature sensor	≤ ± 0.50° C
Shelter Temperature	Accuracy	Comparison to station temperature sensor	\leq ± 2.0° 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
Wind Speed	Accuracy	Shaft rotational speed generated and measured with certified synchronous motor	$\leq \pm 0.5$ mps below 5.0 mps input; $\leq \pm 5.0\%$ of input at or above 5.0 mps
Wind Speed Starting Threshold Starting torque tested with torque gauge		< 0.5 g-cm	

 Table 1. Performance Audit Challenge and Acceptance Criteria

Sensor	Parameter	Audit Challenge	Acceptance Criteria	
Mass Flow Controller	Flow Rate	Comparison with Primary Standard	$\leq \pm 5.0\%$ of designated rate	
Ozone	Slope	Linear regression of multi- point test gas concentration as	$0.9000 \le m \le 1.1000$	
Ozone	Intercept		-5.0 ppb ≤b ≤ 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	$\leq \pm 10.0\%$ of test gas concentration	
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 2017

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 2017. 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	
KNZ184	Flow only	EPA	4/4/2017	Konza Prairie	
KIC003	Flow only	EPA	4/5/2017	Kickapoo Tribe - Powhattan	
CAD150	Without met	EPA	4/6/2017	Caddo Valley	
CDZ171	Without met	EPA	4/7/2017	Cadiz	
CHE185	With met	EPA	5/9/2017	Cherokee Nation	
CHC432	With met	NPS	5/10/2017	Chaco NHP	
DCP114	Without met	EPA	5/22/2017	Deer Creek St. Park	
OXF122	Without met	EPA	5/23/2017	Oxford	
SEK430	Without met	NPS	5/23/2017	Sequoia NP - Ash Mountain	
QAK172	Without met	EPA	5/24/2017	Quaker City	
YOS404	Without met	NPS	5/24/2017	Yosemite NP	
PIN414	Without met	NPS	5/25/2017	Pinnacles NP	
LAV410	Without met	NPS	5/30/2017	Lassen Volcanic NP	

 Table 2. Site Audit Visits

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>	<u>Site Visit Date</u>	Station Name
PET427	Ozone	NPS	4/24/2017	Petrified Forest NP
CHA467	Ozone	NPS	4/26/2017	Chiricahua NM
GRC474	Ozone	NPS	4/28/2017	Grand Canyon NP
CAN407	Ozone	NPS	5/1/2017	Canyonlands NP
GRB411	Ozone	NPS	6/8/2017	Great Basin NP

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

2.2 **Project Objectives**

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

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

2.3 NADP Sites Visited Second Quarter 2017

This report covers the results from the NADP sites surveyed during the second quarter (April through June) of 2017. The station names and dates of the audits are presented in Table 4.

Side ID	<u>Network</u>	<u>Visit Date</u>	Station Name	
AR02	NTN	4/12/2017	Warren 2WSW	
AR03	NTN / AMoN	4/6/2017	Caddo Valley	
AR16	NTN	5/15/2017	Buffalo National River-Buffalo Point	
AR27	NTN	5/8/2017	Fayettville	
AZ06	NTN	4/27/2017	Organ Pipe Cactus NP	
AZ97	NTN	4/24/2017	Petrified Forest National Park-Rainbow Forest	
AZ98	NTN/AMoN	4/26/2017	Chiricahua NM	
AZ99	NTN	4/25/2017	Oliver Knoll	
CA28	NTN	5/22/2017	Kings River Experimental Watershed	
KS03	MDN/AMoN	4/5/2017	Reserve	
KS05	MDN	4/6/2017	Coffey County Lake	
KS07	NTN	4/6/2017	Farlington Fish Hatchery	
KS24	MDN	4/3/2017	Glen Elder State Park	
KS31	NTN	4/4/2017	Konza Prarie	
KS97	AMoN	4/5/2017	Kickapoo Tribe - Powhattan	
NM07	NTN	5/9/2017	Bandelier National Monument	
NM08	NTN	5/8/2017	Mayhill	
OH09	NTN	5/23/2017	Oxford	
OH49	NTN	5/24/2017	Caldwell	
OH54	NTN	5/10/2017	Deer Creek State Park	

 Table 4. Sites Surveyed – Second Quarter 2017

Side ID	<u>Network</u>	<u>Visit Date</u>	Station Name		
OK00	NTN	4/3/2017	Salt Plains National Wildlife Refuge		
OK01	MDN	4/5/2017	McGee Creek		
OK04	MDN	4/5/2017	Lake Murray		
OK06	MDN	4/4/2017	Wichita Mountains NWR		
OK29	NTN	4/2/2017	Goodwell Research Station		
OK31	MDN	4/4/2017	Copan		
OK99	MDN/AMoN	5/9/2017	Cherokee		
TX21	MDN/NTN	4/10/2017	Longview		

2.4 Survey Results

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

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

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

APPENDIX A

CASTNET Audit Report Forms

Site Inventory by Site Visit

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number				
KNZ	KNZ184-Martin Valvur-04/04/2017									
1	4/4/2017	Computer	Dell	07016	Inspiron 15	DK2MC12				
2	4/4/2017	DAS	Campbell	000361	CR3000	2139				
3	4/4/2017	Elevation	Elevation	None	1	None				
4	4/4/2017	Filter pack flow pump	Thomas	04921	107CAB18	060300019983				
5	4/4/2017	Flow Rate	Apex	000849	AXMC105LPMDPCV	illegible				
6	4/4/2017	Infrastructure	Infrastructure	none	none	none				
7	4/4/2017	Modem	Raven	06478	V4221-V	0808311141				
8	4/4/2017	Sample Tower	Aluma Tower	missing	В	none				
9	4/4/2017	Shelter Temperature	Campbell	none	107-L	none				
10	4/4/2017	Siting Criteria	Siting Criteria	None	1	None				
11	4/4/2017	Temperature	RM Young	04686	41342VC	6700				

Flow Data Form

Mfg	Serial Nur	nber Ta	Site	Te	chnician	Site Visit I	Date Paran	neter	Owner ID
Apex	illegible		KNZ184	Ма	artin Valvur	04/04/2017	7 Flow F	Rate	000849
					Mfg Serial Number Tfer ID	BIOS 148613 01421	1	Parameter Flo	
					Slope	1.	00153 Int	ercept	0.00366
					Cert Date	1/2	5/2017 Co	rrCoff	1.00000
DAS 1: A Avg % Diff: 2.18%	A Max % Di 2.29%	DAS 2: A Avg %	Dif A Max	x % Di	Cal Factor Z Cal Factor F Rotometer R	ull Scale		0 0 0	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignal	II PctDifference
primary	pump off	0.000	0.000	-0.01	0.000	-0.05	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	3.070	3.060	3.05	0.000	2.99	l/m	l/m	-2.29%
primary	test pt 2	3.070	3.060	3.05	0.000	2.99	l/m	l/m	-2.29%
primary	test pt 3	3.060	3.050	3.05	0.000	2.99	l/m	l/m	-1.97%
Sensor Comp	onent Leak Tes	st		Conditio	n		Statu	s pass	
Sensor Comp	onent Tubing C	Condition		Conditio	Good		Status	s pass	
Sensor Comp	onent Filter Pos	sition		Conditio	Good		Statu	s pass	
Sensor Comp	onent Rotomet	er Conditio	n	Conditio	Clean and dry		Statu	s pass	
Sensor Comp	onent Moisture	Present		Conditio	No moisture p	resent	Status	s pass	
Sensor Comp	onent Filter Dis	tance		Conditio	6.0 cm		Statu	s pass	
Sensor Comp	onent Filter De	pth		Conditio	3.0 cm		Statu	s pass	
Sensor Comp	onent Filter Azi	muth		Conditio	n 360 deg		Statu	s pass	
Sensor Comp	onent System M	Nemo		Conditio	on		Statu	s pass	

Temperature Data Form

Mfg	Serial Number	Ta Site]	Fechn i	ician	Site V	isit Date	visit Date Parame		Owner ID
RM Young	6700	KNZ184		Martin	Valvur	04/04	4/2017	Temper	rature	04686
				Mf	ġ	Fluke		Ра	arameter Temperature	
				Serial Number		32751	3275143 Tf		fer Desc. R	ГD
				Tfe	er ID	01229)			
DAS 1: DAS 2:				Slo	pe	1.00006 Inter		rcept	0.03191	
Abs Avg Err Abs Max Er Abs Avg Err Abs Ma			Max Er	ax Er Cert Date			1/23/201	7 Cor	rCoff	1.00000
0.04	0.06									
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference
primary Te	mp Low Range	0.03	0.00		0.000		-0.1		С	-0.06
primary Te	emp Mid Range	23.54	23.51		0.000		23.	5	С	0.01
primary Te	emp High Range	48.24	48.21		0.000		48.	2	С	-0.06
Sensor Compo	nent Shield		Condi	tion C	Clean			Status	pass	
Sensor Component Blower			Condi	Condition N/A				Status	pass	
Sensor Component Blower Status Switch				Condition N/A				Status	pass	
Sensor Compo	nent System Memo		Condi	Condition				Status	pass	

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	KNZ184	Martin Valvur	04/04/2017	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter She	Iter Temperatur
Abs Avg Err Ab	os Max Er Abs Avg 1.43	Err Abs Max Er	Serial Number	3275143	Tfer Desc. RTD)
			Tfer ID	01229		
			Slope	1.0000	6 Intercept	0.03191
			Cert Date	1/23/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference		
primary	Temp Mid Range	26.42	26.39	0.000	26.4	С	-0.02		
primary	Temp Mid Range	25.01	24.98	0.000	26.4	С	1.43		
primary	Temp Mid Range	25.12	25.09	0.000	25.2	С	0.09		
Sensor Con	nponent System Memo	1	Condition	Condition Status			pass		

Infrastructure Data For

Site ID	KNZ184	Technician	Martin Valvur	S	Site Visit Date	04/04/2017	
Shelter M	lake	Shelter Model	S	Shelter S	Size		
Wells Car	до	EW1211 (s/n 1WC200E162304		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	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: SitingCriteriaCom

The site is located at a Long Term Ecological Research site operated by KSU.

2 Parameter: ShelterCleanNotes

The shelter is very clean, neat, well organized and well maintained. The shelter floor is beginning to deteriorate.

F-02058-1500-S1-rev002

Site ID KNZ184	Technician Martin Valvur	Site Visit Date 04/0	4/2017		
Site Sponsor (agency)	EPA	USGS Map	Swede Creek		
Operating Group	Kansas State University	Map Scale			
AQS #	20-161-9991	Map Date			
Meteorological Type	R.M. Young				
Air Pollutant Analyzer	Ozone	QAPP Latitude	39.1021		
Deposition Measurement	dry, wet	QAPP Longitude	-96.6096		
Land Use	range	QAPP Elevation Meters	348		
Terrain	gently rolling	QAPP Declination	4.5		
Conforms to MLM	Yes	QAPP Declination Date	01/07/2005		
Site Telephone	(785) 770-8426	Audit Latitude	39.10216		
Site Address 1	Konza Prairie Lane	Audit Longitude	-96.609583		
Site Address 2	CR 901	Audit Elevation	346		
County	Riley	Audit Declination	4.2		
City, State	Manhattan, KZ	Present			
Zip Code	66502	Fire Extinguisher 🗹	No inspection date		
Time Zone	central	First Aid Kit			
Primary Operator		Safety Glasses			
Primary Op. Phone #		Safety Hard Hat 🔽			
Primary Op. E-mail		Climbing Belt			
Backup Operator		Security Fence			
Backup Op. Phone #		Secure Shelter			
Backup Op. E-mail		Stable Entry Step 🔽			
Shelter Working Room ✓	Make Wells Cargo M	EW1211 (s/n 1WC20	Shelter Size 640 cuft		
Shelter Clean	Notes The shelter is very clean, neat deteriorate.	, well organized and well mainta	ained. The shelter floor is beginning to		
Site OK	Notes				
right c	Manhattan take route 177 south. At the onto CR901 (McDowell Creek Road). Co ical Station. The site is through the gate	ntinue approximately 6.2 miles	and turn left into the Konza Prairie		

KNZ184

F-02058-1500-S2-rev002

Site ID

Techn

Technician Martin Valvur

Site Visit Date 04/04/2017

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		\checkmark
Tree line	50 m		\checkmark
Obstacles to wind	10 times obstacle height		

Siting Distances OK

Siting Criteria Comment

The site is located at a Long Term Ecological Research site operated by KSU.

Fi	eld Systems Data Form	F-02058-1500-S3-rev0					
Sit	E ID KNZ184 Technician Martin Valvur		Site Visit Date 04/04/2017				
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				
	ovide any additional explanation (photograph or sketch if nece tural or man-made, that may affect the monitoring parameters		y) regarding conditions listed above, or any other features,				

F-02058-1500-S4-rev002

Site	e ID	KNZ184	Technician	Martin Valvur		Site Visit Date	04/04/2017	
1		e meterological senso 1, and well maintained		intact, in good	✓	Temperature only		
2	Are all the reporting	ne meteorological sens g data?	sors operational	l online, and	✓	Temperature only		
3	Are the s	hields for the temper	ature and RH s	ensors clean?	✓			
4	Are the a	spirated motors wor	king?		✓	N/A		
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		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 H	orm		F-02058-1500-S5-rev002
Sit	e ID	KNZ184	Technician Martin Valvur		Site Visit Date 04/04/2017
	<u>Siting C</u>	riteria: Are the poll	atant analyzers and deposition ec	uipı	nent sited in accordance with 40 CFR 58, Appendix E
1		ample inlets have at cted airflow?	least a 270 degree arc of	✓	
2	Are the	sample inlets 3 - 15	neters above the ground?	✓	
3		sample inlets > 1 me neters from trees?	ter from any major obstruction,	✓	
	<u>Pollutan</u>	t analyzers and dep	osition equipment operations and	l ma	<u>intenance</u>
1		nalyzers and equipm n and well maintain	nent appear to be in good ed?	✓	N/A
2	Are the reportin		ors operational, on-line, and	✓	N/A
3	Describe	e ozone sample tube.			N/A
4	Describe	e dry dep sample tub	ю.		3/8 teflon by 12 meters
5		ine filters used in the location)	e ozone sample line? (if yes	✓	N/A
6	Are sam obstruct		of kinks, moisture, and	✓	
7	Is the ze	ro air supply desicca	ant unsaturated?	✓	N/A
8	Are then	re moisture traps in	the sample lines?	✓	
9	Is there clean?	a rotometer in the d	ry deposition filter line, and is it		Clean and dry

Fi	eld Sy	stems Data Fo	orm]	F-020	58-15	00-S6-rev002
Site	e ID	KNZ184	Technician	Martin Valvur		Site Visi	it Date 04/0	04/2017		
	DAS, sei	nsor translators, and p	<u>eripheral equi</u>	pment operatio	ons and	<u>l maintena</u>	<u>nce</u>			
1		DAS instruments appeantained?	ar to be in good	l condition and						
2		he components of the l backup, etc)	DAS operation	al? (printers,						
3		nalyzer and sensor sig g protection circuitry?	through							
4		signal connections pro intained?	e weather and							
5	Are the	signal leads connected	to the correct	DAS channel?						
6	Are the grounde	DAS, sensor translator d?	rs, and shelter	properly						
7	Does the	e instrument shelter ha	ve a stable pov	ver source?						
8	Is the in	strument shelter temp	erature contro	lled?						
9	Is the m	et tower stable and gro	ounded?			Stable		Gr	ounded	
10	Is the sa	mple tower stable and	grounded?							
11	Tower c	omments?								

Field	Systems Data	For	m				F-02	058-	1500-S7-ı	rev002
Site ID	KNZ184		Technie	cian Mart	in Valvur	Site Visit Date	04/04/2017			
Docun	nentation									
Does t	he site have the requi	red inst	rument	and equi	pment manuals?					
		Yes	No	N/A			Yes	No	N/A	
_	eed sensor			\checkmark	Data logg					
	rection sensor			\checkmark	Data logg					
	iture sensor					rt recorder				
	humidity sensor				Computer	r				
	liation sensor				Modem			✓		
	wetness sensor				Printer					
	nsor translator				Zero air p					
•	ture translator			\checkmark	Filter flov					
-	y sensor translator				Surge pro	otector				
	liation translator				UPS					
	bucket rain gauge					protection device				
Ozone an	•				Shelter he					
	ck flow controller				Shelter ai	r conditioner	\checkmark			
Filter pa	ck MFC power supply	y 🗌		\checkmark						
Does	<mark>s the site have the requ</mark>	iired an	<u>id most</u>	recent Q	<u>C documents and</u>	<u>d report forms?</u>				
		Prese	nt				Curre	nt		
Station L	uog						\checkmark			
SSRF			•				\checkmark			
Site Ops	Manual		00	t 2001						
HASP										
Field Op	s Manual									
Calibrati	ion Reports						\checkmark			
Ozone z/s	s/p Control Charts									
Preventiv	ve maintenance sched	ul 🗌								
1 Is th	ne station log properly	v comple	eted du	ring every	v site visit? 🔽					
	the Site Status Repor rent?	t Form	s being	completed	i and 🔽					
	the chain-of-custody ple transfer to and fro			used to c	locument 🗹					
	ozone z/s/p control ch rent?	arts pr	operly o	completed	land 🔽 🛛	N/A				

Site	e ID KNZ184 Technician M	fartin Valvur	Site Visit Date	04/04/2017	
1	Site operation procedures Has the site operator attended a formal CAST course? If yes, when and who instructed?	NET training 🗸	Trained by MACTEC	C personnel during site	installation
2	Has the backup operator attended a formal CA training course? If yes, when and who instruct		Trained by site opera	ator	
	Is the site visited regularly on the required Tue schedule?	esday 🗸			
	Are the standard CASTNET operational proce flollowed by the site operator?	edures being			
	Is the site operator(s) knowledgeable of, and ab the required site activities? (including documen				

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	Weekly	
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	N/A	
Automatic Zero/Span Tests	N/A	\checkmark
Manual Zero/Span Tests	N/A	\checkmark
Automatic Precision Level Tests	N/A	
Manual Precision Level Test	N/A	
Analyzer Diagnostics Tests	N/A	\checkmark
In-line Filter Replacement (at inlet)	N/A	\checkmark
In-line Filter Replacement (at analyze	N/A	\checkmark
Sample Line Check for Dirt/Water	N/A	\checkmark
Zero Air Desiccant Check	N/A	\checkmark

- **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?

\checkmark	N/A
✓	N/A
✓	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:

F-02058-1500-S8-rev002

Fi	eld Sy	stems Data Fo	rm					F-02058- 2	1500-S9-rev002		
Sit	e ID	KNZ184	Technic	ian	Martin Valvur		Site Visit Date	04/04/2017			
	<u>Site ope</u>	eration procedures									
1	Is the fi	lter pack being changed	d every Tu	iesd	ay as scheduled?		Filter changed mori	nings			
2	Are the correct	Site Status Report For ly?	ms being o	com	pleted and filed						
3	Are dat schedul	a downloads and backu ed?	ips being j	perf	ormed as		No longer required				
4	Are gen	neral observations being	g made and	d re	corded? How?	✓	SSRF, logbook				
5	Are site fashion	e supplies on-hand and 1 ?	replenishe	d in	a timely	✓					
6	Are san	nple flow rates recorded	l? How?			✓	SSRF, call-in				
7	Are san fashion	nples sent to the lab on a ?	a regular :	sche	edule in a timely						
8		ers protected from cont pping? How?	amination	u du	ring handling	✓	Clean gloves on an	d off			
9		site conditions reported ons manager or staff?	d regularl	y to	the field						
QC	Check P	erformed		Fre	quency			Compliant			
I	Multi-poi	nt MFC Calibrations	\checkmark	Sen	niannually						
	-	em Leak Checks	\checkmark	Wee	ekly						
		k Inspection									
		e Setting Checks	\checkmark	Wee	ekly						
	Visual Ch	neck of Flow Rate Rotor	neter 🗹	Wee	ekly						
I	In-line Fil	lter Inspection/Replacer	ment 🗹	Wee	ekly			\checkmark			
		ine Check for Dirt/Wat		Wee	ekly			\checkmark			
Dros	ido ony o	additional avalanation (nhotogra	ah o	n skotah if naaas	CONT) recording conditi	iona listed above or	any other features		

Field Systems Data Form	I

Technician Martin Valvur

F-02058-1500-S10-rev002

Site Visit Date 04/04/2017

Site	Vicit	Sensors
Sile	VISIU	Sensor

Site ID

KNZ184

Parameter Manufacturer Model S/N **Client ID** Inspiron 15 Computer Dell DK2MC12 07016 DAS Campbell CR3000 2139 000361 Elevation Elevation 1 None None Filter pack flow pump Thomas 107CAB18 060300019983 04921 Flow Rate Apex AXMC105LPMDPC illegible 000849 Infrastructure Infrastructure none none none Modem Raven V4221-V 0808311141 06478 Sample Tower Aluma Tower В none missing Shelter Temperature Campbell 107-L none none Siting Criteria Siting Criteria 1 None None RM Young 41342VC 6700 04686 Temperature

Site Inventory by Site Visit

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number			
KIC003-Martin Valvur-04/05/2017									
1	4/5/2017	DAS	Campbell	000816	CR850	28382			
2	4/5/2017	Filter pack flow pump	Permotec	none	BL30EB	unknown			
3	4/5/2017	Flow Rate	Apex	000668	AXMC105LPMDPCV	illegible			
4	4/5/2017	Modem	Sierra wireless	06996	unknown	unknown			
5	4/5/2017	Sample Tower	Aluma Tower	000814	В	none			
6	4/5/2017	Temperature	RM Young	06112	41342	10176			

Flow Data Form

Mfg	Serial Nun	nber Ta	Site	Te	chnician	Site Visit I	Date Paran	neter	Owner ID	
Apex	Apex illegible KIC003		Ма	artin Valvur	04/05/2017	7 Flow F	Rate	000668		
					Mfg Serial Number Tfer ID	BIOS 148613 01421	1	arameter Flo		
					Slope	1.	00153 Int	ercept	0.00366	
					Cert Date	1/2	5/2017 Co	rrCoff	1.00000	
DAS 1: A Avg % Diff: 0.55%	A Max % Di 0.67%	DAS 2: A Avg %	Dif A Max	x % Di	Cal Factor Z Cal Factor F Rotometer R	ull Scale		0 0 0		
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	0.000	-0.01	1/m	l/m		
primary	leak check	0.000	0.000	0.00	0.000	-0.01	l/m	l/m		
primary	test pt 1	2.990	2.980	2.99	0.000	3.00	l/m	l/m	0.67%	
primary	test pt 2	3.020	3.010	2.99	0.000	2.99	l/m	l/m	-0.66%	
primary	test pt 3	3.010	3.000	2.99	0.000	2.99	l/m	l/m	-0.33%	
Sensor Comp	onent Leak Tes	st		Conditio	on		Status	pass		
Sensor Comp	onent Tubing C	ondition		Conditio	Condition Good			Status pass		
Sensor Comp	onent Filter Pos	sition		Conditio	Good	Status		s pass		
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	Clean and dry	Statu		Is pass		
Sensor Comp	onent Moisture	Present		Conditio	No moisture p	resent	Status	pass		
Sensor Comp	onent Filter Dis	tance		Conditio	6.5 cm		Status	pass		
Sensor Comp	onent Filter Dep	oth		Conditio	n 1.0 cm		Status		IS pass	
Sensor Comp	onent Filter Azi	muth		Conditio	270 deg		Status	pass		
Sensor Comp	onent System N	Nemo		Conditio	on 🗌		Status	pass		

Temperature Data Form

Mfg	Serial Number	Fa Site	,	Techn	ician	Site V	isit Date	Param	eter	Owner ID	
RM Young	10176	KIC003		Martin	Valvur	04/05	5/2017	Temper	ature	06112	
				Mf	g	Fluke		Pa	rameter Te	emperature	
				Ser	rial Number	32751	43	Tf	er Desc. R	ſD	
				Tfe	er ID	01229)				
DAS 1:	DAS	2:		Slope		1.00006 Inter		ercept 0.03191			
Abs Avg Err Ab			Max Er	ax Er Cert Date		1/23/2017 CorrCoff		rCoff	1.00000	I	
0.07	0.09										
UseDesc.	Test type	InputTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Tem	p Low Range	0.07	0.04	ŀ	0.000		0.1	l	С	0.05	
primary Tem	p Mid Range	22.83	22.80	0	0.000		22.	9	С	0.06	
primary Tem	p High Range	47.61	47.58	47.58		0.000 47		7	С	0.09	
Sensor Compone	ent Shield		Condi	ition C	Clean			Status	pass		
Sensor Component Blower			Condi	Condition N/A				Status	pass		
Sensor Component Blower Status Switch			Condi	Condition N/A				Status	pass		
Sensor Compone	ent System Memo		Condi	Condition				Status	pass		

Field Systems Comments

1 Parameter: DocumentationCo

The site logbook is not provided by AMEC, however the site operator maintains records.

2 Parameter: SitingCriteriaCom

The site is located across the street from the community school in a very small town.

3 Parameter: ShelterCleanNotes

Small footprint site with no shelter.

F-02058-1500-S1-rev002

Site ID KIC003	Technician Martin Valvur	Site Visit Date 04/05	/2017
Site Sponsor (agency)	EPA	USGS Map	
Operating Group	Kickapoo Tribe	Map Scale	
AQS #		Map Date	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer		QAPP Latitude	
Deposition Measurement		QAPP Longitude	
Land Use		QAPP Elevation Meters	
Terrain		QAPP Declination	
Conforms to MLM		QAPP Declination Date	
Site Telephone		Audit Latitude	39.76102
Site Address 1		Audit Longitude	-95.63599
Site Address 2		Audit Elevation	367
County	Brown	Audit Declination	
City, State	Powhattan, KS	Present	
Zip Code	66527	Fire Extinguisher	
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 Mo	odel	Shelter Size
Shelter Clean	Notes Small footprint site with no she	lter.	
Site OK	Notes		
Driving Directions			

KIC003

F-02058-1500-S2-rev002

Site ID

Technician Martin Valvur

Site Visit Date 04/05/2017

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

Siting Distances OK

Siting Criteria Comment

The site is located across the street from the community school in a very small town.

Fi	eld Systems Data Form	F-02058-1500-S3-rev002			
Site	EID KIC003 Technician Martin Valvur	Site Visit Date 04/05/2017			
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			
	ovide any additional explanation (photograph or sketch if nec cural or man-made, that may affect the monitoring parameter	essary) regarding conditions listed above, or any other features,			

F-02058-1500-S4-rev002

Site	ID	KIC003	Technician	Martin Valvur		Site Visit Date 04/0	05/2017	
1		e meterological senso 1, and well maintaine		intact, in good	✓	Temperature only		
2	Are all the meteorological sensors operational online, and reporting data?					Temperature only		
3	Are the s	hields for the temper	ature and RH s	ensors clean?	✓			
4	Are the a	aspirated motors wor	king?		✓	N/A		
5	Is the sol scratches	ar radiation sensor's 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		ensor signal and pow n, and well maintaine		, in good				
8		ensor signal and pow elements and well ma		ctions protected	\checkmark			
						L		

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	EID KIC003 Technician Martin Valvur		Site Visit Date 04/05/2017
	Siting Criteria: Are the pollutant analyzers and deposition ed	luipı	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	l 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.		N/A
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)		N/A
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?	✓	N/A
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	KIC003	Technician	Martin Valvur		Site Vis	it Date	04/05/2017	,	
	DAS, ser	nsor translators, and j	peripheral equi	pment operatio	ns an	<u>d maintena</u>	nce			
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						
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 d?	rs, and shelter	properly						
7	Does the	e instrument shelter ha	ave a stable pov	ver source?						
8	Is the in	strument shelter temp	erature contro	lled?		N/A				
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 S	ystems Data	a Fo	rm			F-02	.058-	1500-S7-rev002
Site ID	KIC003		Tech	mician Marti	n Valvur Site Visit Date)4/05/2017	7	
Docume	ntation							
Does the	site have the requ				oment manuals?			
Solar radia Surface wet Wind senso Temperatu Humidity s Solar radia Tipping bu Ozone anal Filter pack	tion sensor re sensor midity sensor tion sensor tness sensor or translator re translator ensor translator tion translator cket rain gauge	Yes			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 V V V V V V V V V
		- -	and mo	ost recent QC	<u>C documents and report forms?</u>			
Station Log SSRF		Pres				Curre	ent	
Site Ops M HASP Field Ops M Calibration Ozone z/s/p	Ianual			Feb 2014 Feb 2014				
1 Is the	station log properl	y comp	oleted	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?

✓	
✓	N/A

The site logbook is not provided by AMEC, however the site operator maintains records.

Field Systems Data Form

Site ID KIC003 Technician Martin Valvur Site Visit Date 04/05/2017 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	Com
Multipoint Calibrations	\checkmark	N/A	\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?

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

- **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?

\checkmark	N/A
✓	N/A
✓	N/A

F-02058-1500-S8-rev002

pliant

Fi	eld Sy	stems Data Fo	orm					F-02058	-1500-S9-rev002	
Sit	e ID	KIC003	Technic	nician Martin Valvur		Site Visit Date	04/05/2017			
	Site ope	ration procedures								
1	Is the fil	ter pack being change	ed every Tu	esd	ay as scheduled?		Filter changed morn	ings		
2	Are the correctl	Site Status Report For y?	rms being o	om	pleted and filed	✓				
3	Are dat schedul	a downloads and back ed?	ups being J	oerf	formed as		No longer required			
4	Are gen	eral observations bein	g made and	l re	corded? How?	✓	SSRF, logbook, call	-in		
5	Are site fashion	supplies on-hand and	replenishe	d in	a timely					
6	Are san	ple flow rates recorde	d? How?			✓	SSRF, logbook, call-in			
7	Are sam fashion	ples sent to the lab on	a regular s	sche	edule in a timely	✓				
8		ers protected from con oping? How?	tamination	du	ring handling	✓	Clean gloves on and	d off		
9		site conditions reporte ons manager or staff?	ed regularly	y to	the field					
QC	Check P	erformed		Fre	quency			Compliant		
]	Multi-poi	nt MFC Calibrations		Sen	niannually					
]	Flow Syste	em Leak Checks		Wee	ekly					
]	Filter Pac	k Inspection								
]	Flow Rate Setting Checks									
	Visual Check of Flow Rate Rotometer Weekly						\checkmark			
]	In-line Fil	ter Inspection/Replace	ement 🗹	As r	needed			\checkmark		
1	Sample Li	ne Check for Dirt/Wa	ter 🔽	Wee	ekly					

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Field Sys	stems Data Fo	rm			F-02058-15 0	0-S10-rev002
Site ID	KIC003	Technician	Martin Valvur	Site Visit Date	04/05/2017	

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR850	28382	000816
Filter pack flow pump	Permotec	BL30EB	unknown	none
Flow Rate	Apex	AXMC105LPMDPC	illegible	000668
Modem	Sierra wireless	unknown	unknown	06996
Sample Tower	Aluma Tower	В	none	000814
Temperature	RM Young	41342	10176	06112

Site Inventory by Site Visit

Site Vi	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number						
CAD1	CAD150-Sandy Grenville-04/06/2017											
1	4/6/2017	Computer	Dell	07061	Inspiron 15	CL3MC12						
2	4/6/2017	DAS	Campbell	000421	CR3000	2530						
3	4/6/2017	Elevation	Elevation	None	1	None						
4	4/6/2017	Filter pack flow pump	Thomas	00462	107CA110	09883403-01-4						
5	4/6/2017	Flow Rate	Арех	000597	AXMC105LPMDPCV	illegible						
6	4/6/2017	Infrastructure	Infrastructure	none	none	none						
7	4/6/2017	Modem	Raven	06469	H4222-C	0808310608						
8	4/6/2017	Ozone	ThermoElectron Inc	000624	49i A1NAA	1009241792						
9	4/6/2017	Ozone Standard	ThermoElectron Inc	000495	49i A3NAA	0622717849						
10	4/6/2017	Sample Tower	Aluma Tower	03538	A	none						
11	4/6/2017	Shelter Temperature	Campbell	none	107-L	none						
12	4/6/2017	Siting Criteria	Siting Criteria	None	1	None						
13	4/6/2017	Temperature	RM Young	04682	41342VC	9699						
14	4/6/2017	Zero air pump	Werther International	06914	C 70/4	000829156						

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial N	Number Site	2	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2530	CA	D150	Sandy Grenville	04/06/2017	DAS	Primary
Das Date:	4 /6 /2017	Audit Date	4 /6 /2017	Mfg	Datel	Parameter	DAS
Das Time:	13:35:01	Audit Time		Serial Number	15510194	Tfer Desc	Source generator (D
Das Day:	96	Audit Day	96	Serial Number		The Dese.	econoc generator (B
Low Channel	l:	High Chann	el:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0001	0.00	02 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	0 Intercept	0.00000
				Cert Date	1/23/201	7 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.000	0 V	V	0.0000	
7	0.1000	0.0998	0.0999	9 V	V	0.0001	
7	0.3000	0.2997	0.2998	8 V	V	0.0001	
7	0.5000	0.4995	0.4990	5 V	V	0.0001	
7	0.7000	0.6994	0.6990		V	0.0002	
7	0.9000	0.8993	0.8993		V	0.0002	
7	1.0000	0.9992	0.9993	3 V	V	0.0001	

Flow Data Form

Mfg	Ser	ial Number Ta	Site	Тес	hnician	Site Visit I	Date Param	neter	Owner ID	
Apex	ille	gible	CAD150	Sa	ndy Grenville	04/06/2017	7 Flow R	late	000597	
					Mfg	BIOS	P	arameter F	eter Flow Rate	
					Serial Number	103471	T	fer Desc. ne	exus	
					Tfer ID	01420				
								Г		
					Slope			ercept	0.00497	
					Cert Date	2/7	7/2017 Col	rrCoff	0.99991	
					Mfg	BIOS	P	arameter F	ow Rate	
					Serial Number	103424	Т	fer Desc. B	IOS cell	
					Tfer ID	01410				
					Slope	0	99825 Inte	ercept	0.00497	
					•			- L	0.99991	
					Cert Date	21		rrCoff	0.99991	
DAS 1:		DAS 2:			Cal Factor Z	Zero	0.0)3		
A Avg % Diff:	A Max	% Di A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	1.()2		
0.66%		0.66%			Rotometer R	leading:	1.4	45		
Desc.	Test	••	n Input Corr_	MfcDisp.	OutputSignal	-	-		ll PctDifference	
primary	pump o		0.000	-0.04	0.000	0.00	l/m	l/m		
primary	leak che		0.000	0.00	0.000	0.00	l/m	l/m		
primary	test pt 1		1.510	1.49	0.000	1.50	l/m	l/m	-0.66%	
primary	test pt 2		1.510	1.49	0.000	1.50	l/m	l/m	-0.66%	
primary	test pt 3	I	1.510	1.49	0.000	1.50	l/m	l/m	-0.66%	
Sensor Comp	onent Le	eak Test		Conditio	n		Status		pass	
Sensor Comp	onent T	ubing Condition		Conditio	n Good		Status	pass		
Sensor Comp	onent F	ilter Position		Conditio	n Good		Status	pass		
Sensor Comp	onent R	otometer Conditio	n	Conditio	n Clean and dry		Status	pass		
Sensor Component Moisture Present		Conditio	n No moisture p	resent	Status	Status pass				
Sensor Comp	onent F	ilter Distance		Conditio	n 4.0 cm		Status	pass		
Sensor Comp	onent F	ilter Depth		Conditio	n 2.0 cm		Status	pass		
Sensor Comp	onent F	ilter Azimuth		Conditio	n 270 deg		Status	Status pass		
Sensor Comp	L			Conditio						
					L			pass		

Ozone Data Form

Mfg		Serial N	lumber Ta	r Ta Site Technician		Site Visit	t Date	Parame	ter	Owner I	D		
ThermoElec	tron Inc	100924	1792	CAD150	Sa	andy Grei	nville	04/06/20	17	Ozone		000624	
Slope: Intercept CorrCoff	().99828).38094).99973	Slope: Intercept CorrCoff	0.0000	0	Mfg Serial N Tfer ID		ThermoE 51711217 01111			rameter ozc er Desc. Oz		/ stan
DAS 1: DAS 2: A Avg % Diff: A Max % Di A Avg % 1.4% 1.9%		6Dif A Max % Di Cert Date		ıte	L	1.00250 Inter 3/21/2017 Corr		· _	0.45	870 0000			
prin prin	nary nary		I I <thi< th=""> <thi< th=""> <thi< th=""> <thi< th=""></thi<></thi<></thi<></thi<>	Tfer Raw 0.09 14.99 35.05 72.05 110.10	Tfer -0. 14. 34. 71. 109	36 .49 .50 .41	14 34	66] .63] .99] .03]	Site ppb ppb ppb ppb ppb	e Unit	PctDiff	erence 0.97% 1.42% -1.93% 1.13%	
Sensor Co	ompone	nt Samp	le Train		Conditio	on Good				Status	pass		
Sensor Co	ompone	nt 22.5 c	legree rule		Conditio	on				Status	pass		
Sensor Co	ompone	nt Inlet F	ilter Conditic	n	Conditio	on Clean	1			Status	pass		
Sensor Co	ompone	nt Batter	y Backup		Conditio	on N/A				Status	pass		
Sensor Co	ompone	nt Offset	t		Conditio	on 0.20				Status	pass		_
Sensor Co	omponei	nt Span				on 1.037				Status			
Sensor Co	•		/oltage		Conditio	L				Status			
			ale Voltage		Conditio					Status			
Sensor Co	•					on 114.1	kH7			Status			
Sensor Co	•					on 0.8 pp				Status			
	-					L							
Sensor Co	_					on 0.74 l				Status			
Sensor Co	•					on 741.1				Status			
Sensor Co	_					on 33.5 (Status			
Sensor Co	ompone	nt Cell B	Freq.			on 100.6				Status	pass		
Sensor Co	ompone	nt Cell B	Noise		Conditio	on 0.9 pp	b			Status	pass		
Sensor Co	ompone	nt Cell B	Flow		Conditio	on 0.77 l	pm			Status	pass		
Sensor Co	ompone	nt Cell B	Pressure		Conditio	on Not te	sted			Status	pass		
Sensor Co	ompone	nt Cell B	Tmp.		Conditio	on				Status	pass		
Sensor Co	ompone	nt Line L	.OSS		Conditio	on Not te	sted			Status	pass		
Sensor Co	ompone	nt Syste	m Memo		Conditio	on				Status	pass		

Temperature Data Form

Mfg	Serial Number Ta	a Site	,	Techni	ician	Site V	isit Date/	Param	eter	Owner ID	
RM Young	9699	CAD150		Sandy Grenville		04/06	6/2017	Temper	ature	04682	
				Mf	g	Extec	h	Pa	arameter Te	emperature	
				Ser	rial Number	H232	734	Tf	er Desc. R	ſD	
				Tfe	er ID	01227	7				
DAS 1:	DAS 2	2:		Slo	pe		1.0075	9 Inte	rcept	0.14754]
Abs Avg Err Abs Max Er Abs Avg Err Abs Max I		Max Er	Er Cert Date		2/4/2017 Cor		rrCoff 1.00000				
0.08	0.16										
UseDesc.	Test type I	nputTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Temp	b Low Range	0.17	0.02	2 0.000		0.0		C	0		
primary Temp	o Mid Range	25.70	25.3	6	0.000	25.2		2	С	-0.16	
primary Temp	o High Range	49.63	49.1	1	0.000		49.	0	С	-0.09	
Sensor Compone	nt Shield		Cond	ition N	Moderately clea	an		Status	pass		
Sensor Compone	nt Blower		Cond	ition 🛚	N/A			Status	pass		
Sensor Component Blower Status Switch			Cond	Condition N/A				Status	pass		
Sensor Compone	nt System Memo		Cond	ition				Status	pass		

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CAD150	Sandy Grenville	04/06/2017	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	lter Temperatur
Abs Avg ErrAb0.22	os Max Er Abs Avg 0.58	Err Abs Max Er	Serial Number	H232734	Tfer Desc. RT	D
			Tfer ID	01227		
			Slope	1.0075	9 Intercept	0.14754
			Cert Date	2/4/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.80	26.45	0.000	25.9	С	-0.58
primary	Temp Mid Range	26.04	25.70	0.000	25.7	С	-0.03
primary	Temp Mid Range	25.23	24.89	0.000	24.9	С	0.04
Sensor Con	nponent System Memo)	Condition		Status	pass	

Infrastructure Data For

Site ID	CAD150	Technician Sandy	y Grenville Site Visit Date 04/06/2017
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	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 ozone analyzer sample train filter is replaced and the system is leak tested monthly.

2 Parameter: ShelterCleanNotes

The shelter walls have been repaired.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID CAD150	Technician Sandy Grenville	Site Visit Date 04/06	6/2017		
Site Sponsor (agency)	EPA	USGS Map	Caddo Valley		
Operating Group	Ouachita Baptist University	Map Scale			
AQS #		Map Date			
Meteorological Type	Climatronics				
Air Pollutant Analyzer	Ozone	QAPP Latitude	34.1792		
Deposition Measurement	dry, wet	QAPP Longitude	-93.0989		
Land Use	woodland - mixed	QAPP Elevation Meters	71		
Terrain	gently rolling	QAPP Declination	2.3		
Conforms to MLM	Marginally	QAPP Declination Date	12/28/2004		
Site Telephone	(870) 246-0030	Audit Latitude	34.179278		
Site Address 1	DeGray Regulating Dam	Audit Longitude	-93.098755		
Site Address 2	Route 390	Audit Elevation	78		
County	Clark	Audit Declination	1.3		
City, State	Arkadelphia, AR	Present			
Zip Code	71923	Fire Extinguisher 🔽	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 Ekto Me	odel 8810	Shelter Size640 cuft		
Shelter Clean	Notes The shelter walls have been re	paired.			
Site OK	Notes				
immed	Interstate 30 in Arkadelphia take exit 78 a diately west of the interstate. This road ru Continue for approximately 1 mile, the sit	ns parallel to the interstate for	approximately 1/2 mile and then turns		

Field Systems Data Form

CAD150

F-02058-1500-S2-rev002

Site ID

Techr

Technician Sandy Grenville

Site Visit Date 04/06/2017

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		\checkmark
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-rev00					
Site	CAD150 Technician Sandy Grenville		Site Visit Date 04/06/2017				
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				

Field Systems Data Form F-02058-1500-S4-rev002 Site Visit Date 04/06/2017 CAD150 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?		Temperature
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?

Site ID

1

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

od	✓	Temperature only
ł	✓	Temperature only
n?	✓	
	✓	N/A
		N/A
		N/A
		N/A
ted		N/A

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev002
Site	e ID	CAD150	Technician	Sandy Grenville		Site Visit Date 04/06/2017
	Siting C	Criteria: Are the pollut	ant analyzers a	nd deposition eq	<u>uipn</u>	pment 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 mete meters from trees?	er from any maj	or obstruction,	✓	
	<u>Polluta</u>	nt analyzers and depos	sition equipment	t operations and	mai	aintenance
1		analyzers and equipme on and well maintained		in good	✓	
2		analyzers and monito ng 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 e location)	ozone sample lin	e? (if yes		At inlet only
6	Are san obstruc	nple lines clean, free of tions?	f kinks, moisture	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

Field Systems Data Form						F-02	2058-15	00-S6-rev002	
Site	e ID	CAD150	Technician	Sandy Grenville	•	Site Visit Date	04/06/2017	7	
	DAS, se	nsor translators, and	peripheral equi	pment operatio	ns ai	nd maintenance			
1	Do the I well ma	DAS instruments appe intained?	ear to be in good	l condition and					
2		he components of the backup, etc)	DAS operation	al? (printers,	✓				
3		nalyzer and sensor signalyzer and sensor signation sensor signature in the sensor signature is the sensor sis the sensor signa		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 ed?	ors, and shelter	properly		Shelter not ground	ed		
7	Does the	e instrument shelter h	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 o	omments?				Sample tower is st	able but not	grounded	

Field S	ystems Data	For	m				F- ()2058	-1500-S	57-rev00
Site ID	CAD150		Tech	nician	Sandy Grenville	Site Visit Dat	e 04/06/20)17		
Docume	<u>ntation</u>									
Does the	site have the requir	ed ins	strume	ent and	l equipment manuals?					
		Yes	No	N/ .	Ά		Yes	No	N/A	
Wind speed	sensor			✓	Data logge	er		\checkmark		
Wind direct	tion sensor			✓	Data logge	er			\checkmark	
Temperatu	re sensor		✓		Strip char	t recorder			\checkmark	
Relative hu	midity sensor			\checkmark	Computer		\checkmark			
Solar radia	tion sensor			\checkmark	Modem			\checkmark		
Surface wet	mess sensor			\checkmark	Printer				\checkmark	
Wind senso	r translator			\checkmark	Zero air p	ump	\checkmark			
Temperatu	re translator			\checkmark	Filter flow	pump		\checkmark		
Humidity se	ensor translator			\checkmark	Surge pro	tector			\checkmark	
Solar radia	tion translator			\checkmark	UPS					
Tipping bu	cket rain gauge			\checkmark	Lightning	protection devi	ce			
Ozone anal	yzer	\checkmark			Shelter he	ater		\checkmark		
Filter pack	flow controller	\checkmark			Shelter air	conditioner	\checkmark			
Filter pack	MFC power supply			\checkmark]					
Does th	<u>e site have the requi</u>	i <mark>red a</mark>	nd mo	ost rece	ent QC documents and	l report forms?				
		Pres	ent				Cu	rrent		
Station Log		ŀ						✓		
SSRF		•						✓		
Site Ops Ma	anual									
HASP		ŀ		2016				✓		

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? ☑ Minimal information

✓

✓

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:

✓

Field Systems Data Form

Site	CAD150 Technician Sandy Grenville	le Site Visit Date 04/06/2017
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	✓	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			
Automatic Precision Level Tests	\checkmark	Daily	
Manual Precision Level Test			
Analyzer Diagnostics Tests	\checkmark	Weekly	
In-line Filter Replacement (at inlet)	\checkmark	Monthly	
In-line Filter Replacement (at analyze		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 and
	reported? If yes, how?

	Unknown	
✓		
	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

Fi	eld Sy	stems Data F	orm					F-02058-1	500-S9-rev002
Site	e ID	CAD150	Techr	nician	Sandy Grenville		Site Visit Date	04/06/2017	
	<u>Site ope</u>	ration procedures							
1	Is the fi	lter pack being chang	ed every [Fuesda	ay as scheduled?		Filter changed morir	nings	
2	Are the correctl	Site Status Report Fo y?	orms being	g comj	pleted and filed				
3	Are dat schedul	a downloads and back ed?	ups being	g perf	ormed as		No longer required		
4	Are gen	eral observations beir	ng made a	nd ree	corded? How?	✓	SSRF		
5	5 Are site supplies on-hand and replenished in a timely fashion?								
6	Are sample flow rates recorded? How?					SSRF, logbook, call-in			
7	Are san fashion	nples sent to the lab or ?	ı a regula	r sche	dule in a timely				
8		ers protected from cor pping? How?	ntaminati	o <mark>n du</mark> i	ring handling	✓	Clean gloves on and	loff	
9		site conditions report ons manager or staff?	ed regula	rly to	the field				
QC	Check P	erformed		Fre	quency			Compliant	
N	Aulti-poi	nt MFC Calibrations	V	Sem	niannually				
I	Flow Syst	em Leak Checks		Wee	ekly				
I	Filter Pac	k Inspection							
I	Tow Rate	e Setting Checks		Wee	ekly			\checkmark	
V	/isual Ch	eck of Flow Rate Rote	ometer 🖣	Wee	ekly			\checkmark	
Ι	n-line Fil	ter Inspection/Replac	ement	Sem	niannually				
8	Sample Li	ine Check for Dirt/Wa	ater 🔽	Wee	ekly				
	• •				1 (1 10				

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Field Systems Data Form

CAD150

F-02058-1500-S10-rev002

Site ID	Site	ID	
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Tech

Technician Sandy Grenville

Site Visit Date 04/06/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	CL3MC12	07061
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	Raven	H4222-C	0808310608	06469
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 Vi	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CDZ1	71-Sandy	Grenville-04/07/2017				
1	4/7/2017	Computer	Dell	07063	Inspiron 15	HX4MC12
2	4/7/2017	DAS	Campbell	000352	CR3000	2130
3	4/7/2017	Elevation	Elevation	None	1	None
4	4/7/2017	Filter pack flow pump	Thomas	06020	107CAB18D	060400022646
5	4/7/2017	Flow Rate	Арех	000669	AXMC105LPMDPCV	54766
6	4/7/2017	Infrastructure	Infrastructure	none	none	none
7	4/7/2017	Modem	Raven	06457	V42221	0808338189
8	4/7/2017	Ozone	ThermoElectron Inc	000727	49i A1NAA	1105347320
9	4/7/2017	Ozone Standard	ThermoElectron Inc	000544	49i A3NAA	0929938242
10	4/7/2017	Sample Tower	Aluma Tower	000125	В	none
11	4/7/2017	Shelter Temperature	Campbell	none	107-L	none
12	4/7/2017	Siting Criteria	Siting Criteria	None	1	None
13	4/7/2017	Temperature	RM Young	06403	41342VC	14036
14	4/7/2017	Zero air pump	Werther International	06899	PC70/4	000821902

DAS Data Form

DAS Time Max Error:

0

Mfg	Serial N	lumber Site	Т	echnician	Site Visit Date	Parameter	Use Desc.
Campbell	2130	CD	Z171 S	Sandy Grenville	04/07/2017	DAS	Primary
Das Date:	4 /7 /2017	Audit Date	4 /7 /2017	Mfg	Datel	Parameter	DAS
Das Time:	18:06:00	Audit Time	18:06:00	G	45540404		Occurrence and the state of D
Das Day:	97	Audit Day	97	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Channel	l:	High Channe	ł:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0000	0.000	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	1/23/201	7 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	V	V	0.0000	
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	0.8993	V	V	-0.0001	
7	1.0000	0.9993	0.9992	V	V	-0.0001	

Flow Data Form

Apex 64766 CD2171 Sandy Grenville 04/07/2017 Flow Rate 000669 Arg Mfg BIOS Parameter Flow Rate Serial Number 103471 Tfer Desc. nexus Tfer ID 01420 01420 000699 0.99825 Intercept 0.00497 Cert Date 2772017 CorrCoff 0.99991 Mfg BIOS Parameter Flow Rate Serial Number 103424 Tfer Dosc. 00497 Cert Date 2772017 CorrCoff 0.99991 Arg % Diff: A Max % Di A Arg % Obff A Max % Di Cal Factor Zero 0 Cal Factor Full Scale 0.09 1.32% 1.32% 0.000 0.000 0.000 0.00 0.00 0.00 0.00 1.5 Vm Primary pump off 0.000 0.000 0.000 0.000 0.000 1.5 Vm 1.32% Primary pump off 0.000 0.000 0.000 0.000 1.5 Vm 1.32% Primary test pt 1	Mfg	Se	erial Nun	ıber Ta	Site	Тес	chnician	Site Visit I	Date Paran	neter	Owner ID
Serial Number 103471 Ter Dase. nexus Tfer ID 01420 01420 Stope 0.99825 Intercept 0.00497 Cert Date 277/2017 CoreCoff 0.99991 Mfg BIOS Parameter/Flow Rate Serial Number 103424 Tfer Desc. BIOS cell Tfer ID 01410 Ter Desc. BIOS cell Tfer ID 01410 Cert Date 277/2017 CoreCoff 0.99991 DAS 1: DAS 2: Cal Factor Zero 0 0 0.00497 Cert Date 277/2017 CoreCoff 0.99991 0.99921 DAS 1: DAS 2: Cal Factor Zero 0 0 0.00497 Cert Date 277/2017 CoreCoff 0.99991 0.99921 0.99921 1.32% 1.32% 0.000	Apex	5	4766		CDZ171	Sa	ndy Grenville	04/07/2017	7 Flow F	Rate	000669
Trer ID 01420 Slope 0.93825 Intercept 0.00497 Cert Date 277/2017 Corr Coff 0.99991 Mfg BIOS Parameter Flow Rate Serial Number 103424 Tfer Desc. BIOS cell Tfer ID 01410 01410 Stope 0.99925 Intercept 0.00497 Cert Date 277/2017 Corr Coff 0.99991 DAS 1: DAS 2: Cal Factor Full Scale 0.99 1.32% 1.32% Cal Factor Full Scale 0.99 1.32% 1.32% 0.000 0.000 0.000 Primary pump off 0.000 0.000 0.000 1.50 I/m I/m primary leak check 0.000 0.000 0.000 1.50 I/m I/m -1.32% primary lest pt 1 1.524 1.520 1.52 0.000 1.50 I/m I/m -1.32% primary lest pt 3 1.524 1.520 0.000 1.50 I/m I/m -1.32% Sensor Component Leak rest Condition							Mfg	BIOS	P	arameter FI	ow Rate
Siope 0.99825 intercept 0.00497 Cert Date 2/7/2017 Corr Coff 0.99991 Mfg BIOS Parameter Flow Rate Serial Number 103424 Tfer Desc. BIOS cell Tfer ID 01410 Itercept 0.00497 Cert Date 2/7/2017 Corr Coff 0.99991 DAS 1: DAS 2: Cal Factor Z=ro 0 Cert Date 2/7/2017 Corr Coff 0.99991 DAS 1: DAS 2: Cal Factor Z=ro 0 Card Factor Ful Scale 0.999 0.99991 0.00497 1.32% 1.32% 0.000 0.000 0.000 1.32% 1.32% 0.000 0.000 0.000 0.000 Pimary pupp off 0.000 0.000 0.000 0.000 1.50 1/m 1.32% primary pupp off 0.000 0.000 0.000 1.50 1/m 1.32% primary test pt 1 1.524 1.520 1.52 0.000 1.50 1/m 1.32% Sensor Component							Serial Number	103471	r	fer Desc. ne	exus
Slope 0.99825 Intercept 0.00497 Cert Date 2/7/2017 Corr Coff 0.99991 Mfg BIOS Parameter, Flow Rate Serial Number 103424 Tfer Desc, BIOS cell TTer ID 01410							Tfer ID	01420			
Cert Date 277/2017 CorrCoff 0.99991 Mfg BIOS Parameter Flow Rate Serial Number 103424 Tfer Desc. BIOS cell Tfer ID 01410								0	00825	. [0.00407
Mfg BIOS Parameter Flow Rate Serial Number 103424 Tfer Desc. BIOS cell Tfer ID 01410 Slope 0.99825 Intercept 0.00497 Cert Date 277/2017 CorrCoff 0.99991 DAS 1: DAS 2: Cal Factor Zero 0 A vg % Diff: A Max % Di A Ng %Dif A Max % Di Cal Factor Zero 0 Parameter 1.32% 1.32% 0.000 0.000 0.000 Pesc. Test type Input Vm Input Corr_ MfcDisp. OutputSignal Output S E Input/Uni Output Signal Vim Vim -1.32% Pesc. Test type Input Vm Input Corr_ MfcDisp. OutputSignal Output S E Input/Uni Output Signal Vim -1.32% primary leak check 0.000 0.000 0.000 1.50 Vm Vm -1.32% primary test pt 1 1.524 1.520 1.52 0.000 1.50 Vm Vm -1.32% Sensor Component Tobing Condition											
Serial Number 103424 Tfer Desc. BIOS cell Tfer ID 01410 Slope 0.99825 Intercept 0.00497 Cert Date 277/2017 Corr Coff 0.99991 DAS 1: DAS 2: Cal Factor Zero 0 A vg % Diff: A Max % Di A Avg %Dif A Max % Di Cal Factor Full Scale 0.999 1.32% 1.32% 0.000 0.000 0.000 0.000 0.000 Pimary pump off 0.000 0.000 0.000 0.000 Vm Vm primary lesk check 0.000 0.000 0.000 1.50 Vm Vm -1.32% primary test pt 1 1.524 1.520 1.52 0.000 1.50 Vm Vm -1.32% primary test pt 2 1.523 1.520 1.52 0.000 1.50 Vm Vm -1.32% primary test pt 3 1.524 1.520 1.52 0.000 1.50 Vm Vm -1.32% Sensor Component Tubing Condition Condition Good <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Cert Date</td> <td>2/7</td> <td>7/2017 Co</td> <td>rrCoff</td> <td>0.99991</td>							Cert Date	2/7	7/2017 Co	rrCoff	0.99991
Tfer ID 01410 Slope 0.99825 Intercept 0.00437 Cert Date 277/2017 Corr Coff 0.99991 DAS 1: DAS 2: Cal Factor Zero 0 A vg % Diff: A Max % Di A Avg %Dif A Max % Di Cal Factor Full Scale 0.999 1.32% 1.32%							Mfg	BIOS	P	arameter FI	ow Rate
Slope 0.99825 Intercept 0.00497 Cert Date 2/7/2017 CorrCoff 0.99991 DAS 1: DAS 2: Cal Factor Zero 0 A vg % Diff: A Max % Di A Avg %Dif A Max % Di Cal Factor Full Scale 0.99 1.32% 1.32% Cal Factor Full Scale 0.99 1.32% 1.32% Cal Factor Scale 0.99 Posec. Test type Input Vm Input Corr MfcDisp. OutputSignal OutputSignal OutputSignal PutputSignal PutputSigna							Serial Number	103424	T	fer Desc. Bl	OS cell
Cert Date 2/7/2017 CorrCoff 0.99991 DAS 1: DAS 2: Cal Factor Zero 0 A Avg % Diff: A Max % Di A Avg %Dif A Max % Di Cal Factor Full Scale 0.999 1.32% 1.32% 0 0 Cal Factor Full Scale 0.999 maintenance 0.000 0.000 0.000 0.000 0.000 0.000 primary pump off 0.000 0.000 0.000 0.000 1.50 Vm Vm primary test pt 1 1.524 1.520 1.52 0.000 1.50 Vm Vm -1.32% primary test pt 2 1.523 1.520 0.50 Vm Vm -1.32% primary test pt 3 1.524 1.520 0.000 1.50 Vm Vm -1.32% Sensor Component Leak Test Condition Good Status pass Sensor Component Filter Position Condition Good Status pass Sensor Component Filter Distance Condition Scond Status pass Se							Tfer ID	01410			
Cert Date 2/7/2017 CorrCoff 0.99991 DAS 1: DAS 2: Cal Factor Zero 0 A Avg % Diff: A Max % Di A Avg %Dif A Max % Di Cal Factor Full Scale 0.999 1.32% 1.32% 0 0 Cal Factor Full Scale 0.999 maintenance 0.000 0.000 0.000 0.000 0.000 0.000 primary pump off 0.000 0.000 0.000 0.000 1.50 Vm Vm primary test pt 1 1.524 1.520 1.52 0.000 1.50 Vm Vm -1.32% primary test pt 2 1.523 1.520 0.50 Vm Vm -1.32% primary test pt 3 1.524 1.520 0.000 1.50 Vm Vm -1.32% Sensor Component Leak Test Condition Good Status pass Sensor Component Filter Position Condition Good Status pass Sensor Component Filter Distance Condition Scond Status pass Se							Slone		00825 Int	oncont	0.00497
DAS 1: DAS 2: Cal Factor Zero O A Avg % Diff: A Max % Di A Avg %Dif A Max % Di Cal Factor Full Scale 0.99 1.32% 1.32% 1.32% 0 Cal Factor Full Scale 0.99 Rotometer Reading: 1.5 Desc. Test type Input I/m Input Corr_ MfcDisp. OutputSignal Output S E InputUnit OutputSignal PetDifference primary pump off 0.000 0.000 0.000 0.000 1/m I/m I/m primary test pt 1 1.524 1.520 1.52 0.000 1.50 I/m I/m -1.32% primary test pt 2 1.524 1.520 1.52 0.000 1.50 I/m I/m -1.32% primary test pt 3 1.524 1.520 1.52 0.000 1.50 I/m I/m -1.32% Sensor Component Leak Test Condition Good Status pass Sensor Component Filter Position Condition Good Status pass Sensor Component							Î			- L	
A Avg % Diff: A Max % Di A Avg %Diff A Max % Di Cal Factor Full Scale 0.99 1.32% 1.32% 1.32% 1.5 Desc. Test type Input /m Input Corr MfcDisp. OutputSignal Output S E InputUit OutputSignall PctDifference primary pump off 0.000							Cert Date	2/	7/2017 Co	rrCoff	0.99991
1.32% 1.32% Rotometer Reading: 1.5 Desc. Test type Input I/m Input Corr MfcDisp. OutputSignal Output S E InputUnit OutputSignall PctDifference primary pump off 0.000 0.000 0.000 0.000 Vm Vm Vm primary leak check 0.000 0.000 0.000 0.000 Vm Vm Vm primary test pt 1 1.524 1.520 1.52 0.000 1.50 Vm Vm -1.32% primary test pt 2 1.523 1.520 1.52 0.000 1.50 Vm Vm -1.32% primary test pt 3 1.524 1.520 1.52 0.000 1.50 Vm Vm -1.32% Sensor Component Leak Test Condition Good Status pass Sensor Component Filter Position Condition Good Status pass Sensor Component Folter Present Condition Condition Status pass Sensor Component Filter Distance Condition	DAS 1:			DAS 2:			Cal Factor Z	lero		0	
Desc.Test typeInput I/mInput Corr_MfcDisp.OutputSignalOutput S EInputUnitOutputSignalPctDifferenceprimarypump off0.0000.0000.0000.0000.0000.0001/m1/mprimaryleak check0.0000.0000.0000.0000.0001/m1/mprimarytest pt 11.5241.5201.520.0001.501/m1/m-1.32%primarytest pt 21.5231.5201.520.0001.501/m1/m-1.32%primarytest pt 31.5241.5201.520.0001.501/m1/m-1.32%primarytest pt 31.5241.5201.520.0001.501/m1/m-1.32%Sensor ComponentLeak TestConditionGoodStatuspassSensor ComponentFilter PositionConditionGoodStatuspassSensor ComponentRotometer ConditionConditionClean and dryStatuspassSensor ComponentFilter DistanceCondition3.5 cmStatuspassSensor ComponentFilter DistanceCondition4.5 cmStatuspassSensor ComponentFilter DepthCondition4.5 cmStatuspassSensor ComponentFilter AzimuthCondition180 degStatuspass	A Avg % Diff:	A Ma	x % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	0.9	99	
primary pump off 0.000 0.000 0.000 0.000 1/m 1/m primary leak check 0.000 0.000 0.000 0.000 1/m 1/m primary leak check 0.000 0.000 0.000 0.000 1/m 1/m primary test pt 1 1.524 1.520 1.52 0.000 1.50 1/m 1/m -1.32% primary test pt 2 1.523 1.520 1.52 0.000 1.50 1/m 1/m -1.32% primary test pt 3 1.524 1.520 1.52 0.000 1.50 1/m 1/m -1.32% Sensor Component Leak Test Condition Good Status pass Sensor Component Filter Position Condition Good Status pass Sensor Component Filter Position Condition Good Status pass Sensor Component Moisture Present Condition 3.5 cm Status	1.32%		1.32%				Rotometer R	eading:	1	.5	
primary leak check 0.000 0.000 0.000 0.000 1/m 1/m primary test pt 1 1.524 1.520 1.52 0.000 1.50 1/m 1/m -1.32% primary test pt 2 1.523 1.520 1.52 0.000 1.50 1/m 1/m -1.32% primary test pt 2 1.523 1.520 1.52 0.000 1.50 1/m 1/m -1.32% primary test pt 3 1.524 1.520 1.52 0.000 1.50 1/m 1/m -1.32% Sensor Component Leak Test Condition Good Status pass				-	-		1 0	-			ll PctDifference
primary test pt 1 1.524 1.520 1.52 0.000 1.50 1/m 1/m -1.32% primary test pt 2 1.523 1.520 1.52 0.000 1.50 1/m 1/m -1.32% primary test pt 3 1.524 1.520 1.52 0.000 1.50 1/m 1/m -1.32% Sensor Component Leak Test Condition Good 1.50 1/m 1/m -1.32% Sensor Component Leak Test Condition Good 1.50 1/m 1/m -1.32% Sensor Component Tubing Condition Condition Good Status pass		1 1									
primary primarytest pt 21.5231.5201.520.0001.501/m1/m-1.32%primarytest pt 31.5241.5201.520.0001.501/m1/m-1.32%Sensor ComponentLeak TestConditionGoodStatuspassSensor ComponentTubing ConditionConditionGoodStatuspassSensor ComponentFilter PositionConditionGoodStatuspassSensor ComponentRotometer ConditionConditionClean and dryStatuspassSensor ComponentMoisture PresentConditionNo moisture presentStatuspassSensor ComponentFilter DistanceCondition3.5 cmStatuspassSensor ComponentFilter DepthCondition4.5 cmStatuspassSensor ComponentFilter AzimuthCondition180 degStatuspass		-									
primary test pt 3 1.524 1.520 1.52 0.000 1.50 1/m 1/m -1.32% Sensor Component Leak Test Condition Good Status pass Sensor Component Tubing Condition Condition Good Status pass Sensor Component Filter Position Condition Good Status pass Sensor Component Filter Position Condition Good Status pass Sensor Component Rotometer Condition Condition Good Status pass Sensor Component Rotometer Condition Condition Clean and dry Status pass Sensor Component Moisture Present Condition No moisture present Status pass Sensor Component Filter Distance Condition 3.5 cm Status pass Sensor Component Filter Depth Condition 4.5 cm Status pass Sensor Component Filter Azimuth Condition 180 deg Status pass		test p	t 1							l/m	
Sensor ComponentLeak TestConditionStatuspassSensor ComponentTubing ConditionConditionGoodStatuspassSensor ComponentFilter PositionConditionGoodStatuspassSensor ComponentRotometer ConditionConditionClean and dryStatuspassSensor ComponentMoisture PresentConditionNo moisture presentStatuspassSensor ComponentFilter DistanceCondition3.5 cmStatuspassSensor ComponentFilter DepthCondition4.5 cmStatuspassSensor ComponentFilter AzimuthCondition180 degStatuspass		test p	t 2								
Sensor ComponentTubing ConditionConditionGoodStatuspassSensor ComponentFilter PositionConditionGoodStatuspassSensor ComponentRotometer ConditionConditionClean and dryStatuspassSensor ComponentMoisture PresentConditionNo moisture presentStatuspassSensor ComponentFilter DistanceCondition3.5 cmStatuspassSensor ComponentFilter DepthCondition4.5 cmStatuspassSensor ComponentFilter AzimuthCondition180 degStatuspass	1 7				1.520			1.50			-1.32%
Sensor ComponentFilter PositionConditionGoodStatuspassSensor ComponentRotometer ConditionConditionClean and dryStatuspassSensor ComponentMoisture PresentConditionNo moisture presentStatuspassSensor ComponentFilter DistanceCondition3.5 cmStatuspassSensor ComponentFilter DepthCondition4.5 cmStatuspassSensor ComponentFilter AzimuthCondition180 degStatuspass	Sensor Compo	onent	Leak Tes	t		Conditio	n		Status	pass	
Sensor ComponentRotometer ConditionConditionClean and dryStatuspassSensor ComponentMoisture PresentConditionNo moisture presentStatuspassSensor ComponentFilter DistanceCondition3.5 cmStatuspassSensor ComponentFilter DepthCondition4.5 cmStatuspassSensor ComponentFilter AzimuthCondition180 degStatuspass	Sensor Compo	onent	Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor ComponentMoisture PresentConditionNo moisture presentStatuspassSensor ComponentFilter DistanceCondition3.5 cmStatuspassSensor ComponentFilter DepthCondition4.5 cmStatuspassSensor ComponentFilter AzimuthCondition180 degStatuspass	Sensor Compo	onent	Filter Pos	ition		Conditio	n Good		Status	pass	
Sensor ComponentFilter DistanceCondition3.5 cmStatuspassSensor ComponentFilter DepthCondition4.5 cmStatuspassSensor ComponentFilter AzimuthCondition180 degStatuspass	Sensor Compo	onent	Rotomete	er Conditic	n	Conditio	n Clean and dry		Status	pass	
Sensor ComponentFilter DepthCondition4.5 cmStatuspassSensor ComponentFilter AzimuthCondition180 degStatuspass	Sensor Compo	onent	Moisture	Present		Conditio	n No moisture p	resent	Status	pass	
Sensor Component Filter Azimuth Condition 180 deg Status pass	Sensor Compo	onent	Filter Dist	ance		Conditio	n 3.5 cm		Status	pass	
	Sensor Compo	onent	Filter Dep	oth		Conditio	n 4.5 cm		Status	pass	
Sensor Component System Memo Condition Status pass	Sensor Compo	onent	Filter Azir	nuth		Conditio	n 180 deg		Status	pass	
	Sensor Compo	onent	System M	lemo		Conditio	n		Status	pass	

Ozone Data Form

Mfg	S	erial N	umber Ta	Site	Tee	chnician		Site Visi	t Date	Parame	eter	Owner I	D
ThermoElec	ctron Inc	110534	7320	CDZ171	Sa	andy Grei	nville	04/07/20	017	Ozone		000727	
Slope: Intercept CorrCoff	0.0	98660 60180 99999	Slope: Intercept CorrCoff	0.00000)	Mfg Serial N Tfer ID		ThermoE 5171121 01111			rameter ozone		/ stan
DAS 1: A Avg % D 1.3	Diff: A Ma	1x % D 3.6°		bDif A Max 9	% Di	Slope Cert Da	ıte	3	1.0025 3/21/201		ccept Coff	0.45	
prin prin prin prin	scription nary nary nary nary		nncGroup 1 2 3 4	Tfer Raw 0.01 15.29 35.02 72.19	Tfer -0 14. 34. 71.	44 79 47 55	0. 15 34 71	.32 .29 .30	Sit ppb ppb ppb ppb	e Unit	PctDi	fference 3.58% -0.52% -0.35%	
	nary		5	110.09	109			8.50	ppb			-0.78%	
	omponent				Conditio	on Good				Status			
Sensor Co	omponent	22.5 d	legree rule		Conditio					Status	pass		
Sensor C	omponent	Inlet F	ilter Conditio	n	Conditio	on Clean				Status	pass		
Sensor C	omponent	Batter	y Backup		Conditio	n N/A				Status	pass		
Sensor C	omponent	Offset			Conditio	on 0.000				Status	pass		
Sensor C	omponent	Span			Conditio	n 1.007				Status	pass		
Sensor Co	omponent	Zero \	/oltage		Conditio	n N/A				Status	pass		
	-		ale Voltage		Condition N/A					us pass			
	omponent				Conditio	L	H7			Status			
	-					L							
	omponent				Conditio	L				Status			
	omponent				Conditio	L				Status			
Sensor Co	omponent	Cell A	Pressure		Conditio					Status	pass		
Sensor C	omponent	Cell A	Tmp.		Conditio	on 31.4 (2			Status	pass		
Sensor C	omponent	Cell B	Freq.		Conditio	92.0	κHz			Status	pass		
Sensor C	omponent	Cell B	Noise		Conditio	on 0.6 pp	b			Status	s pass		
Sensor Co	omponent	Cell B	Flow		Conditio	on 0.74 l	pm			Status	pass		
Sensor C	omponent	Cell B	Pressure		Conditio	n Not te	sted			Status	pass		_
Sensor C	omponent	Cell B	Tmp.		Conditio	on 🗌				Status	pass]
	omponent				Conditio		sted			Status]
	omponent				Conditio					Status			

Temperature Data Form

Mfg	Serial Number 7	Fa Site	1	Fechn i	ician	Site V	isit Date	Param	eter	Owner ID
RM Young	14036	CDZ171		Sandy	Grenville	04/07	7/2017	Temper	rature	06403
				Mf	g	Extec	h	Pa	arameter Te	emperature
				Ser	ial Number	H232	734	Tí	fer Desc. R	٢D
				Tfe	er ID	01227	7			
DAS 1:	DAS	2:		Slo	ре		1.0075	9 Inte	rcept	0.14754
Abs Avg Err	Abs Avg Err Abs Max Er Abs Avg Err Abs M			ax Er Cert Date			2/4/201	7 Cor	rCoff	1.00000
0.09	0.15									
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference
primary T	emp Low Range	0.13	-0.02	,	0.000		0.1	1	С	0.15
primary T	emp Mid Range	26.69	26.34	Ļ	0.000		26.	4	С	0.04
primary T	Temp High Range	48.85	48.34	ļ	0.000		48.	3	С	-0.09
Sensor Comp	onent Shield		Condi	tion N	Aoderately cle	an		Status	pass	
Sensor Comp	Sensor Component Blower			tion N	I/A			Status	pass	
Sensor Comp	onent Blower Status	Switch	Condi	tion N	I/A			Status	pass	
Sensor Comp	onent System Memo		Condi	tion				Status	pass	

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CDZ171	Sandy Grenville	04/07/2017	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	Iter Temperatur
Abs Avg Err Ab	os Max Er Abs Avg 0.38	Err Abs Max Er	Serial Number	H232734	Tfer Desc. RTD)
			Tfer ID	01227		
			Slope	1.0075	9 Intercept	0.14754
			Cert Date	2/4/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.28	21.97	0.000	21.8	С	-0.19
primary	Temp Mid Range	21.69	21.38	0.000	21.4	С	0.06
primary	Temp Mid Range	22.37	22.06	0.000	21.7	С	-0.38
Sensor Con	nponent System Memo)	Condition		Status	pass	

Infrastructure Data For

Site ID	CDZ171	Technician Sandy	Grenville Site Visit Date 04/07/2017
Shelter	·Make	Shelter Model	Shelter Size
Ekto		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	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: SitingCriteriaCom

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

2 Parameter: ShelterCleanNotes

The shelter floor is beginning to rot again by the door. The shelter is still cluttered and dirty.

3 Parameter: MetSensorComme

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

Field Sy	stems Data Fo	orm			F-02058-15	00-S1-rev002
Site ID	CDZ171	Technician	Sandy Grenville	Site Visit Date	04/07/2017	

Site Sponsor (agency)	EPA	USGS Map	Cadiz
Operating Group	private, TVA	Map Scale	
AQS #	21-221-9991	Map Date	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, SO2, NOy, PM2.5, IMPROVE	QAPP Latitude	36.7841
Deposition Measuremen	ıt dry	QAPP Longitude	-87.8500
Land Use	agriculture, woodland - mixed	QAPP Elevation Meters	189
Terrain	gently rolling	QAPP Declination	-2.01
Conforms to MLM	Yes	QAPP Declination Date	2/23/2006
Site Telephone	(270) 522-9373	Audit Latitude	36.784053
Site Address 1	4560 Old Dover Road	Audit Longitude	-87.85015
Site Address 2	route 1175	Audit Elevation	190
County	Trigg	Audit Declination	-2.7
City, State	Cadiz, KY	Present	
Zip Code	42211	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 Ekto M	odel 8810	Shelter Size 640 cuft
Shelter Clean	✓ Notes The shelter floor is beginning t	to rot again by the door. The sl	nelter is still cluttered and dirty.
Site OK	Notes		
	m route 68 in Cadiz turn south on 1175 and the right. Turn onto the gravel road just pas		

Field Systems Data Form

CDZ171

F-02058-1500-S2-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 04/07/2017

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		
Limited agricultural operations	200 m	15 m	
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

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

Fie	eld Sy	stems Data F	orm		F-02058-1500-S3-rev()02
Site	e ID	CDZ171	Technician Sa	andy Grenville	Site Visit Date 04/07/2017	
1		d speed and direction fluenced by obstruct		s to avoid 🔽	✓ N/A	
2	(i.e. wind horizont	d sensors mounted so d sensors should be r tally extended boom to the prevailing win	nounted atop the to >2x the max diame	ower or on a	✓ N/A	
3	Are the	tower and sensors pl	umb?	\checkmark	N/A	
4		temperature shields diated heat sources s			SE	
5	conditio surface	perature and RH ser ns? (i.e. ground belo and not steeply slope g water should be avo	w sensors should be d. Ridges, hollows,	e natural		
6	Is the so	lar radiation sensor	plumb?	\checkmark	✓ N/A	
7	Is it site light?	d to avoid shading, o	r any artificial or re	eflected 🔽	✓ N/A	
8	Is the ra	in gauge plumb?		\checkmark	✓ N/A	
9	Is it site towers,	d to avoid sheltering etc?	effects from buildin	ngs, trees, 🔽	N/A	
10	Is the su facing n	rface wetness sensor orth?	sited with the grid	surface 🗹	N/A	
11	Is it inc	lined approximately	30 degrees?	\checkmark	N/A	

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

Field Systems Data Form F-02058-1500-S4-rev002 Site ID CDZ171 Technician Sandy Grenville Site Visit Date 04/07/2017 ✓ 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?

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	ID CDZ171 Technician Sandy Grenville	!	Site Visit Date 04/07/2017
	Siting Criteria: Are the pollutant analyzers and deposition e	quipi	ment sited in accordance with 40 CFR 58, Appendix E
1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	✓	
2	Are the sample inlets 3 - 15 meters above the ground?	✓	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	✓	
	Pollutant analyzers and deposition equipment operations an	d ma	<u>intenance</u>
1	Do the analyzers and equipment appear to be in good condition and well maintained?		
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓	
3	Describe ozone sample tube.		1/4 teflon by 18 meters
4	Describe dry dep sample tube.		3/8 teflon by 15 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	✓	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?		
7	Is the zero air supply desiccant unsaturated?	✓	
8	Are there moisture traps in the sample lines?	✓	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	CDZ171	Technician	Sandy Grenville		Site Visit Date	04/07/2017		
	DAS, se	nsor translators, and	peripheral equi	pment operatio	ns ai	nd maintenance			
1	Do the I well mai	DAS instruments appe intained?	ear 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 ed?	ors, and shelter	properly					
7	Does the	e instrument shelter h	ave a stable pov	ver source?	✓				
8	Is the in	strument shelter temp	perature control	lled?					
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	d grounded?						
11	Tower c	omments?				Met tower removed			

Field Sys	tems Data	For	m				F-02	058-	1500-S'	7-rev(002
Site ID	CDZ171		Techni	cian	Sandy Grenville Site	Visit Date	04/07/2017				
Documenta	<u>tion</u>										
Does the sit	<u>e have the requir</u>	ed ins	strument	and	equipment manuals?						
Wind speed se Wind direction Temperature s Relative humid Solar radiation Surface wetnes Wind sensor th Temperature t Humidity sens Solar radiation Tipping bucke Ozone analyze	n sensor sensor dity sensor n sensor ss sensor ranslator translator or translator n translator t rain gauge	Yes □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □		 N/2 Y 	A Data logger Data logger Strip chart recor Computer Modem Printer Zero air pump Filter flow pump Surge protector UPS Lightning protec Shelter heater)	Yes □ □ □ □ □ □ □ □ □ □ □ □ □				
Filter pack flo					Shelter air condi	tioner	\checkmark				
	FC power supply ite have the requ			✓ rece	nt QC documents and report	<u>t forms?</u>	Curren	.+			
		rres	ent				Curren	ll			

Station Log	\checkmark		
SSRF	\checkmark		
Site Ops Manual	\checkmark	Oct 2014	
HASP	\checkmark	2016	
Field Ops Manual	\checkmark	Oct 2014	
Calibration Reports			
Ozone z/s/p Control Charts			
Preventive maintenance schedul			

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

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

Control charts not used

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

✓

Site	e ID CDZ171 Technician Sandy	Grenville	Site Visit Date	04/07/2017	
1	Site operation procedures Has the site operator attended a formal CASTNET course? If yes, when and who instructed?	training			
2	Has the backup operator attended a formal CAST training course? If yes, when and who instructed?	NET			
3	Is the site visited regularly on the required Tuesday schedule?				
4	Are the standard CASTNET operational procedure flollowed by the site operator?	s being 🗹			
5	Is the site operator(s) knowledgeable of, and able to the required site activities? (including documentation				

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

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

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

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

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

✓	
	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:

F-02058-1500-S8-rev002

Compliant

✓ ✓ ✓ ✓ ✓ ✓

Fi	eld Sy	stems Data Fo	orm				F-02058	-1500-S9-rev002		
Sit	e ID	CDZ171	Technicia	Sandy Grenville	!	Site Visit Date	04/07/2017			
	Site ope	eration procedures								
1	Is the fi	lter pack being change	ed every Tueso	day as scheduled	~	Filter changed after	noons (90% of the	time)		
2	2 Are the Site Status Report Forms being completed and filed correctly?									
3	Are dat schedul	a downloads and back ed?	ups being per	formed as		No longer required				
4	Are gen	eral observations bein	g made and r	ecorded? How?	✓	SSRF				
5	Are site fashion	supplies on-hand and ?	replenished i	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 sch	edule in a timely	✓					
8		ers protected from con pping? How?	tamination dı	uring handling	✓	Clean gloves on an	d off			
9		site conditions reporte ons manager or staff?	ed regularly to	o the field						
QC	Check P	erformed	Fr	equency			Compliant			
I	Multi-poi	nt MFC Calibrations	✓ Se	miannually						
I	Flow Syst	em Leak Checks	✓ We	eekly			\checkmark			
I	Filter Pack Inspection									
I	Flow Rate	e Setting Checks	✓ We	eekly			\checkmark			
1	Visual Check of Flow Rate Rotometer Veekly						\checkmark			
J	In-line Fil	ter Inspection/Replace	ement 🗹 Se	miannually			\checkmark			
5	Sample L	ine Check for Dirt/Wa	ter							
		dditional annianation	(mb starmanh	an alsotals if manage	~ ~ ~ ~ ~) magazing and dit	and listed above	an ann ath an faatanaa		

CDZ171

F-02058-1500-S10-rev002

Site ID

Techr

Technician Sandy Grenville

Site Visit Date 04/07/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	HX4MC12	07063
DAS	Campbell	CR3000	2130	000352
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18D	060400022646	06020
Flow Rate	Арех	AXMC105LPMDPC	54766	000669
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V42221	0808338189	06457
Ozone	ThermoElectron Inc	49i A1NAA	1105347320	000727
Ozone Standard	ThermoElectron Inc	49i A3NAA	0929938242	000544
Sample Tower	Aluma Tower	В	none	000125
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	14036	06403
Zero air pump	Werther International	PC70/4	000821902	06899

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number				
CHI	CHE185-Eric Hebert-05/09/2017									
1	5/9/2017	DAS	Environmental Sys Corp	120283	8832	A0382				
2	5/9/2017	Elevation	Elevation	None	1	None				
3	5/9/2017	Filter pack flow pump	Thomas	00498	107CAB18	0000110				
4	5/9/2017	Flow Rate	Apex	000641	AXMC105LPMDPCV	116				
5	5/9/2017	Infrastructure	Infrastructure	none	none	none				
6	5/9/2017	Met tower	Universal Tower	03662	unknown	none				
7	5/9/2017	Modem	Raven	06984	H4222-C	0808685382				
8	5/9/2017	Modem	US Robotics	05624	unknown	unknown				
9	5/9/2017	Ozone	Monitor Labs, Inc.	54901	ML9811	191				
10	5/9/2017	Precipitation	Climatronics	03372	100508-2	illegible				
11	5/9/2017	Printer	Hewlett Packard	none	6500A	unknown				
12	5/9/2017	Relative Humidity	Rotronic	04200	MP 101A-C4	55606				
13	5/9/2017	Sample Tower	Aluma Tower	000054	В	AT-81213-T12				
14	5/9/2017	Shelter Temperature	unknown	none	none	015				
15	5/9/2017	Shield (10 meter)	RM Young	04620	Aspirated 43408	none				
16	5/9/2017	Shield (2 meter)	RM Young	04680	Aspirated 43408	none				
17	5/9/2017	Siting Criteria	Siting Criteria	None	1	None				
18	5/9/2017	Solar Radiation	Licor	06532	LI-200	PY61006				
19	5/9/2017	Solar Radiation Translator	RM Young	06615	70101-X	none				
20	5/9/2017	Surface Wetness	RM Young	03335	58101	none				
21	5/9/2017	Temperature	RM Young	05047	41342VC	9682				
22	5/9/2017	Temperature2meter	RM Young	06244	41342VC	12791				
23	5/9/2017	Wind Direction	RM Young	04865	AQ05305	58321wdr				
24	5/9/2017	Wind Speed	RM Young	04865	AQ05305	58321wsp				
25	5/9/2017	Zero air pump	Ecotech	none	8301LC	01-0658				

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial	Number Site	e	Technician	Site Visit Date	Parameter	Use Desc.
Environmental	I Sys A0382	2 Cł	IE185	Eric Hebert	05/09/2017	DAS	Primary
Das Date:	5 /10/2017 9:30:00	Audit Date		Mfg	Datel	Paramete	rDAS
Das Time: Das Day:	9.30.00	Audit Time Audit Day	130	Serial Number	4000392	Tfer Desc	Source generator (D
Low Channel		High Chann		Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0004	4 0.00	0.000	0.0004	Cert Date	1/22/201	5 CorrCoff	1.00000
				Mfg	Fluke	Paramete	rDAS
				Serial Number	86590148	Tfer Desc	. DVM
				Tfer ID	01310		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	2/23/201	7 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
6	0.0000	0.0000	-0.0004	4 V	V	-0.0004	
6	0.1000	0.1000	0.0996	5 V	V	-0.0004	
6	0.3000	0.2999	0.2990	5 V	V	-0.0003	
6	0.5000	0.4999	0.4995		V	-0.0004	
6	0.7000	0.6998	0.6995	5 V	V	-0.0003	
6	0.9000	0.8998	0.8994		V	-0.0004	
6	1.0000	0.9999	0.9995	5 V	V	-0.0004	

Flow Data Form

Mfg	Serial Nur	nber Ta	Site	Тес	chnician	Site Visit I	Date Paran	neter	Owner ID
Apex	116		CHE185	Eri	c Hebert	05/09/2017	7 Flow F	Rate	000641
					Mfg Serial Number Tfer ID	BIOS 122974 01416		Parameter Flo	
					Slope Cert Date	1.		ercept rrCoff	-0.02202 0.99970
DAS 1: A Avg % Diff: 2.51%	A Max % Di 2.79%	DAS 2: A Avg %	Dif A Max	x % Di	Cal Factor Z Cal Factor F Rotometer R	ull Scale	5.0	0 11 .5	'
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	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.00	l/m	l/m	
primary	test pt 1	1.516	1.530	1.50	0.000	1.50	l/m	l/m	-2.09%
primary	test pt 2	1.531	1.540	1.50	0.000	1.50	l/m	l/m	-2.66%
primary	test pt 3	1.534	1.540	1.50	0.000	1.50	l/m	l/m	-2.79%
Sensor Comp	onent Leak Tes	st		Conditio	n		Statu	s pass	
Sensor Comp	onent Tubing C	Condition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Fair		Statu	s pass	
Sensor Comp	onent Rotomet	er Conditio	'n	Conditio	n Clean and dry		Statu	s pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture p	resent	Statu	s pass	
Sensor Comp	onent Filter Dis	tance		Conditio	n 5.5 cm		Statu	s pass	
Sensor Comp	onent Filter De	pth		Conditio	n 0.0 cm		Statu	s pass	
Sensor Comp	Sensor Component Filter Azimuth			Conditio	n 90 deg	Statu	s pass		
Sensor Comp	onent System	Vemo		Conditio	n		Statu	s pass	

Ozone Data Form

Mfg		Serial N	umber Ta	Site	Те	chnician		Site Visi	t Date	Parame	ter	Owner I	D
Monitor Lab	os, Inc.	191		CHE185	E	ric Hebert	:	05/09/20)17	Ozone		54901	
Slope: Intercept CorrCoff	7	.02420 7.38922 0.99998	Slope: Intercept CorrCoff	0.0000	0	Mfg Serial N Tfer ID		ThermoE 0517112 01113			rameter ozo er Desc. Ozo		' stan
DAS 1: A Avg % E 23.2		[ax % D 47.09		6Dif A Max	% Di	Slope Cert Da	ıte		1.0056 /21/201		- L	0.06	
prin prin prin prin	scription nary nary nary nary		DincGroup 1 2 3 4 5	Tfer Raw 0.38 16.17 36.14 72.76	0. 16 35 72	.01	7. 23 44 81	.54 .60 .24	ppb ppb ppb ppb	e Unit	PctDiff	47.03% 24.34% 12.40%	
Sensor C	nary	t Samp	-	111.92	Conditi		121	1.30	ppb	Status	nass	9.06%	7
			legree rule		Conditi					Status			
	-		Filter Condition	n		on Clear	1			Status			
Sensor C	_				Conditi					Status			
Sensor C					Conditi					Status			
	•		•										
Sensor C	•		/			on 1.002				Status			
Sensor C					Conditi					Status			
			ale Voltage		Conditi					Status			
Sensor C	omponer	t Cell A	Freq.		Conditi	on N/A				Status	pass		
Sensor C	omponer	nt Cell A	Noise		Conditi	on N/A				Status	pass		
Sensor C	omponer	t Cell A	Flow		Conditi	on 0.5 lp	m			Status	pass		
Sensor C	omponer	nt Cell A	Pressure		Conditi	on 707.5	mmHg			Status	pass		
Sensor C	omponer	nt Cell A	Tmp.		Conditi	on 35.1 (C			Status	pass		7
Sensor C	omponer	nt Cell B	Freq.		Conditi	on N/A				Status	pass		7
Sensor C	omponer	nt Cell B	Noise		Conditi	on N/A				Status	pass		7
Sensor C					Conditi					Status			
Sensor C	•				Conditi					Status			
Sensor C	•				Conditi					Status			
Sensor C	•					on Not te	ested			Status			
Sensor C	•				Conditi					Status			
	Ponel	,	-							~~~~~	•		

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Tech	nician	Site Visit Date	Parameter	Owner II	D
RM Young	58321wsp	CHE185	Eric	Hebert	05/09/2017	Wind Speed	04865	
				Afg Serial Number	RM Young		eter wind speed esc. wind speed mo	otor (h
			I	fer ID	01262			
Prop or Cups SN	50202		S	lope	1.0000	0 Intercept	0.00	000
Prop or Cups Torq Prop Correction Fa			0.3	Cert Date	1/26/201	7 CorrCoff	f 1.00	000
DASLowAbs Avg ErrAbs Max Er	RangeHigh Ra0.072	DAS 2: nge Low Ra 2.42% 2.55%		gh Range				
UseDescription:	Input Device Inp	ut RPM Ir	nput m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.20	0.0	0.0		-0.20	
primary	01262	200	0.98	0.0	1.0		0.05	
primary	01262	400	1.96	0.0	1.9		-0.04	
primary	01262	800	3.82	0.0	3.8		0.00	
primary	01262	1200	5.88	0.0	5.8	-2.21%	, D	
primary	01262	2400	11.76	0.0	11.5	-2.38%	, D	
primary	01262	4000	19.60	0.0	19.1	-2.55%	, D	
primary	01262	9400	46.06	0.0	44.9	-2.52%	Ď	
Sensor Componen	t Condition		Condition	Good		Status pass	3	
Sensor Componen	nt Prop or Cups Con	dition	Condition	Good		Status pass	3	
Sensor Componen	t Sensor Heater		Condition	N/A		Status pass	3	
Sensor Componen	nt Torque		Condition			Status pass	3	
Sensor Componen	t Sensor Plumb		Condition	Plumb		Status pass	3	
Sensor Componen	t System Memo		Condition			Status pass	3	

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	58321wdr	CHE185	Eric Hebert	05/09/2017	Wind Direction	04865
			Mfg	RM Young	Parameter W	ind direction
			Serial Number	None	Tfer Desc. W	ind direction wheel
			Tfer ID	01458		
Vane SN:	N/A C. A	. Align. deg. true:	Slope	1.0000	0 Intercept	0.00000
VaneTorque	12 to 14	180	Cert Date	1/1/201	7 CorrCoff	1.00000
			Mfg	Ushikata	Parameter W	ind direction
			Serial Number	191832	Tfer Desc. tr	ansit
			Tfer ID	01272		
			Slope	1.0000	0 Intercept	0.00000
			Cert Date	2/8/201	7 CorrCoff	1.00000
	DAS 1:	DAS 2:	L			
	Orientation Linearity	y: Orientation	Linearity:			
Abs Avg Err	8.8	0.8				

Abs Max Er	10	1						
UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01458	0		0.000	357	3	45	0
primary	01458	45		0.000	41	4	44	-1
primary	01458	90		0.000	87	3	46	1
primary	01458	135	\checkmark	0.000	133	2	46	1
primary	01458	180	\checkmark	0.000	177	3	44	-1
primary	01458	225	\checkmark	0.000	222	3	45	0
primary	01458	270	\checkmark	0.000	266	4	44	-1
primary	01458	315	\checkmark	0.000	312	3	46	1
primary	01272	90		0.000	81	9		9
primary	01272	180		0.000	173	7		7
primary	01272	270		0.000	260	10		10
primary	01272	360		0.000	351	9		ç
Sensor Compon	ent Condition		Condi	ition Good		Status	pass	
Sensor Compon	nent Mast		Condi	ition Good		Status	pass	
Sensor Compon	ent Sensor Heate	er	Condi	ition N/A		Status	pass	
Sensor Compon	ent Sensor Plum	b	Condi	ition Plumb		Status	pass	
Sensor Compon	ent Torque		Condi	ition		Status	pass	
Sensor Compon	ent Vane Conditi	Condition Condition		ition Good		Status	pass	
Sensor Compon	ent System Mem	0	Condi	ition		Status	pass	

Temperature Data Form

Mfg	Serial Number Ta Site			Technician			isit Date	Param	eter	Owner ID
RM Young	9682	CHE185		Eric H	ebert	05/09	9/2017	Temper	ature	05047
				Mf	g	Extec	h	Pa	rameter Te	mperature
				Ser	rial Number	H232	679	Tf	er Desc. R	D
				Tfe	Tfer ID		01228			
DAS 1:	DAS 2	:		Slo	ре	1.00656		6 Inte	rcept	-0.03341
			Max Er	Ce	rt Date		2/4/201	7 Cor	rCoff	1.00000
0.11	0.16									
UseDesc.	Test type Ir	nputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference
primary Temp	Low Range	0.12	0.15	5	0.000		0.2	7	С	0.12
primary Temp	Mid Range	24.52	24.3	9	0.000		24.3	33	С	-0.06
primary Temp	High Range	44.27	44.0	1	0.000		43.8	35	С	-0.16
Sensor Compone	nt Shield		Cond	ition [Dirty			Status	Fail	
Sensor Component Blower			Cond	ition F	Functioning			Status	pass	
Sensor Component Blower Status Switch		Cond	Condition N/A				Status	IS pass		
Sensor Component System Memo		Cond	Condition See comments				Status	pass		

2 Meter Temperature Data Form

Calc. Difference

Mfg	S	erial Numbe	er Ta	Site			Tecl	hnicia	n	Site Vis	it Date	Parame	ter		Owner ID	1
RM Young	1	2791		CHE18	35		Eric	Hebe	ert	05/09/2	2017	Temper	ature2mete	er	06244	
							I	Mfg		Extech		Pa	rameter T	em	perature	
							5	Serial	Number	H23267	9	Tf	er Desc. R	TD		
]	Гfer I	D	01228						
DAS 1:		D	AS 2:				5	Slope			1.0065	6 Inter	cept		-0.033	41
Abs Avg Err A	Abs N	fax Er A	os Avg	Err A	Abs Ma	x Er	(C <mark>ert I</mark>	Date		2/4/201	7 Cori	Coff		1.000	00
0.12		0.23]									
UseDescription		Fest type	Inpuť	TmpRav	v Inpu	tTmp	Corre	cted	OutputTm	pSignal	OutputS	SignalEng	g OSE Ur	nit	Difference	2
primary	Tem	p Low Rang		0.1	2			0.15		0.000		0.3	8 C		0.2	3
primary	Tem	p Mid Rang		24.5	52		2	24.39		0.000		24.4	1 C		0.0	2
primary	Tem	p High Rang		44.2	27		4	44.01		0.000		44.1	2 C		0.1	1
Sensor Compo	nent	Properly Site	ed			Cond	lition	Prop	perly sited			Status	pass			
Sensor Compo	nent	Shield				Cond	lition	Moc	lerately cle	an		Status	pass			
Sensor Compo	nent	Blower				Cond	lition	Fun	ctioning			Status	pass			
Sensor Compo	nent	Blower State	us Swit	ch		Cond	lition	N/A				Status	pass			
Sensor Compo	nent	System Mer	no			Cond	lition	1 📃				Status	pass			

Humidity Data Form

Mfg	Serial Nun	erial Number Ta Site			Technician			isit Date	Para	meter	Owner ID
Rotronic	55606	C	CHE185	Er	ic Hebert		05/09/	05/09/2017		ve Humidity	04200
					Mfg		Rotron	ic]	Parameter Re	lative Humidity
					Serial Nu	ımber	124432	2		Ffer Desc. Hy	groclip
					Tfer ID		01225				
					Slope			0.9944	0 Int	tercept	0.38390
	DAS 1:		DAS 2:		Cert Dat	e		1/23/201	7 C o	orrCoff	0.99999
	Low Range	High Range	e Low Rar	nge H	ligh Rang	e					
Abs Avg Err	1.8										
Abs Max Er	2.3										
UseDesc.	Test type	Device	Input R	H G	TL Raw	RH (Corr.	DAS V	olts	DAS %RH	Difference
primary	RH Low Range	Hygroclip	p 32.8		33.1	32	2.8	0.000	0	34.3	1.5
primary	RH Low Range	Hygroclip	p 52.9		54.8	52	2.9	0.000	0	51.2	-1.7
primary	RH Low Range	Hygroclip	p 75.3		69.7	75	5.3	0.000	0	77.6	2.3
Sensor Com	ponent RH Filter			Conditio	Modera	tely cle	an		Statu	is pass	
Sensor Com	ponent Shield			Conditio	Modera	tely cle	an		Statu	Is pass	
Sensor Component Blower Co					n N/A				Statu	is pass	
Sensor Component Blower Status Switch Co					ondition N/A				Statu	s pass	
Sensor Com	ponent System N	lemo		Conditio	on				Statu	Is pass	

Solar Radiation Data Form

Mfg	Serial Numbe	r Ta Site	Те	chnician	Site Visit Date	Param	eter ()wner ID
Licor	PY61006	CHE185	Er	ric Hebert	05/09/2017	Solar R	adiation 0	6532
Mfg	RM Young			Mfg	Eppley	Pa	arameter solar r	adiation
SN/Owner ID	none	06615		Serial Number	10765	T	fer Desc. SR tra	nsfer translat
Parameter	Solar Radiation Tra	anslator		Tfer ID	01246			
DAS 1:	DA	AS 2:		Slope	1.000	00 Inte	rcept	0.00000
% Diff of Avg	%Diff of Max %	Diff of Avg %D	iff of Max	Cert Date	2/10/20	17 Cor	rCoff	1.00000
				Mfg	Eppley	Pa	arameter solar r	adiation
				Serial Number	34341F3	T	fer Desc. SR tra	nsfer sensor
				Tfer ID	01245			
				Slope	1.000	00 Inte	rcept	0.00000
				Cert Date	2/10/20	17 Cor	rCoff	1.00000
0.6%	0.2%	0.0%	0.0%					
UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Cor	r DAS w	/m2	PctDifference	
primary	5/10/2017	10:00	778	778	780)	0.29	%
primary	5/10/2017	11:00	750	750	748	3	-0.39	%
primary	5/10/2017	12:00	748	748	753	3	0.69	%
primary	5/10/2017	13:00	656	656	662	2	0.99	%
primary	5/10/2017	14:00	411	411	420)	2.19	%
Sensor Compo	onent Sensor Clea	n	Conditio	Clean		Status	pass	
Sensor Compo	onent Sensor Leve		Conditio	Dn Level		Status	pass	
Sensor Compo	Properly Site	ed	Conditio	Properly sited		Status	pass	
Sensor Compo	onent System Merr	וס	Conditio	on		Status	pass	

Surface Wetness Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID	
RM Young	none	CHE185	Eric Hebert	05/09/2017	Surface Wetness	03335	
			Mfg	Ohmite	Parameter su	rface wetness	
			Serial Number	296-1200	Tfer Desc. de	cade box	
			Tfer ID	01210			
			Slope	1.0000	0 Intercept	0.00000	
			Cert Date	1/4/201	1 CorrCoff	1.00000	

Manual Test Pass

UseDescription	Test Type	Tfer kOhms	OutputSignal	DAS eng	OutputSignalEngUni	TferUnits	OutputSignalUnit	
primary	wet	N/A	1.044	1.04	V	N/A	V	
primary	dry	N/A	0.019	0.02	V	N/A	V	
	Dava sale Oita		a b	Deservative site of				
Sensor Compone	Property Sited		Condition	Properly sited	Sta	tus pass		
Sensor Compone	ent Grid Clean		Condition	Condition Clean				
Sensor Compone	ent Grid Angle		Condition	about 45 deg	Sta	Status pass		
Sensor Compone	ent Grid Orientati	on	Condition	North	Sta	tus pass		
Sensor Compone	ent Grid Condition	n	Condition	Poor	Sta	tus Fail		
Sensor Compone	ent Grid Type		Condition	Grid without ho	les Sta	tus pass		
Comer Common	ensor Component System Memo				Sta	tus pass		

Precipitation Data Form

Mfg	Serial	Number Ta	Site	T	echnician	Site	e Visit Date	Paramo	eter	Owner ID
Climatronics	illegib	le	CHE185	E	ric Hebert	05	/09/2017	Precipit	ation	03372
					Mfg	PM	P	Pa	rameter Pre	cipitation
DAS 1:		DAS 2:			Serial Nun	nber EW	-06134-50	Tf	er Desc. 250)ml graduate
A Avg % Diff 0.0%		Di A Avg %	Dif A N	/lax % Di	Tfer ID	012	250			
0.078	0.	0 78			Slope		1.0000	0 Inte	rcept	0.00000
					Cert Date		9/5/200	5 Cori	rCoff	1.00000
UseDesc.	Test type	TferVolume	Iteration	TimePerTip	Eq.Ht	DAS eng	g Eq.HtUnit	OSE Ur	nit TferUnits	PctDifference
1 7	tip check	10 manual	1	2 sec	0.10	0.10	in	in	ml	
primary	test 1	231.5	1	8 sec	0.50	0.50	in	in	ml	0.0%
Sensor Com	ponent Prop	erly Sited		Conditi	ion Properly	sited		Status	pass	
Sensor Com	ponent Gau	ge Drain Scree	n	Conditi	ion Installed			Status	pass	
Sensor Com	ponent Fun	nel Clean		Conditi	ion Clean			Status	pass	
Sensor Com	ponent Con	dition		Conditi	ion Good			Status	pass	
Sensor Com	ponent Gau	ge Screen		Conditi	ion Installed			Status	pass	
Sensor Com	Sensor Component Gauge Clean			Conditi	ion Clean			Status	pass	
Sensor Com	Sensor Component Level		Conditi	ion Level			Status			
Sensor Com	Sensor Component Sensor Heater		Conditi	tion Functioning			Status	pass		
Sensor Com	Sensor Component System Memo			Conditi	ion			Status	pass	

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
unknown	015	CHE185	Eric Hebert	05/09/2017	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	Iter Temperatur
Abs Avg Err Ab	0.64 Abs Avg	Err Abs Max Er	Serial Number	H232679	Tfer Desc. RTD)
			Tfer ID	01228		
			Slope	1.0065	6 Intercept	-0.03341
			Cert Date	2/4/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.06	21.95	0.000	22.6	С	0.64
primary	Temp Mid Range	23.92	23.80	0.000	24.3	С	0.48
Sensor Con	nponent System Memo)	Condition		Status	pass	

Infrastructure Data For

Site ID CHE185	5 Technician Eric Heb	bert Site Visit Date 05/09/2017
Shelter Make	Shelter Model	Shelter Size
Shelter One	8128	768 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.	Hazard	Problem
Ozone The ozone sample train	CHE185 is composed of n	Eric Hebert naterials other than	05/09/2017 the recommende	System Memo ed materials which	· · · · · · · · · · · · · · · · · · ·	1183 ss only.		
Temperature Additional details can be	CHE185 e found in the ha	Eric Hebert rdcopy of the site a	05/09/2017 udit report.	System Memo	RM Young	4147		
Wind Direction The wind direction orier	CHE185 ntation is not acc	Eric Hebert urate. The sensor a	05/09/2017 lignment ring ha	Alignment as been rotated and	RM Young is not aligned with	1005 the crossarm.		

Field Systems Comments

1 Parameter: SiteOpsProcComm

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

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

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

4 Parameter: MetOpMaintCom

The temperature blower housings are clogged with insect nests. See the image included as Figure 1.

F-02058-1500-S1-rev002

Site ID	CHE185 Technician Eric Hebert		Eric Hebert	Site Visit D	ate 05/09	9/2017]	
Site Sponsor	(agency)	EPA	U	SGS Map		Stilwell West		
Operating G		Cherokee Nation OES	M	ap Scale				
AQS #			M	ap Date				
	eteorological Type R.M. Young							
Air Pollutant		Ozone, NOy, ammonia	0	APP Latitude		35.7507		
		dry, Hg, passive ammoni		APP Longitude		-94.6700		
Land Use		agriculture, pasture		APP Elevation N	Aeters	299		
Terrain		rolling		APP Declination		3.25		
	MIM			APP Declination		9/16/2005		
	nforms to MLM Marginally				Date	3/10/2003		
Site Telephor	te Telephone (918) 696-5604			udit Latitude		35.750786		
Site Address	Address 1 Cherry Tree			udit Longitude			-94.669789	
Site Address	Address 2 Dahlonegah School			udit Elevation			305	
County		Adair	A	udit Declination		2		
City, State		Stilwell, OK		Р	resent			
Zip Code		74960	Fi	re Extinguisher		New in 2015		
Time Zone		Central	Fi	rst Aid Kit				
Primary Ope	erator		Sa	afety Glasses				
Primary Op.	Phone #		Sa	afety Hard Hat	\checkmark			
Primary Op.	E-mail		C	limbing Belt				
Backup Oper	rator		Se	ecurity Fence				
Backup Op.	Phone #		Se	ecure Shelter				
Backup Op.	E-mail		St	able Entry Step				
Shelter Work	xing Room ☑	Make Shelter One	Model	8128		Shelter Size	768 cuft	
Shelter Clear	n	Notes The shelter is in	n very good conditio	on, clean, neat, an	nd well org	janized.		
Site OK		Notes						
Driving Dire	miles	interstate 40 take exit 311 south of Stilwell turn left (v negah school. Continue to	vest) on an unmark	ed road. There is	a sign fo	r Cherry Tree Ba	ptist Church and	

CHE185

F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 05/09/2017

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

Fi	eld Sy	stems Data Fo	orm			F-02058-15	500-S3-rev002
Site	e ID	CHE185	Technician Eric Heber	t	Site Visit Date	05/09/2017]
1		d speed and direction fluenced by obstructio	sensors sited so as to avoid ons?				
2	(i.e. wind horizont	d sensors should be m	as to minimize tower effect nounted atop the tower or o >2x the max diameter of the d)	on a			
3	Are the	tower and sensors plu	ımb?				
4			pointed north or positioned uch as buildings, walls, etc				
5	conditio surface	ns? (i.e. ground below	sors sited to avoid unnatur v sensors should be natural d. Ridges, hollows, and area ided)	l			
6	Is the so	lar radiation sensor p	blumb?				
7	Is it site light?	d to avoid shading, or	any artificial or reflected				
8	Is the ra	in gauge plumb?					
9	Is it site towers,		effects from buildings, tree	s, 🗸	15 degree rule viola	ation	
10	Is the su facing n		sited with the grid surface				
11	Is it inc	lined approximately 3	30 degrees?				
-				L			

F-02058-1500-S4-rev002

Site	e ID	CHE185	Technician	Eric Hebert		Site Visit Date	05/09/2017]
1		e meterological senson n, and well maintained		intact, in good				
2	Are all the reporting	ne meteorological sens g data?	ors operational	online, and				
3	Are the s	hields for the tempera	ature and RH so	ensors clean?				
4	Are the a	aspirated motors work	king?					
5	Is the solar radiation sensor's lens clean and free of scratches?							
6	Is the su	rface wetness sensor g	rid clean and u	ndamaged?				
7		ensor signal and powers n, and well maintained		in good				
8		ensor signal and powe 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 blower housings are clogged with insect nests. See the image included as Figure 1.



Fi	eld Sy	stems Data Fo	orm		F-02058-1500-S5-rev(
Site	e ID	CHE185	Technician	Eric Hebert		Site Visit Date 05/09/2017				
	Siting C	riteria: Are the pollut	ant analyzers a	nd deposition eq	uipr	pment sited in accordance with 40 CFR 58, Appendix E				
1		cample inlets have at le	ast a 270 degre	e arc of						
2	Are the	sample inlets 3 - 15 me	eters above the	ground?	✓					
3		sample inlets > 1 mete meters from trees?	r from any maj	or obstruction,						
	<u>Pollutar</u>	nt analyzers and depos	ition equipment	t operations and	mai	<u>aaintenance</u>				
1		analyzers and equipme on and well maintained		in good	✓					
2	Are the reportir	analyzers and monitor ng data?	rs operational, o	on-line, and	✓					
3	Describ	e ozone sample tube.				1/4 teflon by 15 meters				
4	Describ	e dry dep sample tube.				3/8 teflon by 10 meters				
5		ine filters used in the o location)	zone sample lin	ne? (if yes		At inlet and analyzer				
6	Are san obstruc	ple lines clean, free of tions?	kinks, moisture	e, and						
7	Is the ze	ero air supply desiccan	t unsaturated?		✓					
8	Are the	re moisture traps in the	e sample lines?							
9	Is there clean?	a rotometer in the dry	deposition filte	er line, and is it		Clean and dry				

Fi	eld Sy	stems Data Fo	orm					F-02	058-15	00-S6-rev002
Site	e ID	CHE185	Technician	Eric Hebert		Site Visit	Date	05/09/2017		
	DAS, sei	nsor translators, and	peripheral equi	pment operation	ns ai	nd maintenan	<u>ice</u>			
1		AS instruments appe ntained?	ear to be in good	l condition and						
2		he components of the backup, etc)	al? (printers,	✓						
3	Do the a lightning		Met sensors o	only						
4		signal connections pro ntained?								
5	Are the signal leads connected to the correct DAS channel?									
6	Are the grounde	DAS, sensor translato d?	ors, and shelter	properly	✓					
7	Does the	instrument shelter h	ave a stable pov	ver source?	✓					
8	Is the ins	strument shelter temp	perature control	lled?						
9	Is the mo	et tower stable and gr	ounded?			Stable			Grounded	
10	0 Is the sample tower stable and grounded?									
11	Tower c	omments?								

Fie	eld Systems Data	For	·m			F-0205	58-1500-S7-rev002
Site	ID CHE185		Techni	cian Eric I	Hebert Site Visit Date	5/09/2017	
<u>D</u>	ocumentation						
D	oes the site have the requi	red ins	trumen	t and equip	oment manuals?		
Wind Wind Tem Rela Solar Surfa Wind Tem Hum Solar Tipp Ozor Filte	d speed sensor d direction sensor operature sensor tive humidity sensor r radiation sensor face wetness sensor d sensor translator operature translator nidity sensor translator r radiation translator oing bucket rain gauge ne analyzer er pack flow controller or pack MFC power supply	Yes 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 ✓ () () ✓ () ✓ ()) ✓ () ✓ ()) ✓ () ✓ ()) ✓ () ✓ () ✓ ()) ✓ () ✓ ()) ✓ () ()) ✓ () ✓ () ✓ () ✓ () ✓ () ✓ () ✓ () ✓ ()) ✓ ())) ✓ ())) ✓ ())) ✓ ())))))))))))) ()))))	
]	Does the site have the requ	uired a	nd most	recent QC	C documents and report forms?		
SSRI Site HAS Field Calil Ozor	Ops Manual			ct 2011 ov 2011		Current ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	
1	Is the station log properly	y comp	leted du	ring every	site visit? 🔽		
	Are the Site Status Repor current?	rt Form	ıs being	completed	and 🔽		
	Are the chain-of-custody sample transfer to and fr			y used to d	ocument 🔽		

4 Are ozone z/s/p control charts properly completed and current?

Control charts not used

Site ID CHE185 Technician Eric Hebert Site Visit Date 05/09/2017 Site operation procedures Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

QC Check Performed

Frequency

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

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

OC	Check	Perf	formed
\mathbf{v}	Chiech		or mea

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

	Frequency	Co
	Quarterly	
	Daily	
	Every 2 weeks	
	Every 2 weeks	
	Weekly	
]	Monthly	\checkmark
	Monthly	
	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:

✓

✓

mpliant

Compliant

 \checkmark

 \checkmark

 \checkmark

 \checkmark

✓

 \checkmark

F-02058-1500-S8-rev002

Fi	eld Sy	stems Data Form	1					F-02058-	1500-S9-rev002
Sit	e ID	CHE185	echnici	an E	Eric Hebert		Site Visit Date	05/09/2017	
	Site ope	eration procedures							
1	Is the fi	lter pack being changed eve	ery Tue	esday	as scheduled?		Filter changed morir	nings	
2	Are the correct	Site Status Report Forms b ly?	eing co	omple	eted and filed				
3	Are dat schedul	a downloads and backups b ed?	eing p	erfor	med as		No longer required		
4	Are ger	neral observations being ma	de and	reco	rded? How?	✓	SSRF, logbook		
5	Are site fashion	e supplies on-hand and reple ?	enished	l in a	timely				
6	Are san	nple flow rates recorded? H	ow?			✓	SSRF, call-in		
7	Are san fashion	nples sent to the lab on a reg ?	gular so	chedu	ıle in a timely	✓			
8		ers protected from contamin pping? How?	nation	durin	ng handling	✓	Clean gloves on and	d off	
9		site conditions reported reg ons manager or staff?	gularly	to th	e field				
QC	Check P	erformed	F	requ	iency			Compliant	
I	Multi-poi	nt MFC Calibrations	✓ S	Semia	innually				
1	Flow Syst	em Leak Checks	✓ V	Veekl	у				
I	Filter Pack Inspection								
I	Flow Rate	e Setting Checks	✓ V	Veekl	у				
	Visual Ch	neck of Flow Rate Rotomete	r 🗸 V	Veekl	у			\checkmark	
1	n-line Fi	Iter Inspection/Replacement	t 🗹 A	s nee	eded				
5	Sample L	ine Check for Dirt/Water	✓ V	Veekl	у				
Prov	vide anv a	additional explanation (pho	tograp	h or s	sketch if neces	sarv) regarding conditi	ons listed above, or	r any other features.

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other feature 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

Techni

Technician Eric Hebert

Site Visit Date 05/09/2017

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	Monitor Labs, Inc.	ML9811	191	54901
Precipitation	Climatronics	100508-2	illegible	03372
Printer	Hewlett Packard	6500A	unknown	none
Relative Humidity	Rotronic	MP 101A-C4	55606	04200
Sample Tower	Aluma Tower	B	AT-81213-T12	000054
Shelter Temperature	unknown	none	015	none
Shield (10 meter)	RM Young	Aspirated 43408	none	04620
Shield (2 meter)	RM Young	Aspirated 43408	none	04680
Siting Criteria	Siting Criteria	1	None	None
Solar Radiation	Licor	LI-200	PY61006	06532
Solar Radiation Translator	RM Young	70101-X	none	06615
Surface Wetness	RM Young	58101	none	03335
Temperature	RM Young	41342VC	9682	05047
Temperature2meter	RM Young	41342VC	12791	06244
Wind Direction	RM Young	AQ05305	58321wdr	04865
Wind Speed	RM Young	AQ05305	58321wsp	04865
Zero air pump	Ecotech	8301LC	01-0658	none

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
СН	C432-Marti	n Valvur-05/10/2017				
1	5/10/2017	Computer	Hewlett Packard	none	ProBook	5CG5340VRK
2	5/10/2017	DAS	Environmental Sys Corp	none	8832	A4871K
3	5/10/2017	elevation	Elevation	none	none	none
4	5/10/2017	Infrastructure	Infrastructure	none	none	none
5	5/10/2017	Modem	CradlePoint	none	unknown	unknown
6	5/10/2017	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460049
7	5/10/2017	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1152780006
8	5/10/2017	Precipitation	Texas Electronics	none	TR-525i-HT	64172-315
9	5/10/2017	Relative Humidity	Vaisala	none	HMP45AC	Z1730091
10	5/10/2017	Sample Tower	Aluma Tower	none	FOT-10	Unknown
11	5/10/2017	Shelter Temperature	ARS	none	unknown	none
12	5/10/2017	siting criteria	Siting Criteria	none	none	None
13	5/10/2017	Solar Radiation	Licor	none	LI-200	PY100793
14	5/10/2017	Temperature2meter	Vaisala	none	HMP45AC	Z1730091
15	5/10/2017	Wind Direction	RM Young	90877	AQ05305	54061wdr
16	5/10/2017	Wind Speed	RM Young	90877	AQ05305	54061wsp
17	5/10/2017	Zero air pump	Werther International	none	P 70/4	000756726

DAS Data Form

DAS Time Max Error:

3

Mfg	Serial	Number Si	te	Technician	Site Visit Date	Parameter	Use Desc.
Environmental	ental Sys A4871K CHC432		HC432	Martin Valvur	05/10/2017	DAS	Primary
Das Date:	5 /10/2017 9:53:00	Audit Date		Mfg	HY	Parameter	DAS
Das Time: Das Day:	9.53.00	Audit Tim Audit Day		Serial Number	12010039329	Tfer Desc.	Source generator (D
Low Channel:		High Chan		Tfer ID	01322		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.00000	Intercept	0.00000
0.0005	0.0	0.00	05 0.0008	Cert Date	6/15/2014	4 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740243	Tfer Desc.	DVM
				Tfer ID	01312		
				Slope	1.00000	Intercept	0.00000
				Cert Date	1/23/201	7 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
9	0.0000	-0.0005	-0.000	4 V	V	0.0001	
9	0.1000	0.0994	4 0.100	0 V	V	0.0006	
9	0.3000	0.2997	0.299	6 V	V	-0.0001	
9	0.5000	0.4996	5 0.500	0 V	V	0.0004	
9	0.7000	0.6996	5 0.700	2 V	V	0.0006	
9	0.9000	0.8996			V	0.0008	
9	1.0000	0.9996	5 1.000	3 V	V	0.0007	

Ozone Data Form

Mfg	Se	erial N	umber Ta	Site	Te	chnician		Site Visit Dat	e Param	eter	Owner ID	
ThermoElec	ctron Inc	CM0846	60049	CHC432	Ma	artin Valv	ur	05/10/2017	Ozone		none	
Slope: Intercept CorrCoff	-0.0	7855 5935 9998	Slope: Intercept CorrCoff	0.00000	D	Mfg Serial N		ThermoElectro		arameter fer Desc.	ozone Ozone primary stan	
DAS 1: A Avg % D 8.1	Diff: A Max	x % D 8.9 ⁰		Dif A Max '	% Di	Tfer ID Slope Cert Da		01110		rcept rCoff	0.01298	
UseDes	cription	Co	oncGroup	Tfer Raw	Tfer	Corr	Si	te	Site Unit	Pct	Difference	
prin	nary		1	0.50	0.4	48	0.	30 ppb				
prin	nary		2	15.06	14.	.97	16	.30 ppb			8.88%	
prin	nary		3	35.04	34.		37	.70 ppb			8.15%	
prin	•		4	71.07	70.		75				7.23%	
prin	nary		5	110.02	109	.49	118	3.20 ppb			7.96%	
Sensor Co	omponent	Samp	le Train		Conditio	on Good			Status	pass		
Sensor Co	omponent	22.5 d	legree rule		Conditio	on			Status	pass		
Sensor Co	omponent	Inlet F	ilter Conditio	n	Conditio	on Clean			Status	pass		
Sensor Co	omponent	Batter	y Backup		Condition N/A				Status	Status pass		
Sensor Co	omponent	Offset			Conditio	Condition 0.2			Status	us pass		
Sensor Co	omponent	Span			Conditio	Condition 1.011			Status	pass		
Sensor Co	omponent	Zero \	/oltage		Condition N/A				Status	pass		
Sensor Co	omponent	Fullsc	ale Voltage		Condition N/A			Status	pass			
Sensor Co	omponent	Cell A	Freq.		Condition 68.2 kHz			Status	pass			
Sensor Co	omponent	Cell A	Noise		Conditio	Condition 0.7 ppb			Status	pass		
Sensor Co	omponent	Cell A	Flow		Conditio	Condition 0.63 lpm			Status	pass		
Sensor Co	omponent	Cell A	Pressure		Conditio	on 585.3	mmHg		Status	pass		
Sensor Co	omponent	Cell A	Tmp.		Conditio	on 37.3 ()		Status	pass		
Sensor Co	omponent	Cell B	Freq.		Conditio	on 87.9 k	Hz		Status	pass		
Sensor Co	omponent	Cell B	Noise		Conditio	on 0.6 pp	b		Status	pass		
Sensor Co	omponent	Cell B	Flow			on 0.62 l			Status	pass		
	omponent				Conditio	on 585.0	mmHg		Status			
Sensor Co	omponent	t Cell B Tmp.			Conditio	ion			Status	pass		
Sensor Co	omponent	t Line Loss			Conditio	on Not te	sted		Status	pass		
Sensor Co	omponent	Syster	m Memo		Conditio	on			Status	pass		

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Tech	nician	Site Visit Date	Parameter	Owner I	D
RM Young	54061wsp	CHC432	Mar	tin Valvur	05/10/2017	Wind Speed	d 90877	
				Mfg Serial Number	RM Young		neter wind speed Desc. wind speed me	otor (h
			T	lfer ID	01262			
Prop or Cups SN	74592		s	Slope	1.0000	0 Intercep	ot 0.00	0000
Prop or Cups Torq Prop Correction Fa			0.3	Cert Date	1/26/201	7 CorrCo	ff 1.00	0000
DAS		DAS 2:	:					
	Range High Ra		ange Hig	gh Range				
Abs Avg Err		0.04%						
Abs Max Er		.08%						
UseDescription:	Input Device Inp	ut RPM Ir	nput m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.20	0.0	0.0		-0.20	
primary	01262	200	1.02	0.0	1.0		0.01	
primary	01262	400	2.05	0.0	2.1		0.00	
primary	01262	800	4.10	0.0	4.1		0.00	
primary	01262	1200	6.14	0.0	6.1	0.00	%	
primary			12.29	0.0	12.3	0.08	%	
primary	01262	4000	20.48	0.0	20.5	0.00	%	
primary	01262	9400	48.13	0.0	48.2	0.06	%	
Sensor Componen	nt Condition		Condition	Good		Status pas	SS	
Sensor Componen	nt Prop or Cups Con	dition	Condition	Good		Status pas	SS	
Sensor Componen	nt Sensor Heater		Condition	N/A		Status pas	38	
Sensor Componen	nt Torque		Condition			Status pas	38	
Sensor Componen	nt Sensor Plumb		Condition	ondition Plumb Status pa		Status pas	38	
Sensor Componen	nt System Memo		Condition			Status pas	SS	

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	54061wdr	CHC432	Martin Valvur	05/10/2017	Wind Direction	90877
			Mfg	RM Young	Parameter	ind direction
			Serial Number		Tfer Desc. wi	nd direction wheel
			Tfer ID	01266]	
Vane SN:	N/A C. A	. Align. deg. true:	Slope	1.00000	Intercept	0.00000
VaneTorque	9 to 9	180	Cert Date	1/1/2006	CorrCoff	1.00000
			Mfg	Ushikata	Parameter W	ind direction
			Serial Number	190037	Tfer Desc. tra	ansit
			Tfer ID	01265]	
			Slope	1.00000	Intercept	0.00000
			Cert Date	2/8/2017	CorrCoff	1.00000
	DAS 1:	DAS 2:				
	Orientation Linearit	y: Orientation	Linearity:			
Abs Avg Err	8.3	1.0				
Abs Max Er	12	2				
UseDescripti	ion TferID In	nut Raw Linearity	/ Output V Out	nut Deg Differ	ance Change	Error

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01266	0	\checkmark	0.0000	352	8	43	-2
primary	01266	45	✓	0.0000	39	6	47	2
primary	01266	90	\checkmark	0.0000	85	5	46	1
primary	01266	135	\checkmark	0.0000	129	6	44	-1
primary	01266	180	✓	0.0000	175	5	46	1
primary	01266	225	✓	0.0000	220	5	45	0
primary	01266	270	✓	0.0000	265	5	45	0
primary	01266	315	✓	0.0000	309	6	44	-1
primary	01265	90		0.0000	85	5		5
primary	01265	180		0.0000	168	12		12
primary	01265	270		0.0000	265	5		5
primary	01265	360		0.0000	349	11		11
Sensor Compon	ent Condition		Condi	tion Good		Status	pass	
Sensor Compon	ent Mast		Condi	tion Good		Status	pass	
Sensor Compon	ent Sensor Heate	er	Condi	tion N/A		Status	pass	
Sensor Compon	ent Sensor Plumb	D	Condi	tion Plumb		Status	pass	
Sensor Compon	ent Torque		Condi	tion		Status	pass	
Sensor Component Vane Condition		Condi	tion Good		Status	pass		
Sensor Compon	ent System Mem	0	Condi	tion		Status	pass	

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number	r Ta Site	Tech	nician	Site Visit	Date Paramete	er	Owner ID
Vaisala	Z1730091	CHC432	Mar	tin Valvur	05/10/201	Temperat	ure2meter	none
			N	Afg	Fluke	Para	ameter Tem	perature
			S	erial Number	3275143	Tfer	Desc. RTD	
			Г	fer ID	01229			
DAS 1:	DA	AS 2:	S	Slope	1	.00006 Interc	ept	0.03191
Abs Avg Err A			s Max Er	Cert Date	1/2	23/2017 Corr C	Coff	1.00000
0.5	0.59							
UseDescription	Test type	InputTmpRaw	InputTmpCorrec	cted OutputTm	pSignal O	utputSignalEng	OSE Unit	Difference
primary	Temp Mid Rang	10.70	1	0.67	0.0000	10.33	С	-0.34
primary	Temp Mid Rang	11.70	1	1.67	0.0000	11.08	С	-0.59
primary	Temp Mid Rang	11.50	1	1.47	0.0000	10.90	С	-0.57
Sensor Compor	Properly Site	d	Condition	Properly sited		Status P	ass	
Sensor Compor	ent Shield		Condition	Clean		Status P	ass	
Sensor Compor	ent Blower		Condition	Functioning		Status P	ass	
Sensor Compor	Blower Statu	s Switch	Condition	N/A		Status P	ass	
Sensor Compor	ent System Merr	10	Condition			Status P	ass	

Humidity Data Form

Mfg	Serial Nu	nber Ta S	Site		Technician		Site V	isit Date	Para	meter	Owner ID
Vaisala	Z1730091		CHC432		Martin Valvu		05/10	/2017	Relat	ive Humidity	none
					Mfg		Rotron	ic		Parameter Rel	ative Humidity
					Serial Nu	mber	75296			Tfer Desc. GT	L
					Tfer ID		01220				
					Slope			0.9978	0 In	tercept	0.06850
	DAS 1:		DAS 2	:	Cert Date	e		1/23/201	7 C	orrCoff	0.99994
	Low Range	High Rang	ge Low F	lange	High Range	e					
Abs Avg Err	7.6		4.7								
Abs Max Er	8.4		4.7								
UseDesc.	Test type	Device	e Input	RH	GTL Raw	RH	Corr.	DAS V	olts	DAS %RH	Difference
primary	RH Low Range	GTL	32	8	35.3	32	2.8	0.000	0	39.6	6.8
primary	RH Low Range	GTL	52	9	59.0	52	2.9	0.000	0	61.3	8.4
primary	RH High Range	GTL	93	.6	93.3	93	8.6	0.000	0	98.3	4.7
Sensor Com	ponent RH Filte	ſ		Cond	lition Clean				Statı	1s pass	
Sensor Com	ponent Shield			Cond	lition Clean				Statı	1s pass	
Sensor Com	ponent Blower			Condition Functioning					Statu	1s pass	
Sensor Com	ponent Blower S	Status Switch	า	Condition N/A Status pass					1s pass		
Sensor Com	ponent System	Memo		Cond	lition				Statu	1s pass	

Precipitation Data Form

Mfg	5	Serial Nu	mber Ta	Site		Tee	chnician		Site	Visit Date	Param	eter		Ow	ner ID
Texas Electron	nics	64172-31	5	CHC432		Ma	artin Valvur		05/1	0/2017	Precipit	ation		non	e
							Mfg		PMP	,	Pa	aram	eter Pr	ecipitat	tion
DAS 1:			DAS 2:				Serial Nun	nber	None	Э	Tf	fer D	esc. 25	0ml gra	aduate
A Avg % Diff		ax % Di 0.0%	A Avg %	Dif A	Max % Di		Tfer ID		0124	9					
							Slope			1.0000	0 Inte	rcept	t [0.00000
							Cert Date			4/26/201	3 Cor	rCof	f		1.00000
UseDesc.	Test	type Tf	erVolume	Iteration	TimePerT	Tip	Eq.Ht	DAS	S eng	Eq.HtUnit	OSE UI	nit T	ferUnit	s PctD	ifference
primary	test 1		231.5	1	8 sec		3.70	3.	70	mm	mm		ml		0.0%
Sensor Com	ponen	t Properly	Sited		Cond	litio	Properly	sited			Status	pass	3		
Sensor Com	iponen	t Gauge D	Drain Scree	n	Cond	litio	n Installed				Status	pass	6		
Sensor Com	ponen	t Funnel C	Clean		Cond	litio	Clean				Status	pass	6		
Sensor Com	ponen	t Conditio	n		Cond	litio	n Good				Status	pass	3		
Sensor Com	ponen	t Gauge S	Screen		Cond	litio	n Installed				Status	pass	3		
Sensor Com	ponen	t Gauge C	Clean		Cond	litio	n Clean				Status	pass	5		
Sensor Com	iponen	t Level			Cond	litio	n Level				Status	pass	6		
Sensor Com	ponen	t Sensor I	Heater		Cond	litio	n Function	ng			Status	pass	6		
Sensor Com	ponen	t System	Memo		Cond	litio	on				Status	pass	5		

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	one CHC432		05/10/2017	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter She	Iter Temperatur
Abs Avg ErrAb0.68	os Max Er Abs Avg 0.82	g Err Abs Max Er	Serial Number	3275143	Tfer Desc. RTD)
			Tfer ID	01229		
			Slope	1.0000	6 Intercept	0.03191
			Cert Date	1/23/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.62	24.59	0.000	23.8	С	-0.82
primary	Temp Mid Range	24.47	24.44	0.000	23.7	С	-0.7
primary	Temp Mid Range	24.24	24.21	0.000	23.7	С	-0.53
Sensor Component System Memo Condition Status pass							

Infrastructure Data For

Site ID	CHC432	Technician	Martin Valvur	Site Visit Date	05/10/2017
Shelter M	lake	Shelter Model	Shelte	r Size	
				57-247-3455-653745-8-74	

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	N/A	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	N/A	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	N/A	Status	pass
Sensor Component	Sample Train	Condition	N/A	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard Proble	÷m
Temperature2meter	CHC432	Martin Valvur	05/10/2017	System Memo	Vaisala	4333		
T (1.1.1)	1 11.			1 . 1	.1 1	1	1.	

Temperature and relative humidity are being measured using a combination sensor which cannot be submerged in a water bath for audits.

Field Systems Comments

- Parameter: SiteOpsProcComm
 Dry deposition samples are not collected at this CASTNET site.
- 2 Parameter: SitingCriteriaCom

See maps included as Figures 1 through 3.

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Site ID CHC432	Technician Martin Valvur	Site Visit Date 05/1	0/2017
Site Sponsor (agency)	NPS	USGS Map	
Operating Group	NPS	Map Scale	
AQS #		Map Date	
Meteorological Type			
Air Pollutant Analyzer		QAPP Latitude	
Deposition Measurement		QAPP Longitude	
Land Use		QAPP Elevation Meters	
Terrain		QAPP Declination	
Conforms to MLM		QAPP Declination Date	
Site Telephone		Audit Latitude	36.034484
Site Address 1		Audit Longitude	-107.904275
Site Address 2		Audit Elevation	1964
County	San Juan	Audit Declination	9.2
City, State	Nageezi, NM	Present	
Zip Code	87037	Fire Extinguisher	Not present
Time Zone	Mountain	First Aid Kit	Not present
Primary Operator		Safety Glasses	
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 Step 🔽	
Shelter Working Room ✓	Make Ekto Mo	odel 8812	Shelter Size 768 cuft
	Notes		
Site OK	Notes		
park e	highway 550 take county road 7950 (dirt r ntrance look for a gate on the north side o dirt road to the top of the mesa.		

CHC432

F-02058-1500-S2-rev002

Site ID

Techr

Technician Martin Valvur

Site Visit Date 05/10/2017

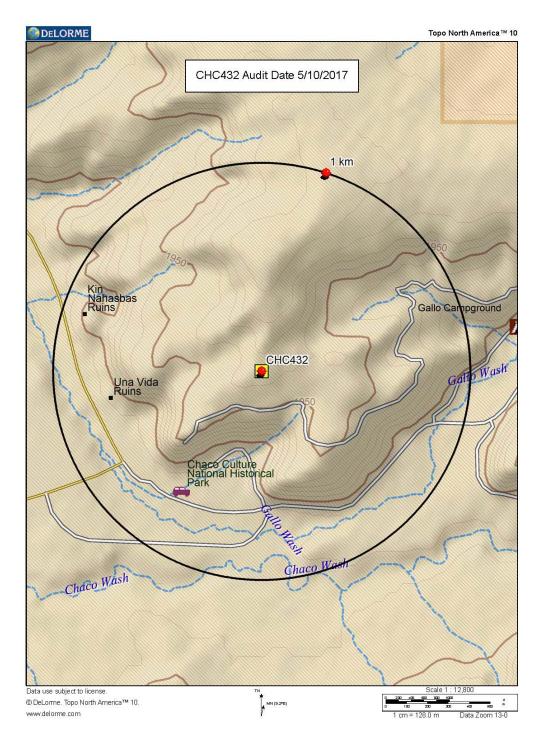
Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		
Major industrial complex	10 to 20 km		
City > 50,000 population	40 km		
City 10,000 to 50,000 population	10 km		
City 1,000 to 10,000 population	5 km		
Major highway,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

Siting Distances OK

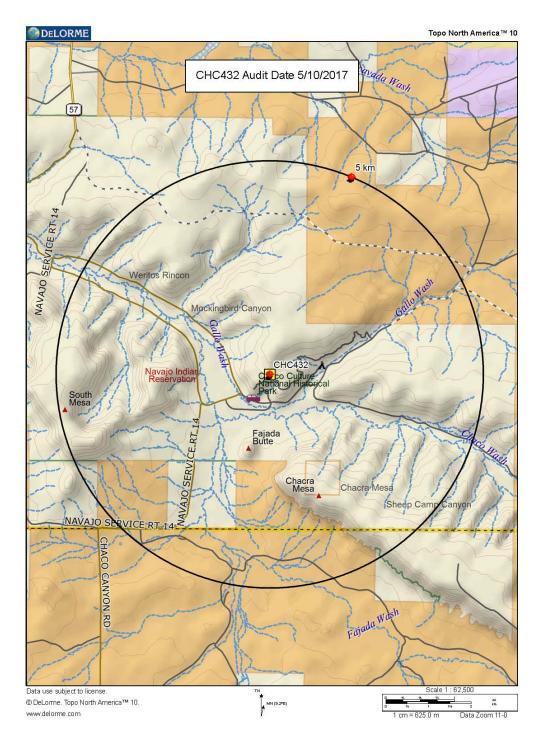
Siting Criteria Comment

See maps included as Figures 1 through 3.

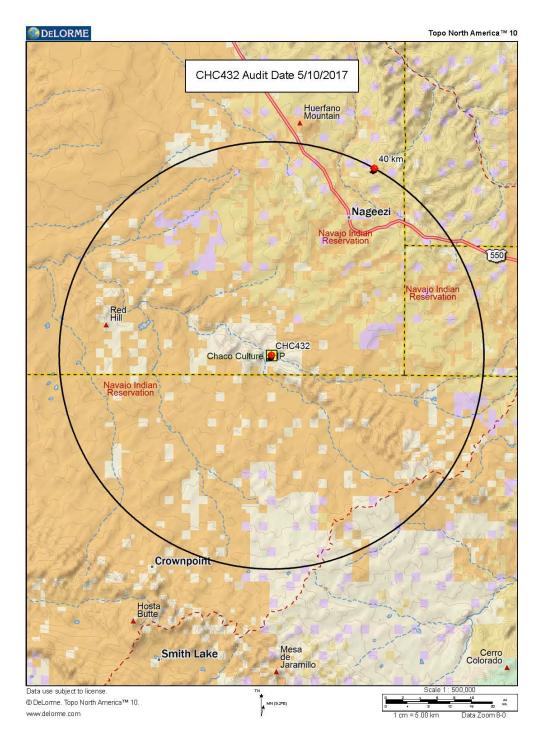












Fie	eld Sy	stems Data F	orm				F-02058 -	1500-S3-rev002
Site	e ID	CHC432	Technician	Martin Valvur		Site Visit Date	05/10/2017	
1		d speed and direction fluenced by obstruct		as to avoid	✓			
2	(i.e. win horizon	d sensors mounted so d sensors should be a tally extended boom to the prevailing wir	nounted atop the >2x the max dia	e tower or on a				
3	Are the	tower and sensors pl	umb?		✓			
4		temperature shields idiated heat sources s			✓			
5	conditio surface	perature and RH sen ns? (i.e. ground belo and not steeply slope g water should be ave	w sensors should d. Ridges, hollov	be natural				
6	Is the so	lar radiation sensor	plumb?		✓			
7	Is it site light?	d to avoid shading, o	r any artificial o	r reflected	✓			
8	Is the ra	in gauge plumb?			✓			
9	Is it site towers,	d to avoid sheltering etc?	effects from bui	ldings, trees,	✓			
10	Is the su facing n	rface wetness sensor orth?	sited with the g	rid surface	✓	N/A		
11	Is it inc	lined approximately	30 degrees?			N/A		

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Site	e ID	CHC432	Technician	Martin Valvur	Site Visit Date	05/10/2017	
1 2 3	condition Are all th reporting	e meterological senso n, and well maintained he meteorological sens g data? shields for the temper	d?	l online, and			
4	Are the a	aspirated motors worl	king?				
5	Is the sol scratches	ar radiation sensor's s?	lens clean and f	ree of			
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			

Field Systems Data Form			F-02058-1500-S5-rev002
Site	CHC432 Technician Martin Valvur		Site Visit Date 05/10/2017
	Siting Criteria: Are the pollutant analyzers and deposition e	<u>quip</u> r	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.		N/A
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?		Not present
9	Is there a rotometer in the dry deposition filter line, and is it clean?		N/A

Fi	Field Systems Data Form							F-02	2058-15	500-S6-rev002
Site	e ID	CHC432	Technician	Martin Valvur		Site Visi	it Date 0	5/10/2017	7]
	DAS, ser	nsor translators, and p	eripheral equi	pment operatio	ons and	maintena	<u>nce</u>			
1		DAS instruments appea 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						
4		signal connections pro intained?	tected from the	e weather and						
5	Are the	signal leads connected	to the correct	DAS channel?						
6	Are the grounde	DAS, sensor translator	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 contro	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?								

Field S	ystems Data	Fo	rm			F-0 2	2058-	-1500-S7-rev002
Site ID	CHC432		Techi	nician Martin Va	alvur Site Visit Date)5/10/2017	7	
Docume	<u>ntation</u>							
Does the	site have the requi	red in	strume	nt and equipme	<u>nt manuals?</u>			
		Yes	No	N/A		Yes	No	N/A
Wind speed	sensor		\checkmark		Data logger		\checkmark	
Wind direct	tion sensor		✓		Data logger			
Temperatu	re sensor		✓		Strip chart recorder			\checkmark
Relative hu	midity sensor		\checkmark		Computer	\checkmark		
Solar radia	tion sensor		\checkmark		Modem		\checkmark	
Surface wet	ness sensor			\checkmark	Printer			\checkmark
Wind senso	r translator			\checkmark	Zero air pump		\checkmark	
Temperatu	re translator			\checkmark	Filter flow pump			
Humidity se	ensor translator			\checkmark	Surge protector			
Solar radiat	tion translator			\checkmark	UPS		\checkmark	
Tipping buo	cket rain gauge		\checkmark		Lightning protection device		\checkmark	
Ozone analy	yzer	\checkmark			Shelter heater		\checkmark	
Filter pack	flow controller				Shelter air conditioner		\checkmark	
Filter pack	MFC power supply							
Does th	e site have the requ	ired a	and mos	st recent QC do	cuments and report forms?			
		Pres	sent			Curre	ent	
Station Log				Dataview				
SSRF				N/A		\checkmark		
Site Ops Ma	anual		[Electronic copy				
HASP			[Electronic copy				
Field Ops M	Ianual			Electronic copy				

Ele **Ozone z/s/p Control Charts** ✓ Ele **Preventive maintenance schedul** ✓

✓

Calibration Reports

	Curre
Dataview	
N/A	
Electronic copy	

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

Site	ID CHC432 Technician Martin Valvur		Site Visit Date	05/10/2017	
1	Site operation procedures Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	✓	N/A		
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	✓	N/A		
3	Is the site visited regularly on the required Tuesday schedule?	✓			
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	✓	N/A		
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	✓			
	An nomina operational OA/OC sharks performed on motors	nala	cical instruments?		

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

QC Check Performed

Frequency

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

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

QC Check Performed

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

- Frequency ✓ ✓ Semiannually \checkmark \checkmark Daily ✓ ✓ Every 2 weeks ✓ ✓ Daily \checkmark Not performed ✓ ✓ Alarm values only ✓ ✓ Every 2 weeks \checkmark \checkmark N/A \checkmark \checkmark Every 2 weeks ✓ \checkmark Weekly
- Do multi-point calibration gases go through the complete 1 sample train including all filters?
- 2 Do automatic and manual z/s/p gasses go through the complete sample train including all filters?

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

✓	Unknown
✓	
✓	Electronic copy

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

Compliant

Compliant

✓

✓

 \checkmark

 \checkmark

✓

 \checkmark

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Site	e ID	CHC432	Techni	cian	Martin Valvur		Site Visit Date	05/10/2017				
	<u>Site ope</u>	ration procedures										
1	Is the fil	ter pack being changed	l every T	iesda	ay as scheduled?		N/A					
2	Are the correctly	Site Status Report For y?	ms being	comj	pleted and filed	✓	N/A					
3	Are data schedule	a downloads and backu ed?	ips being	perfo	ormed as		N/A					
4	Are gen	eral observations being	g made an	d reo	corded? How?	✓	N/A					
5	Are site fashion	supplies on-hand and i	replenish	ed in	a timely	✓						
6	6 Are sample flow rates recorded? How?											
7	Are sam fashion?	ples sent to the lab on a	a regular	sche	dule in a timely	✓	1 N/A					
8		ers protected from cont oping? How?	aminatio	ı duı	ring handling	✓	N/A					
9		site conditions reported ons manager or staff?	d regular	y to	the field							
QC	Check Po	erformed		Free	quency			Compliant				
N	Iulti-poii	nt MFC Calibrations	\checkmark	N/A				\checkmark				
F	low Syste	em Leak Checks	\checkmark	N/A								
F	Filter Pack Inspection							\checkmark				
F	Flow Rate Setting Checks							\checkmark				
V	Visual Check of Flow Rate Rotometer V							\checkmark				
Ь	In-line Filter Inspection/Replacement 🔽 N/A							\checkmark				
S	Sample Line Check for Dirt/Water											
Prov	ide any a	dditional explanation (photogra	ph o	r sketch if neces	sarv) regarding condition	ons listed above, or ar	y 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:

Dry deposition samples are not collected at this CASTNET site.

CHC432

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Site ID

Tech

Technician Martin Valvur

Site Visit Date 05/10/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	ProBook	5CG5340VRK	none
DAS	Environmental Sys Corp	8832	A4871K	none
elevation	Elevation	none	none	none
Infrastructure	Infrastructure	none	none	none
Modem	CradlePoint	unknown	unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	CM08460049	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1152780006	none
Precipitation	Texas Electronics	TR-525i-HT	64172-315	none
Relative Humidity	Vaisala	HMP45AC	Z1730091	none
Sample Tower	Aluma Tower	FOT-10	Unknown	none
Shelter Temperature	ARS	unknown	none	none
siting criteria	Siting Criteria	none	None	none
Solar Radiation	Licor	LI-200	PY100793	none
Temperature2meter	Vaisala	HMP45AC	Z1730091	none
Wind Direction	RM Young	AQ05305	54061wdr	90877
Wind Speed	RM Young	AQ05305	54061wsp	90877
Zero air pump	Werther International	P 70/4	000756726	none

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
DCI	P114-Sandy	Grenville-05/22/2017				
1	5/22/2017	Computer	Dell	07053	Inspiron 15	2N2MC12
2	5/22/2017	DAS	Campbell	000345	CR3000	2124
3	5/22/2017	Elevation	Elevation	None	1	None
4	5/22/2017	Filter pack flow pump	Thomas	00390	107CA18	00001630787
5	5/22/2017	Flow Rate	Apex	000659	AXMC105LPMDPCV	54748
6	5/22/2017	Infrastructure	Infrastructure	none	none	none
7	5/22/2017	Modem	Raven	06382	H4222-C	0802310513
8	5/22/2017	Ozone	ThermoElectron Inc	000615	49i A1NAA	1009241787
9	5/22/2017	Ozone Standard	ThermoElectron Inc	000515	49i A3NAA	0922236891
10	5/22/2017	Sample Tower	Aluma Tower	000030	В	AT-81056-J-4
11	5/22/2017	Shelter Temperature	Campbell	none	107-L	none
12	5/22/2017	Siting Criteria	Siting Criteria	None	1	None
13	5/22/2017	Temperature	RM Young	06390	41342VC	13993
14	5/22/2017	Zero air pump	Werther International	06939	PC70/4	000829175

DAS Data Form

DAS Time Max Error:

0

Mfg	g Serial Number		e 1	Fechnician	Site Visit Date	Parameter	Use Desc.
Campbell	2124	DC	P114	Sandy Grenville	05/22/2017	DAS	Primary
Das Date:	5 /23/2017	Audit Date	5 /23/2017	Mfg	Datel	Parameter	DAS
Das Time:	15:39:25	Audit Time	15:39:25		45540404	T A _ D	Occurrence and a sector (D
Das Day:	143	Audit Day	143	Serial Number	15510194	Tfer Desc.	Source generator (D
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	0.0001	0.000	1 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	1/23/201	7 CorrCoff	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0001	V	V	0.0001	
7	0.1000	0.0999	0.1000) V	V	0.0001	
7	0.3000	0.2997	0.2998	B V	V	0.0001	
7	0.5000	0.4996	0.4997	V V	V	0.0001	
7	0.7000	0.6995	0.6996	5 V	V	0.0001	
7	0.9000	0.8994	0.8995	5 V	V	0.0001	
7	1.0000	0.9993	0.9993	B V	V	0.0000	

Flow Data Form

Mfg Serial Number Ta Site Teo		hnician	Site Visit I	Date Paran	neter	Owner ID				
Арех	54748	3	DCP114	Sar	ndy Grenville	05/22/2017	7 Flow R	Rate	000659	
				-	Mfg	BIOS	P	arameter Fl	ow Rate	
					Serial Number	103471	T	fer Desc. ne	exus	
					Tfer ID	01420				
								_		
				:	Slope	0.	99825 Int	ercept	0.00497	
					Cert Date	2/	7/2017 Co	rrCoff	0.99991	
					Mfg	BIOS	P	arameter Fl	ow Rate	
				:	Serial Number	103424	Г	fer Desc. BI	OS cell	
					Tfer ID	01410				
					Slope	0.	99825 Int	ercept	0.00497	
					Cert Date	2/	7/2017 Co	rrCoff	0.99991	
DAS 1:		DAS 2:			Cal Factor Z	lero	-0.0	02		
A Avg % Diff:	A Max %	Di A Avg %	blif A Max	x % Di	Cal Factor F	ull Scale	0.9	95		
1.96%	1.9	6%			Rotometer R	leading:		0		
Desc.	Test ty		n Input Corr_	MfcDisp.	OutputSignal	-	-		ll PctDifference	
primary	pump off	0.000	0.000	0.00	0.000	-0.02	1/m	l/m		
primary	leak check		0.000	0.00	0.000	-0.02	1/m	l/m		
primary	test pt 1	1.532	1.530	1.53	0.000	1.50	l/m	l/m	-1.96%	
primary	test pt 2	1.532	1.530	1.53	0.000	1.50	1/m	l/m	-1.96%	
primary	test pt 3	1.531	1.530	1.53	0.000	1.50	l/m	l/m	-1.96%	
Sensor Comp	onent Lea	< Test		Condition	1		Status	pass		
Sensor Comp	onent Tub	ng Condition		Condition	Good		Status	pass		
Sensor Comp	onent Filte	r Position		Condition	Good		Status	pass		
Sensor Comp	onent Roto	ometer Conditio	on	Condition	Clean and dry		Status	pass		
Sensor Comp	Sensor Component Moisture Present			Condition	No moisture p	resent	Status	pass		
Sensor Comp	onent Filte	r Distance		Condition	4.5 cm		Status	pass		
Sensor Comp	onent Filte	r Depth		Condition	2.5 cm		Status	pass		
Sensor Comp	onent Filte	r Azimuth		Condition	1 210 deg		Status	Status pass		
Sensor Comp	onent Sys	em Memo		Condition	n		Status	pass		

Ozone Data Form

Mfg		Serial N	lumber Ta	Site	Technician S		Site Visit Date Parameter		eter	Owner II	D		
ThermoElec	tron Inc	100924	1787	DCP114	Sa	andy Grei	nville	05/22/20	017	Ozone		000615	
Slope: Intercept CorrCoff	().98610).73952 I.00000	Slope: Intercept CorrCoff	0.00000	0 Serial Number		ThermoE 51711213 01111			rameter ozo er Desc. Ozo		stan	
DAS 1: A Avg % D 1.1	Diff: A M 1%	fax % D 3.0'		Dif A Max % Di		Slope Cert Date			1.00250 Inter 3/21/2017 Corr			0.45	
prin prin prin prin	UseDescriptionConcGroupTfer Rawprimary10.02primary215.14primary335.03primary472.04primary5110.04		Tfer Corr Site -0.43 0.49 14.64 15.08 34.48 34.63 71.40 71.10 109.30 108.60		49 .08 .63 .10	49 ppb 08 ppb 63 ppb 10 ppb		PctDiff	3.01% 0.44% -0.42% -0.64%				
Sensor Co	ompone	nt Samp	le Train		Conditio	on Good				Status	pass		
Sensor Co	ompone	nt 22.5 c	legree rule		Conditio	on				Status	pass		
Sensor Co	ompone	nt Inlet F	ilter Conditic	n	Conditio	on Clean				Status	pass		
Sensor Co	ompone	nt Batter	y Backup		Conditio	on N/A				Status	us pass]
Sensor Co	ompone	nt Offset	t		Conditio	on 0.000				Status	pass]
Sensor Co	ompone	nt Span				on 0.999				Status	pass]
Sensor Co	-		/oltage		Condition N/A				Status				
	_		ale Voltage		Condition N/A				Status				
	•												
Sensor Co	•					on 102.8				Status			
Sensor Co	-					on 0.4 pp				Status			
Sensor Co	ompone	nt Cell A	Flow		Condition	on 1.43 l	om			Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditio	on 713.7	mmHg			Status	pass		
Sensor Co	ompone	nt Cell A	. Tmp.		Conditio	on 39.0 C)			Status	pass		
Sensor Co	ompone	nt Cell B	Freq.		Conditio	on 94.7 k	Hz			Status	pass		
Sensor Component Cell B Noise			Conditio	on 0.6 pp	b			Status	pass		7		
Sensor Component Cell B Flow			Conditio	on 1.44 l	om			Status	pass]		
Sensor Component Cell B Pressure			Conditio	Condition 713.1 mmHg				Status	pass]		
Sensor Co	_				Conditio		-			Status]
Sensor Co	•					on Not te	sted]	Status]
Sensor Co	•]	Status			
Sensor Co	ompone	Jysie			Conditio					Status	pass		

Temperature Data Form

Mfg	Serial Number T	a Site	,	Techn i	ician	Site V	isit Date	Param	eter	Owner ID	
RM Young	13993	DCP114		Sandy	Grenville	05/22	2/2017	Temper	ature	06390	
				Mf	g	Extec	h	Pa	arameter Te	emperature	
				Ser	rial Number	H232	734	Tf	er Desc. R	ſD	
				Tfe	er ID	01227	7				
DAS 1: DAS 2:				Slo	pe		1.0075	9 Inte	rcept	0.14754	ł
Abs Avg Err Ab			Max Er	Ce	rt Date		2/4/201	7 Cor	rCoff	1.00000)
0.11	0.17										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Tem	p Low Range	0.22	0.07		0.000		0.1	l	С	0.07	
primary Tem	p Mid Range	25.38	25.04	4	0.000		25.	2	С	0.17	
primary Tem	p High Range	49.27	48.7	5	0.000		48.	7	С	-0.09	
Sensor Compone	nt Shield		Condi	ition N	Moderately clea	an		Status	pass		
Sensor Component Blower				Condition N/A				Status	pass		
Sensor Compone	Sensor Component Blower Status Switch				Condition N/A				pass		
Sensor Compone	nt System Memo		Condi	Condition				Status	pass		

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	I none DCP114		Sandy Grenville	05/22/2017	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	Iter Temperatur
Abs Avg Err Ab	s Max Er Abs Avg 1.34	Err Abs Max Er	Serial Number	H232734	Tfer Desc. RTD)
			Tfer ID	01227		
			Slope	1.0075	9 Intercept	0.14754
			Cert Date	2/4/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	28.15	27.79	0.000	27.8	С	0.04
primary	Temp Mid Range	23.80	23.47	0.000	24.8	С	1.34
primary	Temp Mid Range	24.41	24.08	0.000	25.1	С	1.02
Sensor Con	nponent System Memo)	Condition		Status	pass	

Infrastructure Data For

Site ID	DCP114	Technician Sandy Gr	enville Site Visit Date 05/22/2017
Shelter	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2149-13)	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	Good	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Fair	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Comments

1 Parameter: SiteOpsProcComm

The site operator is following procedures and doing a very good job with filter handling.

2 Parameter: DasComments

Met tower removed.

3 Parameter: SiteOpsProcedures

The ozone inlet filter is replaced and the sample line is leak-tested every two weeks.

4 Parameter: SitingCriteriaCom

The site is located in a wooded thicket within a state park. The area surrounding the park is almost completely intensive agriculture. The site may not be regionally representative.

5 Parameter: ShelterCleanNotes

The shelter is currently in fair condition. There are loose floor tiles.

6 Parameter: MetOpMaintCom

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

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Site ID DCP114	Technician Sandy Grenville	Site Visit Date 05/22	2/2017		
Site Sponsor (agency)	EPA	USGS Map	Mount Sterling		
Operating Group	private / state	Map Scale			
	39-047-9991	Map Date			
	R.M. Young				
Air Pollutant Analyzer	Ozone	QAPP Latitude	39.6358		
Deposition Measurement	dry, wet	QAPP Longitude	-83.2600		
Land Use	agriculture, woodland - mixed		267		
Terrain	flat	QAPP Declination	6.25		
Conforms to MLM	Marginally	QAPP Declination Date	2/23/2006		
Site Telephone	(740) 869-4722	Audit Latitude	39.635888		
Site Address 1	Waterloo Road	Audit Longitude	-83.260563		
Site Address 2	Deer Creek State Park	Audit Elevation	264		
County	Fayette	Audit Declination	-6.3		
City, State	Mount Sterling, OH	Present			
Zip Code	43143	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	none	Security Fence			
Backup Op. Phone #		Secure Shelter			
Backup Op. E-mail		Stable Entry Step 🔽			
Shelter Working Room ✓	Make Ekto Me	odel 8810 (s/n 2149-13)	Shelter Size 640 cuft		
_	Notes The shelter is currently in fair c	ondition. There are loose floor	tiles.		
	Notes				
signs t lodge.	Circleville take 22/56 west. Stay on 22 th for the park office and lodge. After crossi Continue approximately 1.5 miles and tu ne next right onto a stone road. Continue	ng the river, turn right at the sig Irn right again into the park. Go	on for the park office, golf course, and o past the office and golf course and		

DCP114

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Site ID

Tech

Technician Sandy Grenville

Site Visit Date 05/22/2017

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		
Major industrial complex	10 to 20 km		
City > 50,000 population	40 km		
City 10,000 to 50,000 population	10 km		
City 1,000 to 10,000 population	5 km		
Major highway, airport or rail yard	2 km		
Secondary road, heavily traveled	500 m		
Secondary road, lightly traveled	200 m		
Feedlot operations	500 m		
Intensive agricultural ops (including aerial spraying)	500 m		
Limited agricultural operations	200 m		
Large parking lot	200 m		
Small parking lot	100 m		
Tree line	50 m	15 m	
Obstacles to wind	10 times obstacle height		

Siting Distances OK

Siting Criteria Comment

The site is located in a wooded thicket within a state park. The area surrounding the park is almost completely intensive agriculture. The site may not be regionally representative.

Fi	eld Systems Data Form	F-02058-1500-S3-rev00				
Site	DCP114 Technician Sandy Grenville	Site Visit Date 05/22	/2017			
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	/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)	/A				
3	Are the tower and sensors plumb?	/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?	/A				
7	Is it sited to avoid shading, or any artificial or reflected light?	/Α				
8	Is the rain gauge plumb?	/A				
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	/A				
10	Is the surface wetness sensor sited with the grid surface facing north?	/A				
11	Is it inclined approximately 30 degrees?	/A				

condition, and well maintained?

Site	e ID	DCP114	Technician Sandy Grenville		Site Visit Date 05/22/2017
1		e meterological senso n, and well maintaine	rs appear to be intact, in good d?		N/A
2	Are all t reportin	U U	sors operational online, and	✓	N/A
3	Are the	shields for the temper	ature and RH sensors clean?	✓	Moderately clean
4	Are the	aspirated motors wor	king?	✓	N/A
5	Is the so scratche		lens clean and free of	✓	N/A
6	Is the su	rface wetness sensor g	grid clean and undamaged?	✓	N/A
7	Are the	sensor signal and pow	er cables intact, in good	\checkmark	

8 Are the sensor signal and power cable connections protected **rom** the elements and well maintained?

natural or man-made, that may affect the monitoring parameters: The temperature sensor is mounted in a naturally aspirated shield on the sample tower.

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features,

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Field Systems Data Form							F-0205 8	8-1500-	S5-rev002
Site	e ID	DCP114	Technician	Sandy Grenville		Site Visit Date	05/22/2017		
	Siting C	criteria: Are the pollut	ant analyzers a	nd deposition eq	uipı	nent sited in accor	dance with 40 C	<u>EFR 58, Ap</u>	pendix E
1		cample inlets have at le	ast a 270 degre	e arc of	✓				
2	2 Are the sample inlets 3 - 15 meters above the ground?				✓				
3		sample inlets > 1 mete meters from trees?	r from any ma	jor obstruction,		Small trees within 1	0 meters		
	<u>Pollutar</u>	nt analyzers and depos	ition equipmen	t operations and	ma	<u>intenance</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 me	ters		
4	Describ	e dry dep sample tube.				3/8 teflon by 12 me	ters		
5		ine filters used in the o location)	zone sample lii	ne? (if yes	✓	At inlet only			
6	Are sam	ple lines clean, free of tions?	kinks, moistur	e, 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 filt	er line, and is it		Clean and dry			

Field Systems Data Form							F-02	00-S6-rev002	
Site	e ID	DCP114	Technician	Sandy Grenville		Site Visit Date	05/22/2017	7	
	DAS, se	ensor translators, and	peripheral equi	pment operatior	<u>is a</u> i	nd maintenance			
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 signal sensor s		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?			DAS channel?	✓				
6	Are the ground	DAS, sensor translate ed?	ors, and shelter	properly					
7	Does th	e instrument shelter h	ave a stable pov	ver source?	✓				
8	Is the ir	nstrument shelter temp	perature contro	lled?	✓				
9	Is the m	net tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	ample tower stable and	l grounded?						
11	1 Tower comments?					Tower not grounded	1		

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:

Met tower removed.

Field Sy	ystems Data	F-02	F-02058-1500-S7-rev002									
Site ID	DCP114		Technician Sandy Grenvil			Grenville	Site Visit Date	05/22/2017	05/22/2017			
Documen	<u>itation</u>											
Does the	<u>site have the require</u>	ed ins	trum	ent and	equipm	ent manuals?						
Solar radiat Surface weth Wind sensor Temperatur Humidity se Solar radiat	sensor ion sensor re sensor midity sensor ion sensor ness sensor r translator re translator ensor translator ion translator eket rain gauge	Yes		N/. V V V V V V V V V V V V V		Computer Modem Printer Zero air p Filter flow Surge pro UPS	er *t recorder • • • • • • • • • • • • • • • • • • •		No V V V V V V V V V			
Filter pack f	flow controller		\checkmark			Shelter ai	r conditioner	\checkmark				
Filter pack I	MFC power supply			\checkmark								
Does the	<u>e site have the requi</u>	red a	nd mo	ost rece	nt QC d	ocuments and	l report forms?					
		Pres	ent					Curre	nt			
Station Log SSRF Site Ops Ma HASP Field Ops M	lanual	ی ا ا		Feb 20 July 19								
Calibration	Reports Control Charts		2									
-	naintenance schedul											
1 Is the s	tation log properly c	comp	leted	during	every sit	te 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	DCP114 Technician Sandy Grenville	Site Visit Date 05/22/2017
1	Site operation procedures	Trained during site installation by ESE employee DDK
1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	
3	Is the site visited regularly on the required Tuesday schedule?	
4	Are the standard CASTNET operational procedures being followed by the site operator?	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	

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

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	\checkmark	N/A	\checkmark
Visual Inspections	✓	N/A	\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?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	\checkmark	Semiannually	\checkmark
Automatic Zero/Span Tests	\checkmark	Daily	
Manual Zero/Span Tests			
Automatic Precision Level Tests		Daily	
Manual Precision Level Test			\checkmark
Analyzer Diagnostics Tests	\checkmark	Weekly	\checkmark
In-line Filter Replacement (at inlet)	\checkmark	Every 2 weeks	\checkmark
In-line Filter Replacement (at analyze	\checkmark	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?
- 2 Do automatic and manual z/s/p gasses go through the complete sample train including all filters?
- 3 Are the automatic and manual z/s/p checks monitored and reported? If yes, how?

✓	SSRF, call-in	

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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:

The ozone inlet filter is replaced and the sample line is leak-tested every two weeks.

Fie	eld Sy	stems Data Fo	orm			F-02058-1500-S9-rev002						
Site	e ID	DCP114	Technic	ian	Sandy Grenville		Site Visit Date	05/22/2017				
	<u>Site ope</u>	eration procedures										
1	Is the fi	lter pack being change	d every Tu	esd	ay as scheduled		Filter changed mori	nings				
2	2 Are the Site Status Report Forms being completed and filed correctly?											
3	Are data downloads and backups being performed as scheduled?						No longer required					
4	Are general observations being made and recorded? How?						SSRF, logbook					
5	5 Are site supplies on-hand and replenished in a timely fashion?											
6	Are sample flow rates recorded? How?						SSRF, logbook, call-in					
7	Are san fashion	nples sent to the lab on ?	a regular s	che	dule in a timely							
8		ers protected from cont pping? How?	tamination	du	ring handling	✓	Clean gloves on and off					
9		site conditions reporte ons manager or staff?	d regularly	v to	the field							
QC	Check P	erformed]	Fre	quency			Compliant				
N	Iulti-poi	nt MFC Calibrations		Sem	niannually							
F	'low Syst	em Leak Checks		Wee	ekly							
F	'ilter Pac	k Inspection										
F	Flow Rate Setting Checks							\checkmark				
V	Visual Check of Flow Rate Rotometer 🔽 weekly											
I	In-line Filter Inspection/Replacement Semiannually											
S	Sample Line Check for Dirt/Water Weekly							\checkmark				
Prov	ide any a	additional explanation	(photograp	h o	r sketch if neces	sary) regarding conditi	ons listed above,	or any other features,			

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

The site operator is following procedures and doing a very good job with filter handling.

DCP114

F-02058-1500-S10-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 05/22/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	2N2MC12	07053
DAS	Campbell	CR3000	2124	000345
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	00001630787	00390
Flow Rate	Арех	AXMC105LPMDPC	54748	000659
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4222-C	0802310513	06382
Ozone	ThermoElectron Inc	49i A1NAA	1009241787	000615
Ozone Standard	ThermoElectron Inc	49i A3NAA	0922236891	000515
Sample Tower	Aluma Tower	В	AT-81056-J-4	000030
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	13993	06390
Zero air pump	Werther International	PC70/4	000829175	06939

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
OX	F122-Sandy	Grenville-05/23/2017				
1	5/23/2017	Computer	Dell	07008	Inspiron 15	694MC12
2	5/23/2017	DAS	Campbell	000425	CR3000	2528
3	5/23/2017	Elevation	Elevation	None	1	None
4	5/23/2017	Filter pack flow pump	Thomas	04924	107CAB18	100300020817
5	5/23/2017	Flow Rate	Apex	000556	AXMC105LPMDPCV	illegible
6	5/23/2017	Infrastructure	Infrastructure	none	none	none
7	5/23/2017	Modem	Raven	06601	V4221-V	0844430833
8	5/23/2017	Ozone	ThermoElectron Inc	000737	49i A1NAA	1105347312
9	5/23/2017	Ozone Standard	ThermoElectron Inc	000545	49i A3NAA	0929938241
10	5/23/2017	Sample Tower	Aluma Tower	000018	В	AT-61152-A-H8-E
11	5/23/2017	Shelter Temperature	Campbell	none	107-L	10755-148
12	5/23/2017	Siting Criteria	Siting Criteria	None	1	None
13	5/23/2017	Temperature	RM Young	02823	41342	illegible
14	5/23/2017	Zero air pump	Werther International	06911	PC70/4	000829167

DAS Data Form

0 DAS Time Max Error:

Mfg	Serial N	umber Sit	e T	Fechnician	Site Visit Date	Parameter	Use Desc.
Campbell	2528	0)	XF122	Sandy Grenville	05/23/2017	DAS	Primary
Das Date: 5 /22/2017 Audit Date 5 /22/2017		Mfg	Datel	Parameter	DAS		
Das Time:	18:29:37	Audit Time	18:29:37		15510194	TE D	Course generator (D
Das Day:	142	Audit Day	142	Serial Number	15510194	Tier Desc.	Source generator (D
Low Channel: High Channel:				Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0000	0.000	1 0.000	0.0001	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	DAS	
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/23/201	7 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0001	V	V	0.0001	
7	0.1000	0.0999	0.0999	V	V	0.0000	
7	0.3000	0.2998	0.2998	V	V	0.0000	
7	0.5000	0.4996	0.4996		V	0.0000	
7	0.7000	0.6995	0.6995		V	0.0000	
7	0.9000	0.8994	0.8994		V	0.0000	
7	1.0000	0.9993	0.9992	2 V	V	-0.0001	

Flow Data Form

Mfg	Serial Nur	nber Ta S	lite	Tec	hnician	Site Visit I	Date Param	neter	Owner ID
Apex	illegible		OXF122	Sar	ndy Grenville	05/23/2017	7 Flow R	ate	000556
				-	Mfg	BIOS	Р	arameter	low Rate
					Serial Number	103471	Т	Tfer Desc. nexus	
					Tfer ID	01420			
					Slope	0.	99825 Inte	ercept	0.00497
	Cert Date 2/7/		7/2017 Cor	rCoff	0.99991				
			Mfg BIOS		P	Parameter Flow Rate			
				:	Serial Number	103424	Т	fer Desc.	BIOS cell
					Tfer ID	01410			
					Slope	0.	99825 Inte	ercept	0.00497
	Cert Date2/7/2017CorrCoff					rCoff	0.99991		
DAS 1:		DAS 2:		L	Cal Factor Z	ero	-0.0)2	
A Avg % Diff:	A Max % Di	A Avg %I	Dif A Max	: % Di	Cal Factor F	ull Scale	0.9	97	
1.32%	1.32%				Rotometer R	eading:	1	.5	
Desc.	Test type	-	Input Corr_	MfcDisp.	OutputSignal	Output S E InputUnit		1 0	all 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	-0.01	l/m	l/m	
primary	test pt 1	1.522	1.520	1.54	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 2	1.524	1.520	1.54	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 3	1.525	1.520	1.54	0.000	1.50	l/m	l/m	-1.32%
Sensor Comp	onent Leak Te	st		Condition	1		Status	pass	
Sensor Comp	onent Tubing C	Condition		Condition	Good		Status	pass	
Sensor Comp	onent Filter Po	sition		Condition	Good		Status	pass	
Sensor Comp	onent Rotomet	er Condition		Condition	Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Condition	No moisture p	resent	Status	pass	
Sensor Comp	onent Filter Dis	stance		Condition	4.0 cm		Status	pass	
Sensor Comp	Sensor Component Filter Depth		Condition	2.5 cm		Status	Status pass		
Sensor Comp	Sensor Component Filter Azimuth		Condition	180 deg		Status	Status pass		
Sensor Component System Memo			Condition	n		Status	pass		

Ozone Data Form

Mfg	Se	erial Number Ta	Site	Te	chnician		Site Visit D	ate Param	eter Owner ID		
ThermoElec	ctron Inc 1	105347312	OXF122	Sa	andy Grei	nville	05/23/2017	Ozone	000737		
Slope: Intercept CorrCoff	tercept 0.51736 Intercept		0.0000	0.00000 0.00000 0.00000		Mfg Serial Number Tfer ID			arameter ozone fer Desc. Ozone primary stan		
DAS 1: DAS 2: A Avg % Diff: A Max % Di A Avg % Dif A 0.9% 3.4%				% Di Cert Date			1.00250 Intercept 0.45870 3/21/2017 CorrCoff 1.00000				
UseDes	scription	ConcGroup	Tfer Raw	Tfer	Corr	Si	te	Site Unit	PctDifference		
	nary	1	0.03	-0.	42	0.	29 ppl	b			
prir	nary	2	15.02	14	.52	15	.02 ppl	b	3.44%		
prir	nary	3	35.20	34		34		b	-0.17%		
-	nary	4	72.10	71		71	11		0.01%		
	nary	5	110.30		9.56		0.50 ppl	b	-0.05%		
Sensor C	omponent	Sample Train		Conditi	on Good			Status	pass		
Sensor C	omponent	22.5 degree rule		Conditi	on			Status	pass		
Sensor C	omponent	Inlet Filter Condition	on	Conditi	on Clean	I		Status	pass		
Sensor C	omponent	Battery Backup		Condition	on N/A			Status	pass		
Sensor C	omponent	Offset		Conditi	on 0.50			Status	pass		
Sensor C	omponent	Span		Conditi	on 1.023			Status	pass		
Sensor C	omponent	Zero Voltage		Conditi	on N/A			Status	pass		
Sensor C	omponent	Fullscale Voltage		Conditi	on N/A			Status	pass		
Sensor C	omponent	Cell A Freq.			on 96.0 k			Status	pass		
Sensor C	omponent	Cell A Noise		Condition 0.6 ppb				Status			
Sensor C	omponent	Cell A Flow		Condition 0.0 lpm				Status	Fail		
Sensor C	omponent	Cell A Pressure			Condition 694.9 mmHg			Status	pass		
Sensor C	omponent	Cell A Tmp.			on 37.0 (Status	pass		
Sensor C	omponent	Cell B Freq.			on 99.9 k			Status			
Sensor C	omponent	Cell B Noise		Conditi	on 0.5 pp	b		Status	pass		
Sensor C	omponent	Cell B Flow		Conditi	on 0.74 l	pm		Status	; pass		
Sensor C	omponent	nponent Cell B Pressure		Conditi	on 695.5	mmHg		Status	us pass		
Sensor C	omponent	Cell B Tmp.		Conditi					lis pass		
Sensor C	omponent	Line Loss		Conditi	ion Not tested			Status	tatus pass		
Sensor C	omponent	System Memo		Conditi	on			Status	pass		

Temperature Data Form

Mfg	Serial Number T	la Site	,	Technician		Site V	isit Date/	Parameter		Owner ID
RM Young	illegible	OXF122		Sandy Grenville		05/23	3/2017 Temper		rature	02823
		Mfg		Extec	Extech Pa		arameter Te	emperature		
					Serial Number		H232734 Tf		fer Desc. R	٢D
		Tfer ID		01227	7					
DAS 1:		Slo	pe	1.00759 Inte		ercept 0.1475				
Abs Avg Err A	DAS bs Max Er Abs A		Max Er	ax Er Cert Date		2/4/2017 Cor		rCoff	1.00000	
0.05	0.07									
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference
primary Ter	mp Low Range	0.17	0.02	2	0.000		0.1		С	0.05
primary Ter	mp Mid Range	24.98	24.6	5	0.000		24.7		С	0.07
primary Ter	mp High Range	49.20	48.68	8	0.000		48.	7	C	0.02
Sensor Compor	nent Shield		Condi	ition N	Moderately clea	an		Status	pass	
Sensor Component Blower				Condition N/A				Status pass		
Sensor Component Blower Status Switch				Condition N/A				Status	pass	
Sensor Component System Memo				Condition Status pass						

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Site Visit Date Parameter	
Campbell	10755-148	OXF122	Sandy Grenville	05/23/2017	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	Iter Temperatur
Abs Avg ErrAb0.15	os Max Er Abs Avg 0.20	Err Abs Max Er	Serial Number	H232734	Tfer Desc. RTD)
			Tfer ID	01227		
			Slope	1.0075	9 Intercept	0.14754
			Cert Date	2/4/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.44	26.09	0.000	26.0	С	-0.07
primary	Temp Mid Range	25.65	25.31	0.000	25.1	С	-0.2
primary	Temp Mid Range	27.34	26.99	0.000	26.8	С	-0.19
Sensor Con	ponent System Memo)	Condition		Status	pass	

Infrastructure Data For

Site ID	OXF122	Technician Sandy G	renville Site Visit Date 05/23/2017
Shelter N	lake	Shelter Model	Shelter Size
Ekto		8810 (s/n 2107-4)	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	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	Fair	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	OXF122	Sandy Grenville			ThermoElectron	3879		
This analyzer diagnostic	check is outside	the manufacturer's	recommended v	value.				

Field Systems Comments

1 Parameter: SiteOpsProcComm

The operator uses procedures written by the previous site operator. She has been operating the site for nearly 2 years and is now proficient.

2 Parameter: DasComments

The met tower is operated by the university and the temperature sensor has been moved to the sample tower in a naturally aspirated shield.

3 Parameter: SitingCriteriaCom

The site is located in university agriculture research facility.

4 Parameter: ShelterCleanNotes

The shelter roof is in poor condition with at least one leak.

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Site ID OXF122	Technician Sandy Grenville	Site Visit Date 05/2	3/2017
Site Sponsor (agency)	EPA	USGS Map	Oxford
Operating Group	Miami University	Map Scale	
AQS#	39-017-9991	Map Date	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	QAPP Latitude	39.5314
Deposition Measurement	dry, wet	QAPP Longitude	-84.7231
Land Use	agriculture, woodland - mixed	QAPP Elevation Meters	284
Terrain	gently rolling	QAPP Declination	5.2
Conforms to MLM	Yes	QAPP Declination Date	2/23/2007
	(513) 523-6912	Audit Latitude	39.531115
Site Address 1	Ecological Research Center		-84.723547
Site Address 1		Audit Longitude	
Site Address 2	Somerville Rd.	Audit Elevation	284
County	Butler	Audit Declination	-5.6
City, State	Oxford, OH	Present	
Zip Code	45056	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 Step 🔽	
Shelter Working Room ✓	Make Ekto Me	odel 8810 (s/n 2107-4)	Shelter Size 640 cuft
	Notes The shelter roof is in poor cond	lition with at least one leak.	
Site OK	Notes		
appro	Oxford proceed north on route 732. Just eximately 1/2 mile and turn right at the sign ngs. The road will turn to the right along the	for the Ecological Research C	enter. Stay on the dirt road past the

OXF122

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Site ID

Tech

Technician Sandy Grenville

Site Visit Date 05/23/2017

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

Siting Distances OK

Siting Criteria Comment

The site is located in university agriculture research facility.

Fi	eld Systems Data Form		F-02058-1500-S3-rev002
Site	e ID OXF122 Technician Sandy Grenville		Site Visit Date 05/23/2017
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,

Form F-02058-1500-S4-rev002

Site	e ID	OXF122	Technician	Sandy Grenville		Site Visit Date	05/23/2017	
1		e meterological senso 1, and well maintained		intact, in good	✓	N/A		
2	Are all the reporting	ne meteorological sens g data?	sors operationa	l online, and	✓	N/A		
3	Are the s	hields for the tempera	ature and RH s	ensors clean?	✓			
4	Are the aspirated motors working?					N/A		
5	Is the sol scratches	ar radiation sensor's 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		ensor signal and pow 1, and well maintained		, in good				
8		ensor signal and pow elements and well ma		ctions protected				

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

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev002
Site	e ID	OXF122	Technician	Sandy Grenville		Site Visit Date 05/23/2017
	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 lo 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 mete meters from trees?	er from any maj	jor obstruction,		
	<u>Pollutar</u>	nt analyzers and depos	sition equipmen	t operations and	mai	<u>intenance</u>
1		analyzers and equipmo on and well maintained		e in good	✓	
2		analyzers and monito ng data?	rs operational,	on-line, and	✓	
3	Describ	e ozone sample tube.				1/4 teflon by 15 meters
4	Describ	e dry dep sample tube				3/8 teflon by 15 meters
5		ine filters used in the o location)	ozone sample lir	ne? (if yes		At inlet only
6	Are san obstruc	ple lines clean, free of tions?	² 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?		✓	Flow line only
9	Is there clean?	a rotometer in the dry	y deposition filte	er line, and is it		

Fi	eld Systems Data Form			F-0 2	2058-15	00-S6-rev002
Site	e ID OXF122 Technician Sandy Grenville	Э	Site Visit Date	05/23/201	7	
	DAS, sensor translators, and peripheral equipment operation	ons a	nd maintenance			
1	Do the DAS instruments appear to be in good condition and well maintained?					
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	✓				
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	✓	Met sensors only			
4	Are the signal connections protected from the weather and well maintained?	✓				
5	Are the signal leads connected to the correct DAS channel?	✓				
6	Are the DAS, sensor translators, and shelter properly grounded?	✓				
7	Does the instrument shelter have a stable power source?	✓				
8	Is the instrument shelter temperature controlled?					
9	Is the met tower stable and grounded?		Stable		Grounded	
10	Is the sample tower stable and grounded?					
11	Tower comments?					

The met tower is operated by the university and the temperature sensor has been moved to the sample tower in a naturally aspirated shield.

Field Systems	Bata Fo	rm			F-02058-1500-S7-rev002			
Site ID OXF122	ite ID OXF122		cian	Sandy Grenville Site Visit Date	05/23/2017	7		
Documentation								
Does the site have	the required in	<u>nstrumen</u>	t and	<u>equipment manuals?</u>				
	Yes	No	N/A	L	Yes	No	N/A	
Wind speed sensor			\checkmark	Data logger		✓		
Wind direction sensor	r 🗌		\checkmark	Data logger			\checkmark	
Temperature sensor				Strip chart recorder			\checkmark	
Relative humidity sen	sor		\checkmark	Computer	\checkmark			
Solar radiation sensor	r 🗌		\checkmark	Modem		\checkmark		
Surface wetness sense	r 🗌		\checkmark	Printer			\checkmark	
Wind sensor translate	or 🗌		\checkmark	Zero air pump		\checkmark		
Temperature translat	or		\checkmark	Filter flow pump		\checkmark		
Humidity sensor tran	slator 🗌		\checkmark	Surge protector			\checkmark	
Solar radiation transl	ator 🗌		\checkmark	UPS		\checkmark		
Tipping bucket rain g	auge		\checkmark	Lightning protection device			\checkmark	
Ozone analyzer				Shelter heater		\checkmark		
Filter pack flow contr	oller 🔽			Shelter air conditioner	\checkmark			
Filter pack MFC pow	er supply		✓					
Does the site have	the required	and most	recer	t QC documents and report forms?				

	Present		Current
Station Log	\checkmark		\checkmark
SSRF	\checkmark		\checkmark
Site Ops Manual	\checkmark	Feb 2014	
HASP	\checkmark	Feb 2014	\checkmark
Field Ops Manual	\checkmark	July 1990	
Calibration Reports	\checkmark		\checkmark
Ozone z/s/p Control Charts			
Preventive maintenance schedul	L 🗌		

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

Site	e ID	OXF122	Technician	Sandy Grenville	 Site Visit Date	05/23/2017	
1	Has the	<u>ration procedures</u> site operator attended If yes, when and who		TNET training	Trained onsite by pr	evious site operator	
2		backup operator atte course? If yes, when					
3	Is the sit schedule	e visited regularly on ?	the required Tu	ıesday			
4		standard 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	
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	Compliant
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		Weekly	
Zero Air Desiccant Check		Weekly	
1 Do multi-point calibration gases go through	the 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?

✓	
	SSRF, call-in

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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:

Fi	eld Sy	stems Data Fo	orm				F-02058-1500-S9-re						
Sit	e ID	OXF122	Technie	cian	Sandy Grenville		Site Visit Date	05/23/2017					
	<u>Site ope</u>	ration procedures											
1	Is the fi	lter pack being change	d every Tu	ıesda	ay as scheduled?		Filter changed morir	nings					
2	Are the correctl	Site Status Report For y?	rms being	com	pleted and filed								
3	Are dat schedul	a downloads and back ed?	ups being	perf	ormed as		No longer required						
4	Are gen	eral observations bein	g made an	d re	corded? How?		SSRF, logbook						
5	Are site fashion	supplies on-hand and ?	replenishe	ed in	a timely								
6	Are san	ple flow rates recorde	d? How?			✓	SSRF, logbook, call-in						
7	Are san fashion	pples sent to the lab on ?	a regular	sche	dule in a timely	✓							
8		ers protected from con pping? How?	tamination	ı du	ring handling	✓	Clean gloves on and off						
9		site conditions reporte ons manager or staff?	ed regularl	y to	the field	✓							
QC	Check P	erformed		Fre	quency			Compliant					
I	Multi-poi	nt MFC Calibrations	\checkmark	Sem	niannually								
I	Flow Syst	em Leak Checks	\checkmark	Wee	ekly								
I	Filter Pac	k Inspection											
I	Flow Rate	e Setting Checks	\checkmark	Wee	ekly			\checkmark					
	Visual Check of Flow Rate Rotometer 🔽 Weekly							\checkmark					
I	n-line Fil	ter Inspection/Replace	ement 🗹	Sem	niannually			\checkmark					
8	Sample Li	ine Check for Dirt/Wa	ter 🗌	Wee	ekly			\checkmark					
Prov	ide env e	dditional evolution	(nhotogra	nh o	r skatch if nacas	corv) regarding conditi	ons listed above	or any other features				

The operator uses procedures written by the previous site operator. She has been operating the site for nearly 2 years and is now proficient.

OXF122

F-02058-1500-S10-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 05/23/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	694MC12	07008
DAS	Campbell	CR3000	2528	000425
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	100300020817	04924
Flow Rate	Арех	AXMC105LPMDPC	illegible	000556
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0844430833	06601
Ozone	ThermoElectron Inc	49i A1NAA	1105347312	000737
Ozone Standard	ThermoElectron Inc	49i A3NAA	0929938241	000545
Sample Tower	Aluma Tower	В	AT-61152-A-H8-E	000018
Shelter Temperature	Campbell	107-L	10755-148	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	illegible	02823
Zero air pump	Werther International	PC70/4	000829167	06911

Site Inventory by Site Visit

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number				
SEK430-Martin Valvur-05/23/2017										
1	5/23/2017	Computer	Hewlett Packard	none	6560 b	5CB1520H7P				
2	5/23/2017	DAS	Environmental Sys Corp	90649	8816	2562				
3	5/23/2017	Elevation	Elevation	None	1	None				
4	5/23/2017	Filter pack flow pump	Thomas	none	107CAB18	120000014367				
5	5/23/2017	flow rate	Tylan	03384	FC280AV	AW9403014				
6	5/23/2017	Infrastructure	Infrastructure	none	none	none				
7	5/23/2017	Met tower Aluma Tower		none	В	none				
8	5/23/2017	MFC power supply	Tylan	03679	RO-32	FP9403015				
9	5/23/2017	Modem	US Robotics	none	56k	unknown				
10	5/23/2017	Ozone	ThermoElectron Inc	90835	49C	0520012327				
11	5/23/2017	Ozone Standard	ThermoElectron Inc	90752	49C	49C-74532-376				
12	5/23/2017	Shelter Temperature	ARS	none	none	none				
13	5/23/2017	Shield (2 meter)	RM Young	none	Aspirated 43408	none				
14	5/23/2017	Siting Criteria	Siting Criteria	None	1	None				
15	5/23/2017	Temperature Translator	RM Young	00819	41406-X	063143				
16	5/23/2017	Temperature2meter	RM Young	none	41342	8472				
17	5/23/2017	Zero air pump	Werther International	none	C 70/4	000838301				

DAS Data Form

DAS Time Max Error: 1.5

Mfg	Serial N	umber Site	7	Fechnician	Site Visit Date	Parameter	Use Desc.
Environmental	mental Sys 2562 SEK430		Martin Valvur	05/23/2017	DAS	Primary	
Das Date:	5 /23/2017	Audit Date	5 /23/2017	Mfg	HY	Parameter	DAS
Das Time: Das Day:	9:21:30 143	Audit Time Audit Day	9:23:00 143	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	D Intercept	0.00000
0.0002	0.000	4 0.0002	0.0004	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	D Intercept	0.00000
				Cert Date	1/23/201	7 CorrCoff	1.00000
Channel	Input I	OVM Output	DAS Output	InputUnit	OutputUnit	Difference	
12	0.0000	-0.0005	-0.0005	5 V	V	0.0000	
12	0.1000	0.0993	0.0995	5 V	V	0.0002	
12	0.3000	0.3002	0.3004	1 V	V	0.0002	
12	0.5000	0.4999	0.4999		V	0.0000	
12	0.7000	0.7000	0.7003		V	0.0003	
12	0.9000	0.8999	0.9002		V	0.0003	
12	1.0000	1.0000	1.0004	4 V	V	0.0004	

Flow Data Form

Mfg	Seri	ial Num	ber Ta	Site	Тес	hnician Site Visit l		Date Paran	neter	Owner ID	
Tylan	AW	/9403014	4	SEK430	Ма	artin Valvur	05/23/2017	7 flow ra	te	03384	
Mfg Tylan SN/Owner ID FP9403015 03679					Mfg Serial Number	BIOS 148613					
Parameter	MFC po	wer sup	ply			Tfer ID	01421				
						Slope	1.	00153 Inte	ercept	0.00366	
						Cert Date	1/2	5/2017 Co	rCoff	1.00000	
DAS 1: A Avg % Diff: 0.53%			DAS 2: A Avg %	Dif A Max	: % Di	Cal Factor Z Cal Factor F Rotometer R	ull Scale	0.12 5.57 3.4	74		
Desc.	Test	type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignal	PctDifference	
primary	pump of	ff	0.000	0.000	-0.08	0.0000	0.06	l/m	l/m		
primary	leak che	eck	0.000	0.000	-0.06	0.0000	0.08	l/m	l/m		
primary	test pt 1		2.986	2.980	2.44	0.0000	2.99	l/m	l/m	0.30%	
primary	test pt 2		2.983	2.970	2.43	0.0000	2.99	l/m	l/m	0.64%	
primary	test pt 3		2.981	2.970	2.43	0.0000	2.99	l/m	l/m	0.64%	
Sensor Comp	onent Le	eak Test			Conditio	n		Status	Status pass		
Sensor Comp	onent Tu	ubing Co	ondition		Conditio	n Fair		Status	pass		
Sensor Comp	onent Fi	lter Posi	tion		Conditio	n Good		Status	pass		
Sensor Comp	onent Ro	otomete	r Conditio	n	Conditio	n Clean and dry		Status	pass		
Sensor Comp	onent M	oisture F	Present		Conditio	n No moisture p	resent	Status	pass		
Sensor Component Filter Distance				Conditio	n 4.5 cm		Status	pass			
Sensor Component Filter Depth				Conditio	n 1.5 cm		Status	pass			
Sensor Component Filter Azimuth					Conditio	n 225 deg		Status	pass		
Sensor Comp	onent Sy	ystem M	emo		Conditio	n See comments	6	Status	pass		

Ozone Data Form

Mfg	Sei	rial N	umber Ta	Site	Te	chnician		Site Visi	it Date	Parame	ter	Owner ID	
ThermoElectron	Inc 05	520012	2327	SEK430	Ma	/lartin Valvur		05/23/2017		Ozone		90835	
Slope:InterceptCorrCoff	ercept -0.13773 Intercept		0.00000 0.00000 0.00000		Mfg Serial Number Tfer ID		ThermoElectron Inc 49CPS-70008-364 01110			rameter er Desc.	ozone Ozone primary stan		
DAS 1: A Avg % Diff: A 3.5%	• % Di 4.4%		Dif A Max	% Di	Slope Cert Date		1.00466 Interd 1/1/2017 Corr(•	-			
UseDescript	ion	Co	oncGroup	Tfer Raw	Tfer	Corr	Si	te	Site	Unit	Pctl	Difference	
primary			1	0.02	0.0	00	0.	32	ppb				
primary			2	19.08	18.	97	19	.52	ppb			2.90%	
primary			3	36.07	35.		36		ppb			2.70%	
primary			4	70.09	69.				ppb			3.83%	
primary			5	110.29	109		114	.60	ppb			4.41%	
Sensor Compo	onent s	Sampl	e Train		Conditio	on Good				Status	pass		
Sensor Compo	onent 2	22.5 d	egree rule		Conditio	on				Status	pass		
Sensor Compo	onent	Inlet F	ilter Conditio	n	Conditio	ondition Clean					pass		
Sensor Compo	onent	Batter	y Backup		Conditio	Condition N/A				Status	pass		
Sensor Compo	onent	Offset			Conditio	on 0.2				Status	pass		
Sensor Compo	onent	Span			Conditio	dition 1.012				Status	pass		
Sensor Compo	onent	Zero V	/oltage		Conditio	Condition -0.075				Status	pass		
Sensor Compo	onent	Fullsca	ale Voltage			Condition 1.000					pass		
Sensor Compo	onent	Cell A	Freq.		Conditio	Condition 89.7 kHz				Status	pass		
Sensor Compo	onent	Cell A	Noise		Conditio	L				Status	pass		
Sensor Compo	onent	Cell A	Flow		Conditio	on 0.66 l	om			Status	pass		
Sensor Compo	onent (Cell A	Pressure			700.1				Status	pass		
Sensor Compo	onent (Cell A	Tmp.			on 38.9 (Status	pass		
Sensor Compo	onent (Cell B	Freq.			on 75.8 k				Status			
Sensor Compo	onent (Cell B	Noise		Conditio	on 0.6 pp	b			Status	pass		
Sensor Compo	onent	Cell B	Flow			lition 0.71 lpm				Status	pass		
Sensor Compo	onent	onent Cell B Pressure			Conditio	on 699.6	mmHg			Status	1s pass		
Sensor Compo	onent	Cell B	Tmp.		Conditio					Status	IS pass		
Sensor Compo	onent l	Line L	OSS		Conditio	ion Not tested				Status	pass		
Sensor Compo	onent	Syster	m Memo		Conditio	on				Status	pass		

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Nun	ıber Ta	Site		1	Technician		Site Vis	sit Date	Paramet	er	Owner ID
RM Young	RM Young 8472 SEK430			Martin Va	alvur	05/23/2	2017	Temperat	ure2meter	none		
Mfg	RM Young]		Mfg		Fluke		Para	ameter Tem	perature
SN/Owner ID	063143	00819		7		Seria	Number	327514	3	Tfer	Desc. RTD)
Parameter	Temperature T	ranslator				Tfer ID 01229]				
DAS 1:		DAS 2:				Slope			1.00006	5 Interc	ept	0.03191
Abs Avg Err	Abs Max Er	Abs Avg	Err Al	os Max	s Max Er		Date	1/23/201		CorrC	Coff	1.00000
0.07	0.14											
UseDescription	Test type	Input	TmpRaw	Input	TmpCo	orrected	OutputTm	pSignal	OutputS	ignalEng	OSE Unit	Difference
primary	Temp Low Ra	ng	0.18			0.15		0.0000		0.01	С	-0.14
primary	Temp Mid Ra	ng	24.24			24.21		0.0000		24.18	С	-0.03
primary	Temp High Ra	ing	47.16			47.13		0.0000		47.08	С	-0.05
Sensor Compo	nent Properly	Sited			Condition Properly sited				Status P	ass		
Sensor Component Shield			Condition Clean		an			Status P	ass			
Sensor Component Blower		Condi	ondition Functioning			Status P	ass					
Sensor Component Blower Status Switch			Condi	tion N/A				Status P	ass			
Sensor Compo	onent System N	lemo			Condi	tion				Status P	ass	

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	SEK430	Martin Valvur	05/23/2017	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter She	Iter Temperatur
Abs Avg ErrAb0.26	0.68 Abs Avg	Err Abs Max Er	Serial Number	3275143	Tfer Desc. RTD)
			Tfer ID	01229		
			Slope	1.0000	6 Intercept	0.03191
			Cert Date	1/23/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.03	25.00	0.000	25.0	С	-0.02
primary	Temp Mid Range	24.27	24.24	0.000	24.9	С	0.68
primary	Temp Mid Range	25.16	25.13	0.000	25.2	С	0.08
Sensor Con	nponent System Memo	1	Condition	Status pass			

Infrastructure Data For

Site ID	SEK430	Technician Martin	/alvur Site Visit Date 05/23/2017
Shelter 1	Make	Shelter Model	Shelter Size
Alan pre-	-fab	s/n 861166 1808	512 cuft
Contractor in The Contractor			

Sensor Component	Sample Tower Type	Condition	Туре В	Status	pass
Sensor Component	Conduit	Condition	Good	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Not installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Door	Condition	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	Fair	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazaro	Problem	
Flow Rate	SEK430	Martin Valvur	05/23/2017	Tubing Condition	J	1414			
The filter sample flow tubing is comprised of sections of Tygon tubing and Teflon tubing which are not securely connected.									

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. Some trees have been trimmed since the previous site audit. 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.

F-02058-1500-S1-rev002

Site ID SEK430	Technician Martin Valvur	Site Visit Date 05/23	3/2017				
Site Sponsor (agency)	NPS	USGS Map	Case Mountain				
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 Step 🗹					
Shelter Working Room	Make Alan pre-fab Me	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	at, 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

F-02058-1500-S2-rev002

Site ID

Technician Martin Valvur

Site Visit Date 05/23/2017

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		
Major industrial complex	10 to 20 km		
City > 50,000 population	40 km		
City 10,000 to 50,000 population	10 km		
City 1,000 to 10,000 population	5 km		
Major highway, airport or rail yard	2 km		
Secondary road, heavily traveled	500 m		
Secondary road, lightly traveled	200 m		
Feedlot operations	500 m		
Intensive agricultural ops (including aerial spraying)	500 m		
Limited agricultural operations	200 m		
Large parking lot	200 m		
Small parking lot	100 m	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. Some trees have been trimmed since the previous site audit. 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	EID SEK430 Technician Martin Valvur		Site Visit Date 05/23/2017				
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?		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 of standing water should be avoided)						
6	Is the solar radiation sensor plumb?	✓	N/A				
7	Is it sited to avoid shading, or any artificial or reflected light?		N/A				
8	Is the rain gauge plumb?	✓	N/A				
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?		N/A				
10	Is the surface wetness sensor sited with the grid surface facing north?	✓	N/A				
11	Is it inclined approximately 30 degrees?	✓	N/A				
Pro	wide any additional explanation (photograph or sketch if nece	ssarv	y) regarding conditions listed above, or any other features,				

F-02058-1500-S4-rev002

Site	ID	SEK430	Technician	Martin Valvur		Site Visit Date	05/23/2017	
1		e meterological senso 1, and well maintaine		intact, in good		Temperature only		
2 Are all the meteorological sensors operational online, and reporting data?					✓	Temperature only		
3	Are the s	shields for the temper	ature and RH s	ensors clean?	✓			
4	Are the a	aspirated motors wor	king?		✓			
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 §	grid clean and u	ndamaged?	✓	N/A		
7		ensor signal and pow 1, and well maintaine		, in good		Signs of wear		
8		ensor signal and pow 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:

Fi	field Systems Data Form				F-02058-1500-S5-rev00			
Site	e ID	SEK430	Technician	Martin Valvur		Site Visit Date 05/23/2017		
	Siting C	riteria: Are the pollut	ant analyzers a	nd deposition eq	uipı	nent sited in accordance with 40 CFR 58, Appendix E		
1		ample inlets have at lo cted airflow?	east a 270 degre	ee arc of				
2	Are the	sample inlets 3 - 15 m	eters above the	ground?	✓			
3		sample inlets > 1 meten neters from trees?	er from any ma	jor obstruction,		Trees within 10 meters		
	Pollutar	nt analyzers and depos	ition equipmen	t operations and	ma	intenance		
1		nalyzers and equipme on and well maintained		e in good	✓			
2	Are the reportin	analyzers and monito ng data?	rs operational,	on-line, and	✓			
3	Describ	e ozone sample tube.				1/4 teflon by 16 meters		
4	Describ	e dry dep sample tube				3/8 teflon by 15 meters		
5		ine filters used in the o location)	ozone sample lii	ne? (if yes		At inlet only		
6	Are sam obstruct	ple lines clean, free of tions?	[°] 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?					
9	Is there clean?	a rotometer in the dry	y 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:

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 Systems Data Form		F-02058-1500-S6-rev002			
Site	e ID SEK430 Technician Martin Valvur		Site Visi	t Date 05/23/201	7	
	DAS, sensor translators, and peripheral equipment operation	ons ai	<u>ıd maintena</u> ı	nce		
1	Do the DAS instruments appear to be in good condition and well maintained?					
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	✓				
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?					
4	Are the signal connections protected from the weather and well maintained?					
5	Are the signal leads connected to the correct DAS channel?	✓				
6	Are the DAS, sensor translators, and shelter properly grounded?		The shelter g	ground may not be	e adequate	
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?			sors are mounted		le tower.

Field S	ystems Data F	orm				F-0 2	2058-	1500-S7-rev002
Site ID	SEK430	Technic	ian Martin Va	alvur	Site Visit Date	5/23/201	7	
Docume	ntation							
Does the	site have the required	instrument	and equipme	<u>nt manuals?</u>				
Solar radiat Surface wet Wind senso Temperatur Humidity so Solar radiat Tipping bud Ozone analy Filter pack	tion sensor [re sensor [midity sensor [tion sensor [ress sensor [r translator [re translator [ensor translator [tion translator [cket rain gauge [N/A V V V V V V V V V V V C C	Shelter hea Shelter air	r recorder imp pump ector protection device iter conditioner	Yes		N/A □ ✓ ✓ ✓ □ □ □ ✓ ✓ □ □ ✓ ✓ □ □ ✓ ✓ ✓ ✓
Preventive	anual Ianual	 ✓ ✓	aView2 2006 ing every site	visit? 🗹 D	ataview			
curren 3 Are the sample	e chain-of-custody form e transfer to and from one z/s/p control chart	ms properly lab?	used to docur	ment 🔽	SRFs are reviewed		nding	
	v additional explanatio nan-made, that may a				regarding conditio	ons listed	above, o	or any other features,

SEK430 Technician Martin Valvur Site Visit Date 05/23/2017 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 4 Are the standard CASTNET operational procedures being flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

QC Check	Performed
----------	-----------

Frequency

Frequency

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

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

QC Check Performed	QC	Check	Perform	ied
--------------------	----	-------	---------	-----

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**

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

✓	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:

Compliant

Compliant

F-02058-1500-S8-rev002

Site ID SEK430 Tec	hnician Martin Valvur	Site Visit Da	te 05/23/2017		
Site operation procedures					
1 Is the filter pack being changed ever	y Tuesday as scheduled	Filter changed mo	Filter changed morinings		
2 Are the Site Status Report Forms be correctly?	ing completed and filed	Flow and observe	Flow and observation sections only		
3 Are data downloads and backups be scheduled?	ing performed as	No longer require	d		
4 Are general observations being made	e and recorded? How?	SSRF	SSRF		
5 Are site supplies on-hand and replen fashion?	ished in a timely				
6 Are sample flow rates recorded? Ho	w?	SSRF	SSRF		
7 Are samples sent to the lab on a regulation fashion?	llar schedule in a timely				
8 Are filters protected from contamina and shipping? How?	ation during handling	Clean gloves on a	and off		
9 Are the site conditions reported regulation operations manager or staff?	llarly to the field				
QC Check Performed	Frequency		Compliant		
Multi-point MFC Calibrations	Semiannually		\checkmark		
Flow System Leak Checks Veekly					
Filter Pack Inspection					
Flow Rate Setting Checks Image: Market of the setting checks					
Visual Check of Flow Rate Rotometer Weekly					
In-line Filter Inspection/Replacement	As needed				
Sample Line Check for Dirt/Water	Weekly		\checkmark		

SEK430

F-02058-1500-S10-rev002

Site ID

Techni

Technician Martin Valvur

Site Visit Date 05/23/2017

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	0520012327	90835
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	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
YOS	404-Martin	n Valvur-05/24/2017				
1	5/24/2017	DAS	Environmental Sys Corp	90645	8816	2558
2	5/24/2017	Elevation	Elevation	None	1	None
3	5/24/2017	Filter pack flow pump	Thomas	none	107CAB18	100800033669
4	5/24/2017	Flow Rate	Alicat	none	Unknown	134655
5	5/24/2017	Infrastructure	Infrastructure	none	none	none
6	5/24/2017	Met tower	unknown	none	unknown	none
7	5/24/2017	Modem	BlueTree	none	Unknown	Unknown
8	5/24/2017	Ozone	ThermoElectron Inc	90763	49C	49C-74534-376
9	5/24/2017	Ozone Standard	ThermoElectron Inc	90524	49C	49C-58308-318
10	5/24/2017	Sample Tower	Aluma Tower	none	В	none
11	5/24/2017	Shelter Temperature	ARS	none	none	none
12	5/24/2017	Siting Criteria	Siting Criteria	None	1	None
13	5/24/2017	Temperature	RM Young	none	41342	18748
14	5/24/2017	Zero air pump	Werther International	none	PC70/4	531397

DAS Data Form

DAS Time Max Error: 1.87

Mfg	Serial Nu	mber Site		Fechnician	Site Visit Date	Parameter	Use Desc.
Environmental	Sys 2558	YOS	6404	Martin Valvur	05/24/2017	DAS	Primary
Das Date:	5 /24/2017 8:13:22	Audit Date	5 /24/2017 8:11:30	Mfg	HY	Parameter	DAS
Das Time:	144	Audit Time Audit Day	144	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	O Intercept	0.00000
0.0002	0.0006	0.0002	0.0006	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	1/23/201	7 CorrCoff	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
3	0.0000	-0.0004	-0.0003	3 V	V	0.0001	
3	0.1000	0.0999	0.0999	9 V	V	0.0000	
3	0.3000	0.2999	0.2998	B V	V	-0.0001	
3	0.5000	0.5000	0.500	l V	V	0.0001	
3	0.7000	0.6999	0.6990	5 V	V	-0.0003	
3	0.9000	0.8997	0.899	l V	V	-0.0006	
3	1.0000	0.9997	0.9998	8 V	V	0.0001	

Flow Data Form

Mfg	Serial Nu	mber Ta	Site	Те	chnician	hnician Site Visit Date		neter	Owner ID	
Alicat	134655		YOS404	Ma	artin Valvur	05/24/2017	7 Flow F	Rate	none	
					Mfg Serial Number	BIOS 148613		Parameter Flo		
					Tfer ID	01421		_		
					Slope			ercept	0.00366	
					Cert Date	1/2	5/2017 Co	rrCoff	1.00000	
DAS 1: A Avg % Diff: 0.36%	A Max % Di 0.46%		bDif A Max	x % Di	Cal Factor Z Cal Factor F Rotometer R	ull Scale	0.0 5.0 3.			
Desc.	Test type	Input l/n	n Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignal	PctDifference	
primary	pump off	0.000	0.000	0.00	0.0000	0.06	l/m	l/m		
primary	leak check	0.000	0.000	0.01	0.0000	0.07	l/m	l/m		
primary	test pt 1	3.031	3.020	3.00	0.0000	3.03	l/m	l/m	0.17%	
primary	test pt 2	3.052	3.040	3.00	0.0000	3.03	l/m	l/m	-0.46%	
primary	test pt 3	3.038	3.030	3.00	0.0000	3.02	l/m	l/m	-0.46%	
Sensor Comp	oonent Leak Te	est		Conditio	Condition		Statu	s pass		
Sensor Comp	onent Tubing	Condition		Conditio	n Good	Status		s pass	pass	
Sensor Comp	onent Filter Po	osition		Conditio	n Good		Statu	s pass		
Sensor Comp	onent Rotome	ter Conditic	n	Conditio	n Clean and dry		Statu	s pass		
Sensor Comp	onent Moistur	e Present		Conditio	n No moisture p	resent	Statu	s pass		
Sensor Component Filter Distance			Conditio	n 3.0 cm		Statu	s pass			
Sensor Comp	onent Filter D	epth		Conditio	n 0.5 cm		Statu	s pass		
Sensor Comp	onent Filter A:	zimuth		Conditio	n 315 deg		Statu	s pass		
Sensor Comp	onent System	Memo		Conditio	n		Statu	s pass		

Ozone Data Form

Mfg	Se	erial N	umber Ta	Site	Те	chnician		Site Visit	Date I	Parame	ter	Owner II)
ThermoElect	tron Inc 4	9C-74	534-376	YOS404	Ma	artin Valv	ur	05/24/20	17 (Dzone		90763	
Slope: [Intercept [CorrCoff]	0.0	4019 3930 9997	Slope: Intercept CorrCoff	0.00000	0	Mfg Serial N Tfer ID		ThermoEl 49CPS-70 01110			rameter er Desc.	ozone Ozone primary	stan
DAS 1: A Avg % D 4.3		x % D 5.49		Dif A Max	% Di	Slope Cert Da	te		1.00466 1/1/2017	Inter Corr	•	0.012	
UseDesc	cription	Co	oncGroup	Tfer Raw	Tfer	Corr	Si	ite	Site	Unit	Pctl	Difference	
prim	nary		1	0.50	0.4	48	0.	22 p	opb				
prim	nary		2	17.05	16.		17	1	opb			3.78%	
prim	•		3	36.06	35.				opb			5.35%	
prim	•		4	70.01	69.		72	1	opb			4.42%	
prim	•		5	111.03	110		114	4.70 p	opb			3.80%	
Sensor Co	omponent	Samp	le Train		Conditio	Good			\$	Status	pass		
Sensor Co	omponent	22.5 c	legree rule		Conditio	on				Status	pass		
Sensor Co	omponent	Inlet F	ilter Conditio	n	Conditio	on Clean				Status	pass		
Sensor Co	omponent	Batter	y Backup		Conditio	n/A			5	Status	pass]
Sensor Co	omponent	Offset			Conditio	0.3			\$	Status	pass]
Sensor Co	omponent	Span			Conditio	Condition 0.994				Status	pass]
Sensor Co	omponent	Zero \	/oltage		Condition -0.0379				Status	pass]	
Sensor Co	omponent	Fullsc	ale Voltage		Condition 1.000					Status	pass]
Sensor Co	omponent	Cell A	Freq.		Conditio	Condition 98.0 kHz				Status	pass]
Sensor Co	omponent	Cell A	Noise		Condition 0.7 ppb			5	Status	pass			
Sensor Co	omponent	Cell A	Flow		Conditio	Condition 0.51 lpm			5	Status	pass]
Sensor Co	omponent	Cell A	Pressure		Conditio	on 615.8	mmHg		5	Status	pass		
Sensor Co	omponent	Cell A	Tmp.			on 35.1 (\$	Status	pass		
Sensor Co	omponent	Cell B	Freq.			n 100.1				Status]
Sensor Co	omponent	Cell B	Noise		Conditio	on 0.9 pp	b			Status	pass		
Sensor Co	omponent	Cell B	Flow			on 0.62 l				Status	pass]
Sensor Co	-				Conditio	on 616.3	mmHg			Status	pass		
Sensor Co	omponent	Cell B	Tmp.		Conditio				\$	Status	pass		
Sensor Co	omponent	Line L	.OSS		Conditio	Not te	sted		\$	Status	pass		
Sensor Co	omponent	Syste	m Memo		Conditio	on			\$	Status	pass]

Temperature Data Form

Mfg	Serial Number 7	Fa Site	1	Technician		Site V	isit Date/	Param	eter	Owner ID
RM Young	18748	YOS404		Martin Valvur		05/24	4/2017	Tempe	rature	none
				Mf	`g	Fluke		Pa	arameter Te	emperature
				Ser	rial Number	32751	143	T	fer Desc. R	ГD
				Tfe	er ID	01229)			
DAS 1:	DAS	2:		Slo	pe		1.0000	6 Inte	rcept	0.03191
Abs Avg Err			Max Er	Ce	rt Date		1/23/201	7 Cor	rCoff	1.00000
0.10	0.27									
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference
primary	Temp Low Range	0.23	0.20	0.0000			0.2		С	-0.02
primary	Temp Mid Range	24.57	24.54		0.0000) 24.6		6	С	0.01
primary	Temp High Range	47.57	47.54		0.0000		47.	3	C	-0.27
Sensor Com	ponent Shield		Condi	tion	Clean			Status	pass	
Sensor Com	ponent Blower		Condi	tion F	Functioning			Status	pass	
Sensor Component Blower Status Switch			Condi	Condition N/A				Status	pass	
Sensor Com	ponent System Memo		Condi	tion				Status	pass	

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	YOS404	Martin Valvur	05/24/2017	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter She	Iter Temperatur
Abs Avg Err Ab	2.26 Abs Avg	Err Abs Max Er	Serial Number	3275143	Tfer Desc. RTE)
			Tfer ID	01229		
			Slope	1.0000	6 Intercept	0.03191
			Cert Date	1/23/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.81	23.78	0.000	23.6	С	-0.19
primary	Temp Mid Range	24.19	24.16	0.000	25.3	С	1.18
primary	Temp Mid Range	24.26	24.23	0.000	26.5	С	2.26
Sensor Con	nponent System Memo)	Condition	Condition Status			

Infrastructure Data For

Site ID	YOS404	Technician Martin V	Site Visit Date 05/24/2017
Shelter M	Iake	Shelter Model	Shelter Size
Ekto		8812 (s/n 3515-2)	768 cuft
and the second second			

Sensor Component	Sample Tower Type	Condition	Туре В	Status	pass
Sensor Component	Conduit	Condition	Good	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Not installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Door	Condition	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 site is neat, clean, and well organized.

F-02058-1500-S1-rev002

Site ID YOS404	Technician Martin Valvur	Site Visit Date 05/24	4/2017				
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					
Primary Op. Phone #		Safety Hard Hat					
Primary Op. E-mail		Climbing Belt					
Backup Operator		Security Fence					
Backup Op. Phone #		Secure Shelter					
Backup Op. E-mail		Stable Entry Step 🔽					
Shelter Working Room	Make Ekto M	odel 8812 (s/n 3515-2)	Shelter Size 768 cuft				
Shelter Clean	Notes The site is neat, clean, and we	ell organized.					
Site OK	Notes						
and th approx	Mariposa take route 140 into Yosemite. From the loop road, take route 41 toward Oakhurst. Continue uphill ough the tunnel. Approximately one mile past the tunnel look for a dirt road on the left. Continue imately 1/2 mile past the gate to the communication station at the top of Turtleback Dome. The site is another rds on the path behind the station.						

YOS404

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Site ID

Technician Martin Valvur

Site Visit Date 05/24/2017

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		\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

₹ie	eld Sy	stems Data	i Form		F-02058-1500-S3-rev002				
Site	ID	YOS404	Technician	Martin Valvur		Site Visit Date 05/24/2017			
L		d speed and direc fluenced by obstr	ction sensors sited so ructions?	as to avoid	✓	N/A			
	(i.e. wind horizont	d sensors should	ed so as to minimize be mounted atop the om >2x the max dian wind)	e tower or on a		N/A			
	Are the tower and sensors plumb?					N/A			
Ļ			lds pointed north or ces such as buildings	Positionea to	✓				
5	conditio surface	ns? (i.e. ground b	l sensors sited to avo pelow sensors should oped. Ridges, hollow avoided)	be natural	✓	N/A			
	Is the so	lar radiation sens	sor plumb?	E	✓	N/A			
	Is it site light?	d to avoid shadin	g, or any artificial o	r reflected	✓	N/A			
	Is the ra	in gauge plumb?		E	✓	N/A			
	Is it site towers,		ing effects from buil	dings, trees,	✓	N/A			
0	Is the su facing n		nsor sited with the g	rid surface	✓	N/A			
1	Is it inc	lined approximat	tely 30 degrees?	E	✓	N/A			

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

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

Field Systems Data Form						F-02058-1500-S5-rev				
Site	e ID	YOS404	Technician	Martin Valvur		Site Visit Date 05/24/2017				
	Siting C	Criteria: Are the pollut	ant analyzers a	nd deposition eq	uipr	oment sited in accordance with 40 CFR 58, Appendix E				
1		sample inlets have at le icted airflow?	ast a 270 degre	e arc of						
2	Are the	sample inlets 3 - 15 me	eters above the	ground?	✓					
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?			or obstruction,						
	<u>Pollutar</u>	nt analyzers and depos	ition equipmen	t operations and	mai	aintenance				
1		analyzers and equipme on and well maintained		in good	✓					
2		analyzers and monitor 1g data?	rs operational, o	on-line, and	✓					
3	Describ	e ozone sample tube.				1/4 teflon by 10 meters				
4	Describ	e dry dep sample tube.				3/8 teflon by 10 meters				
5		ine filters used in the o location)	zone sample lir	ne? (if yes		At inlet only				
6	Are san obstruc	ple lines clean, free of tions?	kinks, moistur	e, and						
7	Is the ze	ero air supply desiccan	t unsaturated?		✓					
8	Are the	re moisture traps in th	e sample lines?			Not present				
9	Is there clean?	a rotometer in the dry	deposition filt	er line, and is it		Clean and dry				

Fi	Field Systems Data Form							F-02	2058-15	00-S6-rev002
Site	e ID	YOS404	Technician	Martin Valvur		Site Visit	t Date	05/24/2017	7	
	DAS, set	nsor translators, and j	peripheral equi	pment operation	ns ai	nd maintenar	<u>ıce</u>			
1		DAS instruments appe intained?	ar to be in good	l condition and	✓					
2		he components of the backup, etc)	DAS operation	al? (printers,	✓					
3		nalyzer and sensor sig g protection circuitry?	-	through	✓	Met sensors	only			
4		signal connections pro intained?	otected from the	e weather and						
5	Are the	signal leads connected	to the correct	DAS channel?	✓					
6	Are the grounde	DAS, sensor translato cd?	rs, and shelter	properly	✓					
7	Does the	e instrument shelter ha	ave a stable pov	ver source?	✓					
8	Is the in	strument shelter temp	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?							Ċ.	

Field S	Systems Data	For	m				F-0 2	2058-	1500-S7-rev002
Site ID	YOS404		Technicia	m Martin Va	alvur	Site Visit Date)5/24/2017	7	
Docum	Documentation								
Does th	he site have the requi	red ins	strument a	nd equipme	ent manuals?				
Temperat Relative F Solar rad Surface w Wind sens Temperat Humidity Solar rad Tipping b Ozone an Filter pac	ection sensor ture sensor numidity sensor iation sensor vetness sensor sor translator ture translator sensor translator iation translator oucket rain gauge alyzer ek flow controller ek MFC power supply				Shelter hea Shelter air	r t recorder ump pump tector protection device ater conditioner	Yes ✓ □ □ □ □ □ □ □ □ □ □ □ □ □	No V V V V V V V V V V V	N/A V
Does	the site have the requ			ecent QC do	cuments and	<u>report forms?</u>			
Ozone z/s	Manual		✓ Data	View2 2006				ent	
1 Is the station log properly completed during every site visit? ✓ □ Dataview									
	2 Are the Site Status Report Forms being completed and current?								
	the chain-of-custody ple transfer to and fr			sed to docu	ment 🔽				
	Are ozone z/s/p control charts properly completed and current?								
	ny additional explan r man-made, that ma					regarding conditio	ons listed	above, o	or any other features,

YOS404 Site Visit Date 05/24/2017 Site ID Technician Martin Valvur Site operation procedures Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark 4 Are the standard CASTNET operational procedures being flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

QC Check	Performed
----------	-----------

Frequency

Multipoint Calibrations	\checkmark	Semiannually	\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?

OC	Check	Performed
Qυ	Chierk	I ci ioi meu

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	Con
Semiannually	
Daily	
Daily	
Alarm values only	
Monthly	
N/A	
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?

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

	Unknown	
✓		
✓	Dataview	

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

opliant

Compliant

F-02058-1500-S8-rev002

Field Systems Data Form F-02058-1500-S9-rev002 YOS404 Technician Martin Valvur Site Visit Date 05/24/2017 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 Flow section only 2 correctly? No longer required Are data downloads and backups being performed as 3 scheduled? ✓ SSRF, dataview 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** ✓ Weekly \checkmark **Filter Pack Inspection** ✓ Weekly \checkmark **Flow Rate Setting Checks** ✓ Weeklv \checkmark Visual Check of Flow Rate Rotometer \checkmark Monthly **In-line Filter Inspection/Replacement** \checkmark ✓ Weekly Sample Line Check for Dirt/Water

YOS404

F-02058-1500-S10-rev002

Site ID

Technician Martin Valvur

Site Visit Date 05/24/2017

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	100800033669	none
Flow Rate	Alicat	Unknown	134655	none
Infrastructure	Infrastructure	none	none	none
Met tower	unknown	unknown	none	none
Modem	BlueTree	Unknown	Unknown	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
Temperature	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
QAI	K172-Sandy	Grenville-05/24/2017				
1	5/24/2017	Computer	Dell	unknown	Inspiron 15	Unknown
2	5/24/2017	DAS	Campbell	000418	CR3000	2518
3	5/24/2017	Elevation	Elevation	None	1	None
4	5/24/2017	Filter pack flow pump	Thomas	02357	107CAB18	1089005314
5	5/24/2017	Flow Rate	Apex	000530	AXMC105LPMDPCV	illegible
6	5/24/2017	Infrastructure	Infrastructure	none	none	none
7	5/24/2017	Modem	Raven	06467	V4221-V	0808338316
8	5/24/2017	Ozone	ThermoElectron Inc	000613	49i A1NAA	1009241783
9	5/24/2017	Ozone Standard	ThermoElectron Inc	000368	49i A3NAA	0726124682
10	5/24/2017	Sample Tower	Aluma Tower	666368	В	AT-5107-E-4-8
11	5/24/2017	Shelter Temperature	Campbell	60712	107-L	230826
12	5/24/2017	Siting Criteria	Siting Criteria	None	1	None
13	5/24/2017	Temperature	RM Young	06530	41342	14601
14	5/24/2017	Zero air pump	Werther International	06870	PC70/4	000814278

DAS Data Form

DAS Time Max Error:

0

Mfg	Serial	Number Site	e T	echnician	Site Visit Date	Parameter	Use Desc.
Campbell	2518	QA	K172	Sandy Grenville	05/24/2017	DAS	Primary
Das Date:	5 /24/2017	Audit Date	5 /24/2017	Mfg	Datel	Parameter	DAS
Das Time:	14:24:32	Audit Time	14:24:32	Serial Number	15510194	Tfor Dogo	Source generator (D
Das Day:	144	Audit Day	144	Serial Number	15510194	Tier Desc.	Source generator (D
Low Channe	4:	High Channe	el:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0000	0.0	0.000	0 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	1/23/201	7 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	-	V	0.0000	
7	0.1000	0.0999	0.0999	V	V	0.0000	
7	0.3000	0.2998	0.2998	V	V	0.0000	
7	0.5000	0.4996	0.4996	V	V	0.0000	
7	0.7000	0.6995	0.6996	V	V	0.0001	
7	0.9000	0.8994	0.8994	V	V	0.0000	
7	1.0000	0.9993	0.9993	V	V	0.0000	

Flow Data Form

Mfg	S	erial Numl	oer Ta	Site	Тес	Technician		ate Paran	neter	Owner ID
Apex	il	llegible		QAK172	Sa	ndy Grenville	05/24/2017	/ Flow R	late	000530
					[Mfg	BIOS	Р	arameter Flo	ow Rate
						Serial Number	103471	Т	fer Desc. ne	xus
						Tfer ID	01420			
						Slope	0	99825 Int	ercept	0.00497
						-				
						Cert Date	2/1		rrCoff	0.99991
						Mfg	BIOS	P	arameter Flo	ow Rate
						Serial Number	103424	Т	fer Desc. Bl	OS cell
						Tfer ID	01410			
						Slope	0.	99825 Int	ercept	0.00497
						Cert Date			rrCoff	0.99991
DAS 1:			DAS 2:			Cal Factor Z		-0.0		
A Avg % Diff: 0.00%	A Ma	x % Di <i>A</i> 0.00%	Avg %	Dif A Max	: % Di	Cal Factor F Rotometer R		0.9	.5	
[]			T	I C.	MGD		<u> </u>			
Desc.	pump	• •	0.000	Input Corr_ 0.000	MfcDisp. 0.00	OutputSignal 0.000	-0.02	l/m	l/m	ll PctDifference
primary		check	0.000	0.000	0.00	0.000	-0.02			
primary	test p		1.502	1.500	1.50	0.000	1.50	1/m	1/m 1/m	0.00%
primary	test p		1.502	1.500	1.50	0.000	1.50	1/m	l/m	0.00%
primary	test p		1.500	1.500	1.50	0.000	1.50	1/m	1/m	0.00%
Sensor Comp	-	-			Conditio				pass	
Sensor Comp	onent	Tubing Co	ndition		Conditio	n Good		Status	pass	
Sensor Comp	onent	Filter Posit	ion		Conditio	n Good		Status	pass	
Sensor Comp				1		n Clean and dry			pass	
Sensor Comp						n No moisture present			pass	
Sensor Comp						1 4.5 cm			pass	
Sensor Comp					_	ndition 3.5 cm Status pass				
Sensor Comp						Condition 90 deg Status pass				
					_					
Sensor Comp	onent	System Me	emo		Conditio	n		Status	pass	

Ozone Data Form

Mfg S	erial Number Ta	Site	Тес	chnician		Site Visit l	Date Par	amet	er	Owner ID
ThermoElectron Inc 1	009241783	QAK172	Sa	indy Grer	nville	05/24/201	7 Ozo	one		000613
Intercept 0.2	28407Slope:26089Intercept29998CorrCoff	0.0000	0.00000 0.00000 0.00000		umber	ThermoElectro 517112175 01111			ameter C	ozone Dzone primary stan
DAS 1: A Avg % Diff: A Ma 1.3%	DAS 2: x % Di A Avg % 1.8%	Dif A Max	% Di	Slope Cert Da	te			nterc CorrC	-	0.45870
UseDescription	ConcGroup	Tfer Raw	Tfer	Corr	Si	te	Site Un	it	PctD	ifference
primary	1	0.05	-0.4		0.					
primary	2	15.06	14.:	56	14					0.55%
primary	3	35.03	34.4	48	33	.87 pr	ob			-1.77%
primary	4	72.03	71.		70	1 1				-1.58%
primary	5	110.06	109.	.32	108	.10 pr	ob			-1.12%
Sensor Component	Sample Train		Conditio	n Good			Sta	tus P	ass	
Sensor Component	22.5 degree rule		Conditio	on			Sta	tus P	ass	
Sensor Component	Inlet Filter Conditio	n	Conditio	n Clean			Sta	tus P	ass	
Sensor Component	Battery Backup		Conditio	N/A			Sta	tus P	ass	
Sensor Component	Offset		Conditio	n 0.10			Sta	tus p	ass	
Sensor Component	Span		Conditio	n 1.001			Sta	tus P	ass	
Sensor Component	Zero Voltage		Conditio	Condition N/A			Sta	tus P	ass	
Sensor Component	Fullscale Voltage		Conditio	Condition N/A			Sta	tus p	ass	
Sensor Component	Cell A Freq.		Conditio				Sta	tus p	ass	
Sensor Component	Cell A Noise		Conditio	Condition 0.7 ppb				tus P		
Sensor Component	Cell A Flow		Conditio	n 0.0 lpi	m		Sta	tus F	ail	
Sensor Component	Cell A Pressure		Conditio				Sta	tus P	ass	
Sensor Component	Sensor Component Cell A Tmp.		Conditio	n 38.3 (;		Sta	tus P	ass	
Sensor Component	Sensor Component Cell B Freq.		Conditio	96.8 k	Hz		Sta	tus p	ass	
Sensor Component	Component Cell B Noise		Conditio	n 0.8 pp	b		Sta	tus P	ass	
Sensor Component	Cell B Flow		Conditio	n 0.70 lj	om		Sta	tus P	ass	
Sensor Component	Cell B Pressure		Conditio	n 692.9	mmHg		Sta	tus P	ass	
Sensor Component	ent Cell B Tmp.		Conditio	tion			Sta	tus P	ass	
Sensor Component	Line Loss		Conditio	Not te	sted		Sta	tus p	ass	
Sensor Component	System Memo		Conditio	n			Sta	tus P	ass	

Temperature Data Form

Mfg	Serial Number T	a Site	,	Techni	ician	Site V	isit Date	Param	eter	Owner ID
RM Young	14601	QAK172		Sandy	Grenville	05/24	l/2017	Temper	ature	06530
				Mf	g	Extec	h	Pa	rameter Te	mperature
				Ser	ial Number	H232	734	Tf	er Desc. R	D
				Tfe	er ID	01227	7			
DAS 1:	DAS	2:		Slo	ре		1.0075	9 Inte	rcept	0.14754
	Abs Avg Err Abs Max Er Abs Avg Err Abs Max		Max Er	Er Cert Date			2/4/201	7 Cor	rCoff	1.00000
0.05	0.07									
UseDesc.	Test type 1	InputTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference
primary Temp	b Low Range	0.14	-0.0	.01 0.000		0.1		l	С	0.07
primary Temp	o Mid Range	25.66	25.3	2	0.000		25.4		С	0.06
primary Temp	High Range	48.81	48.3	0	0.000		48.	3	С	-0.03
Sensor Compone	nt Shield		Cond	ition C	Clean			Status	pass	
Sensor Compone	nt Blower		Cond	ition 🛚	I/A			Status	pass	
Sensor Compone	nt Blower Status S	witch	Cond	ition 🛚	I/A			Status	pass	
Sensor Compone	nt System Memo		Cond	ition				Status	pass	

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	230826	QAK172	Sandy Grenville	05/24/2017	Shelter Temperature	60712
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	Iter Temperatur
Abs Avg ErrAb0.15	os Max Er Abs Avg 0.23	Err Abs Max Er	Serial Number	H232734	Tfer Desc. RTD)
			Tfer ID	01227		
			Slope	1.0075	9 Intercept	0.14754
			Cert Date	2/4/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.91	25.57	0.000	25.8	С	0.23
primary	Temp Mid Range	23.44	23.12	0.000	23.3	С	0.18
primary	Temp Mid Range	25.17	24.83	0.000	24.8	С	-0.04
Sensor Con	nponent System Memo	1	Condition		pass		

Infrastructure Data For

Site ID	QAK172	Technician	Sandy Grenville		Site Visit Date 05/24/2017
Shelter Ma	ıke	Shelter Model		Shelte	er Size
Ekto		8810 (s/n 2625-	-2)	640 ci	uft
	NY ARABANA MANAGANA ANA ANG			141.25 2 2 2 3	

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	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.	Hazard	Problem
Ozone	QAK172	Sandy Grenville		-	ThermoElectron	3498		
This analyzer diagnostic	check is outside	the manufacturer's	recommended v	value.				

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator is doing an excellent job maintaining the site.

2 Parameter: ShelterCleanNotes

The shelter is in good condition.

Field Systems Data Form	

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Site ID	QAK172		Technician	Sandy Grenville	le Site Visit Date 05/24		4/2017			
Site Sponsor	(agency)	EPA			USGS	Мар		Quaker City		
Operating G	roup	Private			Map S	cale				
AQS #		39-121-9	991		Map I	Date				
Meteorologic	al Type	R.M. You	ing							
Air Pollutant	Analyzer	Ozone, II	MPROVE		QAPP	Latitude		39.9431		
Deposition M	leasurement	dry			QAPP	Longitude		-81.3378		
Land Use		woodland	I - mixed, agricu	Ilture	QAPP	Elevation	Meters	372		
Terrain		rolling			QAPP	Declinatio	n	7.9		
Conforms to	MLM	Yes		QAPP	Declinatio	n Date	2/22/2006			
Site Telephor	ne	(740) 679	9-3345		Audit	Latitude				39.942714
Site Address	1	58163 St	. Johns Road		Audit	Longitude				-81.337914
Site Address	2				Audit	Elevation				371
County		Noble			Audit	Declination	1	-8.2		
City, State		Quaker C	City, OH]	Present			
Zip Code		43773			Fire E	xtinguisher		New in 2015		
Time Zone		Eastern			First A	id Kit				
Primary Ope	erator				Safety	Glasses				
Primary Op.	Phone #				Safety	Hard Hat				
Primary Op.	E-mail				Climb	ing Belt				
Backup Oper	rator				Securi	ty Fence				
Backup Op.	Phone #				Secure	Shelter				
Backup Op.	E-mail				Stable	Entry Step				
Shelter Work	xing Room ☑	Make	Ekto	Μ	odel 88	10 (s/n 262	5-2)	Shelter Size	640 cuft	
Shelter Clear	1	Notes	The shelter is i	n good conditio	n.					
Site OK	\checkmark	Notes								
Driving Diree	miles	m I-70 take exit 193, route 513 south to Quaker City. At the 4-way stop turn right and continue approximately 0.8 es and turn left onto CR943. Continue approximately 2 miles and turn right onto Noble County Rd 34 (also St. Ins Road). Continue approximately 1.5 miles and turn left onto a dirt road which is the driveway up a steep hill to site.								

QAK172

F-02058-1500-S2-rev002

Site ID

Те

Technician Sandy Grenville

Site Visit Date 05/24/2017

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		\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		
Tree line	50 m		\checkmark
Obstacles to wind	10 times obstacle height		

Siting Distances OK

Siting Criteria Comment

Fie	eld Systems Data Form	F-02058-1500-S3-rev002					
Site	QAK172 Technician Sandy Grenville		Site Visit Date 05/24/2017				
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				

a Form F-02058-1500-S4-rev002

Site	e ID	QAK172	Technician	Sandy Grenville		Site Visit Date	05/24/2017	
1	condition	e meterological senso n, and well maintained	d?			N/A N/A		
2	Are all the reporting	he meteorological sen g data?	sors operationa	I online, and				
3	Are the s	shields for the temper	ature and RH s	ensors clean?	✓			
4	Are the a	aspirated motors wor	king?		✓	N/A		
5	Is the sol scratches	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	indamaged?	✓	N/A		
7		sensor signal and pow n, and well maintained		, in good				
8		sensor signal and pow elements and well ma		tions protected				

Fi	eld Sy	stems Data Fo	orm				F-0205 8	8-1500-	S5-rev002
Site	e ID	QAK172	Technician	Sandy Grenville		Site Visit Date	05/24/2017		
	Siting C	criteria: Are the pollut	ant analyzers a	nd deposition eq	<u>uipr</u>	nent sited in accord	lance with 40 C	CFR 58, Ap	pendix E
1		cample inlets have at le	east a 270 degre	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	jor obstruction,					
	<u>Pollutar</u>	nt analyzers and depos	ition equipmen	t operations and	mai	intenance			
1		analyzers and equipme on and well maintained		e in good					
2		analyzers and monito ng data?	rs operational, (on-line, and					
3	Describ	e ozone sample tube.				1/4 teflon by 15 met	ers		
4	Describ	e dry dep sample tube				3/8 teflon by 12 met	ers		
5		ine filters used in the o location)	ozone sample lir	ne? (if yes		At inlet only			
6	Are san obstruc	ple lines clean, free of tions?	' kinks, moistur	e, 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	v deposition filte	er line, and is it		Clean and dry			

Fi	Field Systems Data Form						F-0 2	2058-15	00-S6-rev002
Site	e ID	QAK172	Technician	Sandy Grenville		Site Visit Da	ate 05/24/201	7	
	DAS, se	nsor translators, and j	peripheral equip	oment operation	ns ai	nd maintenance			
1	Do the I well mai	DAS instruments appe intained?	ar to be in good	condition and	✓				
2		he components of the backup, etc)	DAS operationa	al? (printers,	✓				
3		nalyzer and sensor sig g protection circuitry?		hrough		Met sensors only	ý		
4		signal connections pro intained?	otected from the	e weather and					
5	Are the	signal leads connected	l to the correct l	DAS channel?	✓				
6	Are the grounde	DAS, sensor translato cd?	rs, and shelter j	properly	✓				
7	Does the	e instrument shelter ha	ave a stable pow	ver source?	✓				
8	Is the in	strument shelter temp	oerature control	led?					
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	l grounded?						
11	Tower c	omments?						Ľ.	

Field Sy	stems Dat	a Fo	rm			F-0 2	2058-	-1500-S	7-rev002
Site ID	QAK172		Techni	ician 🤅	Sandy Grenville Site Visit	Date 05/24/201	7		
Documen	<u>tation</u>								
Does the s	site have the requ	iired in	strumen	<u>t and e</u>	equipment manuals?				
		Yes	No	N/A		Yes	No	N/A	
Wind speed	sensor			\checkmark	Data logger		\checkmark		
Wind direct	ion sensor			\checkmark	Data logger			\checkmark	
Temperatur	e sensor	\checkmark			Strip chart recorder			\checkmark	
Relative hun	nidity sensor			\checkmark	Computer	\checkmark			
Solar radiat	•				Modem		\checkmark		
Surface wet					Printer				
Wind sensor					Zero air pump				
Temperatur					Filter flow pump		\checkmark		
_	nsor translator				Surge protector				
-	ion translator				UPS		\checkmark		
	ket rain gauge				Lightning protection of	device 🗌			
Ozone analy		\checkmark			Shelter heater		\checkmark		
•	low controller				Shelter air conditione	r 🗸			
-	VIFC power supp	_			Sherter an conditione.	•			
		-							
Does the	e site have the rec	uired a	and most	recen	t QC documents and report forr	<u>ns?</u>			
		Pres	sent			Curr	ent		
a									

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

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

Site	e ID	QAK172	Technician	Sandy Grenville		Site Visit Date	05/24/2017]
1	Has the	<u>ration procedures</u> site operator attended If yes, when and who		TNET training	✓	Site operator refresh	ner training July 2006	
2	2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?							
3	Is the site schedule	e visited regularly on ?	the required Tu	ıesday	✓			
4		standard CASTNET of by the site operator?	• •	cedures being	✓			
5		e operator(s) knowled ired site activities? (in	U	able to periori				

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

QC Check Performed
Multipoint Calibrations
Visual Inspections

Frequency

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

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

QC Check Performed	QC	Check	Perf	ormed
--------------------	----	-------	------	-------

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

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

	Unknown
✓	
✓	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:

ompliant

Compliant

F-02058-1500-S8-rev002

Field Systems Data Form F-02058-1500-S9-rev002 QAK172 Technician Sandy Grenville Site Visit Date 05/24/2017 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 🗹 records MFC display as DAS flow value 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? ✓ 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

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

Semiannually

✓ Weekly

The site operator is doing an excellent job maintaining the site.

In-line Filter Inspection/Replacement

Sample Line Check for Dirt/Water

QAK172

F-02058-1500-S10-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 05/24/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	unknown
DAS	Campbell	CR3000	2518	000418
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	1089005314	02357
Flow Rate	Apex	AXMC105LPMDPC	illegible	000530
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0808338316	06467
Ozone	ThermoElectron Inc	49i A1NAA	1009241783	000613
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124682	000368
Sample Tower	Aluma Tower	В	AT-5107-E-4-8	666368
Shelter Temperature	Campbell	107-L	230826	60712
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14601	06530
Zero air pump	Werther International	PC70/4	000814278	06870

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
PIN4	414-Martin	Valvur-05/25/2017				
1	5/25/2017	Computer	Hewlett Packard	none	8460 elitebook	CNU13607G
2	5/25/2017	DAS	Environmental Sys Corp	90612	8816	2615
3	5/25/2017	Elevation	Elevation	None	1	None
4	5/25/2017	Filter pack flow pump	Thomas	none	107CAB18	0000158
5	5/25/2017	Flow Rate	Alicat	none	Unknown	Unknown
6	5/25/2017	Infrastructure	Infrastructure	none	none	none
7	5/25/2017	Modem	Hughesnet	none	Unknown	Unknown
8	5/25/2017	Ozone	ThermoElectron Inc	90765	49C	49c-74530376
9	5/25/2017	Ozone Standard	ThermoElectron Inc	none	49C	0425208055
10	5/25/2017	Sample Tower	Aluma Tower	928348	В	AT-5381-F9-3
11	5/25/2017	Shelter Temperature	ARS	none	none	none
12	5/25/2017	Siting Criteria	Siting Criteria	None	1	None
13	5/25/2017	Temperature Translator	Climatronics	none	100088-2	397
14	5/25/2017	Temperature2meter	Climatronics	none	100093	missing

DAS Data Form

DAS Time Max Error: 0.57

Mfg	Serial Nu	mber Site		Fechnician	Site Visit Date	Parameter	Use Desc.
Environmental S	Sys 2615	PIN4	14	Martin Valvur	05/25/2017	DAS	Primary
Das Date:	5 /25/2017	Audit Date	5 /25/2017	Mfg	HY	Parameter	DAS
Das Time:	8:16:34	Audit Time	8:16:00		4004000000		
Das Day:	145	Audit Day	145	Serial Number	12010039329	Tfer Desc.	Source generator (D
Low Channel:		High Channel	:	Tfer ID	01322		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.00000	Intercept	0.00000
0.0002	0.0004	0.0002	0.0004		C/45/204		1 00000
				Cert Date	6/15/2014	4 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740243	Tfer Desc.	DVM
				Tfer ID	01312]	
				Slope	1.00000	Intercept	0.00000
				Cert Date	1/23/2017	CorrCoff	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
15	0.0000	0.0035	0.003	3 V	V	-0.0002	
15	0.1000	0.0996	0.0999) V	V	0.0003	
15	0.3000	0.2999	0.2997	7 V	V	-0.0002	
15	0.5000	0.4995	0.4996		V	0.0001	
15	0.7000	0.6999	0.7000) V	V	0.0001	
15	0.9000	0.9007	0.9008	8 V	V	0.0001	
15	1.0000	1.0001	1.0005	5 V	V	0.0004	

Flow Data Form

Mfg	Serial Nun	nber Ta	Site	Te	chnician	Site Visit I	Date Paran	neter	Owner ID
Alicat	Unknown		PIN414	Ма	artin Valvur	05/25/2017	7 Flow F	Rate	none
					Mfg Serial Number Tfer ID	BIOS 148613 01421	1	earameter Flo	
					Slope	1.	00153 Int	ercept	0.00366
					Cert Date	1/2	5/2017 Co	rrCoff	1.00000
DAS 1: A Avg % Diff: 0.64%	A Max % Di 0.97%	DAS 2: A Avg %	Dif A Max	x % Di	Cal Factor Z Cal Factor F Rotometer R	ull Scale	-0.00 5.09 4.0	59	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignal	I PctDifference
primary	pump off	0.000	0.000	0.01	0.0000	0.06	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.0000	0.06	l/m	1/m	
primary	test pt 1	3.006	3.000	3.00	0.0000	3.03	l/m	l/m	0.97%
primary	test pt 2	3.027	3.020	3.00	0.0000	3.03	l/m	l/m	0.36%
primary	test pt 3	3.023	3.010	3.00	0.0000	3.03	l/m	l/m	0.60%
Sensor Comp	onent Leak Tes	st		Conditio	on		Status	pass	
Sensor Comp	onent Tubing C	Condition		Conditio	Good		Status	pass	
Sensor Comp	onent Filter Pos	sition		Conditio	Good		Status	pass	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	No moisture p	resent	Status	pass	
Sensor Comp	onent Filter Dis	tance		Conditio	4.5 cm	Status	pass		
Sensor Comp	onent Filter De	pth		Conditio	0.5 cm		Status	pass	
Sensor Comp	onent Filter Azi	muth		Conditio	270 deg		Status	pass	
Sensor Comp	onent System M	Nemo		Conditio	n		Status	pass	

Ozone Data Form

Mfg	Se	erial Numbe	r Ta	Site	Te	chnician		Site Visit	Date	Parame	eter	Owner ID
ThermoElec	ctron Inc 4	9c-74530376		PIN414	M	artin Valv	ur	05/25/201	17	Ozone		90765
Slope: Intercept CorrCoff	0.6	3381 Slope 4621 Inter 0000 Corr	cept	0.00000	2	Mfg Serial N		ThermoEle 49CPS-70 01110			rameter er Desc.	ozone Ozone primary stan
DAS 1: A Avg % I	Diff: A Ma 1%		AS 2: Avg %	6Dif A Max 9	% Di	Tfer ID Slope Cert Da		1	1.00466 /1/2017]	•	0.01298
UseDes	scription	ConcGro	up	Tfer Raw	Tfer	Corr	Si	ite	Site	Unit	Pct	Difference
prir	nary	1	•	0.40	0.3	38	1.	15 p	pb			
prir	nary	2		17.05	16.	.95	18	.21 p	pb			7.43%
prir	nary	3		35.98	35.		37	.45 p	pb			4.61%
-	nary	4		71.93	71.				pb			4.26%
prir	nary	5		110.01	109	9.48	113	8.90 p	pb			4.04%
Sensor C	omponent	Sample Trai	۱		Conditio	on Good				Status	pass	
Sensor C	omponent	22.5 degree	rule		Conditio	on				Status	pass	
Sensor C	omponent	Inlet Filter Co	onditio	on	Conditio	on Clean				Status	pass	
Sensor C	omponent	Battery Back	up		Conditio	on N/A				Status	pass	
Sensor C	omponent	Offset			Conditio	Condition 0.000				Status	pass	
Sensor C	omponent	Span			Conditio	dition 0.999				Status	pass	
Sensor C	omponent	Zero Voltage			Conditio	ndition 0.0454				Status	pass	
Sensor C	omponent	Fullscale Vo	tage		Conditio	ondition 1.0000				Status	pass	
Sensor C	omponent	Cell A Freq.			Conditio	on 110 k	Hz			Status	pass	
Sensor C	omponent	Cell A Noise			Conditio	on 0.6 pp	b			Status	pass	
Sensor C	omponent	Cell A Flow			Conditio	on 0.78 l	om			Status	pass	
Sensor C	omponent	Cell A Press	ure		Conditio	on 709.9	mmHg			Status	pass	
Sensor C	omponent	Cell A Tmp.			Conditio	on 28.9 ()			Status	pass	
Sensor C	omponent	Cell B Freq.			Conditio	on 77.4 k	Hz			Status	pass	
Sensor C	omponent	Cell B Noise			Conditio	on 0.3 pp	b			Status	pass	
Sensor C	omponent	Cell B Flow			Conditio	0.80 l	om			Status	pass	
Sensor C	omponent	Cell B Press	ure		Conditio	on 709.1	mmHg			Status	pass	
Sensor C	omponent	Cell B Tmp.			Conditio					Status	pass	
Sensor C	omponent	Line Loss			Conditio	on Not te	sted			Status	pass	
Sensor C	omponent	System Men	10		Conditio	on				Status	pass	

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Num	ber Ta	Site		Т	echnicia	an	Site Vis	sit Date	Paramet	er	Owner ID
Climatronics	missing		PIN414		Ν	Martin Va	alvur	05/25/2	2017	Tempera	ture2meter	none
Mfg	Climatronics					Mfg		Fluke		Par	ameter Terr	perature
SN/Owner ID	397	none				Seria	l Number	327514	3	Tfe	r Desc. RTD)
Parameter	Temperature Tr	anslator				Tfer]	D	01229				
DAS 1:		DAS 2:]	Slope			1.0000	6 Interc	ept	0.03191
Abs Avg Err	Abs Max Er	Abs Avg	gErr Al	os Ma	x Er	Cert]	Date		1/23/201	7 Corr(Coff	1.00000
0.06	0.1											
UseDescription	Test type	Input	TmpRaw	Inpu	tTmpCo	rrected	OutputTm	pSignal	OutputS	SignalEng	OSE Unit	Difference
primary	Temp Low Rat	ng	0.25			0.22		0.0000		0.22	С	0
primary	Temp Mid Rar	g	25.38			25.35		0.0000		25.42	С	0.07
primary	Temp High Ra	ng	47.64			47.61		0.0000		47.71	С	0.1
Sensor Compo	Properly S	Sited			Condit	ion Pro	perly sited			Status P	ass	
Sensor Compo	nent Shield				Condit	ion Cle	an			Status P	ass	
Sensor Compo	nent Blower				Condit	ion Fur	octioning			Status P	ass	
Sensor Compo	nent Blower St	atus Swit	ch		Condit	ion N/A				Status P	ass	
Sensor Compo	onent System M	emo			Condit	ion				Status P	ass	

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	PIN414	Martin Valvur	05/25/2017	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter She	Iter Temperatur
Abs Avg Err Ab	s Max Er Abs Avg 1.03	Err Abs Max Er	Serial Number	3275143	Tfer Desc. RTD)
			Tfer ID	01229		
			Slope	1.0000	6 Intercept	0.03191
			Cert Date	1/23/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference	
primary	Temp Mid Range	21.61	21.58	0.000	22.0	С	0.39	
primary	Temp Mid Range	23.08	23.05	0.000	22.2	С	-0.83	
primary	Temp Mid Range	20.02	19.99	0.000	21.0	С	1.03	
Sensor Component System Memo Condition Status pass								

Infrastructure Data For

Site ID	PIN414	Technician Martin V	alvur Site Visit Date 05/25/2017
Shelter 1	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	Not installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	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: SiteOpsProcedures

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

2 Parameter: ShelterCleanNotes

Shelter floor and roof leaks have been repaired. The shelter has been cleaned and organized. The lighting is poor.

F-02058-1500-S1-rev002

Site ID PIN414	Technician Martin Valvur	Site Visit Date 05/2	5/2017
	NPS	USGS Map	North Chalone Peak
Site Sponsor (agency)			
Operating Group	NPS	Map Scale	
AQS #		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	QAPP Elevation Meters	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	Audit Declination	13.5
City, State	Paicines, CA	Present	
Zip Code	95043	Fire Extinguisher	Not present
Time Zone	Pacific	First Aid Kit	Not present
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 Alan pre-fab M	lodel s/n 861168 1808	Shelter Size 512 cuft
Shelter Clean	Notes Shelter floor and roof leaks ha	ve been repaired. The shelter	nas been cleaned and organized. The
Site OK	Notes		
west	Hollister proceed south on route 25 to hi on 146 and continue to the fee station. L he road on the right up a hill.		

PIN414

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Site ID

Technician Martin Valvur

Site Visit Date 05/25/2017

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		\checkmark
Obstacles to wind	10 times obstacle height		

Siting Distances OK

Siting Criteria Comment

Fi	eld Systems Data Form	F-02058-1500-S3-rev00				
Site	e ID PIN414 Technician Martin Valvur	Site Visit Date 05/25/2017				
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				
	ovide any additional explanation (photograph or sketch if nec sural or man-made, that may affect the monitoring parameter	7) regarding conditions listed abo	ove, or any other features,			

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	ID	PIN414	Technician	Martin Valvur		Site Visit Date	05/25/2017	
1 Do all the meterological sensors appear to be intact, in good condition, and well maintained?					✓			
2 Are all the meteorological sensors operational online, and reporting data?				✓				
3	Are the s	hields for the temper	ature and RH s	ensors clean?	✓			
4	Are the a	spirated motors worl	king?		✓			
	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	rid clean and u	ndamaged?	✓	N/A		
		ensor signal and pow a, and well maintained		in good	✓			
U		ensor signal and pow elements and well ma		tions protected	✓			

Field Systems Data Form						F-02058-1500-S5-rev002
Site	e ID	PIN414	Technician	Martin Valvur		Site Visit Date 05/25/2017
	<u>Siting C</u>	riteria: Are the pollut	t <mark>ant analyzers a</mark>	nd deposition eq	<u>uipr</u>	nent sited in accordance with 40 CFR 58, Appendix E
1		cample inlets have at located airflow?	east a 270 degre	e arc of		
2	Are the	sample inlets 3 - 15 m	eters above the	ground?	✓	
3		sample inlets > 1 meto meters from trees?	er from any maj	or obstruction,		
	<u>Pollutar</u>	nt analyzers and depos	sition equipmen	t operations and	mai	intenance
1		analyzers and equipmon and well maintained		in good		
2	Are the reportin	analyzers and monitong 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 10 meters
5		ine filters used in the elocation)	ozone sample lin	ne? (if yes		At inlet only
6	Are sam	nple lines clean, free of tions?	f kinks, moistur	e, and	✓	
7	Is the ze	ero air supply desicca	nt unsaturated?		✓	
8	Are the	re moisture traps in th	ne sample lines?			
9	Is there clean?	a rotometer in the dr	y deposition filte	er line, and is it		Clean and dry

Fi	eld Sy	stems Data Fo			F-02	058-15	00-S6-rev002			
Site	e ID	PIN414	Technician	Martin Valvur		Site Visit	Date	05/25/2017	7	
	<u>DAS, se</u>	nsor translators, and	peripheral equi	pment operatio	ns a	nd maintenan	<u>ice</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 sig g protection circuitry		through	✓	Met sensors o	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 ground	DAS, sensor translato ed?	ors, and shelter	properly	✓					
7	Does the	e instrument shelter h	ave a stable pov	ver source?	✓					
8	Is the in	strument shelter temp	perature control	lled?						
9	Is the m	et tower stable and gr	ounded?			Stable 🗸			Grounded	
10	Is the sa	ample tower stable and	l grounded?							
11	Tower o	comments?							<u> </u>	

Field S	Systems Data	Fo	rm					F-0 2	2058-	-1500-S	57-rev002
Site ID	PIN414		Tech	nician	Martin Valvu	ır	Site Visit Date	05/25/201	7		
Docume	entation										
Does the	e site have the requir	ed in	strume	nt and	equipment 1	<u>manuals?</u>					
Temperatu Relative hu Solar radia Surface we Wind sense Temperatu Humidity s Solar radia Tipping bu Ozone ana	ction sensor ure sensor umidity sensor ation sensor etness sensor or translator ure translator sensor translator ation translator ucket rain gauge	Yes	No V V V V V V V V V V V V V		I S C M F Z F S U I S	Shelter hea	recorder mp pump ector protection device	Yes	No 		
Filter pack	MFC power supply		\checkmark								
Does t	he site have the requ	ired a	and mo	st rece	nt QC docur	nents and	report forms?				
		Pres						Curr	ent		
	Ianual Manual n Reports p Control Charts] [[[[[✓ ✓	DataVie Jan 200]		
Preventive	maintenance schedu	ıl (
1 Is the	station log properly	comp	oleted d	luring	every site vis	sit? 🔽 Da	ataview checklists	i			
2 Are th curre	he Site Status Report nt?	t Forn	ns bein	g comp	pleted and	Fic	ow section only				
	he chain-of-custody f le transfer to and fro			rly used	d to docume	nt 🔽					
4 Are or current	zone z/s/p control ch nt?	arts p	oroperl	y comp	leted and		ontrol charts not u	sed			
	y additional explana man-made, that may						egarding condit	ions listed	above,	or any othe	er features,

PIN414 Site Visit Date 05/25/2017 Site ID Technician Martin Valvur Site operation procedures Trained by previous operator, ARS provides updates Has the site operator attended a formal CASTNET training 1 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? \checkmark 4 Are the standard CASTNET operational procedures being flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

QC Check Performed Multipoint Calibration

Translator Zero/Span

Manual Rain Gauge To

Confirm Reasonablene

Test Surface Wetness I

Visual Inspections

Frequency

S	\checkmark	Semiannually
	\checkmark	Weekly
Fests (climatronics)	✓	Weekly
est	\checkmark	Monthly
ss of Current Values	\checkmark	Weekly
Response		N/A
est ss of Current Values		Monthly Weekly

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

QC Check Performed

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

- Frequency \checkmark ✓ Semiannually \checkmark \checkmark Daily \checkmark \checkmark Every 2 weeks \checkmark ✓ Daily \checkmark \checkmark As needed \checkmark Alarm values only ✓ \checkmark Every 2 weeks \square \checkmark N/A \checkmark \checkmark Weekly \checkmark \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 and 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.

Compliant

✓

✓

Compliant

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Site ID PIN414 Technician Martin Valvur Site Visit Date 05/25/2017				
Site operation procedures				
1 Is the filter pack being changed every Tuesday as scheduled? ✓ Filter changed mornings 90%				
2 Are the Site Status Report Forms being completed and filed correctly?				
3 Are data downloads and backups being performed as scheduled?	No longer required			
4 Are general observations being made and recorded? How? ✓ SSRF 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 Clean gloves on and off clean gloves on and off				
9 Are the site conditions reported regularly to the field operations manager or staff?				
QC Check Performed Frequency Compliant				
Multi-point MFC Calibrations				
Flow System Leak Checks Veekly				
Filter Pack Inspection				
Flow Rate Setting Checks Image: Weekly				
Visual Check of Flow Rate Rotometer 🗹 Weekly				
In-line Filter Inspection/Replacement 🗹 As needed				
Sample Line Check for Dirt/Water Veekly				

PIN414

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Site ID

Technician Martin Valvur

Site Visit Date 05/25/2017

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	В	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					
LAV	LAV410-Martin Valvur-05/30/2017										
1	5/30/2017	Computer	Hewlett Packard	none	unknown	5CB1520H6L					
2	5/30/2017	DAS	Environmental Sys Corp	90535	8816	2026					
3	5/30/2017	Elevation	Elevation	None	1	None					
4	5/30/2017	Filter pack flow pump	Thomas	none	107CA18B	099800009735					
5	5/30/2017	Flow Rate	Porter	none	MPC0020B	BNSP10000					
6	5/30/2017	Infrastructure	Infrastructure	none	none	none					
7	5/30/2017	Mainframe	Climatronics	none	100081	1377					
8	5/30/2017	Mainframe power supply	Climatronics	none	101074	858					
9	5/30/2017	Met tower	Rohn	none	unknown	none					
10	5/30/2017	Modem	US Robotics	none	56k	unknown					
11	5/30/2017	Ozone	ThermoElectron Inc	90834	49C	49C-520012-328					
12	5/30/2017	Ozone Standard	ThermoElectron Inc	90567	49C	49C-59283-322					
13	5/30/2017	Sample Tower	Aluma Tower	923314	В	AT-5324-F6-O					
14	5/30/2017	Shelter Temperature	DRI	none	Unknown	Unknown					
15	5/30/2017	Shield (2 meter)	Climatronics	01199	100325	1290					
16	5/30/2017	Siting Criteria	Siting Criteria	None	1	None					
17	5/30/2017	Temperature Translator	Climatronics	03629	100088-2	398					
18	5/30/2017	Temperature2meter	Climatronics	03794	100093	ARS101					
19	5/30/2017	Zero air pump	Werther International	none	PC70/4	847660					

DAS Data Form

DAS Time Max Error: 0.33

Mfg	Serial Nu	mber Site]	Fechnician	Site Visit Date	Parameter	Use Desc.
Environmental	Sys 2026	LAV	410	Martin Valvur	05/30/2017	DAS	Primary
Das Date:	5 /30/2017 7:38:25	Audit Date	5 /30/2017 7:38:05	Mfg	HY	Parameter	DAS
Das Time:	1.38.25	Audit Time Audit Day	151	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
0.0002	0.0004	0.0002	0.0004	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	1/23/201	7 CorrCoff	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
14	0.0000	-0.0003	-0.0006	5 V	V	-0.0003	
14	0.1000	0.1997	0.1996	5 V	V	-0.0001	
14	0.3000	0.2995	0.2993	8 V	V	-0.0002	
14	0.5000	0.4996	0.4997		V	0.0001	
14	0.7000	0.6998	0.6997		V	-0.0001	
14	0.9000	0.8997	0.8996		V	-0.0001	
14	1.0000	1.0001	0.9997	/ V	V	-0.0004	

Flow Data Form

Mfg	Serial Nu	mber Ta	Site	Тес	echnician Site Visi		Date Paran	neter	Owner ID
Porter	BNSP100	000	LAV410	Ma	artin Valvur	05/30/201	7 Flow F	Rate	none
					Mfg Serial Number	BIOS 148613		Parameter Flo	
					Tfer ID	01421	00153 Int		0.00366
					Slope Cert Date			ercept rrCoff	1.00000
DAS 1: A Avg % Diff: 1.34%	A Max % Di		Dif A Max	x % Di	Cal Factor Z Cal Factor F Rotometer R	ull Scale	0.0 20. 3.		
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	0.13	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.13	l/m	l/m	
primary	test pt 1	2.944	2.940	2.80	0.000	2.97	l/m	l/m	1.16%
primary	test pt 2	2.934	2.930	2.80	0.000	2.98	l/m	l/m	1.54%
primary	test pt 3	2.939	2.930	2.80	0.000	2.97	l/m	l/m	1.33%
Sensor Comp	onent Leak Te	st		Conditio	n		Statu	s pass	
Sensor Comp	onent Tubing	Condition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Filter Po	sition		Conditio	n Fair		Statu	s pass	
Sensor Comp	onent Rotome	ter Conditic	n	Conditio	n Clean and dry		Statu	s pass	
Sensor Comp	onent Moistur	e Present		Conditio	n No moisture p	resent	Statu	s pass	
Sensor Comp	onent Filter Di	stance		Conditio	n 5.5 cm		Statu	s pass	
Sensor Comp	onent Filter De	epth		Conditio	n 0.0 cm		Statu	s pass	
Sensor Comp	onent Filter Az	imuth		Conditio	n 90 deg		Statu	s pass	
Sensor Comp	onent System	Memo		Conditio	n		Statu	s pass	

Ozone Data Form

Mfg	Se	erial N	umber Ta	Site	Te	chnician		Site Visit Dat	e Param	eter	Owner ID
ThermoElec	ctron Inc 4	9C-52	0012-328	LAV410	Ma	artin Valv	ur	05/30/2017	Ozone		90834
Slope: Intercept CorrCoff	-0.3	0815 1491 9999	Slope: Intercept CorrCoff	0.00000	ס	Mfg Serial N	umber	ThermoElectro 49CPS-70008		rameter er Desc.	ozone Ozone primary stan
Correon	0.0	0000	Correon	0.0000	2	Tfer ID		01110			
DAS 1:			DAS 2:			Slope		1.004	166 Inte	rcept	0.01298
A Avg % D				Dif A Max	% Di	Cert Da	ite	1/1/2	017 Cor	rCoff	1.00000
0.8	8%	2.0	%								
UseDes	scription	Co	oncGroup	Tfer Raw	Tfer		Si		ite Unit	Pct	Difference
-	nary		1	0.40	0.3		0.	11			
	nary		2	16.31	16.		15			_	-2.03%
	nary		3	37.46	37.		37				-0.21%
-	nary		4	71.82	71.		71			_	0.06%
prin	nary		5	105.27	104	.76	105	5.50 ppb			0.71%
Sensor Co	omponent	Samp	le Train		Conditio	Good			Status	pass	
Sensor Co	omponent	22.5 c	legree rule		Conditio	on			Status	Fail	
Sensor Co	omponent	Inlet F	ilter Conditio	n	Conditio	n Clean			Status	pass	
Sensor Co	omponent	Batter	y Backup		Conditio	n N/A			Status	pass	
Sensor Co	omponent	Offset			Conditio	n 0.000			Status	pass	
Sensor Co	omponent	Span			Conditio	n 1.028			Status	pass	
Sensor C	omponent	Zero \	/oltage		Conditio	n -0.212	25		Status	pass	
Sensor Co	omponent	Fullsc	ale Voltage		Conditio	n 1.000			Status	pass	
Sensor Co	omponent	Cell A	Freq.		Conditio				Status	pass	
Sensor Co	omponent	Cell A	Noise		Conditio	on 0.6 pp	b		Status	pass	
Sensor C	omponent	Cell A	Flow		Conditio)n 0.70 l	om		Status	pass	
Sensor Co	omponent	Cell A	Pressure		Conditio				Status		
Sensor Co	omponent	Cell A	Tmp.		Conditio				Status		
	omponent				Conditio				Status		
	omponent				Conditio				Status		
	omponent				Conditio				Status		
	omponent				Conditio		mmHg		Status		
Sensor C	omponent	Cell B	Tmp.		Conditio	on			Status	pass	
Sensor C	omponent	Line L	.OSS		Conditio	L			Status	pass	
Sensor C	omponent	Syste	m Memo		Conditio	See c	omments	5	Status	pass	

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Num	ber Ta	Site		Т	echnicia	in	Site Vis	sit Date	Paramet	er	Owner ID
Climatronics	ARS101		LAV410)	٢	Martin Va	alvur	05/30/2	2017	Temperat	ure2meter	03794
Mfg	Climatronics					Mfg		Fluke		Par	ameter Tem	perature
SN/Owner ID	398	03629				Serial	Number	327514	3	Tfe	Desc. RTD	
Parameter	Temperature Tr	anslator				Tfer I	D	01229				
DAS 1:		DAS 2:				Slope			1.0000	6 Interc	ept	0.03191
Abs Avg Err	Abs Max Er	Abs Avg	gErr A	bs Ma	x Er	Cert l	Date		1/23/201	7 Corr(Coff	1.00000
0.07	0.08											
UseDescription	Test type	Input	TmpRaw	Inpu	tTmpCc	orrected	OutputTm	pSignal	OutputS	SignalEng	OSE Unit	Difference
primary	Temp Low Rat	ng	0.15	5		0.12		0.000		0.19	С	0.07
primary	Temp Mid Rar	g	24.64	1		24.61		0.000		24.69	С	0.08
primary	Temp High Ra	ng	46.59)		46.56		0.000		46.62	С	0.06
Sensor Compo	nent Properly S	Sited			Condit	ion Pro	perly sited			Status P	ass	
Sensor Compo	onent Shield				Condit	ion Clea	an			Status P	ass	
Sensor Compo	Blower				Condit	ion Fun	ctioning			Status P	ass	
Sensor Compo	Blower St	atus Swit	ch		Condit	ion N/A				Status P	ass	
Sensor Compo	onent System M	emo			Condit	ion				Status P	ass	

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
DRI	Unknown	LAV410	Martin Valvur	05/30/2017	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter She	Iter Temperatur
Abs Avg ErrAb0.83	2.03 Abs Avg	Err Abs Max Er	Serial Number	3275143	Tfer Desc. RTD)
			Tfer ID	01229		
			Slope	1.0000	6 Intercept	0.03191
			Cert Date	1/23/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.12	22.09	0.000	21.8	С	-0.34
primary	Temp Mid Range	20.39	20.36	0.000	22.4	С	2.03
primary	Temp Mid Range	22.45	22.42	0.000	22.3	С	-0.13
Sensor Component System Memo Condition Status pass							

Infrastructure Data For

Site ID	LAV410	Technician Martin	Valvur Site Visit Date 05/30/2017
Shelter M	lake	Shelter Model	Shelter Size
			1150 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	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.	Hazard	Problem
Ozone Trees violate the 22.5 de	LAV410 gree clearance ru	Martin Valvur lle for the ozone sau	05/30/2017 mple inlet.	22.5 degree rule	ThermoElectron	1344		

Field Systems Comments

1 Parameter: SiteOpsProcedures

The ozone inlet filter is changed and the sample line conditioned every four weeks.

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 signal cables are showing signs of wear.

F-02058-1500-S1-rev002

Site ID LAV410	Technician Martin Valvur	Site Visit Date 05/30	0/2017
		Nacan	Mennerite Laka
Site Sponsor (agency)	NPS	USGS Map	Manzanita Lake
Operating Group	NPS	Map Scale	
AQS #		Map Date	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMPROVE	QAPP Latitude	40.5403
Deposition Measurement	dry, wet	QAPP Longitude	-121.5764
Land Use	woodland - evergreen	QAPP Elevation Meters	1756
Terrain	complex	QAPP Declination	
Conforms to MLM	Marginally	QAPP Declination Date	
Site Telephone	(530) 335-7214	Audit Latitude	40.539991
Site Address 1	38050 Hwy 36E	Audit Longitude	-121.576462
Site Address 2		Audit Elevation	1755
County	Shasta	Audit Declination	14.5
City, State	Mineral, CA	Present	
Zip Code	96063	Fire Extinguisher 🗹	Inspected April 2017
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 Step 🔽	
Shelter Working Room ✓	Make M	odel	Shelter Size 1150 cuft
Shelter Clean	Notes The inside equipment is locate	ed in room within the fire station	clean, neat, and organized.
Site OK	Notes		
onto behir	Redding take route 44 east for approxima route 89. Turn right at the first road into th d the fire station at the end of the parking ment.	ne fire station and maintenance	area. Take the first left, the site is

LAV410

F-02058-1500-S2-rev002

Site ID

Technician Martin Valvur

Site Visit Date 05/30/2017

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

Fi	eld Systems Data Form		F-02058-1500-S3-rev00			
Site	EID LAV410 Technician Martin Valvur		Site Visit Date 05/30/2017			
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			
	ovide any additional explanation (photograph or sketch if nece ural or man-made, that may affect the monitoring parameters		y) regarding conditions listed above, or any other features,			

Field Systems Data Form

F-02058-1500-S4-rev002

Site	ID	LAV410	Technician	Martin Valvur		Site Visit Date	05/30/2017	
1		e meterological senso a, and well maintaine		intact, in good	✓	N/A		
2	Are all th reporting	ne meteorological sen g data?	sors operational	l online, and		N/A		
3	Are the s	hields for the temper	ature and RH s	ensors clean?	✓			
4	Are the a	spirated motors wor	king?		✓			
5	Is the sol scratches	ar radiation sensor's ?	lens clean and f	ree of		N/A		
6	Is the sur	face wetness sensor g	grid clean and u	ndamaged?	✓	N/A		
7		ensor signal and pow , and well maintaine		, in good		Signs of wear		
8		ensor signal and pow elements and well ma		tions protected	✓			
								(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 signal cables are showing signs of wear.

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	ID LAV410 Technician Martin Valvur		Site Visit Date 05/30/2017
	Siting Criteria: Are the pollutant analyzers and deposition e	quipi	<u>ment sited in accordance with 40 CFR 58, Appendix E</u>
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?		< 10 meters
	Pollutant analyzers and deposition equipment operations an	d ma	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?		
2	Are the analyzers and monitors operational, on-line, and reporting data?		
3	Describe ozone sample tube.		1/4 teflon by 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

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:

Trees violate the ozone sample inlet siting criteria.

Fi	eld Sys	stems Data Fo	orm				F-0	2058-15	00-S6-rev002
Site	e ID	LAV410	Technician	Martin Valvur		Site Visi	it Date 05/30/20	17	
	DAS, sen	sor translators, and p	eripheral equi	<u>pment operatio</u>	<u>ns and</u>	l maintena	nce		
1	Do the D well main	AS instruments appeantained?	ar to be in good	l condition and					
2		ne components of the l backup, etc)	DAS operation	al? (printers,					
3		nalyzer and sensor sig protection circuitry?		through					
4	Are the s well main	ignal connections pro ntained?	tected from the	e weather and					
5	Are the s	ignal leads connected	to the correct	DAS channel?					
6	Are the I grounded	DAS, sensor translator 1?	rs, and shelter	properly					
7	Does the	instrument shelter ha	ive a stable pov	ver source?					
8	Is the ins	trument shelter temp	erature contro	lled?					
9	Is the me	t tower stable and gro	ounded?			Stable		Grounded	
10	Is the sar	nple tower stable and	grounded?			✓			
11	Tower co	omments?				V			

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

Field Sy	stems Data l	Forr	n				F-02	058-15	500-S7-rev002
Site ID	LAV410]]	Fechnician	Martin Valvur		Site Visit Date	05/30/2017]
Document	ation								
Does the s	ite have the require	d instr	ument and	equipment m	anuals?				
Wind speed s Wind direction Temperature Relative hum Solar radiation Surface weth Wind sensor Temperature Humidity sen Solar radiation	Sensor on sensor e sensor uidity sensor on sensor ess sensor translator e translator sor translator		No N/. Image: State of the state of th	A Da Da Str Co Mo Pri Ze Fil Su UF	ita logger ita logger rip chart : omputer odem inter ro air put iter flow p rge prote PS	recorder mp pump	Yes ✓ □ ✓ □ □ □ □ □ □ □ □ □ □ □ □ □		N/A ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
Ozone analyz					elter heat				
Filter pack fl Filter pack M	ow controller			Sh	elter air o	conditioner			
]	Presen	ıt				Currei	nt	
-	nual		DataVie	12					
1 Is the sta	ation log properly c	omple	ted during	every site visit	? 🗸				
2 Are the current?	Site Status Report I ?	Forms	being com	pleted and					
	chain-of-custody for transfer to and from		coperly use	d to document					
4 Are ozor current	ne z/s/p control chai ?	rts pro	perly comp	oleted and	Co	ntrol charts not us	sed		
	additional explanati					egarding conditi	ons listed a	bove, or a	any other features,

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

Field Systems Data Form

LAV410 Technician Martin Valvur Site Visit Date 05/30/2017 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? \checkmark Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

QC Check Performed

Frequency

Frequency

Multipoint Calibrations	\checkmark	Semiannually	✓
Visual Inspections	\checkmark	Weekly	\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	✓

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

QC	Check	Perf	ormed
----	-------	------	-------

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

- ✓ ✓ Semiannually \checkmark \checkmark Daily ✓ \checkmark Not performed ✓ ✓ Daily \checkmark \checkmark Not performed ✓ ✓ Alarm values only ✓ \checkmark Monthly \checkmark \checkmark N/A
- Do multi-point calibration gases go through the complete 1 sample train including all filters?
- Do automatic and manual z/s/p gasses go through the 2 complete sample train including all filters?

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

✓	
✓	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 four weeks.

F-02058-1500-S8-rev002

✓ \checkmark

Compliant

Compliant

Fi	eld Sy	stems Data Fo	orm					F-02058-1	500-S9-rev002
Sit	e ID	LAV410	Technici	an	Martin Valvur		Site Visit Date	05/30/2017	
	<u>Site ope</u>	eration procedures							
1	Is the fi	lter pack being change	ed every Tue	esd	ay as scheduled		Filter changed betwee	een 11:00 and 13:00	
2	Are the correctl	Site Status Report For y?	rms being co	om	pleted and filed				
3	Are dat schedul	a downloads and back ed?	ups being p	erf	ormed as		No longer required		
4	Are gen	eral observations bein	g made and	re	corded? How?	✓	SSRF, dataview		
5	Are site fashion	supplies on-hand and ?	replenished	l in	a timely				
6	Are san	nple flow rates recorde	ed? How?			✓	SSRF		
7	Are san fashion	nples sent to the lab on ?	a regular s	che	edule in a timely				
8		ers protected from con pping? How?	tamination	du	ring handling	✓	Clean gloves on and	d off	
9		site conditions reporte ons manager or staff?	ed regularly	to	the field				
QC	Check P	erformed	I	re	quency			Compliant	
I	Multi-poi	nt MFC Calibrations		Sen	niannually				
I	Flow Syst	em Leak Checks	✓ V	Vee	ekly			\checkmark	
I	Filter Pac	k Inspection							
I	Flow Rate	e Setting Checks	✓ V	Vee	ekly			\checkmark	
	Visual Ch	eck of Flow Rate Roto	meter 🗹 🛛	Vee	əkly			\checkmark	
I	n-line Fil	ter Inspection/Replace	ement 🔽 🛛	Vee	ekly			\checkmark	
5	Sample Li	ine Check for Dirt/Wa	ter 🗆 V	Vee	ekly				
	de energ				n alaatah if maaaa	~ ~ ~ ~) manual manual dist	and listed above on	ann ath an faatanaa

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

LAV410

F-02058-1500-S10-rev002

Site ID

Techr

Technician Martin Valvur

Site Visit Date 05/30/2017

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	099800009735	none
Flow Rate	Porter	MPC0020B	BNSP10000	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	В	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

APPENDIX B

CASTNET Site Spot Report Forms

Data Compiled: 4/23/2017 11:37:37 AM

SiteVisitDate Site Technician

04/06/2017 CAD150 Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	3	0.08	с	Р
2	Temperature max error	Р	4	0.5	3	0.16	с	Р
3	Ozone Slope	Р	0	1.1	4	0.99828	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.38094	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99973	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.4	%	Р
7	Ozone % difference max	Р	7	10	4	1.9	%	Р
8	Flow Rate average % difference	Р	10	5	2	0.66	%	Р
9	Flow Rate max % difference	Р	10	5	2	0.66	%	Р
10	DAS Time maximum error	Р	0	5	1	0.02	min	Р
11	DAS Voltage average error	Р	7	0.003	56	0.0001	V	Р
12	Shelter Temperature average error	Р	5	2	9	0.22	с	Р
13	Shelter Temperature max error	Р	5	2	9	0.58	с	Р

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	56			
2	Shelter Temperature standard deviation		5	0	9			
3	Temperature standard deviation		4	0	3			

04/06/2017 CAD150

Field Systems Comments

1 Parameter: SiteOpsProcedures

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

Parameter: ShelterCleanNotes 2

The shelter walls have been repaired.

Data Compiled: 6/13/2017 11:50:26 AM

SiteVisitDate	Site	Technician
05/01/2017	CAN407	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99043	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.03773	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.1	%	Р
5	Ozone % difference max	Р	7	10	4	1.3	%	Р

Data Compiled: 4/23/2017 11:59:46 AM

SiteVisitDate Site Technician

04/07/2017 CDZ171 Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	12	0.09	с	Р
2	Temperature max error	Р	4	0.5	12	0.15	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98660	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.60180	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.3	%	Р
7	Ozone % difference max	Р	7	10	4	3.6	%	Р
8	Flow Rate average % difference	Р	10	5	2	1.32	%	Р
9	Flow Rate max % difference	Р	10	5	2	1.32	%	Р
10	DAS Time maximum error	Р	0	5	1	0.00	min	Р
11	DAS Voltage average error	Р	7	0.003	63	0.0000	V	Р
12	Shelter Temperature average error	Р	5	2	9	0.21	с	Р
13	Shelter Temperature max error	Р	5	2	9	0.38	с	Р

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	63			
2	Shelter Temperature standard deviation		5	0	9			
3	Temperature standard deviation		4	0	12			

04/07/2017 CDZ171

Field Systems Comments

1 Parameter: SitingCriteriaCom

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

2 Parameter: ShelterCleanNotes

The shelter floor is beginning to rot again by the door. The shelter is still cluttered and dirty.

3 Parameter: MetSensorComme

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

Data Compiled: 6/13/2017 11:19:03 AM

SiteVisitDate	Site	Technician
04/26/2017	CHA467	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97036	unitless	Р
2	Ozone Intercept	Р	0	5	4	-1.19028	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99995	unitless	Р
4	Ozone % difference avg	Р	7	10	4	6.4	%	Р
5	Ozone % difference max	Р	7	10	4	9.5	%	Р

Data Compiled: 6/16/2017 4:12:12 PM

SiteVisitDate Site Technician

05/10/2017 CHC432 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.50	c	Р
2	Temperature2meter max error	Р	5	0.5	3	0.59	с	Fail
3	Wind Speed average error below 5m/s in m/s	Р	3	0.5	4	0.05	m/s	Р
4	Wind Speed max error below 5m/s in m/s	Р	3	0.5	4	0.20	m/s	Р
5	Wind Speed average % difference above 5 m/s	Р	3	5	4	0.0	%	Р
6	Wind Speed max % difference above 5 m/s	Р	3	5	4	0.1	%	Р
7	Wind Speed Torque average error	Р	3	0.5	1	0.30	g-cm	Р
8	Wind Speed Torque max error	Р	3	0.5	1	0.3	g-cm	Р
9	Wind Direction Input Deg True average error (de	Р	2	5	4	8.2	degrees	Fail
10	Wind Direction Input Deg True max error (deg)	Р	2	5	4	12	degrees	Fail
11	Wind Direction Linearity average error (deg)	Р	2	5	8	1.0	degrees	Р
12	Wind Direction Linearity max error (deg)	Р	2	5	8	2	degrees	Р
13	Wind Direction Torque average error	Р	2	30	1	9	g-cm	Р
14	Wind Direction Torque max error	Р	2	30	1	9	g-cm	Р
15	Relative Humidity average above 85%	Р	6	10	1	4.7	%	Р
16	Relative Humidity max above 85%	Р	6	10	1	4.7	%	Р
17	Relative Humidity average below 85%	Р	6	10	2	7.6	%	Р
18	Relative Humidity max below 85%	Р	6	10	2	8.4	%	Р
19	Precipitation average % difference	Р	1	10	1	0.0	%	Р
20	Precipitation max % difference	Р	1	10	1	0.0	%	Р
21	Ozone Slope	Р	0	1.1	4	1.07855	unitless	Р
22	Ozone Intercept	Р	0	5	4	-0.05935	ppb	Р
23	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
24	Ozone % difference avg	Р	7	10	4	8.1	%	Р
25	Ozone % difference max	Р	7	10	4	8.9	%	Р
26	DAS Time maximum error	Р	0	5	1	3.00	min	Р
27	DAS Voltage average error	Р	9	0.003	7	0.0005	V	Р
28	Shelter Temperature average error	Р	5	2	3	0.68	с	Р
29	Shelter Temperature max error	Р	5	2	3	0.82	с	Р

SiteV	isitDate	Site	Technician						
05/10/2	2017	CHC432	Martin Valvur						
Reco	rds with	out valid pass/fail criteria							
Line	Audite	d Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Vol	tage maximum error		9	0	7			
2	Shelter T	emperature standard deviation		5	0	3			
3	Tempera	ture2meter Standard Deviation		5	0	3			
4	Precipita	tion total of % diff		1	0	1			
5	Precipita	tion total of abs diff mm or in		1	0	1			
6	Precipita	tion total of DAS mm or in		1	0	1			
7	Precipita	tion total of equivalent mm or in	l	1	0	1			

Field Performance Comments

 1
 Parameter:
 Temperature2mete
 SensorComponent:
 System Memo
 CommentCode:
 217

 Temperature and relative humidity are being measured using a combination sensor which cannot be submerged in a water bath for audits.

Field Systems Comments

- Parameter: SiteOpsProcComm
 Dry deposition samples are not collected at this CASTNET site.
- 2 Parameter: SitingCriteriaCom

See maps included as Figures 1 through 3.

Data Compiled: 6/19/2017 2:56:43 PM

05/09/2017

SiteVisitDate Site Technician

CHE185 Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.12	c	Р
2	Temperature2meter max error	Р	5	0.5	3	0.23	с	Р
3	Wind Speed average error below 5m/s in m/s	Р	3	0.5	12	0.07	m/s	Р
4	Wind Speed max error below 5m/s in m/s	Р	3	0.5	12	0.20	m/s	Р
5	Wind Speed average % difference above 5 m/s $$	Р	3	5	12	2.4	%	Р
6	Wind Speed max % difference above 5 m/s	Р	3	5	12	2.6	%	Р
7	Wind Speed Torque average error	Р	3	0.5	1	0.30	g-cm	Р
8	Wind Speed Torque max error	Р	3	0.5	1	0.3	g-cm	Р
9	Wind Direction Input Deg True average error (de	Р	2	5	12	8.8	degrees	Fail
10	Wind Direction Input Deg True max error (deg)	Р	2	5	12	10	degrees	Fail
11	Wind Direction Linearity average error (deg)	Р	2	5	24	0.8	degrees	Р
12	Wind Direction Linearity max error (deg)	Р	2	5	24	1	degrees	Р
13	Wind Direction Torque average error	Р	2	30	1	13	g-cm	Р
14	Wind Direction Torque max error	Р	2	30	1	14	g-cm	Р
15	Temperature average error	Р	4	0.5	6	0.11	c	Р
16	Temperature max error	Р	4	0.5	6	0.16	c	Р
17	Relative Humidity average below 85%	Р	б	10	6	1.8	%	Р
18	Relative Humidity max below 85%	Р	6	10	6	2.3	%	Р
19	Solar Radiation % diff of avg	Р	9	10	5	0.57	%	Р
20	Solar Radiation % diff of max STD value	Р	9	10	5	0.20	%	Р
21	Precipitation average % difference	Р	1	10	1	0.0	%	Р
22	Precipitation max % difference	Р	1	10	1	0.0	%	Р
23	Ozone Slope	Р	0	1.1	4	1.0242	unitless	Р
24	Ozone Intercept	Р	0	5	4	7.38922	ppb	Fail
25	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
26	Ozone % difference avg	Р	7	10	4	23.2	%	Fail
27	Ozone % difference max	Р	7	10	4	47.0	%	Fail
28	Flow Rate average % difference	Р	10	5	4	2.52	%	Р
29	Flow Rate max % difference	Р	10	5	4	2.79	%	Р
30	DAS Time maximum error	Р	0	5	1	0.02	min	Р
31	DAS Voltage average error	Р	6	0.003	7	0.0004	V	Р
32	Surface Wetness Response	Р	12	0.5	1	1.04		Р
33	Shelter Temperature average error	Р	5	2	10	0.56	С	Р

SiteV	isitDate	Site	Technician						
05/09/2	2017	CHE185	Eric Hebert						
34	Shelter T	emperature max error	Р	5	2	10	0.64	c	Р
Reco	rds with	out valid pass/fail criteria							
Line	Audite	d Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Surface V	Wetness Manual Test Pass Fail		12	0	1			
2	DAS Vol	ltage maximum error		6	0	7			
3	Tempera	ture standard deviation		4	0	6			
4	Shelter T	emperature standard deviation		5	0	10			
5	Tempera	ture2meter Standard Deviation		5	0	3			
6	Precipita	tion total of % diff		1	0	1			
7	Precipita	tion total of abs diff mm or in		1	0	1			
8	Precipita	tion total of DAS mm or in		1	0	1			
9	Precipita	tion total of equivalent mm or in		1	0	1			

Technician

Eric Hebert

05/09/2017 CHE185

1	Parameter:	Ozone	SensorComponent:	System Memo	CommentCode: 208
	The ozone sam	pple train is composed of	f materials other than the re	ecommended materials wh	hich are Teflon and glass only.
2	Parameter:	Temperature	SensorComponent:	System Memo	CommentCode: 174
	Additional det	ails can be found in the h	nardcopy of the site audit r	eport.	

3 Parameter: Wind Direction SensorComponent: Alignment CommentCode: 150 The wind direction orientation is not accurate. The sensor alignment ring has been rotated and is not aligned with the crossarm.

Field Systems Comments

1 Parameter: SiteOpsProcComm

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

2 **Parameter:** SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

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

4 Parameter: MetOpMaintCom

The temperature blower housings are clogged with insect nests. See the image included as Figure 1.

Data Compiled: 6/15/2017 3:21:15 PM

SiteVisitDate Site Technician

05/22/2017 DCP114 Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	6	0.11	c	Р
2	Temperature max error	Р	4	0.5	6	0.17	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98610	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.73952	ppb	Р
5	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.1	%	Р
7	Ozone % difference max	Р	7	10	4	3.0	%	Р
8	Flow Rate average % difference	Р	10	5	4	1.96	%	Р
9	Flow Rate max % difference	Р	10	5	4	1.96	%	Р
10	DAS Time maximum error	Р	0	5	1	0.00	min	Р
11	DAS Voltage average error	Р	7	0.003	56	0.0001	V	Р
12	Shelter Temperature average error	Р	5	2	15	0.80	с	Р
13	Shelter Temperature max error	Р	5	2	15	1.34	с	Р

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	56			
2	Shelter Temperature standard deviation		5	0	15			
3	Temperature standard deviation		4	0	6			

05/22/2017 DCP114

Sandy Grenville

Field Systems Comments

1 Parameter: SiteOpsProcComm

The site operator is following procedures and doing a very good job with filter handling.

2 Parameter: DasComments

Met tower removed.

3 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced and the sample line is leak-tested every two weeks.

Parameter: SitingCriteriaCom 4

The site is located in a wooded thicket within a state park. The area surrounding the park is almost completely intensive agriculture. The site may not be regionally representative.

5 Parameter: ShelterCleanNotes

The shelter is currently in fair condition. There are loose floor tiles.

Parameter: MetOpMaintCom 6

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

Data Compiled: 6/19/2017 4:29:59 PM

SiteVisitDate	Site	Technician
06/08/2017	GRB411	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.98090	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.47139	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р
4	Ozone % difference avg	Р	7	10	4	3.9	%	Р
5	Ozone % difference max	Р	7	10	4	7.4	%	Р

Data Compiled: 6/13/2017 11:32:53 AM

SiteVisitDate	Site	Technician
04/28/2017	GRC474	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.96858	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.24999	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99991	unitless	Р
4	Ozone % difference avg	Р	7	10	4	3.4	%	Р
5	Ozone % difference max	Р	7	10	4	4.2	%	Р

Data Compiled: 4/23/2017 11:07:07 AM

SiteVisitDate	Site	Technician
04/05/2017	KIC003	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	6	0.07	с	Р
2	Temperature max error	Р	4	0.5	6	0.09	с	Р
3	Flow Rate average % difference	Р	10	5	3	0.56	%	Р
4	Flow Rate max % difference	Р	10	5	3	0.67	%	Р

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature standard deviation		4	0	6			

04/05/2017 KIC003

Field Systems Comments

1 Parameter: DocumentationCo

The site logbook is not provided by AMEC, however the site operator maintains records.

2 Parameter: SitingCriteriaCom

The site is located across the street from the community school in a very small town.

3 **Parameter:** ShelterCleanNotes

Small footprint site with no shelter.

Data Compiled:	4/23/2017 10:51:15 AM	

SiteVisitDate	Site	Technician
04/04/2017	KNZ184	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	9	0.04	с	Р
2	Temperature max error	Р	4	0.5	9	0.06	c	Р
3	Flow Rate average % difference	Р	10	5	2	2.18	%	Р
4	Flow Rate max % difference	Р	10	5	2	2.29	%	Р
5	Shelter Temperature average error	Р	5	2	15	0.51	с	Р
6	Shelter Temperature max error	Р	5	2	15	1.43	с	Р

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Shelter Temperature standard deviation		5	0	15			
2	Temperature standard deviation		4	0	9			

Field Systems Comments

1 Parameter: SitingCriteriaCom

The site is located at a Long Term Ecological Research site operated by KSU.

2 Parameter: ShelterCleanNotes

The shelter is very clean, neat, well organized and well maintained. The shelter floor is beginning to deteriorate.

Data Compiled: 6/13/2017 4:27:01 PM

SiteVisitDate Site Technician

05/30/2017 LAV410 Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.07	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.08	с	Р
3	Ozone Slope	Р	0	1.1	4	1.00815	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.31491	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 % difference max	Р	7	10	4	2.0	%	Р
8	Flow Rate average % difference	Р	10	5	2	1.34	%	Р
9	Flow Rate max % difference	Р	10	5	2	1.54	%	Р
10	DAS Time maximum error	Р	0	5	1	0.33	min	Р
11	DAS Voltage average error	Р	14	0.003	49	0.0002	V	Р
12	Shelter Temperature average error	Р	5	2	3	0.83	с	Р
13	Shelter Temperature max error	Р	5	2	3	2.03	С	Fail

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		14	0	49			
2	Shelter Temperature standard deviation		5	0	3			
3	Temperature2meter Standard Deviation		5	0	3			

05/30/2017 LAV410

Technician

Martin Valvur

Field Performance Comments

1 Parameter: Ozone

SensorComponent: 22.5 degree rule

CommentCode: 216

Trees violate the 22.5 degree clearance rule for the ozone sample inlet.

Field Systems Comments

1 Parameter: SiteOpsProcedures

The ozone inlet filter is changed and the sample line conditioned every four weeks.

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 signal cables are showing signs of wear.

Data Compiled: 6/15/2017 4:17:38 PM

SiteVisitDate Site Technician

05/23/2017 OXF122 Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	12	0.05	с	Р
2	Temperature max error	Р	4	0.5	12	0.07	с	Р
3	Ozone Slope	Р	0	1.1	4	0.99353	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.51736	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.9	%	Р
7	Ozone % difference max	Р	7	10	4	3.4	%	Р
8	Flow Rate average % difference	Р	10	5	2	1.32	%	Р
9	Flow Rate max % difference	Р	10	5	2	1.32	%	Р
10	DAS Time maximum error	Р	0	5	1	0.00	min	Р
11	DAS Voltage average error	Р	7	0.003	56	0.0000	V	Р
12	Shelter Temperature average error	Р	5	2	15	0.15	с	Р
13	Shelter Temperature max error	Р	5	2	15	0.20	с	Р

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	56			
2	Shelter Temperature standard deviation		5	0	15			
3	Temperature standard deviation		4	0	12			

Technician

05/23/2017 OXF122

Sandy Grenville

Field Performance Comments

1Parameter:OzoneSensorComponent:Cell A Flow

CommentCode: 99

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

Field Systems Comments

1 Parameter: SiteOpsProcComm

The operator uses procedures written by the previous site operator. She has been operating the site for nearly 2 years and is now proficient.

2 Parameter: DasComments

The met tower is operated by the university and the temperature sensor has been moved to the sample tower in a naturally aspirated shield.

3 Parameter: SitingCriteriaCom

The site is located in university agriculture research facility.

4 Parameter: ShelterCleanNotes

The shelter roof is in poor condition with at least one leak.

Data Compiled: 6/13/2017 10:59:54 AM

SiteVisitDate	Site	Technician
04/24/2017	PET427	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97620	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.08736	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	2.7	%	Р
5	Ozone % difference max	Р	7	10	4	3.2	%	Р

Data Compiled: 6/13/2017 3:01:33 PM

SiteVisitDate Site Technician

05/25/2017 PIN414 Martin Valvur

Records with valid pass/fail criteria

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	0.10	с	Р
3	Ozone Slope	Р	0	1.1	4	1.03381	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.64621	ppb	Р
5	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
6	Ozone % difference avg	Р	7	10	4	5.1	%	Р
7	Ozone % difference max	Р	7	10	4	7.4	%	Р
8	Flow Rate average % difference	Р	10	5	2	0.64	%	Р
9	Flow Rate max % difference	Р	10	5	2	0.97	%	Р
10	DAS Time maximum error	Р	0	5	1	0.57	min	Р
11	DAS Voltage average error	Р	15	0.003	56	0.0002	V	Р
12	Shelter Temperature average error	Р	5	2	15	0.75	с	Р
13	Shelter Temperature max error	Р	5	2	15	1.03	с	Р

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		15	0	56			
2	Shelter Temperature standard deviation		5	0	15			
3	Temperature2meter Standard Deviation		5	0	3			

05/25/2017 PIN414

Field Systems Comments

1 Parameter: SiteOpsProcedures

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

Parameter: ShelterCleanNotes 2

Shelter floor and roof leaks have been repaired. The shelter has been cleaned and organized. The lighting is poor.

Data Compiled: 6/15/2017 4:49:28 PM

SiteVisitDate Site Technician

05/24/2017 QAK172 Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	3	0.05	с	Р
2	Temperature max error	Р	4	0.5	3	0.07	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98407	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.26089	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.3	%	Р
7	Ozone % difference max	Р	7	10	4	1.8	%	Р
8	Flow Rate average % difference	Р	10	5	3	0.00	%	Р
9	Flow Rate max % difference	Р	10	5	3	0.00	%	Р
10	DAS Time maximum error	Р	0	5	1	0.00	min	Р
11	DAS Voltage average error	Р	7	0.003	56	0.0000	V	Р
12	Shelter Temperature average error	Р	5	2	15	0.15	с	Р
13	Shelter Temperature max error	Р	5	2	15	0.23	с	Р

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	56			
2	Shelter Temperature standard deviation		5	0	15			
3	Temperature standard deviation		4	0	3			

Technician

05/24/2017 QAK172

Sandy Grenville

Field Performance Comments

1 Parameter: Ozone SensorComponent: Cell A Freq.

CommentCode: 99

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

Field Systems Comments

1 Parameter: SiteOpsProcComm

The site operator is doing an excellent job maintaining the site.

2 Parameter: ShelterCleanNotes

The shelter is in good condition.

EEMS Spot Report

Data Compiled: 6/13/2017 12:51:08 PM

SiteVisitDate Site Technician

05/23/2017 SEK430 Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.07	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.14	с	Р
3	Ozone Slope	Р	0	1.1	4	1.04283	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.13773	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р
6	Ozone % difference avg	Р	7	10	4	3.5	%	Р
7	Ozone % difference max	Р	7	10	4	4.4	%	Р
8	Flow Rate average % difference	Р	10	5	9	0.53	%	Р
9	Flow Rate max % difference	Р	10	5	9	0.64	%	Р
10	DAS Time maximum error	Р	0	5	1	1.5	min	Р
11	DAS Voltage average error	Р	12	0.003	49	0.0002	V	Р
12	Shelter Temperature average error	Р	5	2	15	0.26	с	Р
13	Shelter Temperature max error	Р	5	2	15	0.68	c	Р

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		12	0	49			
2	Shelter Temperature standard deviation		5	0	15			
3	Temperature2meter Standard Deviation		5	0	3			

05/23/2017 SEK430

Martin Valvur

Field Performance Comments

1Parameter:Flow RateSensorComponent:Tubing ConditionCommentCode:194

The filter sample flow tubing is comprised of sections of Tygon tubing and Teflon tubing which are not securely connected.

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. Some trees have been trimmed since the previous site audit. 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.

EEMS Spot Report

Data Compiled: 6/13/2017 2:03:27 PM

SiteVisitDate Site Technician

05/24/2017 YOS404 Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	9	0.10	c	Р
2	Temperature max error	Р	4	0.5	9	0.27	c	Р
3	Ozone Slope	Р	0	1.1	4	1.04019	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.03930	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р
6	Ozone % difference avg	Р	7	10	4	4.3	%	Р
7	Ozone % difference max	Р	7	10	4	5.4	%	Р
8	Flow Rate average % difference	Р	10	5	2	0.36	%	Р
9	Flow Rate max % difference	Р	10	5	2	0.46	%	Р
10	DAS Time maximum error	Р	0	5	1	1.87	min	Р
11	DAS Voltage average error	Р	3	0.003	42	0.0002	V	Р
12	Shelter Temperature average error	Р	5	2	15	1.21	с	Р
13	Shelter Temperature max error	Р	5	2	15	2.26	c	Fail

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		3	0	42			
2	Shelter Temperature standard deviation		5	0	15			
3	Temperature standard deviation		4	0	9			

05/24/2017 YOS404

Martin Valvur

Field Systems Comments

1 Parameter: ShelterCleanNotes

The site is neat, clean, and well organized.

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
PET	427-Martin	n Valvur-04/24/2017				
1	4/24/2017	DAS	Environmental Sys Corp	90641	8816	2526
2	4/24/2017	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460048
3	4/24/2017	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1211052489
4	4/24/2017	Zero air pump	Werther International	none	PC 70/4	531382

Mfg	Se	rial N	umber Ta	Site	Te	chnician		Site Visi	t Date	Parame	ter	Owner ID	
ThermoElectro	on Inc CI	M0846	60048	PET427	Ma	artin Valv	ur	04/24/20	017	Ozone		none	
Slope:InterceptCorrCoff	Intercept -0.08736 Intercept		0.00000	D	Mfg Serial N Tfer ID	umber	ThermoE 49CPS-7 01110			rameter er Desc.	ozone Ozone primary stan		
DAS 1: A Avg % Diff 2.7%	_	x % D i 3.2%		Dif A Max	% Di	Slope Cert Da	te		1.00466 1/1/2017		•	0.01298	
UseDescri	iption	Co	oncGroup	Tfer Raw	Tfer	Corr	Si	te	Site	Unit	Pctl	Difference	
primar	*		1	0.44	0.4	42	0.	36	ppb				
primar	ry		2	17.92	17.	82	17	.25	ppb			-3.20%	
primar	•		3	34.83	34.				ppb			-2.91%	
primar	•		4	73.68	73.		71		ppb			-2.17%	
primar	-		5	108.91	108		105	5.60	ppb			-2.57%	
Sensor Com	ponent	Sampl	e Train		Conditio	Good				Status	pass		
Sensor Com	nponent	22.5 d	egree rule		Conditio	on				Status	pass		
Sensor Com	ponent	Inlet F	ilter Conditio	n	Conditio	Condition Clean				Status	s pass		
Sensor Com	ponent	Batter	y Backup		Conditio	N/A				Status	pass		
Sensor Com	nponent	Offset			Conditio	n 0.8				Status	pass		
Sensor Com	nponent	Span			Condition 0.997					Status	pass		
Sensor Com	nponent	Zero V	/oltage		Condition 0.0452					Status	pass		
Sensor Com	nponent	Fullsca	ale Voltage		Condition 1.0000					Status	pass		
Sensor Com	nponent	Cell A	Freq.		Conditio	n 95.8 k	Hz			Status	pass		
Sensor Com	nponent	Cell A	Noise		Conditio	n 0.6 pp	b			Status	pass		
Sensor Com	nponent	Cell A	Flow		Conditio	n 0.67 l	om			Status	pass		
Sensor Com	nponent	Cell A	Pressure		Conditio	604.7	mmHg			Status	pass		
Sensor Com	nponent	Cell A	Tmp.		Conditio	n 34.3 C	;			Status	pass		
Sensor Com	nponent	Cell B	Freq.		Conditio	96.5 k	Hz			Status	pass		
Sensor Com	nponent	Cell B	Noise		Conditio	0.7 pp	b			Status	pass		
Sensor Com	nponent	Cell B	Flow		Conditio	n 0.66 l	om			Status	pass		
Sensor Com	nponent	Cell B	Pressure		Conditio	604.4	mmHg			Status	pass		
Sensor Com	ponent	Cell B	Tmp.		Conditio					Status	pass		
Sensor Com	Sensor Component Line Loss		Conditio	dition Not tested				Status	pass				
Sensor Com	Sensor Component System Memo			Conditio	lition				Status pass				

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
СНА	.467-Martii	n Valvur-04/26/2017				
1	4/26/2017	DAS	Environmental Sys Corp	90611	8816	2613
2	4/26/2017	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460007
3	4/26/2017	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460051
4	4/26/2017	Zero air pump	Werther International	none	PC70/4	000665785

Mfg	Se	erial N	umber Ta	Site	Те	chnician		Site Visit	Date Pa	arame	ter	Owner II)
ThermoElect	ron Inc	M0846	60007	CHA467	Ma	artin Valv	ur	04/26/20	17 O:	zone		none	
Slope: Intercept CorrCoff	Intercept -1.19028 Intercept		0.00000	0	Mfg Serial N Tfer ID	umber	ThermoEl 49CPS-70			rameter er Desc.	ozone Ozone primary	stan	
DAS 1: A Avg % Di 6.4		x % D i 9.5%		Dif A Max	% Di	Slope Cert Da	te	·	1.00466 /1/2017	Inter Corr	•	0.012	
UseDesc	ription	Co	oncGroup	Tfer Raw	Tfer	Corr	Si	te	Site U	nit	Pct	Difference	
prim	ary		1	0.49	0.4	17	-0.	47 p	pb				
prim	ary		2	16.12	16.		14	1	pb			-9.54%	
prim	•		3	38.78	38.		35	1	pb			-7.91%	
prim	•		4	75.59	75.		72	1	pb		_	-4.19%	
prim			5	108.36	107		103	5.50 p	pb			-4.02%	
Sensor Co	mponent	Sampl	e Train		Conditio	Good			S	tatus	pass		
Sensor Co	mponent	22.5 d	egree rule		Conditio	n			S	tatus	pass		
Sensor Co	mponent	Inlet F	ilter Conditio	n	Condition Clean				S	tatus	pass]
Sensor Co	mponent	Batter	y Backup		Conditio	lition N/A			S	tatus	pass]
Sensor Co	mponent	Offset			Conditio	n 0.4			S	tatus	pass]
Sensor Co	mponent	Span			Conditio	Condition 1.039				tatus	pass]
Sensor Co	mponent	Zero V	/oltage		Conditio	Condition -0.1439				tatus	pass]
Sensor Co	mponent	Fullsca	ale Voltage		Conditio	n 1.000			S	tatus	pass]
Sensor Co	mponent	Cell A	Freq.		Conditio	n 87.6 k	Hz		S	tatus	pass]
Sensor Co	mponent	Cell A	Noise		Conditio	n 0.6 pp	b		S	tatus	pass]
Sensor Co	mponent	Cell A	Flow		Conditio	n 0.72 lj	om		S	tatus	pass]
Sensor Co	mponent	Cell A	Pressure		Conditio	n 625.4	mmHg		S	tatus	pass]
Sensor Co	mponent	Cell A	Tmp.		Conditio	on 37.2 ()		S	tatus	pass]
Sensor Co	mponent	Cell B	Freq.		Conditio	n 89.1 k	Hz		S	tatus	pass]
Sensor Co	mponent	Cell B	Noise		Conditio	n 0.4 pp	b		S	tatus	pass]
Sensor Co	mponent	Cell B	Flow		Conditio	n 0.69 l	om		S	tatus	pass]
Sensor Co	mponent	Cell B	Pressure		Conditio	n 625.1	mmHg		S	tatus	pass		
Sensor Co	mponent	Cell B	Tmp.		Conditio	on			S	tatus	pass		
Sensor Co	mponent	Line L	oss		Conditio	Not te	sted		S	tatus	pass]
Sensor Co	Sensor Component System Memo			Conditio	lition			S	tatus	pass]	

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
GRC	474-Martii	n Valvur-04/28/2017				
1	4/28/2017	DAS	Environmental Sys Corp	90602	8816	2270
2	4/28/2017	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943902
3	4/28/2017	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450191
4	4/28/2017	Zero air pump	Werther International	none	PC70/4	531380

Mfg	Serial Number Ta	Site	Те	chnician		Site Visit Da	te Paramo	eter Owner ID
ThermoElectron Inc	1023943902	GRC474	М	artin Valv	ur	04/28/2017	Ozone	none
Slope:0.96858Slope:Intercept0.24999InterceptCorrCoff0.99991CorrCoff		0.00000 0.00000 0.00000		Mfg Serial Number Tfer ID		ThermoElectr 49CPS-70008 01110		arameter ozone
DAS 1: A Avg % Diff: A M 3.4%	DAS 2: ax % Di A Avg % 4.2%	6Dif A Max 9	% Di	Slope Cert Da	te	1.00		rcept 0.01298 rCoff 1.00000
UseDescription	ConcGroup	Tfer Raw	Tfer	Corr	Si	te	Site Unit	PctDifference
primary	1	0.26	0.1		1.	22 ppb		
primary	2	17.36	-	.26		.62 ppb		-3.71%
primary	3	38.37	38.			.55 ppb		-4.24%
primary	4	78.19	105		75	11		-2.90%
primary	5	106.03		5.52		2.80 ppb		-2.58%
Sensor Componen	t Sample Train		Condition	on Good			Status	pass
Sensor Componen	t 22.5 degree rule		Conditio	on			Status	pass
Sensor Componen	t Inlet Filter Condition	n	Condition Clean				Status	pass
Sensor Componen	t Battery Backup		Conditio	on N/A			Status	pass
Sensor Componen	t Offset		Conditio	on -0.1			Status	pass
Sensor Componen	t Span		Condition 1.003				Status	pass
Sensor Componen	t Zero Voltage		Condition 0.0455				Status	pass
Sensor Componen	t Fullscale Voltage		Conditio	on 1.000			Status	pass
Sensor Componen	t Cell A Freq.		Conditio	on 99.1 k	Hz		Status	pass
Sensor Componen	t Cell A Noise		Conditio	on 0.9 pp	b		Status	pass
Sensor Componen	t Cell A Flow		Conditi	on 0.56 l	om		Status	pass
Sensor Componen	t Cell A Pressure		Conditio	on 585.1	mmHg		Status	pass
Sensor Componen	t Cell A Tmp.		Conditio	on 33.7 ()		Status	pass
Sensor Componen	t Cell B Freq.		Conditio	<mark>on</mark> 85.6 k	Hz		Status	pass
Sensor Componen	t Cell B Noise		Conditio	<mark>on</mark> 0.9 pp	b		Status	pass
Sensor Componen	t Cell B Flow		Conditio	on 0.59 l	om		Status	pass
Sensor Componen	t Cell B Pressure		Conditio	on 584.8	mmHg		Status	pass
Sensor Componen	t Cell B Tmp.		Conditio	on			Status	pass
Sensor Componen	t Line Loss		Conditio	on Not te	sted		Status	pass
Sensor Componen	Sensor Component System Memo		Condition	ndition			Status	pass

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CAN	407-Martii	n Valvur-05/01/2017				
1	5/1/2017	DAS	Environmental Sys Corp	09638	8816	2523
2	5/1/2017	Ozone	ThermoElectron Inc	none	49i A3NAA	1030745086
3	5/1/2017	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1030745084
4	5/1/2017	Zero air pump	Twin Tower Engineering	90721	TT70/E4	526297

Mfg	Se	erial Number Ta	a Site	Те	chnician		Site Visit Date	Parame	eter Owner ID
ThermoElec	ctron Inc 1	030745086	CAN407	M	artin Valv	ur	05/01/2017	Ozone	none
Slope: Intercept CorrCoff	Intercept 0.03773 Intercept			0	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~		ThermoElectron 49CPS-70008-3 01110		er Desc. Ozone primary stan
DAS 1: A Avg % I	Diff: A Ma:	DAS 2 x % Di A Avg 1.3%		% Di	Slope Cert Da	ıte	1.004		ccept 0.01298 Coff 1.00000
UseDes	scription	ConcGroup	Tfer Raw	Tfer	Corr	Si	te Si	te Unit	PctDifference
prir	nary	1	0.36	0.3			64 ppb		
prir	nary	2	16.40	16.			.10 ppb		-1.29%
	nary	3	36.13	35.			.49 ppb		-1.25%
-	nary	4	73.28	72.			.99 ppb		-1.28%
	nary	5	110.00	109			8.70 ppb		-0.70%
Sensor C	omponent	Sample Train		Conditio	on Good			Status	pass
Sensor C	omponent	22.5 degree rule		Conditio	on			Status	pass
Sensor C	omponent	Inlet Filter Cond	tion	Condition Clean				Status	pass
Sensor C	omponent	Battery Backup		Conditio	on N/A			Status	pass
Sensor C	omponent	Offset		Conditio	on -0.2			Status	pass
Sensor C	omponent	Span		Condition 1.008				Status	pass
Sensor C	omponent	Zero Voltage		Condition 0.0682				Status	pass
Sensor C	omponent	Fullscale Voltag	e	Conditio	on 1.000			Status	pass
Sensor C	omponent	Cell A Freq.		Conditio	on 71.2 k	κHz		Status	pass
Sensor C	omponent	Cell A Noise		Conditio	on 0.7 pp	b		Status	pass
Sensor C	omponent	Cell A Flow		Conditio	on 0.70 l	pm		Status	pass
Sensor C	omponent	Cell A Pressure		Conditio	on 602.0	mmHg		Status	pass
Sensor C	omponent	Cell A Tmp.		Conditio	on 36.4 (2		Status	pass
Sensor C	omponent	Cell B Freq.		Conditio	on 80.6 k	κHz		Status	pass
Sensor C	omponent	Cell B Noise		Conditio	0.9 pp	b		Status	pass
Sensor C	omponent	Cell B Flow		Conditio	on 0.69 l	pm		Status	pass
Sensor C	omponent	Cell B Pressure		Conditio	on 602.0	mmHg		Status	pass
Sensor C	omponent	Cell B Tmp.		Conditio	on			Status	pass
Sensor C	omponent	Line Loss		Conditio	on Not te	sted		Status	pass
Sensor C	Sensor Component System Memo		Conditio	lition			Status	pass	

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number	
GRB411-Martin Valvur-06/08/2017							
1	6/8/2017	DAS	Environmental Sys Corp	90635	8816	2507	
2	6/8/2017	Ozone	ThermoElectron Inc	90565	49C	49C-59285-322	
3	6/8/2017	Ozone Standard	ThermoElectron Inc	none	49C	0330302753	
4	6/8/2017	Zero air pump	Werther International	90722	TT70/4E	507782	

Mfg	Serial Number Ta	Site	Те	chnician		Site Visit Date	e Parame	eter Owner ID	
ThermoElectron Inc	GRB411	Martin Valvur		06/08/2017 Ozo		90565			
Intercept	D.98090 Slope: D.47139 Intercept D.999997 CorrCoff	0.00000	0	Mfg Serial N Tfer ID		ThermoElectro 49CPS-70008- 01110		er Desc. Ozone primary stan	
DAS 1: A Avg % Diff: A N 3.9%	% Di	Di Slope 1.004 Cert Date 1/1/20			P				
UseDescription	ConcGroup	Tfer Raw	Tfer	Corr	Si	te S	ite Unit	PctDifference	
primary	1	0.40				33 ppb			
primary	2	16.35				.05 ppb		-7.44%	
primary	3	37.13		.94	1 .			-3.06%	
primary	4	75.08	74			.54 ppb		-2.90%	
primary	5	113.76	113			0.80 ppb	1	-2.13%	
Sensor Compone	nt Sample Train		Condition	on Good			Status	pass	
Sensor Compone	nt 22.5 degree rule		Conditio	on			Status	pass	
Sensor Compone	nt Inlet Filter Condition	on	Conditio	on Clean			Status	pass	
Sensor Compone	nt Battery Backup	Battery Backup		Condition N/A			Status	pass	
Sensor Compone	nt Offset	Offset		Condition -0.2			Status	pass	
Sensor Compone	nt Span	Span		Condition 0.993			Status	pass	
Sensor Compone			Condition 0.1821				Status	pass	
Sensor Compone	Fullscale Voltage		Condition 1.000				Status	pass	
Sensor Compone				Condition 95.1 kHz			Status		
Sensor Compone		Cell A Noise		Condition 0.4 ppb			Status		
Sensor Compone				on 0.70 l	om	Status		pass	
	nt Cell A Pressure			Condition 579.4 mmHg			Status		
Sensor Compone	nt Cell A Tmp.		-	on 38.9 (Status		
Sensor Compone				dition 84.4 kHz			Status		
Sensor Compone				ndition 0.6 ppb		Status			
Sensor Compone				ion 0.64 lpm		Status			
	nt Cell B Pressure			ion 578.9 mmHg			Status		
Sensor Compone	nt Cell B Tmp.	Cell B Tmp.		ion			Status	pass	
Sensor Compone	nt Line Loss		Conditio	on Not te	sted		Status	pass	
Sensor Compone	nt System Memo	System Memo		tion			Status	pass	