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

EPA Contract No. EPW12019

Prepared for:

U. S. Environmental Protection Agency

Prepared by:

environmental engineering
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June 2017

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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.

Table 1. Performance Audit Challenge and Acceptance Criteria

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Precipitation	Response	10 manual tips	1 DAS count per tip
Precipitation	Accuracy	2 introductions of known amounts of water	≤ ±10.0% of input amount
Relative Humidity	Accuracy	Compared to reference instrument or standard solution	≤ ±10.0% RH
Solar Radiation	Accuracy	Compared to WRR traceable standard	≤ ±10.0% of daytime average
Surface Wetness	Response	Distilled water spray mist	Positive response
Surface Wetness	Sensitivity	1% decade resistance	N/A
Temperature	Accuracy	Comparison to 3 NIST measured baths (~ 0° C, ambient, ~ full-scale)	≤ ± 0.5° C
Temperature Difference	Accuracy	Comparison to station temperature sensor	≤ ± 0.50° C
Shelter Temperature	Accuracy	Comparison to station temperature sensor	≤ ± 2.0° C
Wind Direction	Orientation Accuracy	Parallel to alignment rod/crossarm, or sighted to distant point	≤ ±5° from degrees true
Wind Direction	Linearity	Eight cardinal points on test fixture	≤ ±5° mean absolute error
Wind Direction	Response Threshold	Starting torque tested with torque gauge	< 10 g-cm Climatronics; < 20 g-cm R.M. Young
Wind Speed	Accuracy	Shaft rotational speed generated and measured with certified synchronous motor	≤ ±0.5 mps below 5.0 mps input; ≤ ±5.0% of input at or above 5.0 mps
Wind Speed	Starting Threshold	Starting torque tested with torque gauge	< 0.5 g-cm

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Mass Flow Controller	Flow Rate	Comparison with Primary Standard	≤ ± 5.0% of designated rate
Ozone	Slope	Linear regression of multi-point test gas concentration as measured with a certified transfer standard	0.9000 ≤ m ≤ 1.1000
Ozone	Intercept		-5.0 ppb ≤ b ≤ 5.0 ppb
Ozone	Correlation Coefficient		0.9950 ≤ r
Ozone	Percent Difference	Comparison with Level 2 standard concentration	≤ ±10.0% of test gas concentration
DAS	Accuracy	Comparison with certified standard	≤ ± 0.003 VDC

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

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

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

1.3 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.

Table 2. Site Audit Visits

Side ID	Audit Type	Sponsor	Site Visit Date	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

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).

Table 3. TTP Pollutant PE Visits

Side ID	PE Audit Type	Sponsor	Site Visit Date	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

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.

Table 4. Sites Surveyed – Second Quarter 2017

Side ID	Network	Visit Date	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

Side ID	Network	Visit Date	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 Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
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	B	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 Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	KNZ184	Martin Valvur	04/04/2017	Flow Rate	000849

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00153	**Intercept**	0.00366
Cert Date	1/25/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0
2.18%	2.29%			**Cal Factor Full Scale**	0
				Rotometer Reading:	0

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	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 Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**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**	6.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	360 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	6700	KNZ184	Martin Valvur	04/04/2017	Temperature	04686

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	1.00006	**Intercept**	0.03191
Cert Date	1/23/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.04	0.06		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.03	0.00	0.000	-0.1	C	-0.06
primary	Temp Mid Range	23.54	23.51	0.000	23.5	C	0.01
primary	Temp High Range	48.24	48.21	0.000	48.2	C	-0.06

Sensor Component	Shield	**Condition**	Clean	**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	Parameter	Owner ID
Campbell	none	KNZ184	Martin Valvur	04/04/2017	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.51	1.43		

Mfg	Fluke	Parameter	Shelter Temperatur
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00006	Intercept	0.03191
Cert Date	1/23/2017	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	C	-0.02
primary	Temp Mid Range	25.01	24.98	0.000	26.4	C	1.43
primary	Temp Mid Range	25.12	25.09	0.000	25.2	C	0.09

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	KNZ184	Technician	Martin Valvur	Site Visit Date	04/04/2017

Shelter Make	Shelter Model	Shelter Size
Wells Cargo	EW1211 (s/n 1WC200E1623048028)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	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.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	KNZ184	**Technician**	Martin Valvur	**Site Visit Date**	04/04/2017

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		
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** ☑	

Present

Shelter Working Room	☑	**Make**	Wells Cargo	**Model**	EW1211 (s/n 1WC20	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is very clean, neat, well organized and well maintained. The shelter floor is beginning to deteriorate.				
Site OK	☑	**Notes**					

Driving Directions From Manhattan take route 177 south. At the east edge of town, immediately after crossing the Kansas river, turn right onto CR901 (McDowell Creek Road). Continue approximately 6.2 miles and turn left into the Konza Prairie Biological Station. The site is through the gate and up the hill past the three-story stone farm house.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID KNZ184 **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		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

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

Field Systems Data Form

F-02058-1500-S3-rev002

Site 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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	KNZ184	Technician	Martin Valvur	Site Visit Date	04/04/2017

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID KNZ184 **Technician** Martin Valvur **Site Visit Date** 04/04/2017

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	N/A
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	N/A
3	Describe ozone sample tube.		N/A
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID KNZ184 **Technician** Martin Valvur **Site Visit Date** 04/04/2017

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID KNZ184 **Technician** Martin Valvur **Site Visit Date** 04/04/2017

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	KNZ184	Technician	Martin Valvur	Site Visit Date	04/04/2017

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID KNZ184 **Technician** Martin Valvur **Site Visit Date** 04/04/2017

Site operation procedures

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

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

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

Field Systems Data Form F-02058-1500-S10-rev002

Site ID KNZ184 **Technician** Martin Valvur **Site Visit Date** 04/04/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	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	B	none	missing
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	6700	04686

Site Inventory by Site Visit

	Site Visit 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	B	none
6	4/5/2017	Temperature	RM Young	06112	41342	10176

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	KIC003	Martin Valvur	04/05/2017	Flow Rate	000668

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00153	**Intercept**	0.00366
Cert Date	1/25/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0
0.55%	0.67%			**Cal Factor Full Scale**	0
				Rotometer Reading:	0

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	-0.01	l/m	l/m	
primary	test pt 1	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 Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**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**	6.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	10176	KIC003	Martin Valvur	04/05/2017	Temperature	06112

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	1.00006	**Intercept**	0.03191
Cert Date	1/23/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.07	0.09		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.07	0.04	0.000	0.1	C	0.05
primary	Temp Mid Range	22.83	22.80	0.000	22.9	C	0.06
primary	Temp High Range	47.61	47.58	0.000	47.7	C	0.09

Sensor Component	Shield	**Condition**	Clean	**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

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.

Field Systems Data Form

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		
Zip Code	66527		
Time Zone	Central		
Primary Operator			
Primary Op. Phone #			
Primary Op. E-mail			
Backup Operator			
Backup Op. Phone #			
Backup Op. E-mail			

	Present		
Fire Extinguisher	☐		
First Aid Kit	☑		
Safety Glasses	☑		
Safety Hard Hat	☑		
Climbing Belt	☐		
Security Fence	☑		
Secure Shelter	☐		
Stable Entry Step	☐		

Shelter Working Room ☐ **Make** **Model** **Shelter Size**

Shelter Clean ☐ **Notes** Small footprint site with no shelter.

Site OK ☑ **Notes**

Driving Directions

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID KIC003 **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.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID 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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	KIC003	Technician	Martin Valvur	Site Visit Date	04/05/2017

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID KIC003 **Technician** Martin Valvur **Site Visit Date** 04/05/2017

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID KIC003 **Technician** Martin Valvur **Site Visit Date** 04/05/2017

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	KIC003	Technician	Martin Valvur	Site Visit Date	04/05/2017

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Feb 2014	☑
HASP	☑	Feb 2014	☑
Field Ops Manual	☐		☐
Calibration Reports	☐		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	KIC003	Technician	Martin Valvur	Site Visit Date	04/05/2017

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	KIC003	Technician	Martin Valvur	Site Visit Date	04/05/2017

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings
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, call-in
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, logbook, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

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

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

Field Systems Data Form F-02058-1500-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	B	none	000814
Temperature	RM Young	41342	10176	06112

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
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	Apex	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 Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2530	CAD150	Sandy Grenville	04/06/2017	DAS	Primary

Das Date: 4 /6 /2017
Das Time: 13:35:01
Das Day: 96

Audit Date 4 /6 /2017
Audit Time 13:35:00
Audit Day 96

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

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/23/2017	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0998	0.0999	V	V	0.0001
7	0.3000	0.2997	0.2998	V	V	0.0001
7	0.5000	0.4995	0.4996	V	V	0.0001
7	0.7000	0.6994	0.6996	V	V	0.0002
7	0.9000	0.8993	0.8995	V	V	0.0002
7	1.0000	0.9992	0.9993	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	CAD150	Sandy Grenville	04/06/2017	Flow Rate	000597

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.03
0.66%	0.66%			**Cal Factor Full Scale**	1.02
				Rotometer Reading:	1.45

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.04	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.00	l/m	l/m	
primary	test pt 1	1.515	1.510	1.49	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 2	1.516	1.510	1.49	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 3	1.515	1.510	1.49	0.000	1.50	l/m	l/m	-0.66%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**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**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241792	CAD150	Sandy Grenville	04/06/2017	Ozone	000624

Slope:	0.99828	**Slope:**	0.00000
Intercept	0.38094	**Intercept**	0.00000
CorrCoff	0.99973	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00250	**Intercept**	0.45870
Cert Date	3/21/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.4%	1.9%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.09	-0.36	0.66	ppb	
primary	2	14.99	14.49	14.63	ppb	0.97%
primary	3	35.05	34.50	34.99	ppb	1.42%
primary	4	72.05	71.41	70.03	ppb	-1.93%
primary	5	110.10	109.36	110.60	ppb	1.13%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.20	pass
Span	1.037	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	114.1 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.74 lpm	pass
Cell A Pressure	741.1 mmHg	pass
Cell A Tmp.	33.5 C	pass
Cell B Freq.	100.6 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.77 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	9699	CAD150	Sandy Grenville	04/06/2017	Temperature	04682

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00759	**Intercept**	0.14754
Cert Date	2/4/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.08	0.16		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.17	0.02	0.000	0.0	C	0
primary	Temp Mid Range	25.70	25.36	0.000	25.2	C	-0.16
primary	Temp High Range	49.63	49.11	0.000	49.0	C	-0.09

Sensor Component	Shield	**Condition**	Moderately clean	**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	Parameter	Owner ID
Campbell	none	CAD150	Sandy Grenville	04/06/2017	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.22	0.58		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00759	Intercept	0.14754
Cert Date	2/4/2017	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	C	-0.58
primary	Temp Mid Range	26.04	25.70	0.000	25.7	C	-0.03
primary	Temp Mid Range	25.23	24.89	0.000	24.9	C	0.04

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	CAD150	Technician	Sandy Grenville	Site Visit Date	04/06/2017

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type A	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**	04/06/2017

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		
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** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter walls have been repaired.				
Site OK	☑	**Notes**					

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

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID CAD150 **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		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m	30m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID CAD150 **Technician** Sandy Grenville **Site Visit Date** 04/06/2017

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID CAD150 **Technician** Sandy Grenville **Site Visit Date** 04/06/2017

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CAD150 **Technician** Sandy Grenville **Site Visit Date** 04/06/2017

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☐	Met sensors only
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☐	Shelter not grounded
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID CAD150 **Technician** Sandy Grenville **Site Visit Date** 04/06/2017

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☐		☐
HASP	☑	2016	☑
Field Ops Manual	☑	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:

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID CAD150 **Technician** Sandy Grenville **Site Visit Date** 04/06/2017

Site operation procedures

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID CAD150 **Technician** Sandy Grenville **Site Visit Date** 04/06/2017

Site operation procedures

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

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

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

Field Systems Data Form F-02058-1500-S10-rev002

Site ID CAD150 **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	Apex	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 Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CDZ171-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	Apex	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	B	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 Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2130	CDZ171	Sandy Grenville	04/07/2017	DAS	Primary

Das Date: 4 /7 /2017 **Audit Date** 4 /7 /2017
Das Time: 18:06:00 **Audit Time** 18:06:00
Das Day: 97 **Audit Day** 97

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

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/23/2017	**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

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	54766	CDZ171	Sandy Grenville	04/07/2017	Flow Rate	000669

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0
1.32%	1.32%			**Cal Factor Full Scale**	0.99
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.00	l/m	l/m	
primary	test pt 1	1.524	1.520	1.52	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 2	1.523	1.520	1.52	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 3	1.524	1.520	1.52	0.000	1.50	l/m	l/m	-1.32%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**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
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347320	CDZ171	Sandy Grenville	04/07/2017	Ozone	000727

Slope:	0.98660	**Slope:**	0.00000
Intercept	0.60180	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00250	**Intercept**	0.45870
Cert Date	3/21/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.3%	3.6%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.01	-0.44	0.24	ppb	
primary	2	15.29	14.79	15.32	ppb	3.58%
primary	3	35.02	34.47	34.29	ppb	-0.52%
primary	4	72.19	71.55	71.30	ppb	-0.35%
primary	5	110.09	109.35	108.50	ppb	-0.78%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.000	pass
Span	1.007	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	91.9 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	719.7 mmHg	pass
Cell A Tmp.	31.4 C	pass
Cell B Freq.	92.0 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.74 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14036	CDZ171	Sandy Grenville	04/07/2017	Temperature	06403

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00759	**Intercept**	0.14754
Cert Date	2/4/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.09	0.15		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.13	-0.02	0.000	0.1	C	0.15
primary	Temp Mid Range	26.69	26.34	0.000	26.4	C	0.04
primary	Temp High Range	48.85	48.34	0.000	48.3	C	-0.09

Sensor Component	Shield	**Condition**	Moderately clean	**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	Parameter	Owner ID
Campbell	none	CDZ171	Sandy Grenville	04/07/2017	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.21	0.38		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00759	Intercept	0.14754
Cert Date	2/4/2017	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	C	-0.19
primary	Temp Mid Range	21.69	21.38	0.000	21.4	C	0.06
primary	Temp Mid Range	22.37	22.06	0.000	21.7	C	-0.38

Sensor Component	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		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	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 Systems Data Form

F-02058-1500-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 Measurement	dry	**QAPP Longitude**	-87.8500
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	189
Terrain	gently rolling	**QAPP Declination**	-2.01
Conforms to MLM	Yes	**QAPP Declination Date**	2/23/2006
Site Telephone	(270) 522-9373	**Audit Latitude**	36.784053
Site Address 1	4560 Old Dover Road	**Audit Longitude**	-87.85015
Site Address 2	route 1175	**Audit Elevation**	190
County	Trigg	**Audit Declination**	-2.7
City, State	Cadiz, KY		
Zip Code	42211	**Fire Extinguisher** ☑	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** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter floor is beginning to rot again by the door. The shelter is still cluttered and dirty.				
Site OK	☑	**Notes**					

Driving Directions

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

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID CDZ171 **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		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m	15 m	☐
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

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

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CDZ171	Technician	Sandy Grenville	Site Visit Date	04/07/2017

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?	☐	SE
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

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

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

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID CDZ171 **Technician** Sandy Grenville **Site Visit Date** 04/07/2017

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CDZ171 **Technician** Sandy Grenville **Site Visit Date** 04/07/2017

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID CDZ171 **Technician** Sandy Grenville **Site Visit Date** 04/07/2017

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2014	☑
HASP	☑	2016	☑
Field Ops Manual	☑	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:

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	CDZ171	Technician	Sandy Grenville	Site Visit Date	04/07/2017

Site operation procedures

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	CDZ171	Technician	Sandy Grenville	Site Visit Date	04/07/2017

Site operation procedures

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

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

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

Field Systems Data Form F-02058-1500-S10-rev002

Site ID CDZ171 **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	Apex	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	B	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*
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	B	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	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	A0382	CHE185	Eric Hebert	05/09/2017	DAS	Primary

Das Date: 5 /10/2017
Das Time: 9:30:00
Das Day: 130

Audit Date 5 /10/2017
Audit Time 9:30:01
Audit Day 130

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0004	0.0004	0.0004	0.0004

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/23/2017	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
6	0.0000	0.0000	-0.0004	V	V	-0.0004
6	0.1000	0.1000	0.0996	V	V	-0.0004
6	0.3000	0.2999	0.2996	V	V	-0.0003
6	0.5000	0.4999	0.4995	V	V	-0.0004
6	0.7000	0.6998	0.6995	V	V	-0.0003
6	0.9000	0.8998	0.8994	V	V	-0.0004
6	1.0000	0.9999	0.9995	V	V	-0.0004

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	116	CHE185	Eric Hebert	05/09/2017	Flow Rate	000641

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00732	**Intercept**	-0.02202
Cert Date	3/8/2017	**CorrCoff**	0.99970

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0
2.51%	2.79%			**Cal Factor Full Scale**	5.011
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	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 Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Fair	**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**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Monitor Labs, Inc.	191	CHE185	Eric Hebert	05/09/2017	Ozone	54901

Slope:	1.02420	**Slope:**	0.00000
Intercept	7.38922	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00560	**Intercept**	0.06720
Cert Date	3/21/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
23.2%	47.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.38	0.31	7.66	ppb	
primary	2	16.17	16.01	23.54	ppb	47.03%
primary	3	36.14	35.87	44.60	ppb	24.34%
primary	4	72.76	72.28	81.24	ppb	12.40%
primary	5	111.92	111.22	121.30	ppb	9.06%

Sensor Component	Condition	Status
Sample Train	Fair	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset		pass
Span	1.002	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	N/A	pass
Cell A Noise	N/A	pass
Cell A Flow	0.5 lpm	pass
Cell A Pressure	707.5 mmHg	pass
Cell A Tmp.	35.1 C	pass
Cell B Freq.	N/A	pass
Cell B Noise	N/A	pass
Cell B Flow	N/A	pass
Cell B Pressure	N/A	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	58321wsp	CHE185	Eric Hebert	05/09/2017	Wind Speed	04865

Mfg	RM Young	**Parameter**	wind speed
Serial Number		**Tfer Desc.**	wind speed motor (h
Tfer ID	01262		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/26/2017	**CorrCoff**	1.00000

Prop or Cups SN 50202
Prop or Cups Torque 0.3 **to** 0.3
Prop Correction Fact .0049

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.07	2.42%		
Abs Max Er	0.20	2.55%		

UseDescription:	Input Device	Input RPM	Input 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%		
primary	01262	2400	11.76	0.0	11.5	-2.38%		
primary	01262	4000	19.60	0.0	19.1	-2.55%		
primary	01262	9400	46.06	0.0	44.9	-2.52%		

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

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**	wind direction
Serial Number	None	**Tfer Desc.**	wind direction wheel
Tfer ID	01458		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/1/2017	**CorrCoff**	1.00000

Mfg	Ushikata	**Parameter**	wind direction
Serial Number	191832	**Tfer Desc.**	transit
Tfer ID	01272		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/8/2017	**CorrCoff**	1.00000

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

VaneTorque 12 **to** 14 180

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: 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	☑	0.000	133	2	46	1
primary	01458	180	☑	0.000	177	3	44	-1
primary	01458	225	☑	0.000	222	3	45	0
primary	01458	270	☑	0.000	266	4	44	-1
primary	01458	315	☑	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		9

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

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	9682	CHE185	Eric Hebert	05/09/2017	Temperature	05047

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00656	**Intercept**	-0.03341
Cert Date	2/4/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.11	0.16		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.12	0.15	0.000	0.27	C	0.12
primary	Temp Mid Range	24.52	24.39	0.000	24.33	C	-0.06
primary	Temp High Range	44.27	44.01	0.000	43.85	C	-0.16

Sensor Component	Shield	**Condition**	Dirty	**Status**	Fail
Sensor Component	Blower	**Condition**	Functioning	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	12791	CHE185	Eric Hebert	05/09/2017	Temperature2meter	06244

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00656	**Intercept**	-0.03341
Cert Date	2/4/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.12	0.23		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.12	0.15	0.000	0.38	C	0.23
primary	Temp Mid Rang	24.52	24.39	0.000	24.41	C	0.02
primary	Temp High Rang	44.27	44.01	0.000	44.12	C	0.11

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Rotronic	55606	CHE185	Eric Hebert	05/09/2017	Relative Humidity	04200

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	124432	**Tfer Desc.**	Hygroclip
Tfer ID	01225		
Slope	0.99440	**Intercept**	0.38390
Cert Date	1/23/2017	**CorrCoff**	0.99999

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	1.8			
Abs Max Er	2.3			

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	Hygroclip	32.8	33.1	32.8	0.000	34.3	1.5
primary	RH Low Range	Hygroclip	52.9	54.8	52.9	0.000	51.2	-1.7
primary	RH Low Range	Hygroclip	75.3	69.7	75.3	0.000	77.6	2.3

Sensor Component	RH Filter	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Shield	**Condition**	Moderately clean	**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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY61006	CHE185	Eric Hebert	05/09/2017	Solar Radiation	06532

Mfg	RM Young	
SN/Owner ID	none	06615
Parameter	Solar Radiation Translator	

Mfg	Eppley	**Parameter**	solar radiation	
Serial Number	10765	**Tfer Desc.**	SR transfer translat	
Tfer ID	01246			
Slope	1.00000	**Intercept**	0.00000	
Cert Date	2/10/2017	**CorrCoff**	1.00000	
Mfg	Eppley	**Parameter**	solar radiation	
Serial Number	34341F3	**Tfer Desc.**	SR transfer sensor	
Tfer ID	01245			
Slope	1.00000	**Intercept**	0.00000	
Cert Date	2/10/2017	**CorrCoff**	1.00000	

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
0.6%	0.2%	0.0%	0.0%

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	5/10/2017	10:00	778	778	780	0.2%
primary	5/10/2017	11:00	750	750	748	-0.3%
primary	5/10/2017	12:00	748	748	753	0.6%
primary	5/10/2017	13:00	656	656	662	0.9%
primary	5/10/2017	14:00	411	411	420	2.1%

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

Surface Wetness Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	none	CHE185	Eric Hebert	05/09/2017	Surface Wetness	03335

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

☑ **Manual Test Pass**

UseDescription	Test Type	Tfer kOhms	OutputSignal	DAS eng	OutputSignalEngUni	TferUnits	OutputSignalUnit
primary	wet	N/A	1.044	1.04	V	N/A	V
primary	dry	N/A	0.019	0.02	V	N/A	V

Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	Grid Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Grid Angle	**Condition**	about 45 deg	**Status**	pass
Sensor Component	Grid Orientation	**Condition**	North	**Status**	pass
Sensor Component	Grid Condition	**Condition**	Poor	**Status**	Fail
Sensor Component	Grid Type	**Condition**	Grid without holes	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	CHE185	Eric Hebert	05/09/2017	Precipitation	03372

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
0.0%	0.0%		

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

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

Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Gauge Drain Screen	Condition	Installed	Status	pass
Sensor Component	Funnel Clean	Condition	Clean	Status	pass
Sensor Component	Condition	Condition	Good	Status	pass
Sensor Component	Gauge Screen	Condition	Installed	Status	pass
Sensor Component	Gauge Clean	Condition	Clean	Status	pass
Sensor Component	Level	Condition	Level	Status	pass
Sensor Component	Sensor Heater	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
unknown	015	CHE185	Eric Hebert	05/09/2017	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.56	0.64		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00656	Intercept	-0.03341
Cert Date	2/4/2017	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	C	0.64
primary	Temp Mid Range	23.92	23.80	0.000	24.3	C	0.48

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
CHE185	Eric Hebert	05/09/2017

Shelter Make	Shelter Model	Shelter Size
Shelter One	8128	768 cuft

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	CHE185	Eric Hebert	05/09/2017	System Memo	Monitor Labs, I	1183	☐	☐
The ozone sample train is composed of materials other than the recommended materials which are Teflon and glass only.								
Temperature	CHE185	Eric Hebert	05/09/2017	System Memo	RM Young	4147	☐	☐
Additional details can be found in the hardcopy of the site audit report.								
Wind Direction	CHE185	Eric Hebert	05/09/2017	Alignment	RM Young	1005	☐	☐
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.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CHE185	**Technician**	Eric Hebert	**Site Visit Date**	05/09/2017

Site Sponsor (agency)	EPA	**USGS Map**	Stilwell West
Operating Group	Cherokee Nation OES	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, NOy, ammonia	**QAPP Latitude**	35.7507
Deposition Measurement	dry, Hg, passive ammonia	**QAPP Longitude**	-94.6700
Land Use	agriculture, pasture	**QAPP Elevation Meters**	299
Terrain	rolling	**QAPP Declination**	3.25
Conforms to MLM	Marginally	**QAPP Declination Date**	9/16/2005
Site Telephone	(918) 696-5604	**Audit Latitude**	35.750786
Site Address 1	Cherry Tree	**Audit Longitude**	-94.669789
Site Address 2	Dahlonegah School	**Audit Elevation**	305
County	Adair	**Audit Declination**	2
City, State	Stilwell, OK		**Present**
Zip Code	74960	**Fire Extinguisher**	☑ New in 2015
Time Zone	Central	**First Aid Kit**	☑
Primary Operator		**Safety Glasses**	☑
Primary Op. Phone #		**Safety Hard Hat**	☑
Primary Op. E-mail		**Climbing Belt**	☑
Backup Operator		**Security Fence**	☑
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Step**	☑

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

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

Site OK ☑ **Notes**

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

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID CHE185 **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		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

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

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CHE185	Technician	Eric Hebert	Site Visit Date	05/09/2017

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID CHE185 **Technician** Eric Hebert **Site Visit Date** 05/09/2017

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

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.

Figure 1

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	CHE185	Technician	Eric Hebert	Site Visit Date	05/09/2017

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CHE185 **Technician** Eric Hebert **Site Visit Date** 05/09/2017

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	CHE185	Technician	Eric Hebert	Site Visit Date	05/09/2017

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2011	☑
HASP	☐	Nov 2011	☑
Field Ops Manual	☐		☐
Calibration Reports	☐		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	CHE185	Technician	Eric Hebert	Site Visit Date	05/09/2017

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID CHE185 **Technician** Eric Hebert **Site Visit Date** 05/09/2017

Site operation procedures

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

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

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

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

Field Systems Data Form F-02058-1500-S10-rev002

Site ID CHE185 **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*
CHC432-Martin 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	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	A4871K	CHC432	Martin Valvur	05/10/2017	DAS	Primary

Das Date: 5 /10/2017
Das Time: 9:53:00
Das Day: 130

Audit Date 5 /10/2017
Audit Time 9:56:00
Audit Day 130

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0005	0.0008	0.0005	0.0008

Mfg	HY	**Parameter**	DAS
Serial Number	12010039329	**Tfer Desc.**	Source generator (D
Tfer ID	01322		
Slope	1.00000	**Intercept**	0.00000
Cert Date	6/15/2014	**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	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
9	0.0000	-0.0005	-0.0004	V	V	0.0001
9	0.1000	0.0994	0.1000	V	V	0.0006
9	0.3000	0.2997	0.2996	V	V	-0.0001
9	0.5000	0.4996	0.5000	V	V	0.0004
9	0.7000	0.6996	0.7002	V	V	0.0006
9	0.9000	0.8996	0.9004	V	V	0.0008
9	1.0000	0.9996	1.0003	V	V	0.0007

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460049	CHC432	Martin Valvur	05/10/2017	Ozone	none

Slope:	1.07855	**Slope:**	0.00000
Intercept	-0.05935	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00466	**Intercept**	0.01298
Cert Date	1/1/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
8.1%	8.9%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.50	0.48	0.30	ppb	
primary	2	15.06	14.97	16.30	ppb	8.88%
primary	3	35.04	34.86	37.70	ppb	8.15%
primary	4	71.07	70.72	75.83	ppb	7.23%
primary	5	110.02	109.49	118.20	ppb	7.96%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.2	pass
Span	1.011	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	68.2 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.63 lpm	pass
Cell A Pressure	585.3 mmHg	pass
Cell A Tmp.	37.3 C	pass
Cell B Freq.	87.9 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.62 lpm	pass
Cell B Pressure	585.0 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	54061wsp	CHC432	Martin Valvur	05/10/2017	Wind Speed	90877

Mfg	RM Young	**Parameter**	wind speed
Serial Number		**Tfer Desc.**	wind speed motor (h
Tfer ID	01262		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/26/2017	**CorrCoff**	1.00000

Prop or Cups SN	74592		
Prop or Cups Torque	0.3 **to**	0.3	
Prop Correction Fact	0.0512		

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.05	0.04%		
Abs Max Er	0.20	0.08%		

UseDescription:	Input Device	Input RPM	Input 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	01262	2400	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 Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Prop or Cups Condition	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

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

Vane SN: N/A **C. A. Align. deg. true:**
VaneTorque 9 **to** 9 180

Mfg	RM Young	**Parameter**	wind direction
Serial Number		**Tfer Desc.**	wind direction wheel
Tfer ID	01266		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/1/2006	**CorrCoff**	1.00000

Mfg	Ushikata	**Parameter**	wind direction
Serial Number	190037	**Tfer Desc.**	transit
Tfer ID	01265		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/8/2017	**CorrCoff**	1.00000

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	8.3	1.0		
Abs Max Er	12	2		

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01266	0	☑	0.0000	352	8	43	-2
primary	01266	45	☑	0.0000	39	6	47	2
primary	01266	90	☑	0.0000	85	5	46	1
primary	01266	135	☑	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 Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Mast	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Vane Condition	**Condition**	Good	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	Z1730091	CHC432	Martin Valvur	05/10/2017	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00006	Intercept	0.03191
Cert Date	1/23/2017	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.5	0.59		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Rang	10.70	10.67	0.0000	10.33	C	-0.34
primary	Temp Mid Rang	11.70	11.67	0.0000	11.08	C	-0.59
primary	Temp Mid Rang	11.50	11.47	0.0000	10.90	C	-0.57

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	Z1730091	CHC432	Martin Valvur	05/10/2017	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	75296	**Tfer Desc.**	GTL
Tfer ID	01220		
Slope	0.99780	**Intercept**	0.06850
Cert Date	1/23/2017	**CorrCoff**	0.99994

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	7.6	4.7		
Abs Max Er	8.4	4.7		

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	GTL	32.8	35.3	32.8	0.0000	39.6	6.8
primary	RH Low Range	GTL	52.9	59.0	52.9	0.0000	61.3	8.4
primary	RH High Range	GTL	93.6	93.3	93.6	0.0000	98.3	4.7

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

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Texas Electronics	64172-315	CHC432	Martin Valvur	05/10/2017	Precipitation	none

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
0.0%	0.0%		

Mfg	PMP	Parameter	Precipitation
Serial Number	None	Tfer Desc.	250ml graduate
Tfer ID	01249		
Slope	1.00000	Intercept	0.00000
Cert Date	4/26/2013	CorrCoff	1.00000

UseDesc.	Test type	TferVolume	Iteration	TimePerTip	Eq.Ht	DAS eng	Eq.HtUnit	OSE Unit	TferUnits	PctDifference
primary	test 1	231.5	1	8 sec	3.70	3.70	mm	mm	ml	0.0%

Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Gauge Drain Screen	Condition	Installed	Status	pass
Sensor Component	Funnel Clean	Condition	Clean	Status	pass
Sensor Component	Condition	Condition	Good	Status	pass
Sensor Component	Gauge Screen	Condition	Installed	Status	pass
Sensor Component	Gauge Clean	Condition	Clean	Status	pass
Sensor Component	Level	Condition	Level	Status	pass
Sensor Component	Sensor Heater	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	CHC432	Martin Valvur	05/10/2017	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.68	0.82		

Mfg	Fluke	Parameter	Shelter Temperatur
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00006	Intercept	0.03191
Cert Date	1/23/2017	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	C	-0.82
primary	Temp Mid Range	24.47	24.44	0.000	23.7	C	-0.7
primary	Temp Mid Range	24.24	24.21	0.000	23.7	C	-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 Make	Shelter Model	Shelter Size

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	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	Problem
Temperature2meter	CHC432	Martin Valvur	05/10/2017	System Memo	Vaisala	4333	☐	☐

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Dry deposition samples are not collected at this CASTNET site.

2 **Parameter:** SitingCriteriaCom

See maps included as Figures 1 through 3.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CHC432	**Technician**	Martin Valvur	**Site Visit Date**	05/10/2017

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	**Model**	8812	**Shelter Size**	768 cuft
Shelter Clean	☑	**Notes**					
Site OK	☑	**Notes**					

Driving Directions From highway 550 take county road 7950 (dirt road) for 21 miles to the park entrance. Less than one mile from the park entrance look for a gate on the north side of the road. Proceed through the gate for approximately 3 miles on rough dirt road to the top of the mesa.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID CHC432 **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.

Figure 1. One Kilometer Map

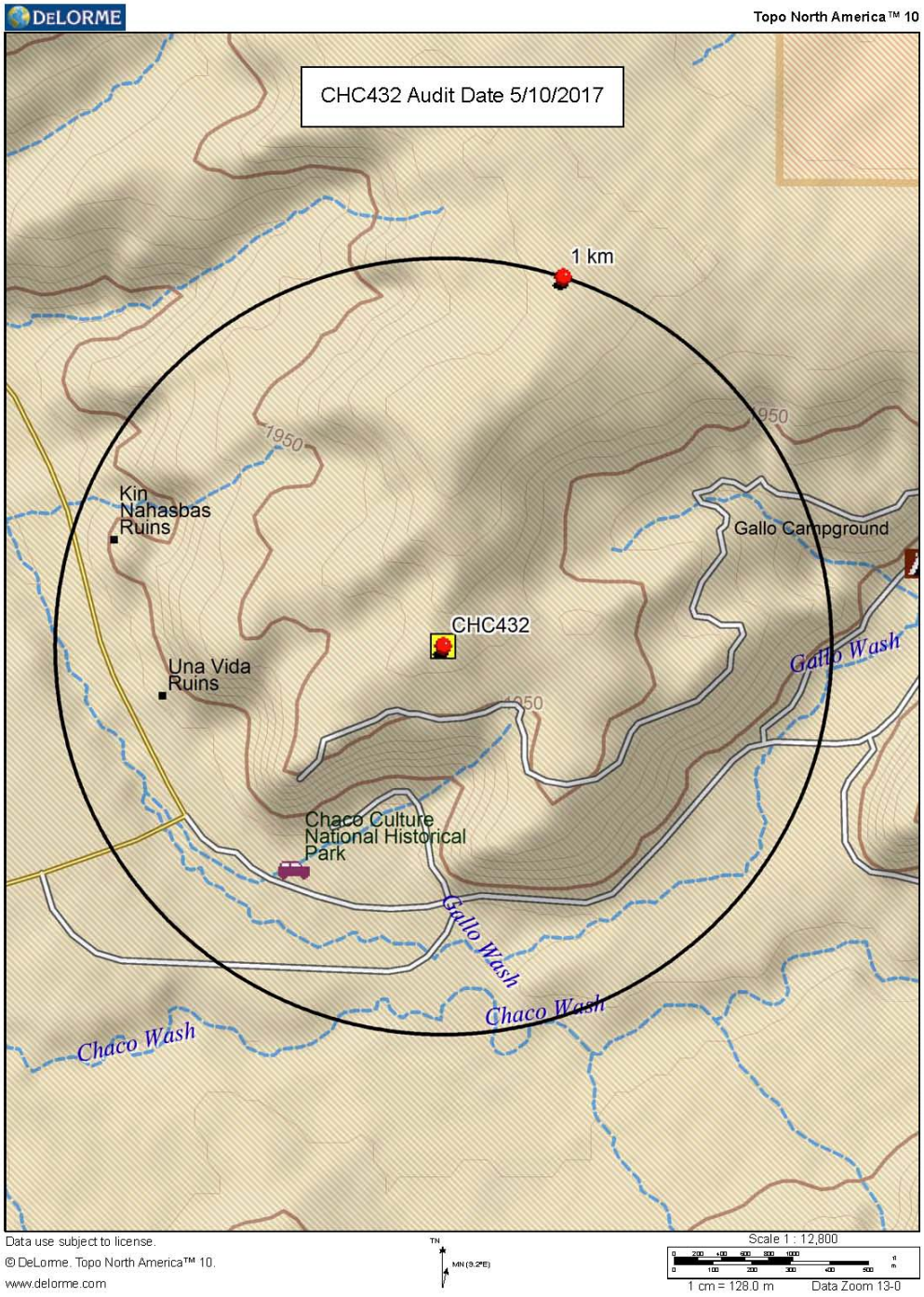


Figure 2. Five Kilometer Map

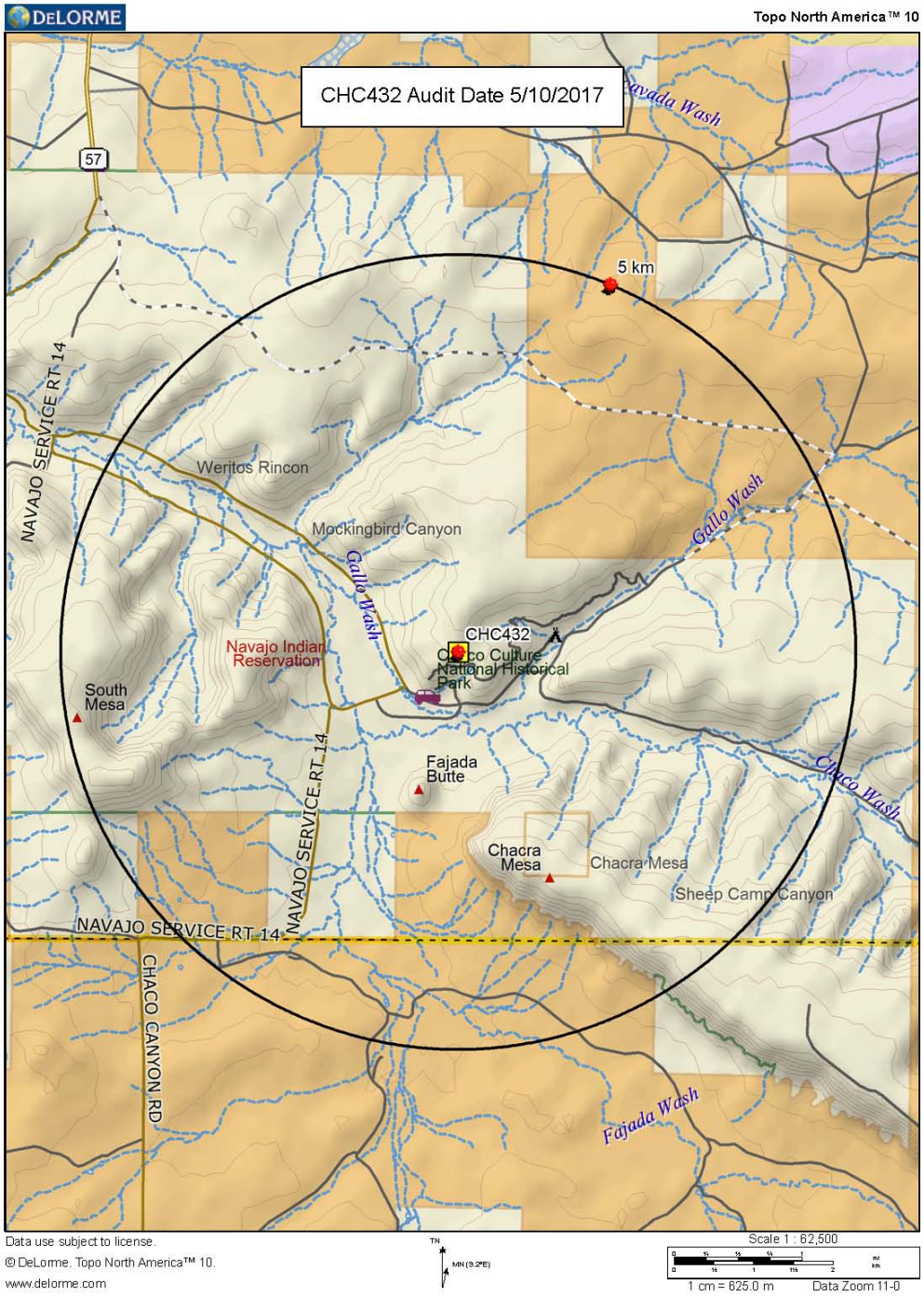
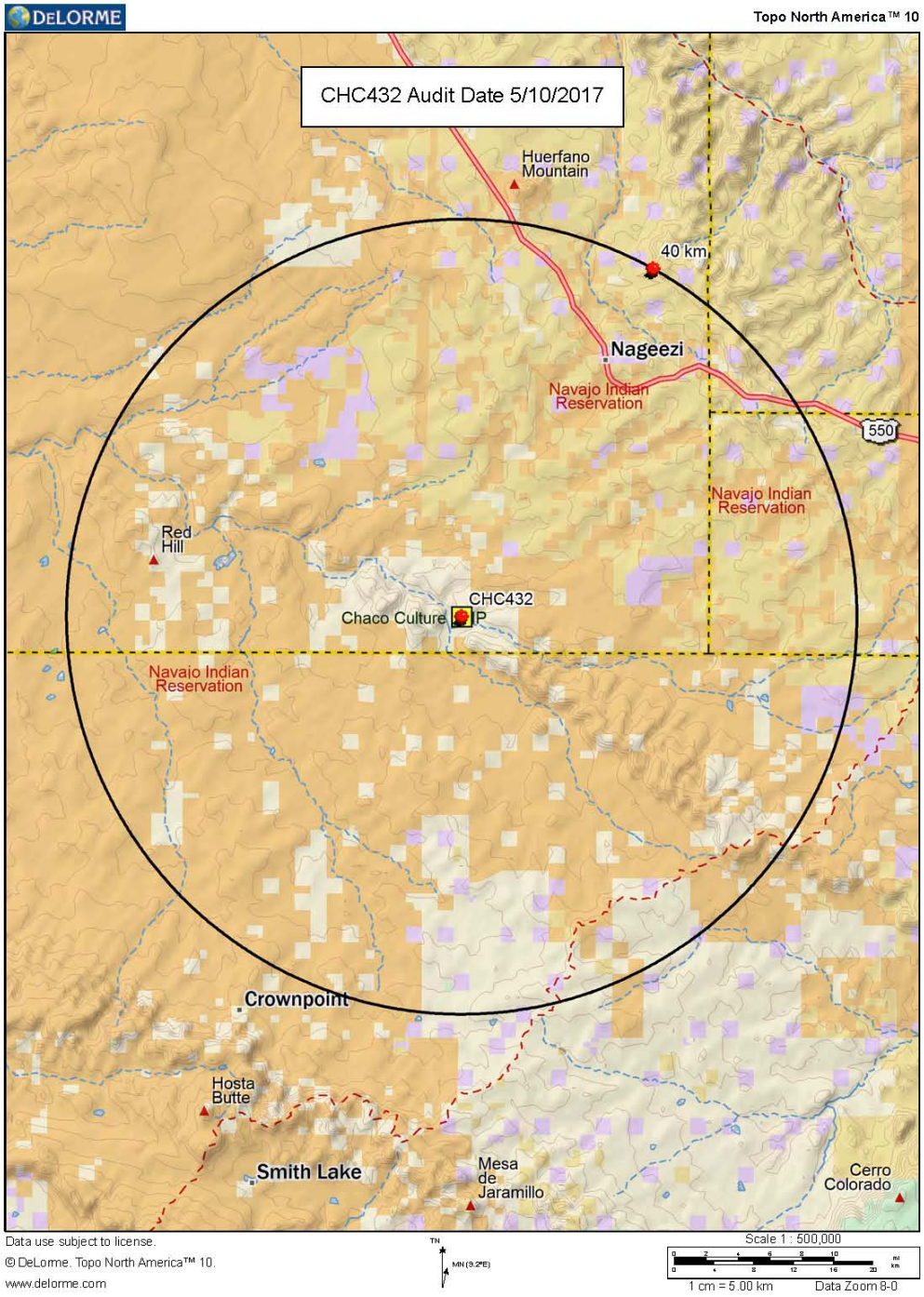


Figure 3. Forty Kilometer Map



Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CHC432	Technician	Martin Valvur	Site Visit Date	05/10/2017

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID CHC432 **Technician** Martin Valvur **Site Visit Date** 05/10/2017

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	CHC432	Technician	Martin Valvur	Site Visit Date	05/10/2017

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CHC432 **Technician** Martin Valvur **Site Visit Date** 05/10/2017

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☑	☑
10	Is the sample tower stable and grounded?	☐	☐

11	Tower comments?	

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	CHC432	Technician	Martin Valvur	Site Visit Date	05/10/2017

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	CHC432	Technician	Martin Valvur	Site Visit Date	05/10/2017

Site operation procedures

1	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)	☑	

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	Every 2 weeks	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐	Not performed	☑
Analyzer Diagnostics Tests	☑	Alarm values only	☑
In-line Filter Replacement (at inlet)	☑	Every 2 weeks	☑
In-line Filter Replacement (at analyze	☑	N/A	☑
Sample Line Check for Dirt/Water	☑	Every 2 weeks	☑
Zero Air Desiccant Check	☑	Weekly	☑

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID CHC432 **Technician** Martin Valvur **Site Visit Date** 05/10/2017

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	N/A
2	Are the Site Status Report Forms being completed and filed correctly?	☑	N/A
3	Are data downloads and backups being performed as scheduled?	☑	N/A
4	Are general observations being made and recorded? How?	☑	N/A
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	N/A
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	N/A
8	Are filters protected from contamination during handling and shipping? How?	☑	N/A
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

Dry deposition samples are not collected at this CASTNET site.

Field Systems Data Form F-02058-1500-S10-rev002

Site ID CHC432 **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*
DCP114-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	B	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	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2124	DCP114	Sandy Grenville	05/22/2017	DAS	Primary

Das Date: 5 /23/2017
Das Time: 15:39:25
Das Day: 143

Audit Date 5 /23/2017
Audit Time 15:39:25
Audit Day 143

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

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/23/2017	**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	0.1000	V	V	0.0001
7	0.3000	0.2997	0.2998	V	V	0.0001
7	0.5000	0.4996	0.4997	V	V	0.0001
7	0.7000	0.6995	0.6996	V	V	0.0001
7	0.9000	0.8994	0.8995	V	V	0.0001
7	1.0000	0.9993	0.9993	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	54748	DCP114	Sandy Grenville	05/22/2017	Flow Rate	000659

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.02
1.96%	1.96%			**Cal Factor Full Scale**	0.95
				Rotometer Reading:	0

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	-0.02	l/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	l/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 Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**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**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	210 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241787	DCP114	Sandy Grenville	05/22/2017	Ozone	000615

Slope:	0.98610	**Slope:**	0.00000
Intercept	0.73952	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00250	**Intercept**	0.45870
Cert Date	3/21/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.1%	3.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.02	-0.43	0.49	ppb	
primary	2	15.14	14.64	15.08	ppb	3.01%
primary	3	35.03	34.48	34.63	ppb	0.44%
primary	4	72.04	71.40	71.10	ppb	-0.42%
primary	5	110.04	109.30	108.60	ppb	-0.64%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.000	pass
Span	0.999	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	102.8 kHz	pass
Cell A Noise	0.4 ppb	pass
Cell A Flow	1.43 lpm	pass
Cell A Pressure	713.7 mmHg	pass
Cell A Tmp.	39.0 C	pass
Cell B Freq.	94.7 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	1.44 lpm	pass
Cell B Pressure	713.1 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	13993	DCP114	Sandy Grenville	05/22/2017	Temperature	06390

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00759	**Intercept**	0.14754
Cert Date	2/4/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.11	0.17		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.22	0.07	0.000	0.1	C	0.07
primary	Temp Mid Range	25.38	25.04	0.000	25.2	C	0.17
primary	Temp High Range	49.27	48.75	0.000	48.7	C	-0.09

Sensor Component	Shield	**Condition**	Moderately clean	**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	Parameter	Owner ID
Campbell	none	DCP114	Sandy Grenville	05/22/2017	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.80	1.34		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00759	Intercept	0.14754
Cert Date	2/4/2017	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	C	0.04
primary	Temp Mid Range	23.80	23.47	0.000	24.8	C	1.34
primary	Temp Mid Range	24.41	24.08	0.000	25.1	C	1.02

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	DCP114	Technician	Sandy Grenville	Site Visit Date	05/22/2017

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-13)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	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.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	DCP114	**Technician**	Sandy Grenville	**Site Visit Date**	05/22/2017

Site Sponsor (agency)	EPA	**USGS Map**	Mount Sterling
Operating Group	private / state	**Map Scale**	
AQS #	39-047-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	39.6358
Deposition Measurement	dry, wet	**QAPP Longitude**	-83.2600
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	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		
Zip Code	43143	**Present**	
Time Zone	Eastern	**Fire Extinguisher** ☑	New in 2015
Primary Operator		**First Aid Kit** ☑	
Primary Op. Phone #		**Safety Glasses** ☑	
Primary Op. E-mail		**Safety Hard Hat** ☑	
Backup Operator	none	**Climbing Belt** ☐	
Backup Op. Phone #		**Security Fence** ☐	
Backup Op. E-mail		**Secure Shelter** ☑	
		Stable Entry Step ☑	

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2149-13)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is currently in fair condition. There are loose floor tiles.				
Site OK	☑	**Notes**					

Driving Directions

From Circleville take 22/56 west. Stay on 22 through Williamsport. Turn right (north) onto route 207 and follow the signs for the park office and lodge. After crossing the river, turn right at the sign for the park office, golf course, and lodge. Continue approximately 1.5 miles and turn right again into the park. Go past the office and golf course and take the next right onto a stone road. Continue to the end and turn left. The site is on the left before the gas pipeline.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID DCP114 **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.

Field Systems Data Form

F-02058-1500-S3-rev002

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID DCP114 **Technician** Sandy Grenville **Site Visit Date** 05/22/2017

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

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID DCP114 **Technician** Sandy Grenville **Site Visit Date** 05/22/2017

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

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☐	Small trees within 10 meters

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID DCP114 **Technician** Sandy Grenville **Site Visit Date** 05/22/2017

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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 Systems Data Form

F-02058-1500-S7-rev002

Site ID DCP114 **Technician** Sandy Grenville **Site Visit Date** 05/22/2017

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	DCP114	Technician	Sandy Grenville	Site Visit Date	05/22/2017

Site operation procedures

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

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID DCP114 **Technician** Sandy Grenville **Site Visit Date** 05/22/2017

Site operation procedures

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

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

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

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

Field Systems Data Form F-02058-1500-S10-rev002

Site ID DCP114 **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	Apex	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	B	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*
OXF122-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	B	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

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2528	OXF122	Sandy Grenville	05/23/2017	DAS	Primary

Das Date: 5 /22/2017
Das Time: 18:29:37
Das Day: 142

Audit Date 5 /22/2017
Audit Time 18:29:37
Audit Day 142

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

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/23/2017	**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	V	0.0000
7	0.7000	0.6995	0.6995	V	V	0.0000
7	0.9000	0.8994	0.8994	V	V	0.0000
7	1.0000	0.9993	0.9992	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	OXF122	Sandy Grenville	05/23/2017	Flow Rate	000556

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.02
1.32%	1.32%			**Cal Factor Full Scale**	0.97
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	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 Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**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**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347312	OXF122	Sandy Grenville	05/23/2017	Ozone	000737

Slope:	0.99353	**Slope:**	0.00000
Intercept	0.51736	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00250	**Intercept**	0.45870
Cert Date	3/21/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.9%	3.4%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.03	-0.42	0.29	ppb	
primary	2	15.02	14.52	15.02	ppb	3.44%
primary	3	35.20	34.65	34.59	ppb	-0.17%
primary	4	72.10	71.46	71.47	ppb	0.01%
primary	5	110.30	109.56	109.50	ppb	-0.05%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.50	pass
Span	1.023	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	96.0 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.0 lpm	Fail
Cell A Pressure	694.9 mmHg	pass
Cell A Tmp.	37.0 C	pass
Cell B Freq.	99.9 kHz	pass
Cell B Noise	0.5 ppb	pass
Cell B Flow	0.74 lpm	pass
Cell B Pressure	695.5 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	illegible	OXF122	Sandy Grenville	05/23/2017	Temperature	02823

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00759	**Intercept**	0.14754
Cert Date	2/4/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.05	0.07		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.17	0.02	0.000	0.1	C	0.05
primary	Temp Mid Range	24.98	24.65	0.000	24.7	C	0.07
primary	Temp High Range	49.20	48.68	0.000	48.7	C	0.02

Sensor Component	Shield	**Condition**	Moderately clean	**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	Parameter	Owner ID
Campbell	10755-148	OXF122	Sandy Grenville	05/23/2017	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.15	0.20		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00759	Intercept	0.14754
Cert Date	2/4/2017	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	C	-0.07
primary	Temp Mid Range	25.65	25.31	0.000	25.1	C	-0.2
primary	Temp Mid Range	27.34	26.99	0.000	26.8	C	-0.19

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	OXF122	Technician	Sandy Grenville	Site Visit Date	05/23/2017

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2107-4)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	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	05/23/2017	Cell A Flow	ThermoElectron	3879	☐	☐

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.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	OXF122	**Technician**	Sandy Grenville	**Site Visit Date**	05/23/2017

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
Site Telephone	(513) 523-6912	**Audit Latitude**	39.531115
Site Address 1	Ecological Research Center	**Audit Longitude**	-84.723547
Site Address 2	Somerville Rd.	**Audit Elevation**	284
County	Butler	**Audit Declination**	-5.6
City, State	Oxford, OH		
Zip Code	45056	**Fire Extinguisher** (Present) ☑	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 **Model** 8810 (s/n 2107-4) **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter roof is in poor condition with at least one leak.

Site OK ☑ **Notes**

Driving Directions From Oxford proceed north on route 732. Just outside of town bear right onto Somerville Road. Continue approximately 1/2 mile and turn right at the sign for the Ecological Research Center. Stay on the dirt road past the buildings. The road will turn to the right along the tree line. The site is in the field on the right.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID OXF122 **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.

Field Systems Data Form

F-02058-1500-S3-rev002

Site 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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID OXF122 **Technician** Sandy Grenville **Site Visit Date** 05/23/2017

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	OXF122	Technician	Sandy Grenville	Site Visit Date	05/23/2017

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 15 meters
4	Describe dry dep sample tube.		3/8 teflon by 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?	☑	

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID OXF122 **Technician** Sandy Grenville **Site Visit Date** 05/23/2017

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☐

11 **Tower comments?**

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 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 Data Form

F-02058-1500-S7-rev002

Site ID OXF122 **Technician** Sandy Grenville **Site Visit Date** 05/23/2017

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	OXF122	Technician	Sandy Grenville	Site Visit Date	05/23/2017

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID OXF122 **Technician** Sandy Grenville **Site Visit Date** 05/23/2017

Site operation procedures

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

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

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

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

Field Systems Data Form F-02058-1500-S10-rev002

Site ID OXF122 **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	Apex	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	B	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	B	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 Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2562	SEK430	Martin Valvur	05/23/2017	DAS	Primary

Das Date: 5 /23/2017
Das Time: 9:21:30
Das Day: 143

Audit Date 5 /23/2017
Audit Time 9:23:00
Audit Day 143

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0004	0.0002	0.0004

Mfg	HY	**Parameter**	DAS
Serial Number	12010039329	**Tfer Desc.**	Source generator (D
Tfer ID	01322		
Slope	1.00000	**Intercept**	0.00000
Cert Date	6/15/2014	**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	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
12	0.0000	-0.0005	-0.0005	V	V	0.0000
12	0.1000	0.0993	0.0995	V	V	0.0002
12	0.3000	0.3002	0.3004	V	V	0.0002
12	0.5000	0.4999	0.4999	V	V	0.0000
12	0.7000	0.7000	0.7003	V	V	0.0003
12	0.9000	0.8999	0.9002	V	V	0.0003
12	1.0000	1.0000	1.0004	V	V	0.0004

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9403014	SEK430	Martin Valvur	05/23/2017	flow rate	03384

Mfg	Tylan
SN/Owner ID	FP9403015 / 03679
Parameter	MFC power supply

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00153	**Intercept**	0.00366
Cert Date	1/25/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.123
0.53%	0.64%			**Cal Factor Full Scale**	5.574
				Rotometer Reading:	3.15

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.08	0.0000	0.06	l/m	l/m	
primary	leak check	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 Component	Condition	Status
Leak Test		pass
Tubing Condition	Fair	pass
Filter Position	Good	pass
Rotometer Condition	Clean and dry	pass
Moisture Present	No moisture present	pass
Filter Distance	4.5 cm	pass
Filter Depth	1.5 cm	pass
Filter Azimuth	225 deg	pass
System Memo	See comments	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	0520012327	SEK430	Martin Valvur	05/23/2017	Ozone	90835

Slope:	1.04283	**Slope:**	0.00000
Intercept	-0.13773	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00466	**Intercept**	0.01298
Cert Date	1/1/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.5%	4.4%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.02	0.00	0.32	ppb	
primary	2	19.08	18.97	19.52	ppb	2.90%
primary	3	36.07	35.88	36.85	ppb	2.70%
primary	4	70.09	69.75	72.42	ppb	3.83%
primary	5	110.29	109.76	114.60	ppb	4.41%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.2	pass
Span	1.012	pass
Zero Voltage	-0.075	pass
Fullscale Voltage	1.000	pass
Cell A Freq.	89.7 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.66 lpm	pass
Cell A Pressure	700.1 mmHg	pass
Cell A Tmp.	38.9 C	pass
Cell B Freq.	75.8 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	699.6 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	8472	SEK430	Martin Valvur	05/23/2017	Temperature2meter	none

Mfg	RM Young	
SN/Owner ID	063143	00819
Parameter	Temperature Translator	

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00006	Intercept	0.03191
Cert Date	1/23/2017	CorrCoff	1.00000

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

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.18	0.15	0.0000	0.01	C	-0.14
primary	Temp Mid Rang	24.24	24.21	0.0000	24.18	C	-0.03
primary	Temp High Rang	47.16	47.13	0.0000	47.08	C	-0.05

Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Blower	Condition	Functioning	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	Parameter	Owner ID
ARS	none	SEK430	Martin Valvur	05/23/2017	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.26	0.68		

Mfg	Fluke	Parameter	Shelter Temperatur
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00006	Intercept	0.03191
Cert Date	1/23/2017	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	C	-0.02
primary	Temp Mid Range	24.27	24.24	0.000	24.9	C	0.68
primary	Temp Mid Range	25.16	25.13	0.000	25.2	C	0.08

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
SEK430	Martin Valvur	05/23/2017

Shelter Make	Shelter Model	Shelter Size
Alan pre-fab	s/n 861166 1808	512 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	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.	Hazard	Problem
Flow Rate	SEK430	Martin Valvur	05/23/2017	Tubing Condition	Tylan	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.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	SEK430	**Technician**	Martin Valvur	**Site Visit Date**	05/23/2017

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		
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** ☑	

(Present)

Shelter Working Room	☑	**Make**	Alan pre-fab	**Model**	s/n 861166 1808	**Shelter Size**	512 cuft
Shelter Clean	☑	**Notes**	The shelter is aging but is in fair condition and kept clean, neat, 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.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID SEK430 **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.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	SEK430	Technician	Martin Valvur	Site Visit Date	05/23/2017

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID SEK430 **Technician** Martin Valvur **Site Visit Date** 05/23/2017

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

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☐	Trees within 10 meters

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 16 meters
4	Describe dry dep sample tube.		3/8 teflon by 15 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☐	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID SEK430 **Technician** Martin Valvur **Site Visit Date** 05/23/2017

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☐	
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☐	The shelter ground may not be adequate
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☑
11	Tower comments?	The met sensors are mounted on the sample tower.	

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	SEK430	Technician	Martin Valvur	Site Visit Date	05/23/2017

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	DataView2	☑
SSRF	☑		☑
Site Ops Manual	☑	Jan 2006	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID SEK430 **Technician** Martin Valvur **Site Visit Date** 05/23/2017

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID SEK430 **Technician** Martin Valvur **Site Visit Date** 05/23/2017

Site operation procedures

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

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

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

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID SEK430 **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	B	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*
YOS404-Martin 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	B	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 Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2558	YOS404	Martin Valvur	05/24/2017	DAS	Primary

Das Date: 5 /24/2017
Das Time: 8:13:22
Das Day: 144

Audit Date 5 /24/2017
Audit Time 8:11:30
Audit Day 144

Low Channel:

Avg Diff:	Max Diff:
0.0002	0.0006

High Channel:

Avg Diff:	Max Diff:
0.0002	0.0006

Mfg	HY	**Parameter**	DAS
Serial Number	12010039329	**Tfer Desc.**	Source generator (D
Tfer ID	01322		
Slope	1.00000	**Intercept**	0.00000
Cert Date	6/15/2014	**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	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
3	0.0000	-0.0004	-0.0003	V	V	0.0001
3	0.1000	0.0999	0.0999	V	V	0.0000
3	0.3000	0.2999	0.2998	V	V	-0.0001
3	0.5000	0.5000	0.5001	V	V	0.0001
3	0.7000	0.6999	0.6996	V	V	-0.0003
3	0.9000	0.8997	0.8991	V	V	-0.0006
3	1.0000	0.9997	0.9998	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Alicat	134655	YOS404	Martin Valvur	05/24/2017	Flow Rate	none

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00153	**Intercept**	0.00366
Cert Date	1/25/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.005
0.36%	0.46%			**Cal Factor Full Scale**	5.033
				Rotometer Reading:	3.35

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	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 Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**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**	3.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	315 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-74534-376	YOS404	Martin Valvur	05/24/2017	Ozone	90763

Slope:	1.04019	**Slope:**	0.00000
Intercept	0.03930	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00466	**Intercept**	0.01298
Cert Date	1/1/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
4.3%	5.4%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.50	0.48	0.22	ppb	
primary	2	17.05	16.95	17.59	ppb	3.78%
primary	3	36.06	35.87	37.79	ppb	5.35%
primary	4	70.01	69.67	72.75	ppb	4.42%
primary	5	111.03	110.50	114.70	ppb	3.80%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.3	pass
Span	0.994	pass
Zero Voltage	-0.0379	pass
Fullscale Voltage	1.000	pass
Cell A Freq.	98.0 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.51 lpm	pass
Cell A Pressure	615.8 mmHg	pass
Cell A Tmp.	35.1 C	pass
Cell B Freq.	100.1 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.62 lpm	pass
Cell B Pressure	616.3 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	18748	YOS404	Martin Valvur	05/24/2017	Temperature	none

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	1.00006	**Intercept**	0.03191
Cert Date	1/23/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.10	0.27		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.23	0.20	0.0000	0.2	C	-0.02
primary	Temp Mid Range	24.57	24.54	0.0000	24.6	C	0.01
primary	Temp High Range	47.57	47.54	0.0000	47.3	C	-0.27

Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower	**Condition**	Functioning	**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	Parameter	Owner ID
ARS	none	YOS404	Martin Valvur	05/24/2017	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
1.21	2.26		

Mfg	Fluke	Parameter	Shelter Temperatur
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00006	Intercept	0.03191
Cert Date	1/23/2017	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	C	-0.19
primary	Temp Mid Range	24.19	24.16	0.000	25.3	C	1.18
primary	Temp Mid Range	24.26	24.23	0.000	26.5	C	2.26

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
YOS404	Martin Valvur	05/24/2017

Shelter Make	Shelter Model	Shelter Size
Ekto	8812 (s/n 3515-2)	768 cuft

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

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The site is neat, clean, and well organized.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	YOS404	**Technician**	Martin Valvur	**Site Visit Date**	05/24/2017

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		
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** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8812 (s/n 3515-2)	**Shelter Size**	768 cuft
Shelter Clean	☑	**Notes**	The site is neat, clean, and well organized.				
Site OK	☑	**Notes**					

Driving Directions

From Mariposa take route 140 into Yosemite. From the loop road, take route 41 toward Oakhurst. Continue uphill and through the tunnel. Approximately one mile past the tunnel look for a dirt road on the left. Continue approximately 1/2 mile past the gate to the communication station at the top of Turtleback Dome. The site is another 100 yards on the path behind the station.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID YOS404 **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		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	YOS404	Technician	Martin Valvur	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)	☑	N/A
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID YOS404 **Technician** Martin Valvur **Site Visit Date** 05/24/2017

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	YOS404	Technician	Martin Valvur	Site Visit Date	05/24/2017

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 10 meters
4	Describe dry dep sample tube.		3/8 teflon by 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?	☐	Not present
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:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID YOS404 **Technician** Martin Valvur **Site Visit Date** 05/24/2017

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID YOS404 **Technician** Martin Valvur **Site Visit Date** 05/24/2017

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	DataView2	☑
SSRF	☑		☑
Site Ops Manual	☑	Jan 2006	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID YOS404 **Technician** Martin Valvur **Site Visit Date** 05/24/2017

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID YOS404 **Technician** Martin Valvur **Site Visit Date** 05/24/2017

Site operation procedures

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

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

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

Field Systems Data Form F-02058-1500-S10-rev002

Site ID YOS404 **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	B	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*
QAK172-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	B	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	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2518	QAK172	Sandy Grenville	05/24/2017	DAS	Primary

Das Date: 5 /24/2017
Das Time: 14:24:32
Das Day: 144

Audit Date 5 /24/2017
Audit Time 14:24:32
Audit Day 144

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

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/23/2017	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2998	0.2998	V	V	0.0000
7	0.5000	0.4996	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	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	QAK172	Sandy Grenville	05/24/2017	Flow Rate	000530

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.02
0.00%	0.00%			**Cal Factor Full Scale**	0.99
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	-0.02	l/m	l/m	
primary	test pt 1	1.502	1.500	1.50	0.000	1.50	l/m	l/m	0.00%
primary	test pt 2	1.500	1.500	1.50	0.000	1.50	l/m	l/m	0.00%
primary	test pt 3	1.501	1.500	1.50	0.000	1.50	l/m	l/m	0.00%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**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**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241783	QAK172	Sandy Grenville	05/24/2017	Ozone	000613

Slope:	0.98407	**Slope:**	0.00000
Intercept	0.26089	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00250	**Intercept**	0.45870
Cert Date	3/21/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.3%	1.8%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.05	-0.40	0.13	ppb	
primary	2	15.06	14.56	14.64	ppb	0.55%
primary	3	35.03	34.48	33.87	ppb	-1.77%
primary	4	72.03	71.39	70.26	ppb	-1.58%
primary	5	110.06	109.32	108.10	ppb	-1.12%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.10	pass
Span	1.001	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	84.7 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.0 lpm	Fail
Cell A Pressure	692.6 mmHg	pass
Cell A Tmp.	38.3 C	pass
Cell B Freq.	96.8 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.70 lpm	pass
Cell B Pressure	692.9 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14601	QAK172	Sandy Grenville	05/24/2017	Temperature	06530

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00759	**Intercept**	0.14754
Cert Date	2/4/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.05	0.07		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.14	-0.01	0.000	0.1	C	0.07
primary	Temp Mid Range	25.66	25.32	0.000	25.4	C	0.06
primary	Temp High Range	48.81	48.30	0.000	48.3	C	-0.03

Sensor Component	Shield	**Condition**	Clean	**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	Parameter	Owner ID
Campbell	230826	QAK172	Sandy Grenville	05/24/2017	Shelter Temperature	60712

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.15	0.23		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00759	Intercept	0.14754
Cert Date	2/4/2017	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	C	0.23
primary	Temp Mid Range	23.44	23.12	0.000	23.3	C	0.18
primary	Temp Mid Range	25.17	24.83	0.000	24.8	C	-0.04

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	QAK172	Technician	Sandy Grenville	Site Visit Date	05/24/2017

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2625-2)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	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	05/24/2017	Cell A Freq.	ThermoElectron	3498	☐	☐

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.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	QAK172	**Technician**	Sandy Grenville	**Site Visit Date**	05/24/2017

Site Sponsor (agency)	EPA	**USGS Map**	Quaker City
Operating Group	Private	**Map Scale**	
AQS #	39-121-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**	39.9431
Deposition Measurement	dry	**QAPP Longitude**	-81.3378
Land Use	woodland - mixed, agriculture	**QAPP Elevation Meters**	372
Terrain	rolling	**QAPP Declination**	7.9
Conforms to MLM	Yes	**QAPP Declination Date**	2/22/2006
Site Telephone	(740) 679-3345	**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**	-8.2
City, State	Quaker City, OH		**Present**
Zip Code	43773	**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	**Model**	8810 (s/n 2625-2)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in good condition.				
Site OK	☑	**Notes**					

Driving Directions From I-70 take exit 193, route 513 south to Quaker City. At the 4-way stop turn right and continue approximately 0.8 miles and turn left onto CR943. Continue approximately 2 miles and turn right onto Noble County Rd 34 (also St. Johns Road). Continue approximately 1.5 miles and turn left onto a dirt road which is the driveway up a steep hill to the site.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID QAK172 **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		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID QAK172 **Technician** Sandy Grenville **Site Visit Date** 05/24/2017

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	QAK172	Technician	Sandy Grenville	Site Visit Date	05/24/2017

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID QAK172 **Technician** Sandy Grenville **Site Visit Date** 05/24/2017

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	QAK172	Technician	Sandy Grenville	Site Visit Date	05/24/2017

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Feb 2014	☑
HASP	☑	Feb 2014	☑
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID QAK172 **Technician** Sandy Grenville **Site Visit Date** 05/24/2017

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Site operator refresher training July 2006
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID QAK172 **Technician** Sandy Grenville **Site Visit Date** 05/24/2017

Site operation procedures

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

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

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

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

Field Systems Data Form F-02058-1500-S10-rev002

Site ID QAK172 **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	B	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*
PIN414-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	B	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 Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2615	PIN414	Martin Valvur	05/25/2017	DAS	Primary

Das Date: 5 /25/2017
Das Time: 8:16:34
Das Day: 145

Audit Date 5 /25/2017
Audit Time 8:16:00
Audit Day 145

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0004	0.0002	0.0004

Mfg	HY	**Parameter**	DAS
Serial Number	12010039329	**Tfer Desc.**	Source generator (D
Tfer ID	01322		
Slope	1.00000	**Intercept**	0.00000
Cert Date	6/15/2014	**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	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
15	0.0000	0.0035	0.0033	V	V	-0.0002
15	0.1000	0.0996	0.0999	V	V	0.0003
15	0.3000	0.2999	0.2997	V	V	-0.0002
15	0.5000	0.4995	0.4996	V	V	0.0001
15	0.7000	0.6999	0.7000	V	V	0.0001
15	0.9000	0.9007	0.9008	V	V	0.0001
15	1.0000	1.0001	1.0005	V	V	0.0004

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Alicat	Unknown	PIN414	Martin Valvur	05/25/2017	Flow Rate	none

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00153	**Intercept**	0.00366
Cert Date	1/25/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.006
0.64%	0.97%			**Cal Factor Full Scale**	5.059
				Rotometer Reading:	4.05

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	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	l/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 Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**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**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49c-74530376	PIN414	Martin Valvur	05/25/2017	Ozone	90765

Slope:	1.03381	**Slope:**	0.00000
Intercept	0.64621	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00466	**Intercept**	0.01298
Cert Date	1/1/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
5.1%	7.4%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.40	0.38	1.15	ppb	
primary	2	17.05	16.95	18.21	ppb	7.43%
primary	3	35.98	35.80	37.45	ppb	4.61%
primary	4	71.93	71.58	74.63	ppb	4.26%
primary	5	110.01	109.48	113.90	ppb	4.04%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.000	pass
Span	0.999	pass
Zero Voltage	0.0454	pass
Fullscale Voltage	1.0000	pass
Cell A Freq.	110 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.78 lpm	pass
Cell A Pressure	709.9 mmHg	pass
Cell A Tmp.	28.9 C	pass
Cell B Freq.	77.4 kHz	pass
Cell B Noise	0.3 ppb	pass
Cell B Flow	0.80 lpm	pass
Cell B Pressure	709.1 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	missing	PIN414	Martin Valvur	05/25/2017	Temperature2meter	none

Mfg	Climatronics	
SN/Owner ID	397	none
Parameter	Temperature Translator	

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00006	Intercept	0.03191
Cert Date	1/23/2017	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.06	0.1		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.25	0.22	0.0000	0.22	C	0
primary	Temp Mid Rang	25.38	25.35	0.0000	25.42	C	0.07
primary	Temp High Rang	47.64	47.61	0.0000	47.71	C	0.1

Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Blower	Condition	Functioning	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	Parameter	Owner ID
ARS	none	PIN414	Martin Valvur	05/25/2017	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.75	1.03		

Mfg	Fluke	Parameter	Shelter Temperatur
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00006	Intercept	0.03191
Cert Date	1/23/2017	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	C	0.39
primary	Temp Mid Range	23.08	23.05	0.000	22.2	C	-0.83
primary	Temp Mid Range	20.02	19.99	0.000	21.0	C	1.03

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	PIN414	Technician	Martin Valvur	Site Visit Date	05/25/2017

Shelter Make	Shelter Model	Shelter Size
Alan pre-fab	s/n 861168 1808	512 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	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.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	PIN414	**Technician**	Martin Valvur	**Site Visit Date**	05/25/2017

Site Sponsor (agency)	NPS	**USGS Map**	North Chalone Peak
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		
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	**Model**	s/n 861168 1808	**Shelter Size**	512 cuft
Shelter Clean	☑	**Notes**	Shelter floor and roof leaks have been repaired. The shelter has been cleaned and organized. The lighting is poor.				
Site OK	☑	**Notes**					

Driving Directions From Hollister proceed south on route 25 to highway 146 and the entrance to Pinnacles National Monument. Turn west on 146 and continue to the fee station. Less than 1/2 mile from the fee station the site will be visible 100 yards from the road on the right up a hill.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID PIN414 **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		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site 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

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

Field Systems Data Form

F-02058-1500-S4-rev002

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID PIN414 **Technician** Martin Valvur **Site Visit Date** 05/25/2017

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☐	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID PIN414 **Technician** Martin Valvur **Site Visit Date** 05/25/2017

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID PIN414 **Technician** Martin Valvur **Site Visit Date** 05/25/2017

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	DataView2	☑
SSRF	☑		☑
Site Ops Manual	☑	Jan 2006	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	PIN414	Technician	Martin Valvur	Site Visit Date	05/25/2017

Site operation procedures

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

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 and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

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

Field Systems Data Form F-02058-1500-S10-rev002

Site ID PIN414 **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	B	AT-5381-F9-3	928348
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature Translator	Climatronics	100088-2	397	none
Temperature2meter	Climatronics	100093	missing	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
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	B	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 Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2026	LAV410	Martin Valvur	05/30/2017	DAS	Primary

Das Date: 5 /30/2017
Das Time: 7:38:25
Das Day: 151

Audit Date 5 /30/2017
Audit Time 7:38:05
Audit Day 151

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0004	0.0002	0.0004

Mfg	HY	**Parameter**	DAS
Serial Number	12010039329	**Tfer Desc.**	Source generator (D
Tfer ID	01322		
Slope	1.00000	**Intercept**	0.00000
Cert Date	6/15/2014	**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	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
14	0.0000	-0.0003	-0.0006	V	V	-0.0003
14	0.1000	0.1997	0.1996	V	V	-0.0001
14	0.3000	0.2995	0.2993	V	V	-0.0002
14	0.5000	0.4996	0.4997	V	V	0.0001
14	0.7000	0.6998	0.6997	V	V	-0.0001
14	0.9000	0.8997	0.8996	V	V	-0.0001
14	1.0000	1.0001	0.9997	V	V	-0.0004

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Porter	BNSP10000	LAV410	Martin Valvur	05/30/2017	Flow Rate	none

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00153	**Intercept**	0.00366
Cert Date	1/25/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.096
1.34%	1.54%			**Cal Factor Full Scale**	20.49
				Rotometer Reading:	3.25

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	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 Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Fair	**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**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-520012-328	LAV410	Martin Valvur	05/30/2017	Ozone	90834

Slope:	1.00815	**Slope:**	0.00000
Intercept	-0.31491	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00466	**Intercept**	0.01298
Cert Date	1/1/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.8%	2.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.40	0.38	0.31	ppb	
primary	2	16.31	16.22	15.89	ppb	-2.03%
primary	3	37.46	37.27	37.19	ppb	-0.21%
primary	4	71.82	71.47	71.51	ppb	0.06%
primary	5	105.27	104.76	105.50	ppb	0.71%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		Fail
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.000	pass
Span	1.028	pass
Zero Voltage	-0.2125	pass
Fullscale Voltage	1.000	pass
Cell A Freq.	83.7 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	607.4 mmHg	pass
Cell A Tmp.	34.6 C	pass
Cell B Freq.	95.3 kHz	pass
Cell B Noise	0.7 ppb	pass
Cell B Flow	0.64 lpm	pass
Cell B Pressure	607.1 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo	See comments	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	ARS101	LAV410	Martin Valvur	05/30/2017	Temperature2meter	03794

Mfg	Climatronics
SN/Owner ID	398 03629
Parameter	Temperature Translator

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00006	Intercept	0.03191
Cert Date	1/23/2017	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.07	0.08		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.15	0.12	0.000	0.19	C	0.07
primary	Temp Mid Rang	24.64	24.61	0.000	24.69	C	0.08
primary	Temp High Rang	46.59	46.56	0.000	46.62	C	0.06

Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Blower	Condition	Functioning	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	Parameter	Owner ID
DRI	Unknown	LAV410	Martin Valvur	05/30/2017	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.83	2.03		

Mfg	Fluke	Parameter	Shelter Temperatur
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00006	Intercept	0.03191
Cert Date	1/23/2017	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	C	-0.34
primary	Temp Mid Range	20.39	20.36	0.000	22.4	C	2.03
primary	Temp Mid Range	22.45	22.42	0.000	22.3	C	-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 Make	Shelter Model	Shelter Size
		1150 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	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	LAV410	Martin Valvur	05/30/2017	22.5 degree rule	ThermoElectron	1344	☐	☐

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.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	LAV410	**Technician**	Martin Valvur	**Site Visit Date**	05/30/2017

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		
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** ☑	

Present

Shelter Working Room ☑	**Make**		**Model**		**Shelter Size**	1150 cuft
Shelter Clean ☑	**Notes**	The inside equipment is located in room within the fire station, clean, neat, and organized.			
Site OK ☑	**Notes**				

Driving Directions

From Redding take route 44 east for approximately 45 miles. At the park, and intersection of 44 and 89, turn right onto route 89. Turn right at the first road into the fire station and maintenance area. Take the first left, the site is behind the fire station at the end of the parking lot. One room in the fire station houses the climate controlled equipment.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID LAV410 **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.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID 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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID LAV410 **Technician** Martin Valvur **Site Visit Date** 05/30/2017

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

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

The signal cables are showing signs of wear.

Field 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 equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☐	< 10 meters

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe 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.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID LAV410 **Technician** Martin Valvur **Site Visit Date** 05/30/2017

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	LAV410	Technician	Martin Valvur	Site Visit Date	05/30/2017

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	DataView2	☑
SSRF	☑		☑
Site Ops Manual	☑	July 2012	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑	Not current	☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	LAV410	Technician	Martin Valvur	Site Visit Date	05/30/2017

Site operation procedures

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

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	Not performed	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☑	Not performed	☑
Analyzer Diagnostics Tests	☑	Alarm values only	☑
In-line Filter Replacement (at inlet)	☑	Monthly	☑
In-line Filter Replacement (at analyze	☑	N/A	☑
Sample Line Check for Dirt/Water	☐		☐
Zero Air Desiccant Check	☐		☐

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID LAV410 **Technician** Martin Valvur **Site Visit Date** 05/30/2017

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed between 11:00 and 13:00
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, dataview
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

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

Field Systems Data Form F-02058-1500-S10-rev002

Site ID LAV410 **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	B	AT-5324-F6-O	923314
Shelter Temperature	DRI	Unknown	Unknown	none
Shield (2 meter)	Climatronics	100325	1290	01199
Siting Criteria	Siting Criteria	1	None	None
Temperature Translator	Climatronics	100088-2	398	03629
Temperature2meter	Climatronics	100093	ARS101	03794
Zero air pump	Werther International	PC70/4	847660	none

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

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	P	4	0.5	3	0.08	c	**P**
2	Temperature max error	P	4	0.5	3	0.16	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99828	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.38094	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99973	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.4	%	**P**
7	Ozone % difference max	P	7	10	4	1.9	%	**P**
8	Flow Rate average % difference	P	10	5	2	0.66	%	**P**
9	Flow Rate max % difference	P	10	5	2	0.66	%	**P**
10	DAS Time maximum error	P	0	5	1	0.02	min	**P**
11	DAS Voltage average error	P	7	0.003	56	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	9	0.22	c	**P**
13	Shelter Temperature max error	P	5	2	9	0.58	c	**P**

Records without valid pass/fail criteria

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			

SiteVisitDate	Site	Technician
04/06/2017	CAD150	Sandy Grenville

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.

EEMS Spot Report

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	P	0	1.1	4	0.99043	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.03773	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.1	%	**P**
5	Ozone % difference max	P	7	10	4	1.3	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

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	P	4	0.5	12	0.09	c	**P**
2	Temperature max error	P	4	0.5	12	0.15	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98660	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.60180	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.3	%	**P**
7	Ozone % difference max	P	7	10	4	3.6	%	**P**
8	Flow Rate average % difference	P	10	5	2	1.32	%	**P**
9	Flow Rate max % difference	P	10	5	2	1.32	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	63	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	9	0.21	c	**P**
13	Shelter Temperature max error	P	5	2	9	0.38	c	**P**

Records without valid pass/fail criteria

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			

SiteVisitDate	Site	Technician
04/07/2017	CDZ171	Sandy Grenville

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.

EEMS Spot Report

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	P	0	1.1	4	0.97036	unitless	**P**
2	Ozone Intercept	P	0	5	4	-1.19028	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
4	Ozone % difference avg	P	7	10	4	6.4	%	**P**
5	Ozone % difference max	P	7	10	4	9.5	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

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

SiteVisitDate	Site	Technician
05/10/2017	CHC432	Martin Valvur

Records with valid pass/fail criteria

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

SiteVisitDate	Site	Technician
05/10/2017	CHC432	Martin Valvur

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		9	0	7			
2	Shelter Temperature standard deviation		5	0	3			
3	Temperature2meter Standard Deviation		5	0	3			
4	Precipitation total of % diff		1	0	1			
5	Precipitation total of abs diff mm or in		1	0	1			
6	Precipitation total of DAS mm or in		1	0	1			
7	Precipitation total of equivalent mm or in		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

1 **Parameter:** SiteOpsProcComm

Dry deposition samples are not collected at this CASTNET site.

2 **Parameter:** SitingCriteriaCom

See maps included as Figures 1 through 3.

EEMS Spot Report

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

SiteVisitDate	Site	Technician
05/09/2017	CHE185	Eric Hebert

Records with valid pass/fail criteria

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

SiteVisitDate	Site	Technician
05/09/2017	CHE185	Eric Hebert

34	Shelter Temperature max error	P	5	2	10	0.64	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Surface Wetness Manual Test Pass Fail		12	0	1			
2	DAS Voltage maximum error		6	0	7			
3	Temperature standard deviation		4	0	6			
4	Shelter Temperature standard deviation		5	0	10			
5	Temperature2meter Standard Deviation		5	0	3			
6	Precipitation total of % diff		1	0	1			
7	Precipitation total of abs diff mm or in		1	0	1			
8	Precipitation total of DAS mm or in		1	0	1			
9	Precipitation total of equivalent mm or in		1	0	1			

SiteVisitDate	Site	Technician
05/09/2017	CHE185	Eric Hebert

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** System Memo **CommentCode:** 208

The ozone sample train is composed of materials other than the recommended materials which are Teflon and glass only.

2 **Parameter:** Temperature **SensorComponent:** System Memo **CommentCode:** 174

Additional details can be found in the hardcopy of the site audit report.

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.

EEMS Spot Report

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	P	4	0.5	6	0.11	c	**P**
2	Temperature max error	P	4	0.5	6	0.17	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98610	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.73952	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.1	%	**P**
7	Ozone % difference max	P	7	10	4	3.0	%	**P**
8	Flow Rate average % difference	P	10	5	4	1.96	%	**P**
9	Flow Rate max % difference	P	10	5	4	1.96	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	56	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	15	0.80	c	**P**
13	Shelter Temperature max error	P	5	2	15	1.34	c	**P**

Records without valid pass/fail criteria

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			

SiteVisitDate	Site	Technician
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.

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.

EEMS Spot Report

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	P	0	1.1	4	0.98090	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.47139	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.9	%	**P**
5	Ozone % difference max	P	7	10	4	7.4	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

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	P	0	1.1	4	0.96858	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.24999	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99991	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.4	%	**P**
5	Ozone % difference max	P	7	10	4	4.2	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

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	P	4	0.5	6	0.07	c	**P**
2	Temperature max error	P	4	0.5	6	0.09	c	**P**
3	Flow Rate average % difference	P	10	5	3	0.56	%	**P**
4	Flow Rate max % difference	P	10	5	3	0.67	%	**P**

Records without valid pass/fail criteria

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

SiteVisitDate	Site	Technician
04/05/2017	KIC003	Martin Valvur

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.

EEMS Spot Report

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	P	4	0.5	9	0.04	c	**P**
2	Temperature max error	P	4	0.5	9	0.06	c	**P**
3	Flow Rate average % difference	P	10	5	2	2.18	%	**P**
4	Flow Rate max % difference	P	10	5	2	2.29	%	**P**
5	Shelter Temperature average error	P	5	2	15	0.51	c	**P**
6	Shelter Temperature max error	P	5	2	15	1.43	c	**P**

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.

EEMS Spot Report

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	P	5	0.5	3	0.07	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.08	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00815	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.31491	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.8	%	**P**
7	Ozone % difference max	P	7	10	4	2.0	%	**P**
8	Flow Rate average % difference	P	10	5	2	1.34	%	**P**
9	Flow Rate max % difference	P	10	5	2	1.54	%	**P**
10	DAS Time maximum error	P	0	5	1	0.33	min	**P**
11	DAS Voltage average error	P	14	0.003	49	0.0002	V	**P**
12	Shelter Temperature average error	P	5	2	3	0.83	c	**P**
13	Shelter Temperature max error	P	5	2	3	2.03	c	**Fail**

Records without valid pass/fail criteria

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			

SiteVisitDate	Site	Technician
05/30/2017	LAV410	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.

EEMS Spot Report

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	P	4	0.5	12	0.05	c	**P**
2	Temperature max error	P	4	0.5	12	0.07	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99353	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.51736	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.9	%	**P**
7	Ozone % difference max	P	7	10	4	3.4	%	**P**
8	Flow Rate average % difference	P	10	5	2	1.32	%	**P**
9	Flow Rate max % difference	P	10	5	2	1.32	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	56	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	15	0.15	c	**P**
13	Shelter Temperature max error	P	5	2	15	0.20	c	**P**

Records without valid pass/fail criteria

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			

SiteVisitDate	Site	Technician
05/23/2017	OXF122	Sandy Grenville

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** 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.

EEMS Spot Report

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	P	0	1.1	4	0.97620	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.08736	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.7	%	**P**
5	Ozone % difference max	P	7	10	4	3.2	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

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	P	5	0.5	3	0.06	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.10	c	**P**
3	Ozone Slope	P	0	1.1	4	1.03381	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.64621	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	5.1	%	**P**
7	Ozone % difference max	P	7	10	4	7.4	%	**P**
8	Flow Rate average % difference	P	10	5	2	0.64	%	**P**
9	Flow Rate max % difference	P	10	5	2	0.97	%	**P**
10	DAS Time maximum error	P	0	5	1	0.57	min	**P**
11	DAS Voltage average error	P	15	0.003	56	0.0002	V	**P**
12	Shelter Temperature average error	P	5	2	15	0.75	c	**P**
13	Shelter Temperature max error	P	5	2	15	1.03	c	**P**

Records without valid pass/fail criteria

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			

SiteVisitDate	Site	Technician
05/25/2017	PIN414	Martin Valvur

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.

EEMS Spot Report

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	P	4	0.5	3	0.05	c	**P**
2	Temperature max error	P	4	0.5	3	0.07	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98407	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.26089	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.3	%	**P**
7	Ozone % difference max	P	7	10	4	1.8	%	**P**
8	Flow Rate average % difference	P	10	5	3	0.00	%	**P**
9	Flow Rate max % difference	P	10	5	3	0.00	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	56	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	15	0.15	c	**P**
13	Shelter Temperature max error	P	5	2	15	0.23	c	**P**

Records without valid pass/fail criteria

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			

SiteVisitDate	Site	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	P	5	0.5	3	0.07	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.14	c	**P**
3	Ozone Slope	P	0	1.1	4	1.04283	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.13773	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.5	%	**P**
7	Ozone % difference max	P	7	10	4	4.4	%	**P**
8	Flow Rate average % difference	P	10	5	9	0.53	%	**P**
9	Flow Rate max % difference	P	10	5	9	0.64	%	**P**
10	DAS Time maximum error	P	0	5	1	1.5	min	**P**
11	DAS Voltage average error	P	12	0.003	49	0.0002	V	**P**
12	Shelter Temperature average error	P	5	2	15	0.26	c	**P**
13	Shelter Temperature max error	P	5	2	15	0.68	c	**P**

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			

SiteVisitDate	Site	Technician
05/23/2017	SEK430	Martin Valvur

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** Tubing Condition **CommentCode:** 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	P	4	0.5	9	0.10	c	**P**
2	Temperature max error	P	4	0.5	9	0.27	c	**P**
3	Ozone Slope	P	0	1.1	4	1.04019	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.03930	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
6	Ozone % difference avg	P	7	10	4	4.3	%	**P**
7	Ozone % difference max	P	7	10	4	5.4	%	**P**
8	Flow Rate average % difference	P	10	5	2	0.36	%	**P**
9	Flow Rate max % difference	P	10	5	2	0.46	%	**P**
10	DAS Time maximum error	P	0	5	1	1.87	min	**P**
11	DAS Voltage average error	P	3	0.003	42	0.0002	V	**P**
12	Shelter Temperature average error	P	5	2	15	1.21	c	**P**
13	Shelter Temperature max error	P	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			

SiteVisitDate	Site	Technician
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 Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PET427-Martin 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

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460048	PET427	Martin Valvur	04/24/2017	Ozone	none

Slope:	0.97620	**Slope:**	0.00000
Intercept	-0.08736	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00466	**Intercept**	0.01298
Cert Date	1/1/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.7%	3.2%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.44	0.42	0.36	ppb	
primary	2	17.92	17.82	17.25	ppb	-3.20%
primary	3	34.83	34.65	33.64	ppb	-2.91%
primary	4	73.68	73.32	71.73	ppb	-2.17%
primary	5	108.91	108.39	105.60	ppb	-2.57%

Sensor Component		Condition		Status	
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	22.5 degree rule	Condition		Status	pass
Sensor Component	Inlet Filter Condition	Condition	Clean	Status	pass
Sensor Component	Battery Backup	Condition	N/A	Status	pass
Sensor Component	Offset	Condition	0.8	Status	pass
Sensor Component	Span	Condition	0.997	Status	pass
Sensor Component	Zero Voltage	Condition	0.0452	Status	pass
Sensor Component	Fullscale Voltage	Condition	1.0000	Status	pass
Sensor Component	Cell A Freq.	Condition	95.8 kHz	Status	pass
Sensor Component	Cell A Noise	Condition	0.6 ppb	Status	pass
Sensor Component	Cell A Flow	Condition	0.67 lpm	Status	pass
Sensor Component	Cell A Pressure	Condition	604.7 mmHg	Status	pass
Sensor Component	Cell A Tmp.	Condition	34.3 C	Status	pass
Sensor Component	Cell B Freq.	Condition	96.5 kHz	Status	pass
Sensor Component	Cell B Noise	Condition	0.7 ppb	Status	pass
Sensor Component	Cell B Flow	Condition	0.66 lpm	Status	pass
Sensor Component	Cell B Pressure	Condition	604.4 mmHg	Status	pass
Sensor Component	Cell B Tmp.	Condition		Status	pass
Sensor Component	Line Loss	Condition	Not tested	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CHA467-Martin 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

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460007	CHA467	Martin Valvur	04/26/2017	Ozone	none

Slope:	0.97036	**Slope:**	0.00000
Intercept	-1.19028	**Intercept**	0.00000
CorrCoff	0.99995	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00466	**Intercept**	0.01298
Cert Date	1/1/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
6.4%	9.5%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.49	0.47	-0.47	ppb	
primary	2	16.12	16.03	14.50	ppb	-9.54%
primary	3	38.78	38.58	35.53	ppb	-7.91%
primary	4	75.59	75.22	72.07	ppb	-4.19%
primary	5	108.36	107.84	103.50	ppb	-4.02%

Sensor Component		Condition		Status	
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	22.5 degree rule	Condition		Status	pass
Sensor Component	Inlet Filter Condition	Condition	Clean	Status	pass
Sensor Component	Battery Backup	Condition	N/A	Status	pass
Sensor Component	Offset	Condition	0.4	Status	pass
Sensor Component	Span	Condition	1.039	Status	pass
Sensor Component	Zero Voltage	Condition	-0.1439	Status	pass
Sensor Component	Fullscale Voltage	Condition	1.000	Status	pass
Sensor Component	Cell A Freq.	Condition	87.6 kHz	Status	pass
Sensor Component	Cell A Noise	Condition	0.6 ppb	Status	pass
Sensor Component	Cell A Flow	Condition	0.72 lpm	Status	pass
Sensor Component	Cell A Pressure	Condition	625.4 mmHg	Status	pass
Sensor Component	Cell A Tmp.	Condition	37.2 C	Status	pass
Sensor Component	Cell B Freq.	Condition	89.1 kHz	Status	pass
Sensor Component	Cell B Noise	Condition	0.4 ppb	Status	pass
Sensor Component	Cell B Flow	Condition	0.69 lpm	Status	pass
Sensor Component	Cell B Pressure	Condition	625.1 mmHg	Status	pass
Sensor Component	Cell B Tmp.	Condition		Status	pass
Sensor Component	Line Loss	Condition	Not tested	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GRC474-Martin 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

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1023943902	GRC474	Martin Valvur	04/28/2017	Ozone	none

Slope:	0.96858	**Slope:**	0.00000
Intercept	0.24999	**Intercept**	0.00000
CorrCoff	0.99991	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00466	**Intercept**	0.01298
Cert Date	1/1/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.4%	4.2%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.26	0.24	1.22	ppb	
primary	2	17.36	17.26	16.62	ppb	-3.71%
primary	3	38.37	38.17	36.55	ppb	-4.24%
primary	4	78.19	77.81	75.55	ppb	-2.90%
primary	5	106.03	105.52	102.80	ppb	-2.58%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.1	pass
Span	1.003	pass
Zero Voltage	0.0455	pass
Fullscale Voltage	1.000	pass
Cell A Freq.	99.1 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.56 lpm	pass
Cell A Pressure	585.1 mmHg	pass
Cell A Tmp.	33.7 C	pass
Cell B Freq.	85.6 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.59 lpm	pass
Cell B Pressure	584.8 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CAN407-Martin 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

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030745086	CAN407	Martin Valvur	05/01/2017	Ozone	none

Slope:	0.99043	**Slope:**	0.00000
Intercept	0.03773	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00466	**Intercept**	0.01298
Cert Date	1/1/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.1%	1.3%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.36	0.34	0.64	ppb	
primary	2	16.40	16.31	16.10	ppb	-1.29%
primary	3	36.13	35.94	35.49	ppb	-1.25%
primary	4	73.28	72.92	71.99	ppb	-1.28%
primary	5	110.00	109.47	108.70	ppb	-0.70%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.2	pass
Span	1.008	pass
Zero Voltage	0.0682	pass
Fullscale Voltage	1.000	pass
Cell A Freq.	71.2 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	602.0 mmHg	pass
Cell A Tmp.	36.4 C	pass
Cell B Freq.	80.6 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.69 lpm	pass
Cell B Pressure	602.0 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

Site Visit 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

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-59285-322	GRB411	Martin Valvur	06/08/2017	Ozone	90565

Slope:	0.98090	**Slope:**	0.00000
Intercept	-0.47139	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00466	**Intercept**	0.01298
Cert Date	1/1/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.9%	7.4%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.40	0.38	0.33	ppb	
primary	2	16.35	16.26	15.05	ppb	-7.44%
primary	3	37.13	36.94	35.81	ppb	-3.06%
primary	4	75.08	74.71	72.54	ppb	-2.90%
primary	5	113.76	113.21	110.80	ppb	-2.13%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.2	pass
Span	0.993	pass
Zero Voltage	0.1821	pass
Fullscale Voltage	1.000	pass
Cell A Freq.	95.1 kHz	pass
Cell A Noise	0.4 ppb	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	579.4 mmHg	pass
Cell A Tmp.	38.9 C	pass
Cell B Freq.	84.4 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.64 lpm	pass
Cell B Pressure	578.9 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass