2021 – 2nd Quarter Report

Support for Conducting Systems & Performance Audits of Clean Air Status and Trends Network (CASTNET) Sites and National Atmospheric Deposition Program (NADP) Monitoring Stations - II

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U. S. Environmental Protection Agency

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List of Acronyms and Abbreviations

% diff	percent difference
A/D	analog to digital converter
ARS	Air Resource Specialists, Inc.
ASTM	American Society for Testing and Materials
BLM	Bureau of Land Management
BLM-WSO	Bureau of Land Management – Wyoming State Office
CAL	Central Analytical Laboratory
CASTNET	Clean Air Status and Trends Network
CMAQ	Community Multiscale Air Quality
DAS	data acquisition system
deg	degree
DVM	digital voltmeter
ECCC	Environment and Climate Change Canada
EEMS	Environmental, Engineering & Measurement Services, Inc.
EPA	U.S. Environmental Protection Agency
ESC	Environmental Systems Corporation
FSA	Field Systems Audit
FSAD	Field Site Audit Database
GPS	geographical positioning system
HAL	Mercury Analytical Laboratory
LADCO	Lake Michigan Air Directors Consortium
lpm	liters per minute
MD DNR	Maryland Department of Natural Resources
MLM	Multilayer Model
MN PCA	Minnesota Pollution Control Agency
m/s	meters per second
mv	millivolt
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NYDEC	New York Department of Conservation
NYSERDA	New York State Energy Research and Development Authority
PE	Performance Evaluation
QAPP	Quality Assurance Project Plan
SCDHEC	South Carolina Department of Health and Environmental Control
SFWMD	South Florida Water Management District
SOP	standard operating procedure
TDEP	Total Deposition
TEI	Thermo Environmental Instruments
USDA-FS	United States Department of Agriculture – Forest Service
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USNO	United States Naval Observatory

VDC	volts direct current
WDEQ	Wyoming Department of Environmental Quality
WDNR	Wisconsin Department of Natural Resources
WRR	World Radiation Reference
WSLH	Wisconsin State Laboratory of Hygiene

1.0 CASTNET Quarterly Report

1.1 Introduction

The Clean Air Status and Trends Network (CASTNET) is a national air monitoring program established in 1988 by the US EPA. Nearly all CASTNET sites measures weekly concentrations of acidic gases and particles to provide accountability for EPA's emission reduction programs. Most sites measure ground-level ozone as well as supplemental measurements such as meteorology and/or other trace gas concentrations.

Ambient concentrations 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 critical loads research.

Historically, CASTNET pollutant flux measurements have been reported as the aggregate product of weekly measured concentrations and model-estimated deposition velocities. The Multi-layer Model (MLM) was used to derive deposition velocity estimates from on-site meteorological parameters, land use types, and site characteristics. In 2011, EPA discontinued meteorological measurements at most EPA-sponsored CASTNET sites.

Currently, CASTNET pollutant flux estimates are calculated as the aggregate product of weekly measured chemical concentrations and gridded model-estimated deposition velocities. Total deposition is assessed using the NADP's Total Deposition Hybrid Method (TDEP; EPA, 2015c; Schwede and Lear, 2014), which combines data from established ambient monitoring networks and chemical-transport models. To estimate dry deposition, ambient measurement data from CASTNET and other networks were merged with dry deposition rates and flux output from the Community Multiscale Air Quality (CMAQ) modeling system.

Since 2011 nearly all CASTNET ozone monitors have adhered to the requirements for State or Local Air Monitoring Stations (SLAMS) as specified by the EPA in 40 CFR Part 58. As such, the ozone data collected must meet the requirements in 40 CFR Part 58 Appendix A, which defines the quality assurance (QA) requirements for gaseous pollutant ambient air monitoring. The audits performed by EEMS under this contract fulfilled the requirement for annual performance evaluation audits of pollutant monitors in the network. The QA requirements can be found at: https://www.epa.gov/amtic/regulations-guidance-and-monitoring-plans

Currently 87 CASTNET sites at 85 distinct locations measure ground-level ozone concentrations. Annual performance evaluation (PE), ozone audit data are submitted to the Air Quality System (AQS) database.

As of December 2020, the network is comprised of 97 active rural sampling sites across the United States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Bureau of Land Management – Wyoming State Office (BLM-WSO) and several independent partners. Wood Environment and Infrastructure Solutions (Wood) is responsible for operating the EPA sponsored sites, and Air Resource Specialists, Inc. (ARS) is responsible for operating the NPS and BLM-WSO sponsored sites

1.2 Project Objectives

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

Performance audits verify that all reported 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.

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

Sensor	Parameter	Audit Challenge	Acceptance Criteria
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
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	≤ ±15.1% of test gas concentration and ≤ ± 0.0015 ppm actual difference
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, at least annually.

Field site systems audits (FSA) 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 2021

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 2021. The site locations, sponsor, visit dates, and parameters audited are included in Table 2.

Table 2. CASTNET Site Audit Visits

Site ID	Sponsor	Date	FSA	O3 PE	NOy	FLOW
WNC429	NPS	4/5/2021	1			1
NEC602	BLM-WSO	4/6/2021	1	1		1
BUF603	BLM-WSO	4/8/2021	1			1
SHE604	BLM-WSO	4/8/2021	1			1
CAD150	EPA	4/15/2021	1	1		1
GAS153	EPA	4/15/2021		1		
COW137	EPA	4/16/2021		1		
CHC432	NPS	4/20/2021	1	1		
CHE185	EPA	4/21/2021	1	1		1
MEV405	NPS	4/21/2021	1	1		1
CAN407	NPS	4/22/2021		1		
DIN431	NPS	4/23/2021		1		
CVL151	EPA	5/1/2021	1	1		1
PND165	BLM-WSO	5/3/2021	1	1	1	1
GRT434	NPS	5/5/2021		1		

Site ID	Sponsor	Date	FSA	O3 PE	NOy	FLOW
YEL408	NPS	5/6/2021	1	1		1
BAS601	BLM-WSO	5/7/2021		1		
CTH110	EPA	5/10/2021		1		
DCP114	EPA	5/14/2021	1	1		1
SAL133	EPA	5/15/2021		1		
ZIO433	NPS	5/17/2021	1	1		
SEK430	NPS	5/21/2021	1	1		1
ROM406	NPS	5/28/2021	1	1		1
GTH161	EPA	6/1/2021	1	1		1
KNZ184	EPA	6/8/2021	1			1
KIC003	EPA	6/9/2021	1			1
WSP144	EPA	6/12/2021	1	1		1
ARE128	EPA	6/13/2021		1		
VPI120	EPA	6/14/2021	1	1		1
SHN418	NPS	6/15/2021	1	1		1
LRL117	EPA	6/17/2021	1	1		1
PSU106	EPA	6/17/2021		1		
KEF112	EPA	6/18/2021		1		

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 system report where necessary. Copies of the spot reports that were sent 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.*

Results of the PE audits of the gaseous pollutant monitors other than ozone, were submitted immediately following the PE and are not included in this report. All TTP PE results of gaseous pollutant monitors are uploaded to AQS and are available there. All audit data and reports are available from the EPA CASTNET website: https://java.epa.gov/castnet/reportPage.do

2.0 NADP Quarterly Report

2.1 Introduction

The National Atmospheric Deposition Program (NADP) operates two 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 precipitation event-based Atmospheric Integrated Research Monitoring Network (AIRMoN) began operation in 1992, and as of July 2019 is no longer in operation. The Mercury Deposition Network (MDN) measures total mercury in precipitation samples from approximately 90 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 networks of the NADP are sponsored by several federal, state, and local agencies as well as private organizations.

The NADP Program Office (PO) operates and administers the two precipitation chemistry networks (NTN and MDN), two atmospheric concentration networks (AMNet and AMoN), and two analytical laboratories (CAL and HAL), from the Wisconsin State Lab of Hygiene (WSLH) at the University of Wisconsin in Madison. The network equipment depot (NED) is also located at the WSLH.

2.2 Project Objectives

The objective of this project is to perform independent and unbiased evaluations of the sites and their operation. 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 2021

This report presents the NADP sites surveyed during the second quarter (April through June) of 2021. The station locations, sponsors, network. and dates of the surveys are presented in Table 3.

Table 3. NADP Site Survey Visits

Site ID	Sponsor	Date	NTN	MDN	AMoN
SD04	NPS	4/5/2021	1		
MS19	NOAA	4/13/2021	1		
AR02	USGS	4/14/2021	1		
AR03	USGS	4/15/2021	1		1
GA41	U of GA	4/15/2021	1		1
NC25	USDA	4/16/2021			1
TX56	USGS	4/17/2021	1		
NC45	USGS	4/19/2021	1		
OK99	Cherokee Nation	4/21/2021		1	1
AR27	USGS	4/22/2021	1		
UT09	NPS	4/22/2021			1
AR16	NPS	4/23/2021	1		
MS30	USDA	5/1/2021	1		1
MS10	USGS	5/3/2021	1		
WY06	EPA	5/3/2021			1
WY94	NPS	5/5/2021			1
WY93	ARS	5/7/2021			1
NY67	EPA	5/10/2021			1
NY10	USGS	5/11/2021	1		
OH71	USGS	5/12/2021	1		
OH49	USGS	5/13/2021	1		
OH54	EPA	5/14/2021	1		1
IN20	USGS	5/15/2021			1
CA75	NPS	5/24/2021	1	1	
CO10	EPA	6/1/2021			1
KS24	KS dept of Health & Environment	6/7/2021		1	
KS31	KSU	6/8/2021	1		1
KS97	Kickapoo Tribe in KS	6/9/2021			1
KS05	KS dept of Health & Environment	6/10/2021		1	

Site ID	Sponsor	Date	NTN	MDN	AMoN
KS07	USGS	6/10/2021	1		
OK31	OK dept of Environmental Quality	6/11/2021		1	
NJ98	EPA	6/12/2021			1
PA00	EPA	6/13/2021			1
VA13	EPA	6/14/2021	1		1
VA99	USDA	6/16/2021	1		
PA96	EPA	6/17/2021			1
PA97	EPA	6/17/2021			1
PA29	EPA	6/18/2021			1
NM07	NPS	6/28/2021	1		
TX04	NPS	6/29/2021	1		

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 the EPA OneDrive account where the NADP PO and the U.S. EPA POs can access them and download them as needed.

Given the volume of data generated, and the fact that data is distributed and/or is available via the internet, 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*
WNC429-Martin Valvur-04/05/2021					
4/5/2021	Computer	Hewlett Packard	none	6560 b	5CB1520H5J
4/5/2021	DAS	Environmental Sys Corp	None	8832	A4868
4/5/2021	Elevation	Elevation	None	1	None
4/5/2021	Filter pack flow pump	Thomas	none	107CAB18	0688001767
4/5/2021	Flow Rate	Apex	none	AXMC105LPMDPCV	illegible
4/5/2021	Infrastructure	Infrastructure	none	none	none
4/5/2021	Met tower	unknown	none	unknown	none
4/5/2021	Sample Tower	Aluma Tower	none	B	none
4/5/2021	Shelter Temperature	ARS	none	none	none
4/5/2021	Shield (2 meter)	RM Young	none	43532	none
4/5/2021	Siting Criteria	Siting Criteria	None	1	None
4/5/2021	Temperature2meter	RM Young	none	41342	14264
4/5/2021	Zero air pump	Teledyne	none	701	1304

DAS Data Form

DAS Time Max Error: 1.2

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	A4868	WNC429	Martin Valvur	04/05/2021	DAS	Primary

Das Date: 4 /5 /2021
Das Time: 08:49:48
Das Day: 95

Audit Date 4 /5 /2021
Audit Time 08:51:00
Audit Day 95

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0003	0.0005	0.0003	0.0005

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	2/11/2021	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
1	0.0000	-0.0008	-0.0008	V	V	0.0000
1	0.1000	0.0997	0.0994	V	V	-0.0003
1	0.3000	0.2995	0.3000	V	V	0.0005
1	0.5000	0.4995	0.4997	V	V	0.0002
1	0.7000	0.6998	0.6993	V	V	-0.0005
1	0.9000	0.9002	0.9004	V	V	0.0002
1	1.0000	0.9995	0.9992	V	V	-0.0003

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	WNC429	Martin Valvur	04/05/2021	Flow Rate	none

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00850	**Intercept**	0.00160
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.008
				Cal Factor Full Scale	5.03
1.02%	1.78%			**Rotometer Reading:**	3.5

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	-0.01	0.0000	0.05	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.0000	0.05	l/m	l/m	
primary	test pt 1	3.002	2.980	3.00	0.0000	3.03	l/m	l/m	1.78%
primary	test pt 2	2.996	2.970	2.99	0.0000	2.96	l/m	l/m	-0.51%
primary	test pt 3	3.012	2.990	2.99	0.0000	3.01	l/m	l/m	0.77%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Poor	**Status**	Fail
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 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	-2.5 cm	**Status**	Fail
Sensor Component	Filter Azimuth	**Condition**	360 deg	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14264	WNC429	Martin Valvur	04/05/2021	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.61	1.68		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.09	0.10	0.0000	1.78	C	1.68
primary	Temp Mid Range	23.26	23.27	0.0000	23.40	C	0.13
primary	Temp High Rang	48.80	48.82	0.0000	48.85	C	0.03

Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Blower	Condition	Not functioning	Status	Fail
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	WNC429	Martin Valvur	04/05/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.67	1.15		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.35	24.36	0.000	25.5	C	1.15
primary	Temp Mid Range	25.07	25.08	0.000	25.6	C	0.47
primary	Temp Mid Range	25.45	25.46	0.000	25.9	C	0.4

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**Condition**		**Status**	pass
Sensor Component	City > 50,000	**Condition**		**Status**	pass
Sensor Component	City 1,000 to 10,000	**Condition**		**Status**	pass
Sensor Component	City 10,000 to 50,000	**Condition**		**Status**	pass
Sensor Component	Feedlot operations	**Condition**		**Status**	pass
Sensor Component	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**Condition**		**Status**	pass
Sensor Component	Major industrial source	**Condition**		**Status**	pass
Sensor Component	Secondary road < or = 100 per da	**Condition**		**Status**	pass
Sensor Component	Secondary road >100 vehicles/da	**Condition**		**Status**	pass
Sensor Component	Small parking lot	**Condition**		**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	WNC429	Technician	Martin Valvur	Site Visit Date	04/05/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 3034-1)	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	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Moisture Trap Type	Condition	Filter	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	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	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
Sensor Component	System Memo	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	WNC429	Martin Valvur	04/05/2021	Filter Position	Apex	4632	☐	☐
The filter attachment plate is mounted too low in the enclosure resulting in the filter being exposed to wind-driven rain and in the standard geometric orientation.								
Temperature2meter	WNC429	Martin Valvur	04/05/2021	Blower	RM Young	4403	☐	☐
The forced-air blower for the shield is not functioning.								

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The general observations section of the SSRF is still not completed. Gloves are not used when handling the filter pack, however the filter bag is used as a glove.

2 **Parameter:** SiteOpsProcedures

The ozone analyzer is operated by the state of South Dakota and the sample train is now 1/4 Teflon with a filter at the inlet 4 meters above the ground.

3 **Parameter:** DocumentationCo

Records of the routine checks performed by the state of SD personnel are kept onsite in a logbook.

4 **Parameter:** ShelterCleanNotes

One shelter houses the ozone monitor and is in good condition and clean. The second shelter houses the flow system and IMPROVE. It is older and not climate controlled.

5 **Parameter:** PollAnalyzerCom

The dry deposition filter is mounted low in the enclosure which changes the particle collection characteristics, and can allow precipitation to enter.

6 **Parameter:** MetOpMaintCom

The temperature sensor signal cable insulation is cracked and showing signs of extreme wear. There are several sections covered with electrical tape.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	WNC429	**Technician**	Martin Valvur	**Site Visit Date**	04/05/2021

Site Sponsor (agency)	NPS	**USGS Map**	Wind Cave
Operating Group	NPS and state of SD	**Map Scale**	
AQS #	46-033-0132	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, NOx, PM2.5, PM10, IMPROVE	**QAPP Latitude**	43.5578
Deposition Measurement	dry, wet	**QAPP Longitude**	-103.4839
Land Use	prairie - woodland - evergreen	**QAPP Elevation Meters**	1292
Terrain	rolling	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	43.557639
Site Address 1	Visitor Center	**Audit Longitude**	-103.483856
Site Address 2	Route 385 Wind Cave National Park	**Audit Elevation**	1288
County	Custer	**Audit Declination**	8.1
City, State	Hot Springs, SD		
Zip Code	57747	**Fire Extinguisher** ☐	
Time Zone	Mountain	**First Aid Kit** ☐	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☐	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Steps** ☑	

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 3034-1)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	One shelter houses the ozone monitor and is in good condition and clean. The second shelter houses the flow system and IMPROVE. It is older and not climate controlled.				
Site OK	☑	**Notes**					

Driving Directions

From Hot Springs proceed north on 385 into Wind Cave National Park. Turn left onto the visitor center loop road. The site operator's office is in the visitors center. The site is up the gravel access road to the park water supply on the opposite side of the parking lot from the visitor center.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	WNC429	Technician	Martin Valvur	Site Visit Date	04/05/2021

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	WNC429	Technician	Martin Valvur	Site Visit Date	04/05/2021

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?	☑	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 temperature sensor signal cable insulation is cracked and showing signs of extreme wear. There are several sections covered with electrical tape.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	WNC429	Technician	Martin Valvur	Site Visit Date	04/05/2021

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 inch teflon, 4 meters above ground
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☐	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

The dry deposition filter is mounted low in the enclosure which changes the particle collection characteristics, and can allow precipitation to enter.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID	WNC429	Technician	Martin Valvur	Site Visit Date	04/05/2021

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?	☑	Signs of wear
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?	☑	Both on

		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	WNC429	Technician	Martin Valvur	Site Visit Date	04/05/2021

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	☑		☑
Site Ops Manual	☑	Jan 2006	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

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

Records of the routine checks performed by the state of SD personnel are kept onsite in a logbook.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	WNC429	Technician	Martin Valvur	Site Visit Date	04/05/2021

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained 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	☑	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	☑	Quarterly	☑
Automatic Zero/Span Tests	☐		☐
Manual Zero/Span Tests	☑	Every 2 weeks	☐
Automatic Precision Level Tests	☐		☐
Manual Precision Level Test	☑	Every 2 weeks	☐
Analyzer Diagnostics Tests	☐		☐
In-line Filter Replacement (at inlet)	☐		☐
In-line Filter Replacement (at analyze	☐		☐
Sample Line Check for Dirt/Water	☐		☐
Zero Air Desiccant Check	☐		☐

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?	☑	Logbook

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 is operated by the state of South Dakota and the sample train is now 1/4 Teflon with a filter at the inlet 4 meters above the ground.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	WNC429	Technician	Martin Valvur	Site Visit Date	04/05/2021

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?	☐	
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?	☐	Gloves not used
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	☐		☐

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 general observations section of the SSRF is still not completed. Gloves are not used when handling the filter pack, however the filter bag is used as a glove.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID WNC429 **Technician** Martin Valvur **Site Visit Date** 04/05/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB1520H5J	none
DAS	Environmental Sys Corp	8832	A4868	None
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	0688001767	none
Flow Rate	Apex	AXMC105LPMDPC	illegible	none
Infrastructure	Infrastructure	none	none	none
Met tower	unknown	unknown	none	none
Sample Tower	Aluma Tower	B	none	none
Shelter Temperature	ARS	none	none	none
Shield (2 meter)	RM Young	43532	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	14264	none
Zero air pump	Teledyne	701	1304	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
NEC602-Martin Valvur-04/06/2021						
1	4/6/2021	DAS	Campbell	none	CR1000	41007
2	4/6/2021	elevation	Elevation	none	none	none
3	4/6/2021	Filter pack flow pump	Thomas	none	107CAB18	061200041880
4	4/6/2021	Flow Rate	Omega	none	FMA6518ST-RS232	394013
5	4/6/2021	Infrastructure	Infrastructure	none	none	none
6	4/6/2021	MFC power supply	Sceptre	none	FMA65PWC	295106-8
7	4/6/2021	Ozone	ThermoElectron Inc	none	49i A1NAA	1214552974
8	4/6/2021	Ozone Standard	ThermoElectron Inc	L0534683	49i E3CAA	1214552972
9	4/6/2021	Sample Tower	Unknown	none	Unknown	None
10	4/6/2021	Shelter Temperature	ARS	none	Thermocouple	none
11	4/6/2021	siting criteria	Siting Criteria	none	none	None
12	4/6/2021	Temperature2meter	Campbell	none	unknown	missing
13	4/6/2021	Zero air pump	Thomas	none	107CAB18	079600005244

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	41007	NEC602	Martin Valvur	04/06/2021	DAS	Primary

Das Date:	4 /6 /2021	**Audit Date**	4 /6 /2021
Das Time:	08:41:50	**Audit Time**	08:42:00
Das Day:	96	**Audit Day**	96

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

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	2/11/2021	**CorrCoff**	1.00000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Omega	394013	NEC602	Martin Valvur	04/06/2021	Flow Rate	none

Mfg	Sceptre	
SN/Owner ID	295106-8	none
Parameter:	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00850	**Intercept**	0.00160
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.98
1.65%	2.21%			**Cal Factor Full Scale**	0.988
				Rotometer Reading:	0

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.16	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	2.967	2.940	0.00	0.000	3.01	l/m	l/m	2.21%
primary	test pt 2	2.974	2.950	0.00	0.000	3.00	l/m	l/m	1.76%
primary	test pt 3	3.001	2.970	0.00	0.000	3.00	l/m	l/m	0.98%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Poor	**Status**	Fail
Sensor Component	Rotometer Condition	**Condition**	Not installed	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	-0.5 cm	**Status**	Fail
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1214552974	NEC602	Martin Valvur	04/06/2021	Ozone	none

Slope:	1.00194	**Slope:**	0.00000
Intercept	-0.14706	**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	1.00340	**Intercept**	0.02230
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.04	0.01	-0.01	ppb		-0.02
primary	2	16.65	16.48	16.60	ppb		0.12
primary	3	38.35	37.99	37.61	ppb	-1.01	
primary	4	67.56	66.95	66.60	ppb	-0.52	
primary	5	109.41	108.45	108.79	ppb	0.31	

Sensor Component	Condition	Status
Audit Pressure	638 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	143 m	Fail
ADT >100 vehicles further than 50	143 m	Fail
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.1	pass
Span	1.005	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	96.2 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.66 lpm	pass
Cell A Pressure	624.5 mmHg	pass
Cell A Tmp.	26.8 C	pass
Cell B Freq.	90.2 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.68 lpm	pass
Cell B Pressure	624.2 mmHg	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	missing	NEC602	Martin Valvur	04/06/2021	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

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

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.02	0.03	0.000	0.06	C	0.03
primary	Temp Mid Range	23.82	23.83	0.000	23.98	C	0.15
primary	Temp High Rang	47.84	47.86	0.000	47.96	C	0.1

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	NEC602	Martin Valvur	04/06/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.77	1.29		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	19.80	19.81	0.000	19.0	C	-0.81
primary	Temp Mid Range	19.50	19.51	0.000	19.3	C	-0.21
primary	Temp Mid Range	18.30	18.31	0.000	19.6	C	1.29

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition	2 km	Status	Fail
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass
Sensor Component	Large point source of So2 or Nox	Condition	< 10 km	Status	Fail
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Major industrial source	Condition	< 10 km	Status	Fail
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
NEC602	Martin Valvur	04/06/2021

Shelter Make	Shelter Model	Shelter Size
Shelter One	AR 263648	24 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Pole type	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	Moisture Trap Type	Condition	Filter	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Not 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	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	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
Sensor Component	System Memo	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	NEC602	Martin Valvur	04/06/2021	Filter Depth	Omega	4633	☐	☐

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator does not use gloves to handle the filter pack. The bag is used as a glove to install and remove the filter.

2 **Parameter:** DocumentationCo

The site operator received a disc with the current QAPP which is kept at his office.

3 **Parameter:** SiteOpsProcedures

The site operator is aware that the desiccant is almost in need of replacement. Some of the items on the SSRF were discussed and the site operator's questions were answered regarding the correct procedures.

4 **Parameter:** SitingCriteriaCom

The site is located approximately 2 km northeast of Newcastle WY which has a population of approximately 3500. There is an oil refinery in Newcastle. A heavily traveled road is approximately 100m west of the site.

5 **Parameter:** ShelterCleanNotes

The shelter houses the ozone, DAS, and MFC only.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	NEC602	**Technician**	Martin Valvur	**Site Visit Date**	04/06/2021

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	BLM	**Map Scale**	
AQS #	560450003	**Map Date**	
Meteorological Type	Met One		
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**	43.8731
Site Address 1		**Audit Longitude**	-104.192009
Site Address 2		**Audit Elevation**	1469
County	Weston	**Audit Declination**	8.2
City, State	Newcastle, WY		
Zip Code	82701		
Time Zone	Mountain		
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 Steps	☑		

Shelter Working Room	☐	**Make**	Shelter One	**Model**	AR 263648	**Shelter Size**	24 cuft
Shelter Clean	☐	**Notes**	The shelter houses the ozone, DAS, and MFC only.				
Site OK	☐	**Notes**					
Driving Directions							

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	NEC602	Technician	Martin Valvur	Site Visit Date	04/06/2021

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	NEC602	Technician	Martin Valvur	Site Visit Date	04/06/2021

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	NEC602	Technician	Martin Valvur	Site Visit Date	04/06/2021

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 Nylon 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?	☐	Not present

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	NEC602	Technician	Martin Valvur	Site Visit Date	04/06/2021

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?	☐	Not present
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	NEC602	Technician	Martin Valvur	Site Visit Date	04/06/2021

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	☐	Not present	☐
SSRF	☑		☑
Site Ops Manual	☑	2013	☑
HASP	☑	2013	☑
Field Ops Manual	☑	2013	☑
Calibration Reports	☐	Not present	☐
Ozone z/s/p Control Charts	☐	Not present	☐
Preventive maintenance schedule	☐	Not present	☐

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:

The site operator received a disc with the current QAPP which is kept at his office.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	NEC602	Technician	Martin Valvur	Site Visit Date	04/06/2021

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	☐	Not performed	☐
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	☐		☐
In-line Filter Replacement (at inlet)	☑	Every 2 months	☑
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?	☐	Unknown

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

The site operator is aware that the desiccant is almost in need of replacement. Some of the items on the SSRF were discussed and the site operator's questions were answered regarding the correct procedures.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	NEC602	Technician	Martin Valvur	Site Visit Date	04/06/2021

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
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☐	Not present	☐
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 does not use gloves to handle the filter pack. The bag is used as a glove to install and remove the filter.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID NEC602 **Technician** Martin Valvur **Site Visit Date** 04/06/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR1000	41007	none
elevation	Elevation	none	none	none
Filter pack flow pump	Thomas	107CAB18	061200041880	none
Flow Rate	Omega	FMA6518ST-RS232	394013	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Sceptre	FMA65PWC	295106-8	none
Ozone	ThermoElectron Inc	49i A1NAA	1214552974	none
Ozone Standard	ThermoElectron Inc	49i E3CAA	1214552972	L0534683
Sample Tower	Unknown	Unknown	None	none
Shelter Temperature	ARS	Thermocouple	none	none
siting criteria	Siting Criteria	none	None	none
Temperature2meter	Campbell	unknown	missing	none
Zero air pump	Thomas	107CAB18	079600005244	none

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
BUF603-Martin Valvur-04/08/2021						
1	4/8/2021	DAS	Campbell	49917	CR1000	43073
2	4/8/2021	elevation	Elevation	none	none	none
3	4/8/2021	Filter pack flow pump	Thomas	none	107CAB18A	119900011286
4	4/8/2021	Flow Rate	Omega	none	FMA6518ST-RS232	315688-1
5	4/8/2021	Infrastructure	Infrastructure	none	none	none
6	4/8/2021	Sample Tower	Unknown	none	Unknown	None
7	4/8/2021	siting criteria	Siting Criteria	none	none	None
8	4/8/2021	Temperature2meter	Campbell	none	10755	Missing

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	43073	BUF603	Martin Valvur	04/08/2021	DAS	Primary

Das Date:	4 /8 /2021	**Audit Date**	4 /8 /2021
Das Time:	14:07:00	**Audit Time**	14:07:00
Das Day:	98	**Audit Day**	98

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

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	2/11/2021	**CorrCoff**	1.00000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Omega	315688-1	BUF603	Martin Valvur	04/08/2021	Flow Rate	none

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00850	**Intercept**	0.00160
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.371
				Cal Factor Full Scale	0.995
1.70%	3.23%			**Rotometer Reading:**	0

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.37	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.37	l/m	l/m	
primary	test pt 1	3.018	2.990	0.00	0.000	3.00	l/m	l/m	0.43%
primary	test pt 2	3.080	3.050	0.00	0.000	3.01	l/m	l/m	-1.44%
primary	test pt 3	3.128	3.100	0.00	0.000	3.00	l/m	l/m	-3.23%

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**	Not installed	**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**	8.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	Missing	BUF603	Martin Valvur	04/08/2021	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

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

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.29	0.30	0.000	0.14	C	-0.16
primary	Temp Mid Range	23.07	23.08	0.000	23.12	C	0.04
primary	Temp High Rang	47.34	47.36	0.000	47.33	C	-0.03

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

Siting Criteria Form

Sensor Component	Limited agriculture operations	**Condition**		**Status**	pass
Sensor Component	City > 50,000	**Condition**		**Status**	pass
Sensor Component	City 1,000 to 10,000	**Condition**		**Status**	pass
Sensor Component	City 10,000 to 50,000	**Condition**		**Status**	pass
Sensor Component	Feedlot operations	**Condition**		**Status**	pass
Sensor Component	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**Condition**		**Status**	pass
Sensor Component	Major industrial source	**Condition**		**Status**	pass
Sensor Component	Secondary road < or = 100 per da	**Condition**		**Status**	pass
Sensor Component	Secondary road >100 vehicles/da	**Condition**		**Status**	pass
Sensor Component	Small parking lot	**Condition**		**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	BUF603	Technician	Martin Valvur	Site Visit Date	04/08/2021

Shelter Make	Shelter Model	Shelter Size

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Pole type	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	Moisture Trap Type	Condition	Filter	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Not 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	N/A	Status	pass
Sensor Component	Shelter walls	Condition	N/A	Status	pass
Sensor Component	Excessive mold present	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
Sensor Component	System Memo	Condition		Status	pass

Field Systems Comments

1 **Parameter:** DasComments

The NEMA enclosure has a cooling fan.

2 **Parameter:** DocumentationCo

A disc with the current QAPP has been received and is kept at the site operator's office. The site operator completes and files a hardcopy checklist developed by ARS for BLM each week.

3 **Parameter:** ShelterCleanNotes

NEMA enclosure, 120 VAC power

4 **Parameter:** PollAnalyzerCom

The dry deposition filter pack enclosure is not the standard "pot" size that is used at the other CASTNET sites. The diameter of the enclosure is much smaller and the filter is mounted much deeper inside the opening. The geometry of the filter pack and enclosure is likely to impact particle collection efficiency.

5 **Parameter:** MetSensorComme

The temperature is measured at 2.5 meters above the ground.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	BUF603	**Technician**	Martin Valvur	**Site Visit Date**	04/08/2021

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	BLM	**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**	44.144135
Site Address 1		**Audit Longitude**	-106.108771
Site Address 2		**Audit Elevation**	1320
County	Johnson	**Audit Declination**	9.3
City, State	Buffalo, WY		
Zip Code	82834	**Fire Extinguisher**	☐
Time Zone	Mountain	**First Aid Kit**	☐
Primary Operator		**Safety Glasses**	☐
Primary Op. Phone #		**Safety Hard Hat**	☐
Primary Op. E-mail		**Climbing Belt**	☐
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Steps**	☑

Present

Shelter Working Room	☐	**Make**		**Model**		**Shelter Size**	
Shelter Clean	☐	**Notes**	NEMA enclosure, 120 VAC power				
Site OK	☐	**Notes**					

Driving Directions

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	BUF603	Technician	Martin Valvur	Site Visit Date	04/08/2021

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?	☑	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 is measured at 2.5 meters above the ground.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	BUF603	Technician	Martin Valvur	Site Visit Date	04/08/2021

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?	☑	N/A
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	BUF603	Technician	Martin Valvur	Site Visit Date	04/08/2021

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 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?	☐	Not present
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☐	Not present

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 dry deposition filter pack enclosure is not the standard "pot" size that is used at the other CASTNET sites. The diameter of the enclosure is much smaller and the filter is mounted much deeper inside the opening. The geometry of the filter pack and enclosure is likely to impact particle collection efficiency.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID	BUF603	Technician	Martin Valvur	Site Visit Date	04/08/2021

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?	☐	Not present
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?	☑	Marginally

		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 NEMA enclosure has a cooling fan.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	BUF603	Technician	Martin Valvur	Site Visit Date	04/08/2021

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	☐	Not present	☐
SSRF	☑		☑
Site Ops Manual	☑	2013	☑
HASP	☑	2013	☑
Field Ops Manual	☑	2013	☑
Calibration Reports	☐	Not present	☐
Ozone z/s/p Control Charts	☐	N/A	☑
Preventive maintenance schedule	☐	Not present	☐

1	Is the station log properly completed during every site visit?	☐	Not present
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:

A disc with the current QAPP has been received and is kept at the site operator's office. The site operator completes and files a hardcopy checklist developed by ARS for BLM each week.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	BUF603	Technician	Martin Valvur	Site Visit Date	04/08/2021

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	☑	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	☐	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	BUF603	Technician	Martin Valvur	Site Visit Date	04/08/2021

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
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?	☑	One set of gloves only
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	☐	Not present	☐
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 BUF603 **Technician** Martin Valvur **Site Visit Date** 04/08/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR1000	43073	49917
elevation	Elevation	none	none	none
Filter pack flow pump	Thomas	107CAB18A	119900011286	none
Flow Rate	Omega	FMA6518ST-RS232	315688-1	none
Infrastructure	Infrastructure	none	none	none
Sample Tower	Unknown	Unknown	None	none
siting criteria	Siting Criteria	none	None	none
Temperature2meter	Campbell	10755	Missing	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SHE604-Martin Valvur-04/08/2021						
1	4/8/2021	DAS	Campbell	none	CR1000	unknown1
2	4/8/2021	elevation	Elevation	none	none	none
3	4/8/2021	Flow Rate	Omega	none	FMA6518ST-RS232	324333-2
4	4/8/2021	Infrastructure	Infrastructure	none	none	none
5	4/8/2021	Sample Tower	Unknown	none	Unknown	None
6	4/8/2021	siting criteria	Siting Criteria	none	none	None
7	4/8/2021	Temperature2meter	Campbell	none	10755	Illegible

DAS Data Form

DAS Time Max Error: 0.17

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	unknown1	SHE604	Martin Valvur	04/08/2021	DAS	Primary

Das Date:	4 /8 /2021	**Audit Date**	4 /8 /2021
Das Time:	10:05:50	**Audit Time**	10:06:00
Das Day:	98	**Audit Day**	98

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

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	2/11/2021	**CorrCoff**	1.00000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Omega	324333-2	SHE604	Martin Valvur	04/08/2021	Flow Rate	none

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00850	**Intercept**	0.00160
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.377
2.04%	2.39%			**Cal Factor Full Scale**	0.959
				Rotometer Reading:	0

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.38	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.38	l/m	l/m	
primary	test pt 1	2.970	2.940	0.00	0.000	3.00	l/m	l/m	2.04%
primary	test pt 2	2.980	2.950	0.00	0.000	3.00	l/m	l/m	1.69%
primary	test pt 3	2.960	2.930	0.00	0.000	3.00	l/m	l/m	2.39%

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**	Not installed	**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**	1.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	300 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	Illegible	SHE604	Martin Valvur	04/08/2021	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

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

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.12	0.13	0.000	0.08	C	-0.05
primary	Temp Mid Range	24.59	24.60	0.000	24.69	C	0.09
primary	Temp High Rang	47.78	47.80	0.000	47.86	C	0.06

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

Siting Criteria Form

Sensor Component	Limited agriculture operations	**Condition**		**Status**	pass
Sensor Component	City > 50,000	**Condition**		**Status**	pass
Sensor Component	City 1,000 to 10,000	**Condition**		**Status**	pass
Sensor Component	City 10,000 to 50,000	**Condition**		**Status**	pass
Sensor Component	Feedlot operations	**Condition**		**Status**	pass
Sensor Component	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**Condition**		**Status**	pass
Sensor Component	Major industrial source	**Condition**		**Status**	pass
Sensor Component	Secondary road < or = 100 per da	**Condition**		**Status**	pass
Sensor Component	Secondary road >100 vehicles/da	**Condition**		**Status**	pass
Sensor Component	Small parking lot	**Condition**		**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	SHE604	Technician	Martin Valvur	Site Visit Date	04/08/2021

Shelter Make	Shelter Model	Shelter Size

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Pole type	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	Moisture Trap Type	Condition	Filter	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	N/A	Status	pass
Sensor Component	Rotometer	Condition	Not 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	N/A	Status	pass
Sensor Component	Shelter walls	Condition	N/A	Status	pass
Sensor Component	Excessive mold present	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
Sensor Component	System Memo	Condition		Status	pass

Field Systems Comments

1 **Parameter:** DasComments

The site power source is solar and wind with battery storage. The NEMA enclosure has a cooling fan.

2 **Parameter:** SiteOpsProcedures

observations of current meteorological measurements are recorded on a hardcopy checklist for ARS and not on the SSRF.

3 **Parameter:** DocumentationCo

The site operator is supplied with a disc containing the QAPP, operating procedures, and HASP which is kept at his office. A hard copy BLM check list developed by ARS is completed and sent to ARS each week. Standard CASTNET SSRF forms are being used now.

4 **Parameter:** SitingCriteriaCom

The site is located in range land. There is an active rail line with coal trains within one kilometer of the site.

5 **Parameter:** ShelterCleanNotes

NEMA enclosure, wind and solar power

6 **Parameter:** PollAnalyzerCom

The dry deposition filter pack enclosure is not the standard "pot" size as at the other CASTNET sites. The diameter is much smaller. It is not clear if this will impact particle collection efficiency.

7 **Parameter:** MetSensorComme

The site is a small footprint solar powered site that has been operating as part of the WARMS network for more than 10 years. Objects violate the 45 degree rule for the tipping bucket rain gage. The temperature and RH are being measured at 2.5 meters above the ground.

8 **Parameter:** MetOpMaintCom

The accuracy of the DAS was not tested with a voltage source since there were no available test channels.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	SHE604	**Technician**	Martin Valvur	**Site Visit Date**	04/08/2021

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	BLM	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type	Met One		
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**	44.933601
Site Address 1		**Audit Longitude**	-106.847161
Site Address 2		**Audit Elevation**	1141
County	Sheridan	**Audit Declination**	9.8
City, State	Sheridan, WY		
Zip Code	82801		
Time Zone	Mountain		
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 Steps	☑	

Shelter Working Room	☐	**Make**		**Model**		**Shelter Size**	
Shelter Clean	☑	**Notes**	NEMA enclosure, wind and solar power				
Site OK	☐	**Notes**					
Driving Directions							

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	SHE604	Technician	Martin Valvur	Site Visit Date	04/08/2021

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?	☑	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 site is a small footprint solar powered site that has been operating as part of the WARMS network for more than 10 years. Objects violate the 45 degree rule for the tipping bucket rain gage. The temperature and RH are being measured at 2.5 meters above the ground.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	SHE604	Technician	Martin Valvur	Site Visit Date	04/08/2021

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?	☑	N/A
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:

The accuracy of the DAS was not tested with a voltage source since there were no available test channels.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	SHE604	Technician	Martin Valvur	Site Visit Date	04/08/2021

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 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?	☑	in-line filter
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☐	Not present

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 dry deposition filter pack enclosure is not the standard "pot" size as at the other CASTNET sites. The diameter is much smaller. It is not clear if this will impact particle collection efficiency.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID SHE604 **Technician** Martin Valvur **Site Visit Date** 04/08/2021

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?	☐	Not present
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?	☐	Marginally

		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 site power source is solar and wind with battery storage. The NEMA enclosure has a cooling fan.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	SHE604	Technician	Martin Valvur	Site Visit Date	04/08/2021

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	☑	2013	☑
HASP	☑	2013	☑
Field Ops Manual	☑	2013	☑
Calibration Reports	☐	Not present	☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

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 operator is supplied with a disc containing the QAPP, operating procedures, and HASP which is kept at his office. A hard copy BLM check list developed by ARS is completed and sent to ARS each week. Standard CASTNET SSRF forms are being used now.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	SHE604	Technician	Martin Valvur	Site Visit Date	04/08/2021

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Training provided by ARS
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	☑	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	☐	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:

observations of current meteorological measurements are recorded on a hardcopy checklist for ARS and not on the SSRF.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	SHE604	Technician	Martin Valvur	Site Visit Date	04/08/2021

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
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?	☑	One set of gloves only
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	☐	Not present	☐
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 SHE604 **Technician** Martin Valvur **Site Visit Date** 04/08/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR1000	unknown1	none
elevation	Elevation	none	none	none
Flow Rate	Omega	FMA6518ST-RS232	324333-2	none
Infrastructure	Infrastructure	none	none	none
Sample Tower	Unknown	Unknown	None	none
siting criteria	Siting Criteria	none	None	none
Temperature2meter	Campbell	10755	Illegible	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CAD150-Eric Hebert-04/15/2021						
1	4/15/2021	Computer	Dell	07029	Inspiron 15	Unknown
2	4/15/2021	DAS	Campbell	000421	CR3000	2530
3	4/15/2021	Elevation	Elevation	None	1	None
4	4/15/2021	Filter pack flow pump	Thomas	00462	107CA110	09883403-01-4
5	4/15/2021	Flow Rate	Apex	000599	AXMC105LPMDPCV	illegible
6	4/15/2021	Infrastructure	Infrastructure	none	none	none
7	4/15/2021	Modem	Digi	07195	LRS4	unknown
8	4/15/2021	Ozone	ThermoElectron Inc	000724	49i A1NAA	1105347328
9	4/15/2021	Ozone Standard	ThermoElectron Inc	000439	49i A3NAA	CM08200015
10	4/15/2021	Sample Tower	Aluma Tower	03538	A	none
11	4/15/2021	Shelter Temperature	Campbell	none	107-L	none
12	4/15/2021	Siting Criteria	Siting Criteria	None	1	None
13	4/15/2021	Temperature	RM Young	04682	41342VC	9699
14	4/15/2021	Zero air pump	Werther International	06937	C 70/4	000821896

DAS Data Form

DAS Time Max Error: 1.67

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2530	CAD150	Eric Hebert	04/15/2021	DAS	Primary

Das Date: 4 /15/2021
Das Time: 09:26:00
Das Day: 105

Audit Date 4 /15/2021
Audit Time 09:24:20
Audit Day 105

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	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	2/11/2021	**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	0.1079	0.1078	V	V	-0.0001
7	0.3000	0.3238	0.3237	V	V	-0.0001
7	0.5000	0.5003	0.5004	V	V	0.0001
7	0.7000	0.7006	0.7006	V	V	0.0000
7	0.9000	0.9005	0.9005	V	V	0.0000
7	1.0000	1.0005	1.0006	V	V	0.0001

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	CAD150	Eric Hebert	04/15/2021	Flow Rate	000599

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number		**Tfer Desc.**	BIOS 530-H
Tfer ID	01414		
Slope	1.00185	**Intercept**	0.02453
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.03
0.22%	0.66%			**Cal Factor Full Scale**	0.98
				Rotometer Reading:	1.55

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.00	l/m	l/m	
primary	test pt 1	1.527	1.500	1.52	0.000	1.50	l/m	l/m	0.00%
primary	test pt 2	1.528	1.500	1.52	0.000	1.50	l/m	l/m	0.00%
primary	test pt 3	1.538	1.510	1.52	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**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347328	CAD150	Eric Hebert	04/15/2021	Ozone	000724

Slope:	1.01633	**Slope:**	0.00000
Intercept	-0.08703	**Intercept**	0.00000
CorrCoff:	0.99999	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00560	**Intercept**	0.14070
Cert Date	4/7/2021	**CorrCoff**	0.99990

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.61	0.46	0.68	ppb		0.22
primary	2	14.84	14.42	14.49	ppb		0.07
primary	3	31.79	31.06	31.18	ppb	0.39	
primary	4	67.57	66.18	67.14	ppb	1.44	
primary	5	113.30	111.06	112.90	ppb	1.64	

Sensor Component	Condition	Status
Audit Pressure	754.8 mmHg	pass
26.6 degree unobstructed rule	False	Fail
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	125 m	Fail
ADT >100 vehicles further than 50	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Dirty	Fail
Offset	-0.50	pass
Span	1.028	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	92.1 kHz	pass
Cell A Noise	0.5 ppb	pass
Cell A Flow	0.72 lpm	pass
Cell A Pressure	715.3 mmHg	pass
Cell A Tmp.	35.7 C	pass
Cell B Freq.	99.3 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	715.9 mmHg	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	9699	CAD150	Eric Hebert	04/15/2021	Temperature	04682

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00751	**Intercept**	0.16174
Cert Date	2/18/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.16	0.30		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.38	0.22	0.000	0.5	C	0.3
primary	Temp Mid Range	23.84	23.50	0.000	23.4	C	-0.09
primary	Temp High Range	47.12	46.61	0.000	46.5	C	-0.09

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CAD150	Eric Hebert	04/15/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
1.86	1.90		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00751	Intercept	0.16174
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.51	22.18	0.000	24.0	C	1.81
primary	Temp Mid Range	22.29	21.96	0.000	23.9	C	1.9

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**Condition**		**Status**	pass
Sensor Component	City > 50,000	**Condition**		**Status**	pass
Sensor Component	City 1,000 to 10,000	**Condition**		**Status**	pass
Sensor Component	City 10,000 to 50,000	**Condition**		**Status**	pass
Sensor Component	Feedlot operations	**Condition**		**Status**	pass
Sensor Component	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**Condition**		**Status**	pass
Sensor Component	Major industrial source	**Condition**		**Status**	pass
Sensor Component	Secondary road < or = 100 per da	**Condition**		**Status**	pass
Sensor Component	Secondary road >100 vehicles/da	**Condition**		**Status**	pass
Sensor Component	Small parking lot	**Condition**		**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
CAD150	Eric Hebert	04/15/2021

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	Moisture Trap Type	Condition	glass bottle and filter	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	Poor	Status	Fail
Sensor Component	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	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
Sensor Component	System Memo	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	CAD150	Eric Hebert	04/15/2021	Moisture Present	Apex	4207	☐	☐

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

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

2 **Parameter:** ShelterCleanNotes

Some shelter floor tiles are cracked and there is indication of insect damage below the heater. The floor is continuing to rot under the tiles.

3 **Parameter:** PollAnalyzerCom

There is a moisture trap and dryer in the ozone sample line.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CAD150	**Technician**	Eric Hebert	**Site Visit Date**	04/15/2021

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**	34.179305
Site Address 1	DeGray Regulating Dam	**Audit Longitude**	-93.098699
Site Address 2	Route 390	**Audit Elevation**	76
County	Clark	**Audit Declination**	1.3
City, State	Arkadelphia, AR		
Zip Code	71923	**Fire Extinguisher** ☑ Present	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 Steps** ☑	

Shelter Working Room ☑ **Make** Ekto **Model** 8810 **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** Some shelter floor tiles are cracked and there is indication of insect damage below the heater. The floor is continuing to rot under the tiles.

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-S3-rev002

Site ID	CAD150	Technician	Eric Hebert	Site Visit Date	04/15/2021

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	Eric Hebert	Site Visit Date	04/15/2021

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	Eric Hebert	Site Visit Date	04/15/2021

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?	☑	
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:

There is a moisture trap and dryer in the ozone sample line.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CAD150 **Technician** Eric Hebert **Site Visit Date** 04/15/2021

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. 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	CAD150	Technician	Eric Hebert	Site Visit Date	04/15/2021

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 schedule	☐		☐

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	Eric Hebert	Site Visit Date	04/15/2021

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)	☑	Quarterly	☑
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 quarterly.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	CAD150	Technician	Eric Hebert	Site Visit Date	04/15/2021

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** Eric Hebert **Site Visit Date** 04/15/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07029
DAS	Campbell	CR3000	2530	000421
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	09883403-01-4	00462
Flow Rate	Apex	AXMC105LPMDPC	illegible	000599
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LRS4	unknown	07195
Ozone	ThermoElectron Inc	49i A1NAA	1105347328	000724
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200015	000439
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	000821896	06937

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CHC432-Martin Valvur-04/20/2021						
1	4/20/2021	Computer	Hewlett Packard	none	6550 b	CN002532PM
2	4/20/2021	DAS	Environmental Sys Corp	none	8832	A4871K
3	4/20/2021	elevation	Elevation	none	none	none
4	4/20/2021	Infrastructure	Infrastructure	none	none	none
5	4/20/2021	Modem	Sierra wireless	none	GX450	Unknown
6	4/20/2021	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460049
7	4/20/2021	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1152780006
8	4/20/2021	Sample Tower	Aluma Tower	none	FOT-10	Unknown
9	4/20/2021	Shelter Temperature	ARS	none	unknown	none
10	4/20/2021	siting criteria	Siting Criteria	none	none	None
11	4/20/2021	Temperature2meter	Vaisala	none	HMP45C	C1210008
12	4/20/2021	Zero air pump	Werther International	none	P 70/4	000756726

DAS Data Form

DAS Time Max Error: 0.28

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	A4871K	CHC432	Martin Valvur	04/20/2021	DAS	Primary

Das Date: 4 /20/2021
Das Time: 09:05:43
Das Day: 110

Audit Date 4 /20/2021
Audit Time 09:06:00
Audit Day 110

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0004	0.0008	0.0004	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	2/11/2021	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
8	0.0000	-0.0004	-0.0004	V	V	0.0000
8	0.1000	0.0998	0.0996	V	V	-0.0002
8	0.3000	0.2997	0.3001	V	V	0.0004
8	0.5000	0.4997	0.5005	V	V	0.0008
8	0.7000	0.6998	0.7002	V	V	0.0004
8	0.9000	0.8995	0.9001	V	V	0.0006
8	1.0000	0.9998	1.0004	V	V	0.0006

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460049	CHC432	Martin Valvur	04/20/2021	Ozone	none

Slope:	0.99258	**Slope:**	0.00000
Intercept	-0.23119	**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	1.00340	**Intercept**	0.02230
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	-0.06	-0.08	-0.25	ppb		-0.17
primary	2	16.34	16.17	15.63	ppb		-0.54
primary	3	36.55	36.21	35.78	ppb	-1.19	
primary	4	65.06	64.48	63.90	ppb	-0.9	
primary	5	111.30	110.32	109.20	ppb	-1.02	

Sensor Component	Audit Pressure	**Condition**	605.2 mmHg	**Status**	pass
Sensor Component	26.6 degree unobstructed rule	**Condition**	True	**Status**	pass
Sensor Component	Tree dewline >10m or below inlet	**Condition**	True	**Status**	pass
Sensor Component	ADT <100 vehicles further than 20	**Condition**	True	**Status**	pass
Sensor Component	ADT >100 vehicles further than 50	**Condition**	True	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Offset	**Condition**	0.50	**Status**	pass
Sensor Component	Span	**Condition**	0.999	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	93.9 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.63 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	589.8 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	27.9 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	128.7 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.63 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	589.5 mmHg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	C1210008	CHC432	Martin Valvur	04/20/2021	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.25	0.34		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	19.10	19.11	0.0000	19.45	C	0.34
primary	Temp Mid Range	23.68	23.69	0.0000	23.61	C	-0.08
primary	Temp Mid Range	25.45	25.46	0.0000	25.79	C	0.33

Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition	See comments	Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	CHC432	Martin Valvur	04/20/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.24	0.33		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	21.58	21.59	0.000	21.4	C	-0.15
primary	Temp Mid Range	22.41	22.42	0.000	22.2	C	-0.23
primary	Temp Mid Range	22.93	22.94	0.000	23.3	C	0.33

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**Condition**		**Status**	pass
Sensor Component	City > 50,000	**Condition**		**Status**	pass
Sensor Component	City 1,000 to 10,000	**Condition**		**Status**	pass
Sensor Component	City 10,000 to 50,000	**Condition**		**Status**	pass
Sensor Component	Feedlot operations	**Condition**		**Status**	pass
Sensor Component	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**Condition**		**Status**	pass
Sensor Component	Major industrial source	**Condition**		**Status**	pass
Sensor Component	Secondary road < or = 100 per da	**Condition**		**Status**	pass
Sensor Component	Secondary road >100 vehicles/da	**Condition**		**Status**	pass
Sensor Component	Small parking lot	**Condition**		**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
CHC432	Martin Valvur	04/20/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8812	768 cuft

Sensor Component	Condition	Status
Sample Tower Type	Type B	pass
Conduit	Good	pass
Met Tower	N/A	pass
Moisture Trap	N/A	pass
Moisture Trap Type	N/A	pass
Power Cables	Glass bottle	pass
Shelter Temp Control	Functioning	pass
Rotometer	N/A	pass
Sample Tower	Good	pass
Shelter Condition	Good	pass
Shelter Door	Good	pass
Shelter Roof	Good	pass
Shelter Floor	Good	pass
Shelter walls	Good	pass
Excessive mold present	Good	pass
Signal Cable	Good	pass
Tubing Type	N/A	pass
Sample Train	N/A	pass
System Memo		pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Temperature2meter	CHC432	Martin Valvur	04/20/2021	System Memo	Vaisala	4644	☐	☐

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.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CHC432	**Technician**	Martin Valvur	**Site Visit Date**	04/20/2021

Site Sponsor (agency)	NPS	**USGS Map**	
Operating Group	NPS	**Map Scale**	
AQS #	35-045-0020	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**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**	9.13
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 Steps** ☑	

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-S3-rev002

Site ID	CHC432	Technician	Martin Valvur	Site Visit Date	04/20/2021

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	04/20/2021

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	04/20/2021

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** 04/20/2021

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	04/20/2021

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 schedule	☑	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	04/20/2021

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?	☑	everyother Tuesday
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	☑	Every 2 weeks	☑
Translator Zero/Span Tests (climatronics)	☑	N/A	☑
Manual Rain Gauge Test	☑	Monthly	☑
Confirm Reasonableness of Current Values	☑	Every 2 weeks	☑
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	☑	Every 2 weeks	☑

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	04/20/2021

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** 04/20/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6550 b	CN002532PM	none
DAS	Environmental Sys Corp	8832	A4871K	none
elevation	Elevation	none	none	none
Infrastructure	Infrastructure	none	none	none
Modem	Sierra wireless	GX450	Unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	CM08460049	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1152780006	none
Sample Tower	Aluma Tower	FOT-10	Unknown	none
Shelter Temperature	ARS	unknown	none	none
siting criteria	Siting Criteria	none	None	none
Temperature2meter	Vaisala	HMP45C	C1210008	none
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*
CHE185-Eric Hebert-04/21/2021					
1 4/21/2021	DAS	Environmental Sys Corp	70865	8832	illegible
2 4/21/2021	Elevation	Elevation	None	1	None
3 4/21/2021	Filter pack flow pump	Thomas	00498	107CAB18	0000110
4 4/21/2021	Flow Rate	Apex	000884	AXMC105LPMDPCV	illegible
5 4/21/2021	Infrastructure	Infrastructure	none	none	none
6 4/21/2021	Met tower	Universal Tower	03662	unknown	none
7 4/21/2021	Modem	US Robotics	05624	unknown	unknown
8 4/21/2021	Modem	Raven	06984	H4222-C	0808685382
9 4/21/2021	Ozone	Ecotech	87161	EC9810B	10-0064
10 4/21/2021	Sample Tower	Aluma Tower	000054	B	AT-81213-T12
11 4/21/2021	Shelter Temperature	unknown	none	none	015
12 4/21/2021	Shield (10 meter)	RM Young	04620	Aspirated 43408	none
13 4/21/2021	Siting Criteria	Siting Criteria	None	1	None
14 4/21/2021	Temperature	RM Young	06304	41342VO	12543
15 4/21/2021	Zero air pump	Ecotech	none	8301LC	01-0658

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	illegible	CHE185	Eric Hebert	04/21/2021	DAS	Primary

Das Date:	4 /21/2021	**Audit Date**	4 /21/2021
Das Time:	14:44:20	**Audit Time**	14:44:20
Das Day:	111	**Audit Day**	111

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

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	2/11/2021	**CorrCoff**	1.00000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	CHE185	Eric Hebert	04/21/2021	Flow Rate	000884

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number		**Tfer Desc.**	BIOS 530-H
Tfer ID	01414		
Slope	1.00185	**Intercept**	0.02453
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.004
				Cal Factor Full Scale	4.934
1.77%	1.84%			**Rotometer Reading:**	1.5

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.00	0.0000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.02	0.0000	0.02	l/m	l/m	
primary	test pt 1	1.501	1.470	1.52	0.0000	1.49	l/m	l/m	1.63%
primary	test pt 2	1.500	1.470	1.52	0.0000	1.50	l/m	l/m	1.84%
primary	test pt 3	1.502	1.470	1.52	0.0000	1.50	l/m	l/m	1.84%

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**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Ecotech	10-0064	CHE185	Eric Hebert	04/21/2021	Ozone	87161

Slope:	1.00097	**Slope:**	0.00000
Intercept	0.02064	**Intercept**	0.00000
CorrCoff:	0.99999	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00560	**Intercept**	0.14070
Cert Date	4/7/2021	**CorrCoff**	0.99990

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.44	0.29	0.41	ppb		0.12
primary	2	14.33	13.92	14.06	ppb		0.14
primary	3	36.19	35.38	35.13	ppb	-0.71	
primary	4	67.40	66.01	66.13	ppb	0.18	
primary	5	109.38	107.21	107.40	ppb	0.18	

Sensor Component		Condition		Status	
Sensor Component	Audit Pressure	Condition	737.0 mmHg	Status	pass
Sensor Component	26.6 degree unobstructed rule	Condition	True	Status	pass
Sensor Component	Tree dewline >10m or below inlet	Condition	True	Status	pass
Sensor Component	ADT <100 vehicles further than 20	Condition	True	Status	pass
Sensor Component	ADT >100 vehicles further than 50	Condition	True	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	Inlet Filter Condition	Condition	Clean	Status	pass
Sensor Component	Offset	Condition	N/A	Status	pass
Sensor Component	Span	Condition	0.997	Status	pass
Sensor Component	Zero Voltage	Condition	N/A	Status	pass
Sensor Component	Fullscale Voltage	Condition	N/A	Status	pass
Sensor Component	Cell A Freq.	Condition	N/A	Status	pass
Sensor Component	Cell A Noise	Condition	N/A	Status	pass
Sensor Component	Cell A Flow	Condition	0.50 lpm	Status	pass
Sensor Component	Cell A Pressure	Condition	714.6 torr	Status	pass
Sensor Component	Cell A Tmp.	Condition	32.7 C	Status	pass
Sensor Component	Cell B Freq.	Condition	N/A	Status	pass
Sensor Component	Cell B Noise	Condition	N/A	Status	pass
Sensor Component	Cell B Flow	Condition	N/A	Status	pass
Sensor Component	Cell B Pressure	Condition	N/A	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	12543	CHE185	Eric Hebert	04/21/2021	Temperature	06304

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00751	**Intercept**	0.16174
Cert Date	2/18/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.29	0.47		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.21	0.05	0.0000	0.5	C	0.47
primary	Temp Mid Range	27.75	27.38	0.0000	27.3	C	-0.08
primary	Temp High Range	46.92	46.41	0.0000	46.7	C	0.31

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
unknown	015	CHE185	Eric Hebert	04/21/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
1.65	1.73		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00751	Intercept	0.16174
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.20	22.87	0.000	24.4	C	1.57
primary	Temp Mid Range	22.11	21.78	0.000	23.5	C	1.73

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**Condition**		**Status**	pass
Sensor Component	City > 50,000	**Condition**		**Status**	pass
Sensor Component	City 1,000 to 10,000	**Condition**		**Status**	pass
Sensor Component	City 10,000 to 50,000	**Condition**		**Status**	pass
Sensor Component	Feedlot operations	**Condition**		**Status**	pass
Sensor Component	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**Condition**		**Status**	pass
Sensor Component	Major industrial source	**Condition**		**Status**	pass
Sensor Component	Secondary road < or = 100 per da	**Condition**		**Status**	pass
Sensor Component	Secondary road >100 vehicles/da	**Condition**		**Status**	pass
Sensor Component	Small parking lot	**Condition**		**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
CHE185	Eric Hebert	04/21/2021

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
Moisture Trap Type	Glass bottle and filter	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
Shelter walls	Good	pass
Excessive mold present	Good	pass
Signal Cable	Good	pass
Tubing Type	3/8 teflon	pass
Sample Train	Good	pass
System Memo		pass

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

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

2 **Parameter:** SitingCriteriaCom

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

3 **Parameter:** ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CHE185	**Technician**	Eric Hebert	**Site Visit Date**	04/21/2021

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 Steps** ☑	

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-S3-rev002

Site ID	CHE185	Technician	Eric Hebert	Site Visit Date	04/21/2021

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	04/21/2021

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?	☑	N/A
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	CHE185	Technician	Eric Hebert	Site Visit Date	04/21/2021

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	04/21/2021

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	04/21/2021

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 schedule	☐		☐

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	04/21/2021

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	☑	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	04/21/2021

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** 04/21/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Environmental Sys Corp	8832	illegible	70865
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	0000110	00498
Flow Rate	Apex	AXMC105LPMDPC	illegible	000884
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	03662
Modem	Raven	H4222-C	0808685382	06984
Modem	US Robotics	unknown	unknown	05624
Ozone	Ecotech	EC9810B	10-0064	87161
Sample Tower	Aluma Tower	B	AT-81213-T12	000054
Shelter Temperature	unknown	none	015	none
Shield (10 meter)	RM Young	Aspirated 43408	none	04620
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VO	12543	06304
Zero air pump	Ecotech	8301LC	01-0658	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MEV405-Martin Valvur-04/21/2021						
1	4/21/2021	Computer	Hewlett Packard	none	8470p	CNU3389GGZ
2	4/21/2021	DAS	Environmental Sys Corp	none	8864	C2597
3	4/21/2021	Elevation	Elevation	None	1	None
4	4/21/2021	Filter pack flow pump	Thomas	none	107CAB18	0814000036788
5	4/21/2021	flow rate	Tylan	none	FC280AV-4S	AW9403013
6	4/21/2021	Infrastructure	Infrastructure	none	none	none
7	4/21/2021	MFC power supply	Tylan	none	RO-32	FP9710002
8	4/21/2021	Modem	Sierra wireless	none	GX450	LA54620331001003
9	4/21/2021	Ozone	ThermoElectron Inc	none	49i A3NCA	120477664
10	4/21/2021	Ozone Standard	ThermoElectron Inc	90604	49C	49C-62014-333
11	4/21/2021	Sample Tower	Aluma Tower	illegible	B	none
12	4/21/2021	Shelter Temperature	ARS	none	none	none
13	4/21/2021	Siting Criteria	Siting Criteria	None	1	None
14	4/21/2021	Temperature2meter	RM Young	none	41342VC	14959
15	4/21/2021	Zero air pump	Werther International	none	C 70/4	000847660

DAS Data Form

DAS Time Max Error: 1.43

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	C2597	MEV405	Martin Valvur	04/21/2021	DAS	Primary

Das Date: 4 /21/2021
Das Time: 08:48:34
Das Day: 111

Audit Date 4 /21/2021
Audit Time 08:50:00
Audit Day 111

Low Channel:

Avg Diff:	Max Diff:
0.0000	0.0001

High Channel:

Avg Diff:	Max Diff:
0.0000	0.0001

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	2/11/2021	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
16	0.0000	-0.0003	-0.0002	V	V	0.0001
16	0.1000	0.0998	0.0998	V	V	0.0000
16	0.3000	0.2996	0.2997	V	V	0.0001
16	0.5000	0.4999	0.4999	V	V	0.0000
16	0.7000	0.6995	0.6995	V	V	0.0000
16	0.9000	0.8996	0.8995	V	V	-0.0001
16	1.0000	0.9993	0.9993	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9403013	MEV405	Martin Valvur	04/21/2021	flow rate	none

Mfg	Tylan	
SN/Owner ID	FP9710002	none
Parameter:	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00850	**Intercept**	0.00160
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	
0.23%	0.33%			

Cal Factor Zero	0.06
Cal Factor Full Scale	5.427
Rotometer Reading:	3.7

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	-0.10	0.0000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	-0.10	0.0000	0.00	l/m	l/m	
primary	test pt 1	3.026	3.000	2.74	0.0000	2.99	l/m	l/m	-0.20%
primary	test pt 2	3.031	3.000	2.73	0.0000	3.01	l/m	l/m	0.17%
primary	test pt 3	3.038	3.010	2.74	0.0000	3.00	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**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	10 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	120477664	MEV405	Martin Valvur	04/21/2021	Ozone	none

Slope:	0.98086	**Slope:**	0.00000
Intercept	-1.28734	**Intercept**	0.00000
CorrCoff:	0.99976	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00340	**Intercept**	0.02230
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.13	0.10	0.19	ppb		0.09
primary	2	16.92	16.75	13.87	ppb		-2.88
primary	3	37.24	36.89	34.54	ppb	-6.58	
primary	4	67.83	67.22	64.53	ppb	-4.08	
primary	5	116.35	115.33	112.20	ppb	-2.75	

Sensor Component	Condition	Status
Audit Pressure	588 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	145	Fail
ADT >100 vehicles further than 50	250	Fail
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.000	pass
Span	1.002	pass
Zero Voltage	0.0001	pass
Fullscale Voltage	0.9996	pass
Cell A Freq.	88.5 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.63 lpm	pass
Cell A Pressure	580.9 mmHg	pass
Cell A Tmp.	32.9 C	pass
Cell B Freq.	78.8 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.62 lpm	pass
Cell B Pressure	580.6 mmHg	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14959	MEV405	Martin Valvur	04/21/2021	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
1.06	2.03		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.10	0.11	0.0000	-0.07	C	-0.18
primary	Temp Mid Range	23.57	23.58	0.0000	22.61	C	-0.97
primary	Temp High Rang	47.61	47.63	0.0000	45.60	C	-2.03

Sensor Component	Shield	Condition	Dirty	Status	Fail
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	MEV405	Martin Valvur	04/21/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
1.27	1.51		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	21.09	21.10	0.000	22.4	C	1.31
primary	Temp Mid Range	21.69	21.70	0.000	23.2	C	1.51
primary	Temp Mid Range	24.73	24.74	0.000	23.8	C	-0.99

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Large parking lot	Condition	30 m	Status	Fail

Infrastructure Data For

Site ID	Technician	Site Visit Date
MEV405	Martin Valvur	04/21/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	888	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	Installed	Status	pass
Sensor Component	Moisture Trap Type	Condition	Filter	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	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	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
Sensor Component	System Memo	Condition		Status	pass

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

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

2 **Parameter:** ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	MEV405	**Technician**	Martin Valvur	**Site Visit Date**	04/21/2021

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Moccasin Mesa
Operating Group	NPS	**Map Scale**	
AQS #	08-083-0101	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, wet, IMPROVE	**QAPP Longitude**	
Land Use	woodland - evergreen	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	37.198398
Site Address 1	Natural Resources	**Audit Longitude**	-108.490462
Site Address 2	Mesa Verde National Park	**Audit Elevation**	2170
County	Montezuma	**Audit Declination**	10.3
City, State	Cortez, CO		
Zip Code	81330	**Fire Extinguisher** ☑	No inspection date
Time Zone	Mountain	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☐	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Steps** ☑	

Shelter Working Room	☑	**Make**	Ekto	**Model**	888	**Shelter Size**	512 cuft
Shelter Clean	☑	**Notes**	The shelter is in good condition, clean, and organized.				
Site OK	☑	**Notes**					

Driving Directions From the main entrance on highway 160, go through the park gate and drive about 35 minutes to mile marker 19. Just after mile marker 19 turn right on the paved service road. The air quality office is the stone building about 200 yards down the road. Continue on the same road to the site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	MEV405	Technician	Martin Valvur	Site Visit Date	04/21/2021

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	MEV405	Technician	Martin Valvur	Site Visit Date	04/21/2021

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?	☐	Shields dirty
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	MEV405	Technician	Martin Valvur	Site Visit Date	04/21/2021

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?	☑	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	MEV405	Technician	Martin Valvur	Site Visit Date	04/21/2021

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	MEV405	Technician	Martin Valvur	Site Visit Date	04/21/2021

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	☑		☑
Site Ops Manual	☑	Electronic copy	☑
HASP	☑	Electronic copy	☑
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☑	Dataview
2	Are the Site Status Report Forms being completed and current?	☑	Flow & observation sections
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and 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	MEV405	Technician	Martin Valvur	Site Visit Date	04/21/2021

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	☑	Every 2 weeks	☑
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	☑	Monthly	☑
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?	☑	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	MEV405	Technician	Martin Valvur	Site Visit Date	04/21/2021

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
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	☑	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 MEV405 **Technician** Martin Valvur **Site Visit Date** 04/21/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	8470p	CNU3389GGZ	none
DAS	Environmental Sys Corp	8864	C2597	none
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	0814000036788	none
flow rate	Tylan	FC280AV-4S	AW9403013	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP9710002	none
Modem	Sierra wireless	GX450	LA54620331001003	none
Ozone	ThermoElectron Inc	49i A3NCA	120477664	none
Ozone Standard	ThermoElectron Inc	49C	49C-62014-333	90604
Sample Tower	Aluma Tower	B	none	illegible
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342VC	14959	none
Zero air pump	Werther International	C 70/4	000847660	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CVL151-Eric Hebert-05/01/2021						
1	5/1/2021	Computer	Dell	07026	Inspiron 15	2Z2MC12
2	5/1/2021	DAS	Campbell	000417	CR3000	2515
3	5/1/2021	Elevation	Elevation	None	1	None
4	5/1/2021	Filter pack flow pump	Thomas	04282	107CAB18B	129800010140
5	5/1/2021	Flow Rate	Apex	000645	AXMC105LPMDPCV	illegible
6	5/1/2021	Infrastructure	Infrastructure	none	none	none
7	5/1/2021	Modem	Digi	07174	LR54	unknown
8	5/1/2021	Ozone	ThermoElectron Inc	000733	49i A1NAA	1105347322
9	5/1/2021	Ozone Standard	ThermoElectron Inc	000696	49i A3NAA	1030244812
10	5/1/2021	Sample Tower	Aluma Tower	03540	A	none
11	5/1/2021	Shelter Temperature	Campbell	none	107-L	none
12	5/1/2021	Siting Criteria	Siting Criteria	None	1	None
13	5/1/2021	Temperature	RM Young	04447	41342	4545
14	5/1/2021	Zero air pump	Werther International	06909	C 70/4	000829161

DAS Data Form

DAS Time Max Error: 0.03

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2515	CVL151	Eric Hebert	05/01/2021	DAS	Primary

Das Date:	5 /1 /2021	**Audit Date**	5 /1 /2021
Das Time:	11:51:02	**Audit Time**	11:51:00
Das Day:	121	**Audit Day**	121

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	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	2/11/2021	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.1000	0.1000	V	V	0.0000
7	0.3000	0.3001	0.3000	V	V	-0.0001
7	0.5000	0.5002	0.5001	V	V	-0.0001
7	0.7000	0.7002	0.7001	V	V	-0.0001
7	0.9000	0.9003	0.9002	V	V	-0.0001
7	1.0000	1.0003	1.0002	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	CVL151	Eric Hebert	05/01/2021	Flow Rate	000645

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number		**Tfer Desc.**	BIOS 530-H
Tfer ID	01414		
Slope	1.00185	**Intercept**	0.02453
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0
				Cal Factor Full Scale	1
1.35%	1.35%			**Rotometer Reading:**	1.5

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	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	0.01	l/m	l/m	
primary	test pt 1	1.510	1.480	1.49	0.000	1.50	l/m	l/m	1.35%
primary	test pt 2	1.512	1.480	1.50	0.000	1.50	l/m	l/m	1.35%
primary	test pt 3	1.512	1.480	1.50	0.000	1.50	l/m	l/m	1.35%

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**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	280 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347322	CVL151	Eric Hebert	05/01/2021	Ozone	000733

Slope:	1.00353	**Slope:**	0.00000
Intercept	-0.10867	**Intercept**	0.00000
CorrCoff:	0.99998	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00560	**Intercept**	0.14070
Cert Date	4/7/2021	**CorrCoff**	0.99990

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.48	0.33	0.47	ppb		0.14
primary	2	14.58	14.17	14.15	ppb		-0.02
primary	3	37.63	36.79	36.56	ppb	-0.63	
primary	4	67.84	66.44	66.24	ppb	-0.3	
primary	5	106.05	103.95	104.50	ppb	0.53	

Sensor Component	Condition	Status
Audit Pressure	736.3 mmHg	pass
26.6 degree unobstructed rule	False	Fail
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	70	Fail
ADT >100 vehicles further than 50	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	-0.50	pass
Span	1.025	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	86.3 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	707.4 mmHg	pass
Cell A Tmp.	36.0 C	pass
Cell B Freq.	91.8 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.70 lpm	pass
Cell B Pressure	708 mmHg	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4545	CVL151	Eric Hebert	05/01/2021	Temperature	04447

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00751	**Intercept**	0.16174
Cert Date	2/18/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.13	0.19		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.38	0.22	0.000	0.3	C	0.1
primary	Temp Mid Range	25.70	25.35	0.000	25.2	C	-0.19
primary	Temp High Range	47.16	46.65	0.000	46.6	C	-0.1

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CVL151	Eric Hebert	05/01/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
1.06	1.11		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00751	Intercept	0.16174
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.84	23.50	0.000	24.6	C	1.11
primary	Temp Mid Range	24.75	24.40	0.000	25.4	C	1

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**Condition**		**Status**	pass
Sensor Component	City > 50,000	**Condition**		**Status**	pass
Sensor Component	City 1,000 to 10,000	**Condition**		**Status**	pass
Sensor Component	City 10,000 to 50,000	**Condition**		**Status**	pass
Sensor Component	Feedlot operations	**Condition**		**Status**	pass
Sensor Component	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**Condition**		**Status**	pass
Sensor Component	Major industrial source	**Condition**		**Status**	pass
Sensor Component	Secondary road < or = 100 per da	**Condition**		**Status**	pass
Sensor Component	Secondary road >100 vehicles/da	**Condition**		**Status**	pass
Sensor Component	Small parking lot	**Condition**		**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
CVL151	Eric Hebert	05/01/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component	Condition	Status
Sample Tower Type	Type A	pass
Conduit	N/A	pass
Met Tower	N/A	pass
Moisture Trap	Installed	pass
Moisture Trap Type	Glass bottle and filter	pass
Power Cables	Good	pass
Shelter Temp Control	Functioning	pass
Rotometer	Installed	pass
Sample Tower	Fair	pass
Shelter Condition	Good	pass
Shelter Door	Fair	pass
Shelter Roof	Good	pass
Shelter Floor	Good	pass
Shelter walls	Good	pass
Excessive mold present	Fair	pass
Signal Cable	Good	pass
Tubing Type	3/8 teflon	pass
Sample Train	Good	pass
System Memo		pass

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

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

2 **Parameter:** ShelterCleanNotes

The shelter has been repaired since the previous audit visit.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CVL151	**Technician**	Eric Hebert	**Site Visit Date**	05/01/2021

Site Sponsor (agency)	EPA	**USGS Map**	Coker Lake
Operating Group	Private - USFS	**Map Scale**	
AQS #	28-161-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	34.0028
Deposition Measurement	dry, wet	**QAPP Longitude**	-89.7989
Land Use	woodland - evergreen	**QAPP Elevation Meters**	134
Terrain	rolling	**QAPP Declination**	0.2
Conforms to MLM	Marginally	**QAPP Declination Date**	2/22/2006
Site Telephone	(662) 623-7334	**Audit Latitude**	34.002747
Site Address 1	Forest Road 809	**Audit Longitude**	-89.799183
Site Address 2	Tombigbee National Forest	**Audit Elevation**	138
County	Yalobusha	**Audit Declination**	-0.95
City, State	Tillatoba, MS		
Zip Code	38961	**Fire Extinguisher** (Present) ☑	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 Steps** ☑	

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter has been repaired since the previous audit visit.				
Site OK	☑	**Notes**					

Driving Directions

From interstate 55 take exit 220 east on highway 330. Continue approximately 5 miles and turn left (north) at the Forest Service sign for the Yalobusha County Work Center and Jamie L. Whitter Plant Materials Center. Immediately after the facility turn left on forest service road 802. Continue approximately 1.5 miles to the stop sign and turn left on road 809. Continue approximately 0.3 miles to the first road on the left.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CVL151	Technician	Eric Hebert	Site Visit Date	05/01/2021

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	CVL151	Technician	Eric Hebert	Site Visit Date	05/01/2021

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	CVL151	Technician	Eric Hebert	Site Visit Date	05/01/2021

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?	☐	13 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?	☑	
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	CVL151	Technician	Eric Hebert	Site Visit Date	05/01/2021

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	CVL151	Technician	Eric Hebert	Site Visit Date	05/01/2021

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	☑	June 2007	☐
HASP	☑	Feb 2014	☑
Field Ops Manual	☑	Feb 2014	☑
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

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	CVL151	Technician	Eric Hebert	Site Visit Date	05/01/2021

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)	☐		☑
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?	☐	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	CVL151	Technician	Eric Hebert	Site Visit Date	05/01/2021

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
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	☑	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 CVL151 **Technician** Eric Hebert **Site Visit Date** 05/01/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	2Z2MC12	07026
DAS	Campbell	CR3000	2515	000417
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	129800010140	04282
Flow Rate	Apex	AXMC105LPMDPC	illegible	000645
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07174
Ozone	ThermoElectron Inc	49i A1NAA	1105347322	000733
Ozone Standard	ThermoElectron Inc	49i A3NAA	1030244812	000696
Sample Tower	Aluma Tower	A	none	03540
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	4545	04447
Zero air pump	Werther International	C 70/4	000829161	06909

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PND165-Martin Valvur-05/03/2021						
1	5/3/2021	DAS	Campbell	000403	CR3000	2516
2	5/3/2021	Elevation	Elevation	None	1	None
3	5/3/2021	Filter pack flow pump	Thomas	00534	107CA18	0000162757
4	5/3/2021	Flow Rate	Apex	000871	AXMC105LPMDPCV	illegible
5	5/3/2021	Infrastructure	Infrastructure	none	none	none
6	5/3/2021	Modem	Digi	07123	LR54	Illegible
7	5/3/2021	Noy	Teledyne	000795	T200U	101
8	5/3/2021	Ozone	ThermoElectron Inc	000621	49i A1NAA	1009241798
9	5/3/2021	Ozone Standard	ThermoElectron Inc	000435	49i A3NAA	CM08200011
10	5/3/2021	Sample Tower	Aluma Tower	000055	B	AT-81213-J12
11	5/3/2021	Shelter Temperature	Campbell	none	107-L	none
12	5/3/2021	Siting Criteria	Siting Criteria	None	1	None
13	5/3/2021	Temperature	RM Young	06539	41342	14800
14	5/3/2021	Zero air pump	Werther International	06881	C 70/4	000815264

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2516	PND165	Martin Valvur	05/03/2021	DAS	Primary

Das Date: 5 /3 /2021
Das Time: 10:25:00
Das Day: 123

Audit Date 5 /3 /2021
Audit Time 10:25:00
Audit Day 123

Low Channel:

Avg Diff:	Max Diff:
0.0001	0.0001

High Channel:

Avg Diff:	Max Diff:
0.0001	0.0001

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	2/11/2021	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0006	-0.0005	V	V	0.0001
7	0.1000	0.0996	0.0997	V	V	0.0001
7	0.3000	0.2996	0.2997	V	V	0.0001
7	0.5000	0.4996	0.4995	V	V	-0.0001
7	0.7000	0.6997	0.6998	V	V	0.0001
7	0.9000	0.8996	0.8997	V	V	0.0001
7	1.0000	0.9995	0.9994	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	PND165	Martin Valvur	05/03/2021	Flow Rate	000871

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00850	**Intercept**	0.00160
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.01
				Cal Factor Full Scale	1
1.32%	1.64%			**Rotometer Reading:**	4

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	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	0.01	0.000	0.02	l/m	l/m	
primary	test pt 1	3.069	3.040	3.01	0.000	3.00	l/m	l/m	-1.32%
primary	test pt 2	3.069	3.040	3.01	0.000	3.01	l/m	l/m	-0.99%
primary	test pt 3	3.075	3.050	3.01	0.000	3.00	l/m	l/m	-1.64%

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**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241798	PND165	Martin Valvur	05/03/2021	Ozone	000621

Slope:	0.99528	**Slope:**	0.00000
Intercept	-0.19251	**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	1.00340	**Intercept**	0.02230
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.16	0.13	0.12	ppb		-0.01
primary	2	15.59	15.43	14.87	ppb		-0.56
primary	3	36.14	35.80	35.57	ppb	-0.64	
primary	4	66.17	65.58	65.03	ppb	-0.84	
primary	5	107.82	106.87	106.20	ppb	-0.63	

Sensor Component		Condition		Status	
Sensor Component	Audit Pressure	Condition	573.7 mmHg	Status	pass
Sensor Component	26.6 degree unobstructed rule	Condition	True	Status	pass
Sensor Component	Tree dewline >10m or below inlet	Condition	True	Status	pass
Sensor Component	ADT <100 vehicles further than 20	Condition	True	Status	pass
Sensor Component	ADT >100 vehicles further than 50	Condition	230 m	Status	Fail
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	Inlet Filter Condition	Condition	Not tested	Status	pass
Sensor Component	Offset	Condition	-0.2	Status	pass
Sensor Component	Span	Condition	1.002	Status	pass
Sensor Component	Zero Voltage	Condition	N/A	Status	pass
Sensor Component	Fullscale Voltage	Condition	N/A	Status	pass
Sensor Component	Cell A Freq.	Condition	96.7 kHz	Status	pass
Sensor Component	Cell A Noise	Condition	0.8 ppb	Status	pass
Sensor Component	Cell A Flow	Condition	0.61 lpm	Status	pass
Sensor Component	Cell A Pressure	Condition	560.6 mmHg	Status	pass
Sensor Component	Cell A Tmp.	Condition	37.4 C	Status	pass
Sensor Component	Cell B Freq.	Condition	83.9 kHz	Status	pass
Sensor Component	Cell B Noise	Condition	0.6 ppb	Status	pass
Sensor Component	Cell B Flow	Condition	0.62 lpm	Status	pass
Sensor Component	Cell B Pressure	Condition	560.0 mmHg	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14800	PND165	Martin Valvur	05/03/2021	Temperature	06539

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.06	0.14		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.02	0.03	0.000	0.1	C	0.04
primary	Temp Mid Range	25.07	25.08	0.000	25.1	C	0.01
primary	Temp High Range	47.01	47.03	0.000	47.2	C	0.14

Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Blower	Condition	Not functioning	Status	Fail
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	PND165	Martin Valvur	05/03/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.15	0.45		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.67	23.68	0.000	24.1	C	0.45
primary	Temp Mid Range	23.65	23.66	0.000	23.7	C	0
primary	Temp Mid Range	25.19	25.20	0.000	25.2	C	0

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**Condition**		**Status**	pass
Sensor Component	City > 50,000	**Condition**		**Status**	pass
Sensor Component	City 1,000 to 10,000	**Condition**		**Status**	pass
Sensor Component	City 10,000 to 50,000	**Condition**		**Status**	pass
Sensor Component	Feedlot operations	**Condition**		**Status**	pass
Sensor Component	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**Condition**		**Status**	pass
Sensor Component	Major industrial source	**Condition**		**Status**	pass
Sensor Component	Secondary road < or = 100 per da	**Condition**		**Status**	pass
Sensor Component	Secondary road >100 vehicles/da	**Condition**		**Status**	pass
Sensor Component	Small parking lot	**Condition**		**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	PND165	Technician	Martin Valvur	Site Visit Date	05/03/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-22)	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	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Moisture Trap Type	Condition	Glass bottle and filter	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	Shelter walls	Condition	Fair	Status	pass
Sensor Component	Excessive mold present	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
Sensor Component	System Memo	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Temperature	PND165	Martin Valvur	05/03/2021	Blower	RM Young	2851	☐	☐

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

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

Construction at the bottom of the hill and entrance to the site access road has been completed.

2 **Parameter:** ShelterCleanNotes

The shelter is well maintained.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	PND165	**Technician**	Martin Valvur	**Site Visit Date**	05/03/2021

Site Sponsor (agency)	EPA	**USGS Map**	Fremont Lake South
Operating Group	Private / BLM	**Map Scale**	
AQS #	56-035-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	42.9214
Deposition Measurement	dry, wet	**QAPP Longitude**	-109.7900
Land Use	range	**QAPP Elevation Meters**	2388
Terrain	complex	**QAPP Declination**	12.75
Conforms to MLM	Marginally	**QAPP Declination Date**	2/22/2006
Site Telephone	(307) 367-6584	**Audit Latitude**	42.929031
Site Address 1	Skyline Drive	**Audit Longitude**	-109.787796
Site Address 2	Fremont Lake Rd.	**Audit Elevation**	2386
County	Sublette	**Audit Declination**	10.9
City, State	Pinedale, WY		
Zip Code	82941	**Fire Extinguisher** (Present) ☑	New in 2015
Time Zone	Mountain	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☑	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Steps** ☑	

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2149-22)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is well maintained.				
Site OK	☑	**Notes**					

Driving Directions

From Rock Springs take route 191 north to Pinedale. At the south edge of town turn right onto Fremont Lake Rd. Continue approximately 6.5 miles on the main road, past Fremont Lake. The road changes to Skyline Drive. The site is visible on a ridge on the right. There is a dirt access road to the site in the summer.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	PND165	Technician	Martin Valvur	Site Visit Date	05/03/2021

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?	☑	Over shelter
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)	☑	Over shelter
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	PND165	Technician	Martin Valvur	Site Visit Date	05/03/2021

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?	☑	N/A
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☐	not functioning
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	PND165	Technician	Martin Valvur	Site Visit Date	05/03/2021

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?	☑	
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	PND165	Technician	Martin Valvur	Site Visit Date	05/03/2021

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	PND165	Technician	Martin Valvur	Site Visit Date	05/03/2021

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	☑	Feb 2014	☑
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

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	PND165	Technician	Martin Valvur	Site Visit Date	05/03/2021

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	☐	N/A	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐	N/A	☑
Analyzer Diagnostics Tests	☑	Every 2 weeks	☑
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?	☑	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	PND165	Technician	Martin Valvur	Site Visit Date	05/03/2021

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed afternoons approximately 80%
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?	☑	
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 PND165 **Technician** Martin Valvur **Site Visit Date** 05/03/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR3000	2516	000403
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	0000162757	00534
Flow Rate	Apex	AXMC105LPMDPC	illegible	000871
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	Illegible	07123
Noy	Teledyne	T200U	101	000795
Ozone	ThermoElectron Inc	49i A1NAA	1009241798	000621
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200011	000435
Sample Tower	Aluma Tower	B	AT-81213-J12	000055
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14800	06539
Zero air pump	Werther International	C 70/4	000815264	06881

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
YEL408-Martin Valvur-05/06/2021						
1	5/6/2021	DAS	Environmental Sys Corp	None	8832	A4888K
2	5/6/2021	Elevation	Elevation	None	1	None
3	5/6/2021	Filter pack flow pump	Thomas	none	107CA18B	111900000185
4	5/6/2021	Flow Rate	Alicat	none	MC-10SLPM-D-PCV	Illgeible
5	5/6/2021	Infrastructure	Infrastructure	none	none	none
6	5/6/2021	Met tower	Climatronics	01362	14 inch taper	illegible
7	5/6/2021	Ozone	ThermoElectron Inc	none	49i A3NAA	1172090002
8	5/6/2021	Ozone Standard	ThermoElectron Inc	none	49i A1NAB	0926938297
9	5/6/2021	Printer	Hewlett Packard	none	840C	unknown
10	5/6/2021	Sample Tower	Aluma Tower	illegible	B	none
11	5/6/2021	Shelter Temperature	ARS	none	none	none
12	5/6/2021	Siting Criteria	Siting Criteria	None	1	None
13	5/6/2021	Temperature2meter	RM Young	none	41342VC	029239
14	5/6/2021	Zero air pump	Werther International	none	PC 70/4	000836215

DAS Data Form

DAS Time Max Error: 1.92

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	A4888K	YEL408	Martin Valvur	05/06/2021	DAS	Primary

Das Date: 5 /6 /2021
Das Time: 07:52:55
Das Day: 126

Audit Date 5 /6 /2021
Audit Time 07:51:00
Audit Day 126

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0005	0.0002	0.0005

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	2/11/2021	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
8	0.0000	-0.0004	-0.0004	V	V	0.0000
8	0.1000	0.0995	0.0996	V	V	0.0001
8	0.3000	0.2996	0.2999	V	V	0.0003
8	0.5000	0.4999	0.4998	V	V	-0.0001
8	0.7000	0.6994	0.6999	V	V	0.0005
8	0.9000	0.8997	0.8995	V	V	-0.0002
8	1.0000	0.9997	0.9996	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Alicat	Illgeible	YEL408	Martin Valvur	05/06/2021	Flow Rate	none

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00850	**Intercept**	0.00160
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.011
1.54%	1.81%			**Cal Factor Full Scale**	5.014
				Rotometer Reading:	3.65

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.03	0.0000	0.05	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.0000	0.03	l/m	l/m	
primary	test pt 1	2.963	2.940	2.98	0.0000	2.98	l/m	l/m	1.43%
primary	test pt 2	2.960	2.930	2.98	0.0000	2.98	l/m	l/m	1.81%
primary	test pt 3	2.965	2.940	2.98	0.0000	2.98	l/m	l/m	1.39%

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**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1172090002	YEL408	Martin Valvur	05/06/2021	Ozone	none

Slope:	0.97127	**Slope:**	0.00000
Intercept	-0.20507	**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	1.00340	**Intercept**	0.02230
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.61	0.58	0.16	ppb		-0.42
primary	2	17.71	17.53	16.81	ppb		-0.72
primary	3	38.72	38.36	37.21	ppb	-3.04	
primary	4	64.26	63.68	61.89	ppb	-2.85	
primary	5	111.77	110.78	107.20	ppb	-3.28	

Sensor Component	Condition	Status
Audit Pressure	576.5 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	True	pass
ADT >100 vehicles further than 50	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	-0.1	pass
Span	0.978	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	113.2 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.64 lpm	pass
Cell A Pressure	559.7 mmHg	pass
Cell A Tmp.	36.2 C	pass
Cell B Freq.	70.7 kHz	pass
Cell B Noise	0.2 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	559.1 mmHg	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	029239	YEL408	Martin Valvur	05/06/2021	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

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

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.01	0.02	0.0000	-0.06	C	-0.08
primary	Temp Mid Range	23.11	23.12	0.0000	23.09	C	-0.03
primary	Temp High Rang	46.51	46.53	0.0000	46.38	C	-0.15

Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	YEL408	Martin Valvur	05/06/2021	Shelter Temperature	none

DAS 1:

Abs Avg Err	Abs Max Err
0.14	0.26

DAS 2:

Abs Avg Err	Abs Max Err

Mfg	Fluke	**Parameter**	Shelter Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99975	**Intercept**	-0.00824
Cert Date	2/9/2021	**CorrCoff**	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.92	22.93	0.000	23.0	C	0.04
primary	Temp Mid Range	25.39	25.40	0.000	25.7	C	0.26
primary	Temp Mid Range	24.34	24.35	0.000	24.2	C	-0.11

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**Condition**		**Status**	pass
Sensor Component	City > 50,000	**Condition**		**Status**	pass
Sensor Component	City 1,000 to 10,000	**Condition**		**Status**	pass
Sensor Component	City 10,000 to 50,000	**Condition**		**Status**	pass
Sensor Component	Feedlot operations	**Condition**		**Status**	pass
Sensor Component	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**Condition**		**Status**	pass
Sensor Component	Major industrial source	**Condition**		**Status**	pass
Sensor Component	Secondary road < or = 100 per da	**Condition**		**Status**	pass
Sensor Component	Secondary road >100 vehicles/da	**Condition**		**Status**	pass
Sensor Component	Small parking lot	**Condition**		**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
YEL408	Martin Valvur	05/06/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2880-1)	640 cuft

Sensor Component	Condition	Status
Sample Tower Type	Type B	pass
Conduit	Good	pass
Met Tower	Good	pass
Moisture Trap	Installed	pass
Moisture Trap Type	Filter	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
Shelter walls	Good	pass
Excessive mold present	Good	pass
Signal Cable	Good	pass
Tubing Type	3/8 teflon	pass
Sample Train	Good	pass
System Memo		pass

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Gloves are not used to handle the filter pack.

2 **Parameter:** DasComments

The shelter heat and air conditioner run simultaneously.

3 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced and the system is leak tested every two weeks.

4 **Parameter:** SitingCriteriaCom

The site is located at the edge of a tree line. Trees as tall as 8 meters are near the sample inlet. Trees taller than 10 meters are 15 meters from the inlet.

5 **Parameter:** ShelterCleanNotes

The shelter is organized and well maintained.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	YEL408	**Technician**	Martin Valvur	**Site Visit Date**	05/06/2021

Site Sponsor (agency)	NPS	**USGS Map**	Lake
Operating Group	NPS	**Map Scale**	
AQS #	56-039-1011	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**	44.5597
Deposition Measurement	dry	**QAPP Longitude**	-110.4006
Land Use	woodland - evergreen	**QAPP Elevation Meters**	2400
Terrain	complex	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone	(307) 242-2410	**Audit Latitude**	44.565356
Site Address 1	Lake Ranger Station	**Audit Longitude**	-110.400338
Site Address 2	route 14	**Audit Elevation**	2430
County	Teton	**Audit Declination**	11.9
City, State	Yellowstone National Park, WY		**Present**
Zip Code	82190	**Fire Extinguisher**	☑ New in 2017
Time Zone	Mountain	**First Aid Kit**	☑
Primary Operator		**Safety Glasses**	☐
Primary Op. Phone #		**Safety Hard Hat**	☐
Primary Op. E-mail		**Climbing Belt**	☑
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Steps**	☑

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2880-1)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is organized and well maintained.				
Site OK	☑	**Notes**					

Driving Directions From Jackson take route 191 / 89 north to Yellowstone National Park. At Thumb Junction take 14 east around Yellowstone Lake. Turn left just past the Lake Area (and hotel) into the park residence and office compound. Continue through the compound past the housing area. The site is up the hill through the gate to the water supply tank for the compound.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	YEL408	Technician	Martin Valvur	Site Visit Date	05/06/2021

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	YEL408	Technician	Martin Valvur	Site Visit Date	05/06/2021

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	YEL408	Technician	Martin Valvur	Site Visit Date	05/06/2021

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 to 15 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 9 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 YEL408 **Technician** Martin Valvur **Site Visit Date** 05/06/2021

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?		

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 shelter heat and air conditioner run simultaneously.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	YEL408	Technician	Martin Valvur	Site Visit Date	05/06/2021

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 2016	☑
HASP	☑	July 2016	☑
Field Ops Manual	☑	July 2016	☑
Calibration Reports	☑	Not current	☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☑	Dataview
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	YEL408	Technician	Martin Valvur	Site Visit Date	05/06/2021

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained by ARS on site
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	☑	Monthly and semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	Every 2 weeks	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☑		☐
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	☐		☐
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:

The ozone inlet filter is replaced and the system is leak tested every two weeks.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	YEL408	Technician	Martin Valvur	Site Visit Date	05/06/2021

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?	☑	Dataview, 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?	☐	
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	☐		☐
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:

Gloves are not used to handle the filter pack.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID YEL408 **Technician** Martin Valvur **Site Visit Date** 05/06/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Environmental Sys Corp	8832	A4888K	None
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18B	111900000185	none
Flow Rate	Alicat	MC-10SLPM-D-PCV	Illgeible	none
Infrastructure	Infrastructure	none	none	none
Met tower	Climatronics	14 inch taper	illegible	01362
Ozone	ThermoElectron Inc	49i A3NAA	1172090002	none
Ozone Standard	ThermoElectron Inc	49i A1NAB	0926938297	none
Printer	Hewlett Packard	840C	unknown	none
Sample Tower	Aluma Tower	B	none	illegible
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342VC	029239	none
Zero air pump	Werther International	PC 70/4	000836215	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
DCP114-Korey Devins-05/14/2021						
1	5/14/2021	Computer	Dell	07031	Inspiron 15	4L2MC12
2	5/14/2021	DAS	Campbell	000345	CR3000	2124
3	5/14/2021	Elevation	Elevation	None	1	None
4	5/14/2021	Filter pack flow pump	Thomas	00390	107CA18	00001630787
5	5/14/2021	Flow Rate	Apex	000659	AXMC105LPMDPCV	54748
6	5/14/2021	Infrastructure	Infrastructure	none	none	none
7	5/14/2021	Modem	Digi	07199	LR54	unknown
8	5/14/2021	Ozone	ThermoElectron Inc	000628	49i A1NAA	1009241786
9	5/14/2021	Ozone Standard	ThermoElectron Inc	000374	49i A3NAA	0726124694
10	5/14/2021	Sample Tower	Aluma Tower	000030	B	AT-81056-J-4
11	5/14/2021	Shelter Temperature	Campbell	none	107-L	none
12	5/14/2021	Siting Criteria	Siting Criteria	None	1	None
13	5/14/2021	Temperature	RM Young	06390	41342VC	13993
14	5/14/2021	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	Korey Devins	05/14/2021	DAS	Primary

Das Date: 5 /14/2021
Das Time: 10:57:00
Das Day: 134

Audit Date 5 /14/2021
Audit Time 10:57:00
Audit Day 134

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/11/2021	**CorrCoff**	1.00000

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0002	0.0000	V	V	0.0002
7	0.1000	0.0997	0.0999	V	V	0.0002
7	0.3000	0.2996	0.2997	V	V	0.0001
7	0.5000	0.4995	0.4996	V	V	0.0001
7	0.7000	0.6994	0.6995	V	V	0.0001
7	0.9000	0.8993	0.8994	V	V	0.0001
7	1.0000	0.9991	0.9993	V	V	0.0002

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	54748	DCP114	Korey Devins	05/14/2021	Flow Rate	000659

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	0.99756	**Intercept**	-0.00058
Cert Date	2/10/2021	**CorrCoff**	0.99993

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.003
				Cal Factor Full Scale	0.991
0.00%	0.00%			**Rotometer Reading:**	1.4

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	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	-0.01	0.000	0.00	l/m	l/m	
primary	test pt 1	1.491	1.500	1.52	0.000	1.50	l/m	l/m	0.00%
primary	test pt 2	1.491	1.500	1.52	0.000	1.50	l/m	l/m	0.00%
primary	test pt 3	1.494	1.500	1.52	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**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	3.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	310 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241786	DCP114	Korey Devins	05/14/2021	Ozone	000628

Slope:	1.00931	**Slope:**	0.00000
Intercept	-0.30228	**Intercept**	0.00000
CorrCoff:	0.99998	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	**Intercept**	0.30550
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.40	0.09	0.01	ppb		-0.08
primary	2	15.78	15.39	15.25	ppb		-0.14
primary	3	35.20	34.72	34.63	ppb	-0.26	
primary	4	67.48	66.83	66.75	ppb	-0.12	
primary	5	112.66	111.79	112.80	ppb	0.9	

Sensor Component	Audit Pressure	**Condition**	745.3 mmHg	**Status**	pass
Sensor Component	26.6 degree unobstructed rule	**Condition**	True	**Status**	pass
Sensor Component	Tree dewline >10m or below inlet	**Condition**	8 m	**Status**	Fail
Sensor Component	ADT <100 vehicles further than 20	**Condition**	True	**Status**	pass
Sensor Component	ADT >100 vehicles further than 50	**Condition**	417 m	**Status**	Fail
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Offset	**Condition**	-0.5	**Status**	pass
Sensor Component	Span	**Condition**	1.022	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	95.8 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.73 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	715.5 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	34.9 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	99.1 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.71 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	716.1 mmHg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	13993	DCP114	Korey Devins	05/14/2021	Temperature	06390

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00743	**Intercept**	0.21666
Cert Date	2/18/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.09	0.23		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.18	-0.04	0.000	0.2	C	0.23
primary	Temp Mid Range	26.12	25.71	0.000	25.7	C	-0.02
primary	Temp High Range	47.28	46.72	0.000	46.7	C	-0.02

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	DCP114	Korey Devins	05/14/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.47	0.54		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00743	Intercept	0.21666
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.79	26.38	0.000	26.9	C	0.53
primary	Temp Mid Range	27.11	26.69	0.000	27.0	C	0.34
primary	Temp Mid Range	27.15	26.73	0.000	27.3	C	0.54

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**Condition**		**Status**	pass
Sensor Component	City > 50,000	**Condition**		**Status**	pass
Sensor Component	City 1,000 to 10,000	**Condition**		**Status**	pass
Sensor Component	City 10,000 to 50,000	**Condition**		**Status**	pass
Sensor Component	Feedlot operations	**Condition**		**Status**	pass
Sensor Component	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**Condition**		**Status**	pass
Sensor Component	Major industrial source	**Condition**		**Status**	pass
Sensor Component	Secondary road < or = 100 per da	**Condition**		**Status**	pass
Sensor Component	Secondary road >100 vehicles/da	**Condition**		**Status**	pass
Sensor Component	Small parking lot	**Condition**		**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
DCP114	Korey Devins	05/14/2021

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

Sensor Component	Condition	Status
Sample Tower Type	Type B	pass
Conduit	N/A	pass
Met Tower	N/A	pass
Moisture Trap	Installed	pass
Moisture Trap Type	Glass bottle and filter	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
Shelter walls	Fair	pass
Excessive mold present	Fair	pass
Signal Cable	Good	pass
Tubing Type	3/8 teflon	pass
Sample Train	Good	pass
System Memo		pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	DCP114	Korey Devins	05/14/2021	Moisture Present	Apex	3744	☐	☐

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

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 and sample tower not grounded.

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 good condition. The floor has been recently repaired.

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**	Korey Devins	**Site Visit Date**	05/14/2021

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	**Fire Extinguisher** ☑	New in 2015
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☑	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator	none	**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Steps** ☑	

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2149-13)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is currently in good condition. The floor has been recently repaired.				
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-S3-rev002

Site ID	DCP114	Technician	Korey Devins	Site Visit Date	05/14/2021

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	Korey Devins	Site Visit Date	05/14/2021

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	Korey Devins	Site Visit Date	05/14/2021

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	Korey Devins	Site Visit Date	05/14/2021

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 and sample tower not grounded.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	DCP114	Technician	Korey Devins	Site Visit Date	05/14/2021

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	☑	May 2019	☑
Field Ops Manual	☑	May 2019	☑
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

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	Korey Devins	Site Visit Date	05/14/2021

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	Korey Devins	Site Visit Date	05/14/2021

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** Korey Devins **Site Visit Date** 05/14/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	4L2MC12	07031
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	Digi	LR54	unknown	07199
Ozone	ThermoElectron Inc	49i A1NAA	1009241786	000628
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124694	000374
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*
ZIO433-Martin Valvur-05/17/2021						
1	5/17/2021	Computer	Hewlett Packard	none	6560 b	5CB22906V0
2	5/17/2021	DAS	Environmental Sys Corp	none	8816	4296
3	5/17/2021	Modem	Sierra wireless	none	GX450	illegible
4	5/17/2021	Ozone	ThermoElectron Inc	90568	49C	49C-59348-322
5	5/17/2021	Ozone Standard	ThermoElectron Inc	90728	49C	49C-70528-366
6	5/17/2021	Shelter Temperature	ARS	none	unknown	none
7	5/17/2021	Temperature2meter	RM Young	none	41432VC	15103
8	5/17/2021	Zero air pump	Werther International	none	PC 70/4	000706556

DAS Data Form

DAS Time Max Error: 0.18

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	4296	ZIO433	Martin Valvur	05/17/2021	DAS	Primary

Das Date: 5 /17/2021
Das Time: 07:50:11
Das Day: 137

Audit Date 5 /17/2021
Audit Time 07:50:00
Audit Day 137

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0001	0.0003	0.0001	0.0003

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	2/11/2021	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
5	0.0000	-0.0001	0.0000	V	V	0.0001
5	0.1000	0.0999	0.0998	V	V	-0.0001
5	0.3000	0.2996	0.2996	V	V	0.0000
5	0.5000	0.4995	0.4996	V	V	0.0001
5	0.7000	0.7000	0.7000	V	V	0.0000
5	0.9000	0.9002	0.8999	V	V	-0.0003
5	1.0000	1.0001	1.0001	V	V	0.0000

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-59348-322	ZIO433	Martin Valvur	05/17/2021	Ozone	90568

Slope:	0.98038	**Slope:**	0.00000
Intercept	0.27490	**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	1.00340	**Intercept**	0.02230
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.10	0.07	0.65	ppb		0.58
primary	2	17.39	17.21	16.90	ppb		-0.31
primary	3	37.12	36.77	36.26	ppb	-1.4	
primary	4	67.43	66.82	65.65	ppb	-1.77	
primary	5	113.29	112.29	110.50	ppb	-1.61	

Sensor Component	Condition	Status
Audit Pressure	658.8 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	True	pass
ADT >100 vehicles further than 50	340 m	Fail
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.8	pass
Span	1.013	pass
Zero Voltage	0.0002	pass
Fullscale Voltage	1.000	pass
Cell A Freq.	75.7 kHz	pass
Cell A Noise	0.5 ppb	pass
Cell A Flow	0.72 lpm	pass
Cell A Pressure	642.4 mmHg	pass
Cell A Tmp.	36.9 C	pass
Cell B Freq.	83.9 kHz	pass
Cell B Noise	0.7 ppb	pass
Cell B Flow	0.72 lpm	pass
Cell B Pressure	642.5 mmHg	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	15103	ZIO433	Martin Valvur	05/17/2021	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.25	0.28		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.09	0.10	0.0000	0.33	C	0.23
primary	Temp Mid Range	21.58	21.59	0.0000	21.83	C	0.24
primary	Temp High Rang	47.85	47.87	0.0000	48.15	C	0.28

Sensor Component	Shield	Condition	Dirty	Status	Fail
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	ZIO433	Martin Valvur	05/17/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.31	0.44		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.19	26.20	0.000	25.8	C	-0.44
primary	Temp Mid Range	26.60	26.61	0.000	26.2	C	-0.41
primary	Temp Mid Range	27.06	27.08	0.000	27.2	C	0.07

Sensor Component	System Memo	Condition		Status	pass

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Dry deposition samples are not collected at this CASTNET site.

2 **Parameter:** MetOpMaintCom

The inside of the temperature shield is dirty.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	ZIO433	**Technician**	Martin Valvur	**Site Visit Date**	05/17/2021

Site Sponsor (agency)	NPS	**USGS Map**	
Operating Group	NPS	**Map Scale**	
AQS #	49-053-0130	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement		**QAPP Longitude**	
Land Use		**QAPP Elevation Meters**	
Terrain		**QAPP Declination**	
Conforms to MLM		**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	37.198299
Site Address 1		**Audit Longitude**	-113.15072
Site Address 2		**Audit Elevation**	1266
County	Washington	**Audit Declination**	11.2
City, State	Virgin, UT		
Zip Code	84779		**Present**
Time Zone	Mountain	**Fire Extinguisher**	☑
Primary Operator		**First Aid Kit**	☑
Primary Op. Phone #		**Safety Glasses**	☐
Primary Op. E-mail		**Safety Hard Hat**	☐
Backup Operator		**Climbing Belt**	☐
Backup Op. Phone #		**Security Fence**	☑
Backup Op. E-mail		**Secure Shelter**	☑
		Stable Entry Steps	☑

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

Shelter Clean ☐ **Notes**

Site OK ☐ **Notes**

Driving Directions From Hurricane UT drive north on state route 9 toward Springdale and Zion NP. Turn right at the Maverick station on the north side of La Verkin, continuing on route 9. Continue through Virgin. Once through Virgin take the second left onto the unpaved road named Dalton Wash. Take the right fork at the orchard on Dalton Wash road. Continue approximately 1/4 mile past the locked gate and then turn right. Continue approximately 1 mile to the site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	ZIO433	Technician	Martin Valvur	Site Visit Date	05/17/2021

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	ZIO433	Technician	Martin Valvur	Site Visit Date	05/17/2021

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?	☐	dirty
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:

The inside of the temperature shield is dirty.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	ZIO433	Technician	Martin Valvur	Site Visit Date	05/17/2021

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?	☑	No
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 ZIO433 **Technician** Martin Valvur **Site Visit Date** 05/17/2021

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?	☐	No
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	ZIO433	Technician	Martin Valvur	Site Visit Date	05/17/2021

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	☐	N/A	☑
Site Ops Manual	☑		☑
HASP	☐	Not present	☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

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?	☑	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	ZIO433	Technician	Martin Valvur	Site Visit Date	05/17/2021

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	trained onsite by ARS
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?	☑	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	☑	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	☐		☑
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?	☑	

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	ZIO433	Technician	Martin Valvur	Site Visit Date	05/17/2021

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?	☑	No longer required
4	Are general observations being made and recorded? How?	☑	Dataview
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 ZIO433 **Technician** Martin Valvur **Site Visit Date** 05/17/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB22906V0	none
DAS	Environmental Sys Corp	8816	4296	none
Modem	Sierra wireless	GX450	illegible	none
Ozone	ThermoElectron Inc	49C	49C-59348-322	90568
Ozone Standard	ThermoElectron Inc	49C	49C-70528-366	90728
Shelter Temperature	ARS	unknown	none	none
Temperature2meter	RM Young	41432VC	15103	none
Zero air pump	Werther International	PC 70/4	000706556	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SEK430-Martin Valvur-05/21/2021						
1	5/21/2021	Computer	Hewlett Packard	none	ProBook	illegible
2	5/21/2021	DAS	Environmental Sys Corp	90649	8816	2562
3	5/21/2021	Elevation	Elevation	None	1	None
4	5/21/2021	Filter pack flow pump	Thomas	none	107CAB18	120000014367
5	5/21/2021	flow rate	Tylan	03384	FC280AV	AW9403014
6	5/21/2021	Infrastructure	Infrastructure	none	none	none
7	5/21/2021	Met tower	Aluma Tower	none	B	none
8	5/21/2021	MFC power supply	Tylan	03679	RO-32	FP9403015
9	5/21/2021	Modem	US Robotics	none	56k	unknown
10	5/21/2021	Ozone	ThermoElectron Inc	none	49i A3NCA	1200666538
11	5/21/2021	Ozone Standard	ThermoElectron Inc	90752	49C	49C-74532-376
12	5/21/2021	Shelter Temperature	ARS	none	none	none
13	5/21/2021	Shield (2 meter)	RM Young	none	Aspirated 43408	none
14	5/21/2021	Siting Criteria	Siting Criteria	None	1	None
15	5/21/2021	Temperature Translator	RM Young	00819	41406-X	063143
16	5/21/2021	Temperature2meter	RM Young	none	41342	8472
17	5/21/2021	Zero air pump	Werther International	none	C 70/4	000838301

DAS Data Form

DAS Time Max Error: 0.2

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2562	SEK430	Martin Valvur	05/21/2021	DAS	Primary

Das Date: 5 /21/2021
Das Time: 09:04:12
Das Day: 141

Audit Date 5 /21/2021
Audit Time 09:04:00
Audit Day 141

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0003	0.0002	0.0003

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	2/11/2021	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
15	0.0000	-0.0009	-0.0006	V	V	0.0003
15	0.1000	0.0997	0.0999	V	V	0.0002
15	0.3000	0.2995	0.2996	V	V	0.0001
15	0.5000	0.4996	0.4999	V	V	0.0003
15	0.7000	0.6996	0.6996	V	V	0.0000
15	0.9000	0.8998	0.8999	V	V	0.0001
15	1.0000	0.9995	0.9996	V	V	0.0001

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9403014	SEK430	Martin Valvur	05/21/2021	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	1.00850	**Intercept**	0.00160
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	
1.99%	2.10%			

Cal Factor Zero	0.063
Cal Factor Full Scale	5.671
Rotometer Reading:	3.15

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	-0.07	0.0000	0.02	l/m	l/m	
primary	leak check	0.000	0.000	-0.06	0.0000	0.02	l/m	l/m	
primary	test pt 1	2.977	2.950	2.43	0.0000	3.01	l/m	l/m	2.10%
primary	test pt 2	2.983	2.960	2.44	0.0000	3.01	l/m	l/m	1.76%
primary	test pt 3	2.980	2.950	2.43	0.0000	3.01	l/m	l/m	2.10%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Poor	**Status**	Fail
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**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	-1.0 cm	**Status**	Fail
Sensor Component	Filter Azimuth	**Condition**	10 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1200666538	SEK430	Martin Valvur	05/21/2021	Ozone	none

Slope:	0.98865	**Slope:**	0.00000
Intercept	-0.06176	**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	1.00340	**Intercept**	0.02230
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.10	0.07	0.23	ppb		0.16
primary	2	16.04	15.88	15.55	ppb		-0.33
primary	3	37.11	36.76	36.13	ppb	-1.73	
primary	4	66.45	65.85	64.94	ppb	-1.39	
primary	5	116.89	115.86	114.60	ppb	-1.09	

Sensor Component	Condition	Status
Audit Pressure	718.5 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	Pass
ADT <100 vehicles further than 20	110 m	fail
ADT >100 vehicles further than 50	110 m	fail
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.000	pass
Span	0.997	pass
Zero Voltage	0.000	pass
Fullscale Voltage	0.9998	pass
Cell A Freq.	62.7 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	696.7 mmHg	pass
Cell A Tmp.	33.3 C	pass
Cell B Freq.	122.8 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	696.4 mmHg	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	8472	SEK430	Martin Valvur	05/21/2021	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	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.06	0.07		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.11	0.12	0.0000	0.16	C	0.04
primary	Temp Mid Range	21.81	21.82	0.0000	21.89	C	0.07
primary	Temp High Rang	47.34	47.36	0.0000	47.29	C	-0.07

Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Properly Sited	Condition	South	Status	Fail
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	SEK430	Martin Valvur	05/21/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.64	0.75		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.23	22.24	0.000	22.7	C	0.44
primary	Temp Mid Range	21.20	21.21	0.000	21.9	C	0.73
primary	Temp Mid Range	21.58	21.59	0.000	22.3	C	0.75

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition	40 m	Status	Fail
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass

Infrastructure Data For

Site ID	SEK430	Technician	Martin Valvur	Site Visit Date	05/21/2021

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	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Moisture Trap Type	Condition	Filter	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	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	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
Sensor Component	System Memo	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	SEK430	Martin Valvur	05/21/2021	Filter Position	Tylan	1414	☐	☐

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

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

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

2 **Parameter:** ShelterCleanNotes

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

3 **Parameter:** PollAnalyzerCom

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	SEK430	**Technician**	Martin Valvur	**Site Visit Date**	05/21/2021

Site Sponsor (agency)	NPS	**USGS Map**	Case Mountain
Operating Group	NPS	**Map Scale**	
AQS #	06-107-0009	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, IMPROVE, BAM	**QAPP Latitude**	
Deposition Measurement	dry	**QAPP Longitude**	
Land Use	woodland - mixed	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	36.489469
Site Address 1	Southern Sierra Research Center	**Audit Longitude**	-118.829153
Site Address 2	Highway 198	**Audit Elevation**	510
County	Tulare	**Audit Declination**	13.1
City, State	Sequoia National Park, CA		**Present**
Zip Code	93262	**Fire Extinguisher**	☑ Inspected March 2021
Time Zone	Pacific	**First Aid Kit**	☑
Primary Operator		**Safety Glasses**	☑
Primary Op. Phone #		**Safety Hard Hat**	☑
Primary Op. E-mail		**Climbing Belt**	☐
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Steps**	☑

Shelter Working Room	☑	**Make**	Alan pre-fab	**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-S3-rev002

Site ID	SEK430	Technician	Martin Valvur	Site Visit Date	05/21/2021

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	05/21/2021

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	05/21/2021

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 5 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 deteriorating.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID SEK430 **Technician** Martin Valvur **Site Visit Date** 05/21/2021

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	05/21/2021

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 schedule	☐		☐

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	05/21/2021

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	05/21/2021

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** 05/21/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	ProBook	illegible	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	49i A3NCA	1200666538	none
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*
ROM406-Martin Valvur-05/28/2021						
1	5/28/2021	Computer	Hewlett Packard	none	6560 b	SCB1520H6N
2	5/28/2021	DAS	Environmental Sys Corp	none	8864	C2601
3	5/28/2021	Elevation	Elevation	None	1	None
4	5/28/2021	flow rate	Tylan	03393	FC280AV	AW9403024
5	5/28/2021	Infrastructure	Infrastructure	none	none	none
6	5/28/2021	Met tower	Rohn	none	unknown	none
7	5/28/2021	MFC power supply	Tylan	none	RO-32	illegible
8	5/28/2021	Ozone	ThermoElectron Inc	none	49i A3NCA	1200666537
9	5/28/2021	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460008
10	5/28/2021	Sample Tower	Aluma Tower	illegible	B	none
11	5/28/2021	Shelter Temperature	ARS	none	unknown	051
12	5/28/2021	Shield (2 meter)	RM Young	none	unknown	none
13	5/28/2021	Siting Criteria	Siting Criteria	None	1	None
14	5/28/2021	Temperature2meter	RM Young	none	41342	17079
15	5/28/2021	Zero air pump	Werther International	none	PC70/4	627675

DAS Data Form

DAS Time Max Error: 0.8

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	C2601	ROM406	Martin Valvur	05/28/2021	DAS	Primary

Das Date: 5 /28/2021
Das Time: 08:44:12
Das Day: 148

Audit Date 5 /28/2021
Audit Time 08:45:00
Audit Day 148

Low Channel:

Avg Diff:	Max Diff:
0.0001	0.0002

High Channel:

Avg Diff:	Max Diff:
0.0001	0.0002

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	2/11/2021	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
10	0.0000	-0.0004	-0.0004	V	V	0.0000
10	0.1000	0.0999	0.1000	V	V	0.0001
10	0.3000	0.2999	0.2999	V	V	0.0000
10	0.5000	0.4995	0.4996	V	V	0.0001
10	0.7000	0.7001	0.6999	V	V	-0.0002
10	0.9000	0.8998	0.8996	V	V	-0.0002
10	1.0000	0.9998	0.9997	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9403024	ROM406	Martin Valvur	05/28/2021	flow rate	03393

Mfg	Tylan		
SN/Owner ID	illegible	none	
Parameter:	MFC power supply		

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00850	**Intercept**	0.00160
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.012
2.64%	2.65%			**Cal Factor Full Scale**	5.602
				Rotometer Reading:	4.2

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	-0.08	0.0000	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	-0.07	0.0000	-0.02	l/m	l/m	
primary	test pt 1	2.939	2.910	2.96	0.0000	2.99	l/m	l/m	2.61%
primary	test pt 2	2.940	2.910	2.96	0.0000	2.99	l/m	l/m	2.65%
primary	test pt 3	2.937	2.910	2.96	0.0000	2.99	l/m	l/m	2.65%

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**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	350 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1200666537	ROM406	Martin Valvur	05/28/2021	Ozone	none

Slope:	0.99873	**Slope:**	0.00000
Intercept	0.49411	**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	1.00340	**Intercept**	0.02230
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.10	0.07	0.86	ppb		0.79
primary	2	17.18	17.01	17.32	ppb		0.31
primary	3	37.67	37.32	37.70	ppb	1.01	
primary	4	67.58	66.97	67.11	ppb	0.21	
primary	5	116.02	115.00	115.55	ppb	0.48	

Sensor Component	Condition	Status
Audit Pressure	553.5 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	70 m	Fail
ADT >100 vehicles further than 50	265 m	Fail
Sample Train	Good	pass
Inlet Filter Condition	Not tested	pass
Offset	-0.7	pass
Span	1.009	pass
Zero Voltage	0.0002	pass
Fullscale Voltage	1.0004	pass
Cell A Freq.	94.9 kHz	pass
Cell A Noise	1.2 ppb	pass
Cell A Flow	0.57 lpm	pass
Cell A Pressure	539.9 mmHg	pass
Cell A Tmp.	32.0 C	pass
Cell B Freq.	80.1 kHz	pass
Cell B Noise	0.5 ppb	pass
Cell B Flow	0.57 lpm	pass
Cell B Pressure	539.9 mmHg	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	17079	ROM406	Martin Valvur	05/28/2021	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.28	0.32		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.16	0.17	0.0000	0.38	C	0.21
primary	Temp Mid Range	22.47	22.48	0.0000	22.79	C	0.31
primary	Temp High Rang	47.38	47.40	0.0000	47.72	C	0.32

Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Properly Sited	Condition	South	Status	Fail
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	051	ROM406	Martin Valvur	05/28/2021	Shelter Temperature	none

DAS 1:

Abs Avg Err	Abs Max Err
0.69	0.89

DAS 2:

Abs Avg Err	Abs Max Err

Mfg	Fluke	**Parameter**	Shelter Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99975	**Intercept**	-0.00824
Cert Date	2/9/2021	**CorrCoff**	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	21.41	21.42	0.000	20.7	C	-0.76
primary	Temp Mid Range	20.20	20.21	0.000	20.6	C	0.42
primary	Temp Mid Range	19.82	19.83	0.000	20.7	C	0.89

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**Condition**		**Status**	pass
Sensor Component	City > 50,000	**Condition**		**Status**	pass
Sensor Component	City 1,000 to 10,000	**Condition**		**Status**	pass
Sensor Component	City 10,000 to 50,000	**Condition**		**Status**	pass
Sensor Component	Feedlot operations	**Condition**		**Status**	pass
Sensor Component	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**Condition**		**Status**	pass
Sensor Component	Major industrial source	**Condition**		**Status**	pass
Sensor Component	Secondary road < or = 100 per da	**Condition**		**Status**	pass
Sensor Component	Secondary road >100 vehicles/da	**Condition**		**Status**	pass
Sensor Component	Small parking lot	**Condition**		**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
ROM406	Martin Valvur	05/28/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8814 (s/n 3062-1)	896 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	Moisture Trap Type	Condition	Filter	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	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	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
Sensor Component	System Memo	Condition		Status	pass

Field Systems Comments

1 **Parameter:** DasComments

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

2 **Parameter:** ShelterCleanNotes

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

3 **Parameter:** MetSensorComme

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	ROM406	**Technician**	Martin Valvur	**Site Visit Date**	05/28/2021

Site Sponsor (agency)	NPS	**USGS Map**	Longs Peak
Operating Group	NPS	**Map Scale**	
AQS #	08-069-0007	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**	40.2778
Deposition Measurement	dry	**QAPP Longitude**	-105.5453
Land Use	woodland - mixed	**QAPP Elevation Meters**	2743
Terrain	complex	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone	(970) 586-8520	**Audit Latitude**	40.278129
Site Address 1	High Peak Camp	**Audit Longitude**	-105.545635
Site Address 2	Route 7	**Audit Elevation**	2742
County	Larimer	**Audit Declination**	9.0
City, State	Estes Park, CO		
Zip Code	80517	**Fire Extinguisher** ☑	Inspected June 2013
Time Zone	Mountain	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☐	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Steps** ☑	

Shelter Working Room	☑	**Make**	Ekto	**Model**	8814 (s/n 3062-1)	**Shelter Size**	896 cuft
Shelter Clean	☑	**Notes**	The shelter is clean, neat, organized, and well maintained.				
Site OK	☑	**Notes**					

Driving Directions From Estes Park take route 7 south approximately 8.5 miles. Turn right onto Preservation Road (dirt road) at the sign for High Peak Camp operated by the Salvation Army. The site is approximately 100 meters on the left.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	ROM406	Technician	Martin Valvur	Site Visit Date	05/28/2021

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?	☐	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:

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	ROM406	Technician	Martin Valvur	Site Visit Date	05/28/2021

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?	☑	
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	ROM406	Technician	Martin Valvur	Site Visit Date	05/28/2021

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?	☑	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 ROM406 **Technician** Martin Valvur **Site Visit Date** 05/28/2021

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:

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	ROM406	Technician	Martin Valvur	Site Visit Date	05/28/2021

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	☑		☑
HASP	☐		☐
Field Ops Manual	☑		☑
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☑	Dataview
2	Are the Site Status Report Forms being completed and current?	☑	Flow and observation sections
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and 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	ROM406	Technician	Martin Valvur	Site Visit Date	05/28/2021

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Trained by previous opertator
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	☑	Monthly and semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	Every 2 weeks	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☑
Analyzer Diagnostics Tests	☐		☑
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	☑	Semiannually	☑

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	ROM406	Technician	Martin Valvur	Site Visit Date	05/28/2021

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
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	☑	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 ROM406 **Technician** Martin Valvur **Site Visit Date** 05/28/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	SCB1520H6N	none
DAS	Environmental Sys Corp	8864	C2601	none
Elevation	Elevation	1	None	None
flow rate	Tylan	FC280AV	AW9403024	03393
Infrastructure	Infrastructure	none	none	none
Met tower	Rohn	unknown	none	none
MFC power supply	Tylan	RO-32	illegible	none
Ozone	ThermoElectron Inc	49i A3NCA	1200666537	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	CM08460008	none
Sample Tower	Aluma Tower	B	none	illegible
Shelter Temperature	ARS	unknown	051	none
Shield (2 meter)	RM Young	unknown	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	17079	none
Zero air pump	Werther International	PC70/4	627675	none

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GTH161-Martin Valvur-06/01/2021						
1	6/1/2021	Computer	Dell	07055	Inspiron 15	834MC12
2	6/1/2021	DAS	Campbell	000416	CR3000	2513
3	6/1/2021	Elevation	Elevation	None	1	None
4	6/1/2021	Filter pack flow pump	Thomas	00517	107CAB18	100300020817
5	6/1/2021	Flow Rate	Apex	000558	AXMC105LPMDPCV	50735
6	6/1/2021	Infrastructure	Infrastructure	none	none	none
7	6/1/2021	Modem	Digi	07128	LR54	Illegible
8	6/1/2021	Ozone	ThermoElectron Inc	000617	49i A1NAA	1009241780
9	6/1/2021	Ozone Standard	ThermoElectron Inc	000208	49i A3NAA	0611416461
10	6/1/2021	Sample Tower	Aluma Tower	none	B	none
11	6/1/2021	Shelter Temperature	Campbell	none	107-L	none
12	6/1/2021	Siting Criteria	Siting Criteria	None	1	None
13	6/1/2021	Temperature	RM Young	06120	41342VC	11742
14	6/1/2021	Zero air pump	Werther International	06927	P 70/4	000836211

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2513	GTH161	Martin Valvur	06/01/2021	DAS	Primary

Das Date: 6 /1 /2021
Das Time: 08:33:00
Das Day: 152

Audit Date 6 /1 /2021
Audit Time 08:33:00
Audit Day 152

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

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	2/11/2021	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	-0.0002	V	V	-0.0001
7	0.1000	0.0997	0.0999	V	V	0.0002
7	0.3000	0.3017	0.3017	V	V	0.0000
7	0.5000	0.4996	0.4997	V	V	0.0001
7	0.7000	0.6997	0.6997	V	V	0.0000
7	0.9000	0.8996	0.8996	V	V	0.0000
7	1.0000	0.9993	0.9994	V	V	0.0001

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	50735	GTH161	Martin Valvur	06/01/2021	Flow Rate	000558

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00850	**Intercept**	0.00160
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.01
1.69%	2.03%			**Cal Factor Full Scale**	0.99
				Rotometer Reading:	3.9

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	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	0.01	0.000	0.00	l/m	l/m	
primary	test pt 1	2.990	2.960	3.00	0.000	3.01	l/m	l/m	1.69%
primary	test pt 2	2.980	2.950	3.01	0.000	3.01	l/m	l/m	2.03%
primary	test pt 3	3.010	2.980	3.01	0.000	3.02	l/m	l/m	1.34%

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**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	350 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241780	GTH161	Martin Valvur	06/01/2021	Ozone	000617

Slope:	1.02201	**Slope:**	0.00000
Intercept	-0.05426	**Intercept**	0.00000
CorrCoff:	0.99996	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00340	**Intercept**	0.02230
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	-0.23	-0.25	-0.01	ppb		0.24
primary	2	14.81	14.66	15.15	ppb		0.49
primary	3	35.05	34.72	34.98	ppb	0.75	
primary	4	65.25	64.66	65.62	ppb	1.47	
primary	5	116.30	115.28	118.10	ppb	2.42	

Sensor Component	Audit Pressure	**Condition**	545.5 mmHg	**Status**	pass
Sensor Component	26.6 degree unobstructed rule	**Condition**	True	**Status**	pass
Sensor Component	Tree dewline >10m or below inlet	**Condition**	True	**Status**	pass
Sensor Component	ADT <100 vehicles further than 20	**Condition**	190 m	**Status**	Fail
Sensor Component	ADT >100 vehicles further than 50	**Condition**	True	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Offset	**Condition**	-0.1	**Status**	pass
Sensor Component	Span	**Condition**	1.046	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	99.9 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.68 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	522.9 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	31.3 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	99.8 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.4 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.45 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	522.3 mmHg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	11742	GTH161	Martin Valvur	06/01/2021	Temperature	06120

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99975	**Intercept**	-0.00824
Cert Date	2/9/2021	**CorrCoff**	1.00000

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

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.06	0.07	0.000	0.2	C	0.15
primary	Temp Mid Range	23.56	23.57	0.000	23.7	C	0.09
primary	Temp High Range	47.53	47.55	0.000	47.6	C	0.04

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	GTH161	Martin Valvur	06/01/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.37	1.09		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	20.49	20.50	0.000	20.5	C	0.02
primary	Temp Mid Range	18.60	18.61	0.000	19.7	C	1.09
primary	Temp Mid Range	24.96	24.97	0.000	25.0	C	0.01

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**Condition**		**Status**	pass
Sensor Component	City > 50,000	**Condition**		**Status**	pass
Sensor Component	City 1,000 to 10,000	**Condition**		**Status**	pass
Sensor Component	City 10,000 to 50,000	**Condition**		**Status**	pass
Sensor Component	Feedlot operations	**Condition**		**Status**	pass
Sensor Component	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**Condition**		**Status**	pass
Sensor Component	Major industrial source	**Condition**		**Status**	pass
Sensor Component	Secondary road < or = 100 per da	**Condition**		**Status**	pass
Sensor Component	Secondary road >100 vehicles/da	**Condition**		**Status**	pass
Sensor Component	Small parking lot	**Condition**		**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	GTH161	Technician	Martin Valvur	Site Visit Date	06/01/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-12)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Other	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	Moisture Trap Type	Condition	Glass bottle and filter	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	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	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
Sensor Component	System Memo	Condition		Status	pass

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

Some floor tiles are damaged.

2 **Parameter:** MetSensorComme

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	GTH161	**Technician**	Martin Valvur	**Site Visit Date**	06/01/2021

Site Sponsor (agency)	EPA	**USGS Map**	Gothic
Operating Group	RMBL	**Map Scale**	
AQS #	08-051-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	38.9573
Deposition Measurement	dry, wet	**QAPP Longitude**	-106.9854
Land Use	mountain meadow, woodland - mixed	**QAPP Elevation Meters**	2926
Terrain	complex	**QAPP Declination**	10.75
Conforms to MLM	No	**QAPP Declination Date**	2/23/2006
Site Telephone	(970) 349-5691	**Audit Latitude**	38.95627
Site Address 1	RMBL	**Audit Longitude**	-106.98587
Site Address 2	Gothic	**Audit Elevation**	2915
County	Gunnison	**Audit Declination**	9.6
City, State	Crested Butte, CO		
Zip Code	81224	**Fire Extinguisher** ☑	Inspected June 2019
Time Zone	Mountain	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☐	
Backup Op. E-mail		**Stable Entry Steps** ☑	

Present

Shelter Working Room ☑	**Make**	Ekto	**Model**	8810 (s/n 2149-12)	**Shelter Size**	640 cuft
Shelter Clean ☑	**Notes**	Some floor tiles are damaged.				
Site OK ☑	**Notes**					

Driving Directions

From Gunnison take route 135 north to Crested Butte. Continue through town to Mount Crested Butte. Continue through town past the fire station and the road maintenance facility onto the dirt road to Gothic. Continue approximately three miles and park at the visitor area at the bottom of the hill below the site. The site is approximately 200 meters on the path up the hill.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	GTH161	Technician	Martin Valvur	Site Visit Date	06/01/2021

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?	☐	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)	☐	Over shelter
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 moved to the sample tower and mounted in a naturally aspirated shield facing south and over the shelter roof. The met tower has been removed.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	GTH161	Technician	Martin Valvur	Site Visit Date	06/01/2021

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	GTH161	Technician	Martin Valvur	Site Visit Date	06/01/2021

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 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	GTH161	Technician	Martin Valvur	Site Visit Date	06/01/2021

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 does not have ground rod but is bolted to shelter.	

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	GTH161	Technician	Martin Valvur	Site Visit Date	06/01/2021

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	☑	July 1990	☐
Calibration Reports	☐		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

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	GTH161	Technician	Martin Valvur	Site Visit Date	06/01/2021

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	☑	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?	☐	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?	☑	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	GTH161	Technician	Martin Valvur	Site Visit Date	06/01/2021

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	☑	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 GTH161 **Technician** Martin Valvur **Site Visit Date** 06/01/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	834MC12	07055
DAS	Campbell	CR3000	2513	000416
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	100300020817	00517
Flow Rate	Apex	AXMC105LPMDPC	50735	000558
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	Illegible	07128
Ozone	ThermoElectron Inc	49i A1NAA	1009241780	000617
Ozone Standard	ThermoElectron Inc	49i A3NAA	0611416461	000208
Sample Tower	Aluma Tower	B	none	none
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	11742	06120
Zero air pump	Werther International	P 70/4	000836211	06927

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
KNZ184-Martin Valvur-06/08/2021						
1	6/8/2021	Computer	Dell	07014	Inspiron 15	313MC12
2	6/8/2021	DAS	Campbell	000361	CR3000	2139
3	6/8/2021	Elevation	Elevation	None	1	None
4	6/8/2021	Filter pack flow pump	Thomas	04855	107CAB18	060300020200
5	6/8/2021	Flow Rate	Apex	000849	AXMC105LPMDPCV	illegible
6	6/8/2021	Infrastructure	Infrastructure	none	none	none
7	6/8/2021	Modem	Digi	07182	LR54	Illegible
8	6/8/2021	Sample Tower	Aluma Tower	missing	B	none
9	6/8/2021	Shelter Temperature	Campbell	none	107-L	none
10	6/8/2021	Siting Criteria	Siting Criteria	None	1	None
11	6/8/2021	Temperature	RM Young	06541	41432VC	14082

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2139	KNZ184	Martin Valvur	06/08/2021	DAS	Primary

Das Date: 6 /8 /2021
Das Time: 10:33:00
Das Day: 159

Audit Date 6 /8 /2021
Audit Time 10:33:00
Audit Day 159

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0003	0.0005	0.0003	0.0005

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	2/11/2021	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0005	-0.0008	V	V	-0.0003
7	0.1000	0.0995	0.0992	V	V	-0.0003
7	0.3000	0.2996	0.2993	V	V	-0.0003
7	0.5000	0.4999	0.4994	V	V	-0.0005
7	0.7000	0.6995	0.6994	V	V	-0.0001
7	0.9000	0.9002	0.9005	V	V	0.0003
7	1.0000	1.0001	0.9996	V	V	-0.0005

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	KNZ184	Martin Valvur	06/08/2021	Flow Rate	000849

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00850	**Intercept**	0.00160
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.073
1.98%	1.98%			**Cal Factor Full Scale**	0.91
				Rotometer Reading:	3.1

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.03	0.000	-0.05	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	-0.06	l/m	l/m	
primary	test pt 1	3.053	3.030	3.10	0.000	2.97	l/m	l/m	-1.98%
primary	test pt 2	3.058	3.030	3.10	0.000	2.97	l/m	l/m	-1.98%
primary	test pt 3	3.059	3.030	3.10	0.000	2.97	l/m	l/m	-1.98%

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**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.5 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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14082	KNZ184	Martin Valvur	06/08/2021	Temperature	06541

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99975	**Intercept**	-0.00824
Cert Date	2/9/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.01	0.01		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.27	0.28	0.000	0.3	C	-0.01
primary	Temp Mid Range	23.49	23.50	0.000	23.5	C	0
primary	Temp High Range	47.97	47.99	0.000	48.0	C	-0.01

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	KNZ184	Martin Valvur	06/08/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.33	0.79		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	27.82	27.84	0.000	27.8	C	0
primary	Temp Mid Range	27.38	27.40	0.000	28.2	C	0.79
primary	Temp Mid Range	26.84	26.86	0.000	27.1	C	0.21

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**Condition**		**Status**	pass
Sensor Component	City > 50,000	**Condition**		**Status**	pass
Sensor Component	City 1,000 to 10,000	**Condition**		**Status**	pass
Sensor Component	City 10,000 to 50,000	**Condition**		**Status**	pass
Sensor Component	Feedlot operations	**Condition**		**Status**	pass
Sensor Component	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**Condition**		**Status**	pass
Sensor Component	Major industrial source	**Condition**		**Status**	pass
Sensor Component	Secondary road < or = 100 per da	**Condition**		**Status**	pass
Sensor Component	Secondary road >100 vehicles/da	**Condition**		**Status**	pass
Sensor Component	Small parking lot	**Condition**		**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
KNZ184	Martin Valvur	06/08/2021

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

Sensor Component	Condition	Status
Sample Tower Type	Type B	pass
Conduit	Good	pass
Met Tower	N/A	pass
Moisture Trap	Installed	pass
Moisture Trap Type	Glass bottle and filter	pass
Power Cables	Good	pass
Shelter Temp Control	Functioning	pass
Rotometer	Installed	pass
Sample Tower	Good	pass
Shelter Condition	Fair	pass
Shelter Door	Good	pass
Shelter Roof	Good	pass
Shelter Floor	Poor	Fail
Shelter walls	Good	pass
Excessive mold present	Good	pass
Signal Cable	Good	pass
Tubing Type	3/8 teflon	pass
Sample Train	Good	pass
System Memo		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 has deteriorated and is poor condition.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	KNZ184	**Technician**	Martin Valvur	**Site Visit Date**	06/08/2021

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 Steps** ☑	

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 has deteriorated and is poor condition.				
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-S3-rev002

Site ID	KNZ184	Technician	Martin Valvur	Site Visit Date	06/08/2021

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	06/08/2021

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	06/08/2021

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** 06/08/2021

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?	☑	N/A
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	06/08/2021

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 schedule	☐		☐

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	06/08/2021

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?	☐	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	06/08/2021

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** 06/08/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	313MC12	07014
DAS	Campbell	CR3000	2139	000361
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	060300020200	04855
Flow Rate	Apex	AXMC105LPMDPC	illegible	000849
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	Illegible	07182
Sample Tower	Aluma Tower	B	none	missing
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41432VC	14082	06541

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
KIC003-Martin Valvur-06/09/2021						
1	6/9/2021	DAS	Campbell	000816	CR850	28382
2	6/9/2021	Filter pack flow pump	Permotec	none	BL30EB	unknown
3	6/9/2021	Flow Rate	Apex	000668	AXMC105LPMDPCV	illegible
4	6/9/2021	Modem	Sierra wireless	06996	unknown	unknown
5	6/9/2021	Sample Tower	Aluma Tower	000814	B	none
6	6/9/2021	Temperature	RM Young	06112	41342	10176

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	28382	KIC003	Martin Valvur	06/09/2021	DAS	Primary

Das Date:	6 /9 /2021	**Audit Date**	6 /9 /2021
Das Time:	07:47:00	**Audit Time**	07:47:00
Das Day:	160	**Audit Day**	160

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

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	2/11/2021	**CorrCoff**	1.00000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	KIC003	Martin Valvur	06/09/2021	Flow Rate	000668

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00850	**Intercept**	0.00160
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.012
1.75%	2.29%			**Cal Factor Full Scale**	0.9992
				Rotometer Reading:	3

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	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	3.070	3.040	3.00	0.000	2.99	l/m	l/m	-1.64%
primary	test pt 2	3.060	3.030	3.00	0.000	2.99	l/m	l/m	-1.32%
primary	test pt 3	3.090	3.060	3.00	0.000	2.99	l/m	l/m	-2.29%

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**	1.5 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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	10176	KIC003	Martin Valvur	06/09/2021	Temperature	06112

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99975	**Intercept**	-0.00824
Cert Date	2/9/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.13	0.19		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.15	0.16	0.000	0.0	C	-0.19
primary	Temp Mid Range	23.75	23.76	0.000	23.6	C	-0.13
primary	Temp High Range	48.64	48.66	0.000	48.6	C	-0.07

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

Field Systems Comments

1 **Parameter:** DocumentationCo

The site operator currently maintains records in a logbook provided by Wood.

2 **Parameter:** SitingCriteriaCom

The site is located across the street from the community school in the town of Powhattan.

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**	06/09/2021

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 Steps	☐	

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-S3-rev002

Site ID	KIC003	Technician	Martin Valvur	Site Visit Date	06/09/2021

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	06/09/2021

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	06/09/2021

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 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	06/09/2021

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	06/09/2021

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 schedule	☐		☐

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 operator currently maintains records in a logbook provided by Wood.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	KIC003	Technician	Martin Valvur	Site Visit Date	06/09/2021

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	trained on site by Wood technician
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	☐	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	06/09/2021

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed afternoons
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** 06/09/2021

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*
WSP144-Korey Devins-06/12/2021						
1	6/12/2021	Computer	Dell	07037	Inspiron 15	Unknown
2	6/12/2021	DAS	Campbell	000430	CR3000	2525
3	6/12/2021	Elevation	Elevation	None	1	None
4	6/12/2021	Filter pack flow pump	Thomas	06021	107CAB18B	060400022648
5	6/12/2021	Flow Rate	Apex	000872	AXMC105LPMDPCV	illegible
6	6/12/2021	Infrastructure	Infrastructure	none	none	none
7	6/12/2021	Modem	Digi	07196	LR54	unknown
8	6/12/2021	Ozone	ThermoElectron Inc	000745	49i A1NAA	1105347310
9	6/12/2021	Ozone Standard	ThermoElectron Inc	000543	49i A3NAA	0929938240
10	6/12/2021	Sample Tower	Aluma Tower	000126	B	none
11	6/12/2021	Shelter Temperature	Campbell	none	107-L	none
12	6/12/2021	Siting Criteria	Siting Criteria	None	1	None
13	6/12/2021	Temperature	RM Young	06387	41342VC	13960
14	6/12/2021	Zero air pump	Werther International	06880	C 70/4	000814273

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2525	WSP144	Korey Devins	06/12/2021	DAS	Primary

Das Date: 6 /12/2021
Das Time: 14:11:00
Das Day: 163

Audit Date 6 /12/2021
Audit Time 14:11:00
Audit Day 163

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/11/2021	**CorrCoff**	1.00000

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0000	V	V	0.0001
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	0.4995	0.4995	V	V	0.0000
7	0.7000	0.6994	0.6994	V	V	0.0000
7	0.9000	0.8993	0.8993	V	V	0.0000
7	1.0000	0.9992	0.9991	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	WSP144	Korey Devins	06/12/2021	Flow Rate	000872

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	0.99756	**Intercept**	-0.00058
Cert Date	2/10/2021	**CorrCoff**	0.99993

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.01
0.22%	0.67%			**Cal Factor Full Scale**	1.01
				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	0.01	l/m	l/m	
primary	leak check	0.000	0.000	-0.02	0.000	-0.01	l/m	l/m	
primary	test pt 1	1.493	1.500	1.48	0.000	1.50	l/m	l/m	0.00%
primary	test pt 2	1.488	1.490	1.48	0.000	1.50	l/m	l/m	0.67%
primary	test pt 3	1.492	1.500	1.48	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**	See comments	**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**	210 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347310	WSP144	Korey Devins	06/12/2021	Ozone	000745

Slope:	1.00409	**Slope:**	0.00000
Intercept	-0.41434	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	**Intercept**	0.30550
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.33	0.02	-0.30	ppb		-0.32
primary	2	15.52	15.13	14.69	ppb		-0.44
primary	3	36.04	35.55	35.24	ppb	-0.88	
primary	4	67.31	66.66	66.54	ppb	-0.18	
primary	5	109.11	108.26	108.30	ppb	0.04	

Sensor Component	Condition	Status
Audit Pressure	753 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	True	pass
ADT >100 vehicles further than 50	265 m	Fail
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.000	pass
Span	1.013	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	88.4 kHz	pass
Cell A Noise	0.5 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	732.4 mmHg	pass
Cell A Tmp.	38.5 C	pass
Cell B Freq.	92.0 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.72 lpm	pass
Cell B Pressure	733.3 mmHg	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	13960	WSP144	Korey Devins	06/12/2021	Temperature	06387

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00743	**Intercept**	0.21666
Cert Date	2/18/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.11	0.31		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.23	0.01	0.000	0.3	C	0.31
primary	Temp Mid Range	25.80	25.39	0.000	25.4	C	0.02
primary	Temp High Range	45.64	45.09	0.000	45.1	C	-0.01

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	WSP144	Korey Devins	06/12/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.86	0.99		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00743	Intercept	0.21666
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	29.37	28.94	0.000	29.7	C	0.78
primary	Temp Mid Range	29.75	29.32	0.000	30.1	C	0.8
primary	Temp Mid Range	26.71	26.30	0.000	27.3	C	0.99

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	City > 50,000	Condition	20 km	Status	Fail
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass

Infrastructure Data For

Site ID	WSP144	Technician	Korey Devins	Site Visit Date	06/12/2021

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	Moisture Trap Type	Condition	Glass bottle and filter	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	Shelter walls	Condition	Fair	Status	pass
Sensor Component	Excessive mold present	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
Sensor Component	System Memo	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	WSP144	Korey Devins	06/12/2021	Moisture Present	Apex	4655	☐	☐

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

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

2 **Parameter:** SitingCriteriaCom

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

3 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, clean, very neat, and well organized but beginning to show signs of wear.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	WSP144	**Technician**	Korey Devins	**Site Visit Date**	06/12/2021

Site Sponsor (agency)	EPA	**USGS Map**	Pennington
Operating Group	NJDEP / WCRC	**Map Scale**	
AQS #	34-021-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, PM2.5, PM10	**QAPP Longitude**	
Land Use	woodland, urban agriculture	**QAPP Elevation Meters**	
Terrain	rolling	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	40.312303
Site Address 1	WCRC-FA	**Audit Longitude**	-74.872663
Site Address 2	Church Rd.	**Audit Elevation**	59
County	Mercer	**Audit Declination**	-12.5
City, State	Titusville, NJ		
Zip Code	08560	**Fire Extinguisher** ☑	dated 2015
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☑	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☑	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Steps** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in fair condition, clean, very neat, and well organized but beginning to show signs of wear.				
Site OK	☑	**Notes**					

Driving Directions

From Philadelphia take I-95 north. Cross the Delaware River into New Jersey and take the first exit, route 29 north, just over the bridge. Continue approximately 4 miles through the traffic light at the intersection of 546 and through the park. Turn right onto Church road at the traffic light. Continue approximately 0.5 miles to the gate for the WCRC-FA on the right. The combination to the lock is 1903. Continue through the gate up the gravel road to the top of the hill and turn right along the edge of the field. Follow the gravel road to the site in the chain-link fenced area.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	WSP144	Technician	Korey Devins	Site Visit Date	06/12/2021

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	WSP144	Technician	Korey Devins	Site Visit Date	06/12/2021

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?	☑	
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	WSP144	Technician	Korey Devins	Site Visit Date	06/12/2021

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?	☑	Moisture in tubing only
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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	WSP144	Technician	Korey Devins	Site Visit Date	06/12/2021

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?	☑	Temperature 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	WSP144	Technician	Korey Devins	Site Visit Date	06/12/2021

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	☑	Oct 2011	☑
Field Ops Manual	☑		☑
Calibration Reports	☐		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

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	WSP144	Technician	Korey Devins	Site Visit Date	06/12/2021

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	☑	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?	☐	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?	☑	SSRF, logbook, call-in

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	WSP144	Technician	Korey Devins	Site Visit Date	06/12/2021

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed afternoons
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	☑	Weekly	☑
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 WSP144 **Technician** Korey Devins **Site Visit Date** 06/12/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07037
DAS	Campbell	CR3000	2525	000430
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	060400022648	06021
Flow Rate	Apex	AXMC105LPMDPC	illegible	000872
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07196
Ozone	ThermoElectron Inc	49i A1NAA	1105347310	000745
Ozone Standard	ThermoElectron Inc	49i A3NAA	0929938240	000543
Sample Tower	Aluma Tower	B	none	000126
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	13960	06387
Zero air pump	Werther International	C 70/4	000814273	06880

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
VPI120-Korey Devins-06/14/2021						
1	6/14/2021	Computer	Dell	07032	Inspiron 15	Unknown
2	6/14/2021	DAS	Campbell	000402	CR3000	2514
3	6/14/2021	Elevation	Elevation	None	1	None
4	6/14/2021	Filter pack flow pump	Thomas	02751	107CAB18	1192001884
5	6/14/2021	Flow Rate	Apex	000591	AXMC105LPMDPCV	illegible
6	6/14/2021	Infrastructure	Infrastructure	none	none	none
7	6/14/2021	Modem	Digi	07209	LR54	unknown
8	6/14/2021	Ozone	ThermoElectron Inc	000690	49i A1NAA	1030244800
9	6/14/2021	Ozone Standard	ThermoElectron Inc	000328	49i A3NAA	0622717850
10	6/14/2021	Sample Tower	Aluma Tower	000828	B	AT-21407Z-2-7-3
11	6/14/2021	Shelter Temperature	Campbell	none	107-L	none
12	6/14/2021	Siting Criteria	Siting Criteria	None	1	None
13	6/14/2021	Temperature	RM Young	04318	41342	4037
14	6/14/2021	Zero air pump	Werther International	06929	C 70/4	000829173

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2514	VPI120	Korey Devins	06/14/2021	DAS	Primary

Das Date: 6 /14/2021
Das Time: 14:04:15
Das Day: 165

Audit Date 6 /14/2021
Audit Time 14:04:15
Audit Day 165

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/11/2021	**CorrCoff**	1.00000

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0001	0.0000	V	V	-0.0001
7	0.1000	0.1000	0.1000	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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	VPI120	Korey Devins	06/14/2021	Flow Rate	000591

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	0.99756	**Intercept**	-0.00058
Cert Date	2/10/2021	**CorrCoff**	0.99993

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0
0.65%	0.65%			**Cal Factor Full Scale**	0.99
				Rotometer Reading:	1.6

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	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	1.528	1.530	1.53	0.000	1.52	l/m	l/m	-0.65%
primary	test pt 2	1.528	1.530	1.53	0.000	1.52	l/m	l/m	-0.65%
primary	test pt 3	1.528	1.530	1.53	0.000	1.52	l/m	l/m	-0.65%

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**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	6.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	45 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244800	VPI120	Korey Devins	06/14/2021	Ozone	000690

Slope:	0.99452	**Slope:**	0.00000
Intercept	-0.40728	**Intercept**	0.00000
CorrCoff:	0.99999	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	**Intercept**	0.30550
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.38	0.07	-0.23	ppb		-0.3
primary	2	15.19	14.81	14.47	ppb		-0.34
primary	3	35.08	34.60	33.76	ppb	-2.46	
primary	4	68.05	67.40	66.45	ppb	-1.42	
primary	5	112.59	111.72	110.86	ppb	-0.77	

Sensor Component	Audit Pressure	**Condition**	702 mmHg	**Status**	pass
Sensor Component	26.6 degree unobstructed rule	**Condition**	True	**Status**	pass
Sensor Component	Tree dewline >10m or below inlet	**Condition**	True	**Status**	pass
Sensor Component	ADT <100 vehicles further than 20	**Condition**	165 m	**Status**	Fail
Sensor Component	ADT >100 vehicles further than 50	**Condition**	165 m	**Status**	Fail
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Offset	**Condition**	0.000	**Status**	pass
Sensor Component	Span	**Condition**	0.998	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	100.3 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.70 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	673.2 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	37.7 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	88.3 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.6 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.70 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	674.1 mmHg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4037	VPI120	Korey Devins	06/14/2021	Temperature	04318

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00743	**Intercept**	0.21666
Cert Date	2/18/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.19	0.34		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.22	0.00	0.000	0.3	C	0.34
primary	Temp Mid Range	26.21	25.80	0.000	25.8	C	-0.04
primary	Temp High Range	46.25	45.69	0.000	45.9	C	0.18

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	VPI120	Korey Devins	06/14/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.17	0.31		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00743	Intercept	0.21666
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	27.84	27.42	0.000	27.1	C	-0.31
primary	Temp Mid Range	28.52	28.09	0.000	28.0	C	-0.13
primary	Temp Mid Range	28.99	28.56	0.000	28.6	C	0.07

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**Condition**	8 m	**Status**	Fail
Sensor Component	City > 50,000	**Condition**		**Status**	pass
Sensor Component	City 1,000 to 10,000	**Condition**		**Status**	pass
Sensor Component	City 10,000 to 50,000	**Condition**		**Status**	pass
Sensor Component	Feedlot operations	**Condition**		**Status**	pass
Sensor Component	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**Condition**		**Status**	pass
Sensor Component	Major industrial source	**Condition**		**Status**	pass
Sensor Component	Secondary road < or = 100 per da	**Condition**		**Status**	pass
Sensor Component	Secondary road >100 vehicles/da	**Condition**		**Status**	pass
Sensor Component	Small parking lot	**Condition**		**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
VPI120	Korey Devins	06/14/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2107-3)	640 cuft

Sensor Component	Condition	Status
Sample Tower Type	Type B	pass
Conduit	N/A	pass
Met Tower	N/A	pass
Moisture Trap	Installed	pass
Moisture Trap Type	Glass bottle and filter	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
Shelter walls	Fair	pass
Excessive mold present	Fair	pass
Signal Cable	Good	pass
Tubing Type	3/8 teflon	pass
Sample Train	Good	pass
System Memo		pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	VPI120	Korey Devins	06/14/2021	Moisture Present	Apex	4140	☐	☐

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

Field Systems Comments

1 **Parameter:** SiteOKNotes

The site was moved to the new location approximately 8/10/2020. There is a significant elevation and land use change.

2 **Parameter:** ShelterCleanNotes

The shelter is clean, neat, and well organized. Floor tiles are loose and the paneling is deteriorating.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	VPI120	**Technician**	Korey Devins	**Site Visit Date**	06/14/2021

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	VA Tech	**Map Scale**	
AQS #	51-071-9992	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	37.3300
Deposition Measurement	dry, wet	**QAPP Longitude**	-80.5573
Land Use	Woodland - mixed	**QAPP Elevation Meters**	920
Terrain	complex	**QAPP Declination**	7.9
Conforms to MLM	Marginally	**QAPP Declination Date**	1/31/2007
Site Telephone		**Audit Latitude**	37.323303
Site Address 1	1567 Blue Grass Trail	**Audit Longitude**	-80.45721
Site Address 2	Newport	**Audit Elevation**	661
County	Giles	**Audit Declination**	-7.8
City, State	Newport, VA		
Zip Code	24128	**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 Steps** ☑	

Shelter Working Room ☑ **Make** Ekto **Model** 8810 (s/n 2107-3) **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter is clean, neat, and well organized. Floor tiles are loose and the paneling is deteriorating.

Site OK ☑ **Notes** The site was moved to the new location approximately 8/10/2020. There is a significant elevation and land use change.

Driving Directions The site was moved to the new location approximately 8/10/2020.
Driving directions are not available.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	VPI120	Technician	Korey Devins	Site Visit Date	06/14/2021

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	VPI120	Technician	Korey Devins	Site Visit Date	06/14/2021

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?	☑	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:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	VPI120	Technician	Korey Devins	Site Visit Date	06/14/2021

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 18 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	VPI120	Technician	Korey Devins	Site Visit Date	06/14/2021

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	VPI120	Technician	Korey Devins	Site Visit Date	06/14/2021

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 2018	☑
HASP	☑	Oct 2018	☑
Field Ops Manual	☑	Oct 2018	☑
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

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	VPI120	Technician	Korey Devins	Site Visit Date	06/14/2021

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Trained 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	☑	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	☑	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	☐		☐
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	VPI120	Technician	Korey Devins	Site Visit Date	06/14/2021

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	☐		☐

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 VPI120 **Technician** Korey Devins **Site Visit Date** 06/14/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07032
DAS	Campbell	CR3000	2514	000402
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	1192001884	02751
Flow Rate	Apex	AXMC105LPMDPC	illegible	000591
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07209
Ozone	ThermoElectron Inc	49i A1NAA	1030244800	000690
Ozone Standard	ThermoElectron Inc	49i A3NAA	0622717850	000328
Sample Tower	Aluma Tower	B	AT-21407Z-2-7-3	000828
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	4037	04318
Zero air pump	Werther International	C 70/4	000829173	06929

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SHN418-Korey Devins-06/15/2021					
1 6/15/2021	Computer	Hewlett Packard	none	8470p	351B4FP
2 6/15/2021	DAS	Environmental Sys Corp	90658	8816	2643
3 6/15/2021	Elevation	Elevation	None	1	None
4 6/15/2021	Filter pack flow pump	Thomas	00443	107CA110	0288714888
5 6/15/2021	flow rate	Tylan	03942	FC280	AW9605202
6 6/15/2021	Infrastructure	Infrastructure	none	none	none
7 6/15/2021	MFC power supply	Tylan	03485	RO-32	FP9404009
8 6/15/2021	Ozone	ThermoElectron Inc	none	49i A3NAA	0903334535
9 6/15/2021	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1030745083
10 6/15/2021	Sample Tower	Aluma Tower	923307	B	none
11 6/15/2021	Shelter Temperature	ARS	none	none	none
12 6/15/2021	Siting Criteria	Siting Criteria	None	1	None
13 6/15/2021	Temperature2meter	RM Young	none	41342VC	14265
14 6/15/2021	Zero air pump	Werther International	none	C 70/4	000855578

DAS Data Form

DAS Time Max Error: 0.33

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2643	SHN418	Korey Devins	06/15/2021	DAS	Primary

Das Date:	6 /15/2021	**Audit Date**	6 /15/2021
Das Time:	12:33:00	**Audit Time**	12:33:20
Das Day:	166	**Audit Day**	166

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/11/2021	**CorrCoff**	1.00000

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

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9605202	SHN418	Korey Devins	06/15/2021	flow rate	03942

Mfg	Tylan	
SN/Owner ID	FP9404009	03485
Parameter:	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	0.99756	**Intercept**	-0.00058
Cert Date	2/10/2021	**CorrCoff**	0.99993

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	
3.70%	3.96%			

Cal Factor Zero	-0.343
Cal Factor Full Scale	5.008
Rotometer Reading:	1.7

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.29	0.0000	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.32	0.0000	0.25	l/m	l/m	
primary	test pt 1	1.441	1.440	1.71	0.0000	1.50	l/m	l/m	3.96%
primary	test pt 2	1.440	1.440	1.71	0.0000	1.50	l/m	l/m	3.89%
primary	test pt 3	1.443	1.450	1.71	0.0000	1.50	l/m	l/m	3.24%

Sensor Component	Leak Test	**Condition**	0.25 lpm	**Status**	Fail
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**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.0 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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	0903334535	SHN418	Korey Devins	06/15/2021	Ozone	none

Slope:	0.99057	**Slope:**	0.00000
Intercept	-0.11762	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	**Intercept**	0.30550
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.37	0.06	-0.04	ppb		-0.1
primary	2	14.74	14.36	13.98	ppb		-0.38
primary	3	34.59	34.11	33.74	ppb	-1.09	
primary	4	66.62	65.98	65.35	ppb	-0.96	
primary	5	111.30	110.43	109.20	ppb	-1.12	

Sensor Component	Condition	Status
Audit Pressure	669.5 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	100 m	Fail
ADT >100 vehicles further than 50	202 m	Fail
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.1	pass
Span	1.004	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	89.3 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.72 lpm	pass
Cell A Pressure	658.9 mmHg	pass
Cell A Tmp.	35.0 C	pass
Cell B Freq.	134.6 kHz	pass
Cell B Noise	1.5 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	660.0 mmHg	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14265	SHN418	Korey Devins	06/15/2021	Temperature2meter	none

Mfg	Extech	Parameter	Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00743	Intercept	0.21666
Cert Date	2/18/2021	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.1	0.14		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.18	-0.04	0.0000	0.02	C	0.06
primary	Temp Mid Range	26.16	25.75	0.0000	25.85	C	0.1
primary	Temp High Rang	46.01	45.46	0.0000	45.60	C	0.14

Sensor Component	Shield	Condition	Moderately clean	Status	pass
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	SHN418	Korey Devins	06/15/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.79	0.81		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00743	Intercept	0.21666
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.38	25.97	0.000	26.8	C	0.78
primary	Temp Mid Range	26.37	25.96	0.000	26.7	C	0.77
primary	Temp Mid Range	26.44	26.03	0.000	26.8	C	0.81

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**Condition**		**Status**	pass
Sensor Component	City > 50,000	**Condition**		**Status**	pass
Sensor Component	City 1,000 to 10,000	**Condition**		**Status**	pass
Sensor Component	City 10,000 to 50,000	**Condition**		**Status**	pass
Sensor Component	Feedlot operations	**Condition**		**Status**	pass
Sensor Component	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**Condition**		**Status**	pass
Sensor Component	Major industrial source	**Condition**		**Status**	pass
Sensor Component	Secondary road < or = 100 per da	**Condition**		**Status**	pass
Sensor Component	Secondary road >100 vehicles/da	**Condition**		**Status**	pass
Sensor Component	Small parking lot	**Condition**		**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	SHN418	Technician	Korey Devins	Site Visit Date	06/15/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8814	896 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	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Moisture Trap Type	Condition	Filter	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	Shelter walls	Condition	Fair	Status	pass
Sensor Component	Excessive mold present	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
Sensor Component	System Memo	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	SHN418	Korey Devins	06/15/2021	Moisture Present	Tylan	56	☐	☐

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

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

2 **Parameter:** ShelterCleanNotes

The shelter is in good condition, clean and well organized

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	SHN418	**Technician**	Korey Devins	**Site Visit Date**	06/15/2021

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Big Meadows
Operating Group	NPS	**Map Scale**	
AQS #	51-113-003	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, PM2.5	**QAPP Latitude**	
Deposition Measurement	dry, wet, Hg, IMPROVE	**QAPP Longitude**	
Land Use	woodland - mixed	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	38.5231
Site Address 1	Shenandoah National Park	**Audit Longitude**	-78.43471
Site Address 2	3655 US Hwy 211 East	**Audit Elevation**	1068
County	Madison	**Audit Declination**	-9.9
City, State	Luray, VA		
Zip Code	22835	**Fire Extinguisher** ☑	Inspected May 2021
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☐	
Primary Op. E-mail		**Climbing Belt** ☑	
Backup Operator		**Security Fence** ☑	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Steps** ☑	

Present

Shelter Working Room ☑	**Make**	Ekto	**Model**	8814	**Shelter Size**	896 cuft
Shelter Clean ☑	**Notes**	The shelter is in good condition, clean and well organized				
Site OK ☑	**Notes**					

Driving Directions Note: arrange for a "EB submaster" key 4 days in advance to be left at Big Meadows Visitor Center. From DC take 460 west to 29N to 33W to Skyline Drive North. Exit into Big Meadows Visitors Center. Go toward lodge and take the first right. Take the gravel road from the parking lot on the left to the site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	SHN418	Technician	Korey Devins	Site Visit Date	06/15/2021

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	SHN418	Technician	Korey Devins	Site Visit Date	06/15/2021

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?	☑	
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	SHN418	Technician	Korey Devins	Site Visit Date	06/15/2021

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	SHN418	Technician	Korey Devins	Site Visit Date	06/15/2021

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	SHN418	Technician	Korey Devins	Site Visit Date	06/15/2021

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	☑		☑
Site Ops Manual	☑		☑
HASP	☑		☑
Field Ops Manual	☑		☑
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☑	Dataview
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?	☑	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-S8-rev002

Site ID	SHN418	Technician	Korey Devins	Site Visit Date	06/15/2021

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	☑	Every 2 weeks	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☑	Every 2 weeks	☑
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	☑	Semiannually	☑

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:

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	SHN418	Technician	Korey Devins	Site Visit Date	06/15/2021

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings 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
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 SHN418 **Technician** Korey Devins **Site Visit Date** 06/15/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	8470p	351B4FP	none
DAS	Environmental Sys Corp	8816	2643	90658
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	0288714888	00443
flow rate	Tylan	FC280	AW9605202	03942
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP9404009	03485
Ozone	ThermoElectron Inc	49i A3NAA	0903334535	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1030745083	none
Sample Tower	Aluma Tower	B	none	923307
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342VC	14265	none
Zero air pump	Werther International	C 70/4	000855578	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
LRL117-Korey Devins-06/17/2021						
1	6/17/2021	Computer	Dell	07067	Inspiron 15	FF4MC12
2	6/17/2021	DAS	Campbell	000344	CR300	2123
3	6/17/2021	Elevation	Elevation	None	1	None
4	6/17/2021	Filter pack flow pump	Thomas	01133	107CA18	1088003123
5	6/17/2021	Flow Rate	Apex	000885	AXMC105LPMDPCV	illegible
6	6/17/2021	Infrastructure	Infrastructure	none	none	none
7	6/17/2021	Ozone	ThermoElectron Inc	000701	49i A1NAA	1030244808
8	6/17/2021	Ozone Standard	ThermoElectron Inc	000444	49i A3NAA	CM08200020
9	6/17/2021	Sample Tower	Aluma Tower	000783	B	none
10	6/17/2021	Shelter Temperature	Campbell	none	107-L	none
11	6/17/2021	Siting Criteria	Siting Criteria	None	1	None
12	6/17/2021	Temperature	RM Young	06245	41342VC	12792
13	6/17/2021	Zero air pump	Werther International	06904	C 70/4	000821901

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2123	LRL117	Korey Devins	06/17/2021	DAS	Primary

Das Date: 6 /17/2021
Das Time: 08:17:00
Das Day: 168

Audit Date 6 /17/2021
Audit Time 08:17:00
Audit Day 168

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/11/2021	**CorrCoff**	1.00000

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0000	V	V	0.0001
7	0.1000	0.0998	0.0999	V	V	0.0001
7	0.3000	0.2997	0.2997	V	V	0.0000
7	0.5000	0.4995	0.4996	V	V	0.0001
7	0.7000	0.6994	0.6995	V	V	0.0001
7	0.9000	0.8993	0.8993	V	V	0.0000
7	1.0000	0.9992	0.9992	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	LRL117	Korey Devins	06/17/2021	Flow Rate	000885

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	0.99756	**Intercept**	-0.00058
Cert Date	2/10/2021	**CorrCoff**	0.99993

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0
1.75%	1.96%			**Cal Factor Full Scale**	0.97
				Rotometer Reading:	1.6

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.00	0.0000	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.0000	0.00	l/m	l/m	
primary	test pt 1	1.519	1.520	1.54	0.0000	1.50	l/m	l/m	-1.32%
primary	test pt 2	1.521	1.530	1.54	0.0000	1.50	l/m	l/m	-1.96%
primary	test pt 3	1.527	1.530	1.54	0.0000	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**	See comments	**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**	130 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244808	LRL117	Korey Devins	06/17/2021	Ozone	000701

Slope:	0.97470	**Slope:**	0.00000
Intercept	-0.43498	**Intercept**	0.00000
CorrCoff:	0.99995	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	**Intercept**	0.30550
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.45	0.14	0.31	ppb		0.17
primary	2	15.53	15.14	13.95	ppb		-1.19
primary	3	35.94	35.45	33.80	ppb	-4.77	
primary	4	66.20	65.56	63.28	ppb	-3.54	
primary	5	109.27	108.41	105.50	ppb	-2.72	

Sensor Component	Condition	Status
Audit Pressure	710.3 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	True	pass
ADT >100 vehicles further than 50	488 m	fail
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	-0.1	pass
Span	1.011	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	137.7 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.60 lpm	pass
Cell A Pressure	695.5 mmHg	pass
Cell A Tmp.	30.7 C	pass
Cell B Freq.	90.6 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	696.4 mmHg	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	12792	LRL117	Korey Devins	06/17/2021	Temperature	06245

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00743	**Intercept**	0.21666
Cert Date	2/18/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.22	0.36		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.20	-0.02	0.0000	0.3	C	0.36
primary	Temp Mid Range	25.69	25.29	0.0000	25.5	C	0.16
primary	Temp High Range	46.65	46.09	0.0000	46.2	C	0.15

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	LRL117	Korey Devins	06/17/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.37	0.52		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00743	Intercept	0.21666
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	27.92	27.50	0.000	27.0	C	-0.52
primary	Temp Mid Range	27.24	26.82	0.000	26.7	C	-0.17
primary	Temp Mid Range	25.24	24.84	0.000	25.3	C	0.41

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**Condition**		**Status**	pass
Sensor Component	City > 50,000	**Condition**		**Status**	pass
Sensor Component	City 1,000 to 10,000	**Condition**		**Status**	pass
Sensor Component	City 10,000 to 50,000	**Condition**		**Status**	pass
Sensor Component	Feedlot operations	**Condition**		**Status**	pass
Sensor Component	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**Condition**		**Status**	pass
Sensor Component	Major industrial source	**Condition**		**Status**	pass
Sensor Component	Secondary road < or = 100 per da	**Condition**		**Status**	pass
Sensor Component	Secondary road >100 vehicles/da	**Condition**		**Status**	pass
Sensor Component	Small parking lot	**Condition**		**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	LRL117	Technician	Korey Devins	Site Visit Date	06/17/2021

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	Moisture Trap Type	Condition	Glass bottle and filter	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	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	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
Sensor Component	System Memo	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	LRL117	Korey Devins	06/17/2021	Moisture Present	Apex	4660	☐	☐

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

Ozone sample line leak checks conducted every other week following the inlet filter replacements.

2 **Parameter:** ShelterCleanNotes

The shelter is in excellent condition and very clean and well organized. A new peaked roof has been installed.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	LRL117	**Technician**	Korey Devins	**Site Visit Date**	06/17/2021

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	private/PADNR	**Map Scale**	
AQS #	42-111-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	woodland - mixed	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	39.988309
Site Address 1	Laurel Hill State Park	**Audit Longitude**	-79.251573
Site Address 2	1447 Laurel Hill State Park Rd.	**Audit Elevation**	609
County		**Audit Declination**	-9
City, State	Somerset, PA		
Zip Code	15501	**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** ☐	Locked gate
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Steps** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in excellent condition and very clean and well organized. A new peaked roof has been installed.				
Site OK	☑	**Notes**					
Driving Directions	From Somerset take 30 west						

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	LRL117	Technician	Korey Devins	Site Visit Date	06/17/2021

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	LRL117	Technician	Korey Devins	Site Visit Date	06/17/2021

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?	☑	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:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	LRL117	Technician	Korey Devins	Site Visit Date	06/17/2021

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 LRL117 **Technician** Korey Devins **Site Visit Date** 06/17/2021

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	LRL117	Technician	Korey Devins	Site Visit Date	06/17/2021

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	☑	May 2019	☑
HASP	☑	May 2019	☑
Field Ops Manual	☑	May 2019	☑
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

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	LRL117	Technician	Korey Devins	Site Visit Date	06/17/2021

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	☑	N/A	☑
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	☐		☐
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:

Ozone sample line leak checks conducted every other week following the inlet filter replacements.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	LRL117	Technician	Korey Devins	Site Visit Date	06/17/2021

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed afternoons
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:

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID LRL117 **Technician** Korey Devins **Site Visit Date** 06/17/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	FF4MC12	07067
DAS	Campbell	CR300	2123	000344
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	1088003123	01133
Flow Rate	Apex	AXMC105LPMDPC	illegible	000885
Infrastructure	Infrastructure	none	none	none
Ozone	ThermoElectron Inc	49i A1NAA	1030244808	000701
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200020	000444
Sample Tower	Aluma Tower	B	none	000783
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	12792	06245
Zero air pump	Werther International	C 70/4	000821901	06904

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: 7/30/2021 12:32:18

SiteVisitDate	Site	Technician
06/13/2021	ARE128	Korey Devins

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	0.99887	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.27916	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.0	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.26	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.37	ppb	**P**

EEMS Spot Report

Data Compiled: 7/29/2021 11:59:20

SiteVisitDate	Site	Technician
05/07/2021	BAS601	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	1.00409	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.41773	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.5	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.57	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.18	ppb	**P**

EEMS Spot Report

Data Compiled: 7/14/2021 08:10:48

SiteVisitDate	Site	Technician
04/08/2021	BUF603	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	0.08	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.16	c	**P**
3	Flow Rate average % difference	P	10	5	8	1.7	%	**P**
4	Flow Rate max % difference	P	10	5	8	3.23	%	**P**

SiteVisitDate	Site	Technician
04/08/2021	BUF603	Martin Valvur

Field Systems Comments

1 **Parameter:** DasComments

The NEMA enclosure has a cooling fan.

2 **Parameter:** DocumentationCo

A disc with the current QAPP has been received and is kept at the site operator's office. The site operator completes and files a hardcopy checklist developed by ARS for BLM each week.

3 **Parameter:** ShelterCleanNotes

NEMA enclosure, 120 VAC power

4 **Parameter:** PollAnalyzerCom

The dry deposition filter pack enclosure is not the standard "pot" size that is used at the other CASTNET sites. The diameter of the enclosure is much smaller and the filter is mounted much deeper inside the opening. The geometry of the filter pack and enclosure is likely to impact particle collection efficiency.

5 **Parameter:** MetSensorComme

The temperature is measured at 2.5 meters above the ground.

EEMS Spot Report

Data Compiled: 7/14/2021 16:56:10

SiteVisitDate	Site	Technician
04/15/2021	CAD150	Eric Hebert

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	0.16	c	**P**
2	Temperature max error	P	4	0.5	9	0.30	c	**P**
3	Ozone Slope	P	0	1.1	4	1.01633	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.08703	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.0	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.22	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.07	ppb	**P**
9	Flow Rate average % difference	P	10	5	4	0.22	%	**P**
10	Flow Rate max % difference	P	10	5	4	0.66	%	**P**
11	DAS Voltage average error	P	7	0.003	84	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	10	1.85	c	**P**
13	Shelter Temperature max error	P	5	2	10	1.9	c	**P**

SiteVisitDate	Site	Technician
04/15/2021	CAD150	Eric Hebert

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

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

2 **Parameter:** ShelterCleanNotes

Some shelter floor tiles are cracked and there is indication of insect damage below the heater. The floor is continuing to rot under the tiles.

3 **Parameter:** PollAnalyzerCom

There is a moisture trap and dryer in the ozone sample line.

EEMS Spot Report

Data Compiled: 7/14/2021 15:32:23

SiteVisitDate	Site	Technician
04/22/2021	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	0.98941	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.12968	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.9	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.23	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.49	ppb	**P**

EEMS Spot Report

Data Compiled: 7/14/2021 14:10:00

SiteVisitDate	Site	Technician
04/20/2021	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	0.25	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.34	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99258	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.23119	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.6	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.17	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.54	ppb	**P**
9	DAS Voltage average error	P	8	0.003	35	0.0004	V	**P**
10	Shelter Temperature average error	P	5	2	12	0.24	c	**P**
11	Shelter Temperature max error	P	5	2	12	0.33	c	**P**

SiteVisitDate	Site	Technician
04/20/2021	CHC432	Martin Valvur

Field Performance Comments

1 **Parameter:** Temperature2meter **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.

EEMS Spot Report

Data Compiled: 7/14/2021 14:34:43

SiteVisitDate	Site	Technician
04/21/2021	CHE185	Eric Hebert

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	0.29	c	**P**
2	Temperature max error	P	4	0.5	6	0.47	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00097	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.02064	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.5	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.12	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.14	ppb	**P**
9	Flow Rate average % difference	P	10	5	2	1.77	%	**P**
10	Flow Rate max % difference	P	10	5	2	1.84	%	**P**
11	Shelter Temperature average error	P	5	2	14	1.65	c	**P**
12	Shelter Temperature max error	P	5	2	14	1.73	c	**P**

SiteVisitDate	Site	Technician
04/21/2021	CHE185	Eric Hebert

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.

EEMS Spot Report

Data Compiled: 7/14/2021 12:13:40

SiteVisitDate	Site	Technician
04/16/2021	COW137	Korey Devins

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	1.00232	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.19439	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.0	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.2	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.27	ppb	**P**

EEMS Spot Report

Data Compiled: 7/29/2021 12:05:15

SiteVisitDate	Site	Technician
05/10/2021	CTH110	Korey Devins

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	1.00905	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.00355	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.9	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.01	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.11	ppb	**P**

EEMS Spot Report

Data Compiled: 7/14/2021 16:51:43

SiteVisitDate	Site	Technician
05/01/2021	CVL151	Eric Hebert

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	0.13	c	**P**
2	Temperature max error	P	4	0.5	9	0.19	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00353	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.10867	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.4	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.14	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.02	ppb	**P**
9	Flow Rate average % difference	P	10	5	8	1.35	%	**P**
10	Flow Rate max % difference	P	10	5	8	1.35	%	**P**
11	DAS Voltage average error	P	7	0.003	77	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	10	1.05	c	**P**
13	Shelter Temperature max error	P	5	2	10	1.11	c	**P**

SiteVisitDate	Site	Technician
05/01/2021	CVL151	Eric Hebert

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

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

2 **Parameter:** ShelterCleanNotes

The shelter has been repaired since the previous audit visit.

EEMS Spot Report

Data Compiled: 7/29/2021 12:56:27

SiteVisitDate	Site	Technician
05/14/2021	DCP114	Korey Devins

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	0.23	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00931	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.30228	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.5	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.08	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.14	ppb	**P**
9	Flow Rate average % difference	P	10	5	8	0.00	%	**P**
10	Flow Rate max % difference	P	10	5	8	0.00	%	**P**
11	DAS Voltage average error	P	7	0.003	84	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	21	0.47	c	**P**
13	Shelter Temperature max error	P	5	2	21	0.54	c	**P**

SiteVisitDate	Site	Technician
05/14/2021	DCP114	Korey Devins

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

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

2 **Parameter:** DasComments

Met tower removed and sample tower not grounded.

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 good condition. The floor has been recently repaired.

6 **Parameter:** MetOpMaintCom

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

EEMS Spot Report

Data Compiled: 7/14/2021 15:44:06

SiteVisitDate	Site	Technician
04/23/2021	DIN431	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	0.97887	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.57366	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.6	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.06	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-1.38	ppb	**P**

EEMS Spot Report

Data Compiled: 7/14/2021 10:57:41

SiteVisitDate	Site	Technician
04/15/2021	GAS153	Korey Devins

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	0.98262	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.32048	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.8	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.13	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.5	ppb	**P**

EEMS Spot Report

Data Compiled: 7/28/2021 16:38:38

SiteVisitDate	Site	Technician
05/05/2021	GRT434	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	1.01196	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.02390	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.0	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.11	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.00	ppb	**P**

EEMS Spot Report

Data Compiled: 7/30/2021 10:12:45

SiteVisitDate	Site	Technician
06/01/2021	GTH161	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	21	0.09	c	**P**
2	Temperature max error	P	4	0.5	21	0.15	c	**P**
3	Ozone Slope	P	0	1.1	4	1.02201	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.05426	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.0	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.24	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.49	ppb	**P**
9	Flow Rate average % difference	P	10	5	6	1.69	%	**P**
10	Flow Rate max % difference	P	10	5	6	2.03	%	**P**
11	DAS Voltage average error	P	7	0.003	63	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	21	0.37	c	**P**
13	Shelter Temperature max error	P	5	2	21	1.09	c	**P**

SiteVisitDate	Site	Technician
06/01/2021	GTH161	Martin Valvur

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

Some floor tiles are damaged.

2 **Parameter:** MetSensorComme

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

EEMS Spot Report

Data Compiled: 7/30/2021 14:57:28

SiteVisitDate	Site	Technician
06/18/2021	KEF112	Korey Devins

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	0.98837	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.1959	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.0	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.05	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.52	ppb	**P**

EEMS Spot Report

Data Compiled: 7/30/2021 11:41:50

SiteVisitDate	Site	Technician
06/09/2021	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	12	0.13	c	**P**
2	Temperature max error	P	4	0.5	12	0.19	c	**P**
3	Flow Rate average % difference	P	10	5	6	1.75	%	**P**
4	Flow Rate max % difference	P	10	5	6	2.29	%	**P**

SiteVisitDate	Site	Technician
06/09/2021	KIC003	Martin Valvur

Field Systems Comments

1 **Parameter:** DocumentationCo

The site operator currently maintains records in a logbook provided by Wood.

2 **Parameter:** SitingCriteriaCom

The site is located across the street from the community school in the town of Powhattan.

3 **Parameter:** ShelterCleanNotes

Small footprint site with no shelter.

EEMS Spot Report

Data Compiled: 7/30/2021 11:25:24

SiteVisitDate	Site	Technician
06/08/2021	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	6	0.01	c	**P**
2	Temperature max error	P	4	0.5	6	0.01	c	**P**
3	Flow Rate average % difference	P	10	5	4	1.98	%	**P**
4	Flow Rate max % difference	P	10	5	4	1.98	%	**P**
5	DAS Voltage average error	P	7	0.003	56	0.0003	V	**P**
6	Shelter Temperature average error	P	5	2	21	0.33	c	**P**
7	Shelter Temperature max error	P	5	2	21	0.79	c	**P**

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 has deteriorated and is poor condition.

EEMS Spot Report

Data Compiled: 7/30/2021 14:37:18

SiteVisitDate	Site	Technician
06/17/2021	LRL117	Korey Devins

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	18	0.22	c	**P**
2	Temperature max error	P	4	0.5	18	0.36	c	**P**
3	Ozone Slope	P	0	1.1	4	0.97470	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.43498	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
6	Ozone % difference avg	P	7	10	4	4.7	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.17	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-1.19	ppb	**P**
9	Flow Rate average % difference	P	10	5	2	1.75	%	**P**
10	Flow Rate max % difference	P	10	5	2	1.96	%	**P**
11	DAS Voltage average error	P	7	0.003	77	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	21	0.37	c	**P**
13	Shelter Temperature max error	P	5	2	21	0.52	c	**P**

SiteVisitDate	Site	Technician
06/17/2021	LRL117	Korey Devins

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

Ozone sample line leak checks conducted every other week following the inlet filter replacements.

2 **Parameter:** ShelterCleanNotes

The shelter is in excellent condition and very clean and well organized. A new peaked roof has been installed.

EEMS Spot Report

Data Compiled: 7/14/2021 15:22:56

SiteVisitDate	Site	Technician
04/21/2021	MEV405	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	1.06	c	**Fail**
2	Temperature2meter max error	P	5	0.5	3	2.03	c	**Fail**
3	Ozone Slope	P	0	1.1	4	0.98086	unitless	**P**
4	Ozone Intercept	P	0	5	4	-1.28734	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99976	unitless	**P**
6	Ozone % difference avg	P	7	10	4	7.6	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.09	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-2.88	ppb	**Fail**
9	Flow Rate average % difference	P	10	5	12	0.23	%	**P**
10	Flow Rate max % difference	P	10	5	12	0.33	%	**P**
11	DAS Voltage average error	P	16	0.003	7	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	21	1.27	c	**P**
13	Shelter Temperature max error	P	5	2	21	1.51	c	**P**

SiteVisitDate	Site	Technician
04/21/2021	MEV405	Martin Valvur

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

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

2 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 7/8/2021 12:58:13

SiteVisitDate	Site	Technician
04/06/2021	NEC602	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	0.09	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.15	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00194	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.14706	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.6	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.02	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.12	ppb	**P**
9	Flow Rate average % difference	P	10	5	2	1.65	%	**P**
10	Flow Rate max % difference	P	10	5	2	2.21	%	**P**
11	Shelter Temperature average error	P	5	2	15	0.77	c	**P**
12	Shelter Temperature max error	P	5	2	15	1.29	c	**P**

SiteVisitDate	Site	Technician
04/06/2021	NEC602	Martin Valvur

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator does not use gloves to handle the filter pack. The bag is used as a glove to install and remove the filter.

2 **Parameter:** SiteOpsProcedures

The site operator is aware that the desiccant is almost in need of replacement. Some of the items on the SSRF were discussed and the site operator's questions were answered regarding the correct procedures.

3 **Parameter:** DocumentationCo

The site operator received a disc with the current QAPP which is kept at his office.

4 **Parameter:** SitingCriteriaCom

The site is located approximately 2 km northeast of Newcastle WY which has a population of approximately 3500. There is an oil refinery in Newcastle. A heavily traveled road is approximately 100m west of the site.

5 **Parameter:** ShelterCleanNotes

The shelter houses the ozone, DAS, and MFC only.

EEMS Spot Report

Data Compiled: 7/28/2021 16:22:34

SiteVisitDate	Site	Technician
05/03/2021	PND165	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	18	0.06	c	**P**
2	Temperature max error	P	4	0.5	18	0.14	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99528	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.19251	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.4	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.01	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.56	ppb	**P**
9	Flow Rate average % difference	P	10	5	2	1.31	%	**P**
10	Flow Rate max % difference	P	10	5	2	1.64	%	**P**
11	DAS Voltage average error	P	7	0.003	84	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	21	0.15	c	**P**
13	Shelter Temperature max error	P	5	2	21	0.45	c	**P**

SiteVisitDate	Site	Technician
05/03/2021	PND165	Martin Valvur

Field Performance Comments

1 **Parameter:** Temperature **SensorComponent:** Blower **CommentCode:** 26

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

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

Construction at the bottom of the hill and entrance to the site access road has been completed.

2 **Parameter:** ShelterCleanNotes

The shelter is well maintained.

EEMS Spot Report

Data Compiled: 7/30/2021 14:49:11

SiteVisitDate	Site	Technician
06/17/2021	PSU106	Korey Devins

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	0.99478	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.26868	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.5	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.26	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.49	ppb	**P**

EEMS Spot Report

Data Compiled: 7/29/2021 15:31:06

SiteVisitDate	Site	Technician
05/28/2021	ROM406	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	0.28	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.32	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99873	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.49411	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 Absolute Difference g1	P	7	3	1	0.79	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.31	ppb	**P**
9	Flow Rate average % difference	P	10	5	12	2.63	%	**P**
10	Flow Rate max % difference	P	10	5	12	2.65	%	**P**
11	DAS Voltage average error	P	10	0.003	7	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	12	0.69	c	**P**
13	Shelter Temperature max error	P	5	2	12	0.89	c	**P**

SiteVisitDate	Site	Technician
05/28/2021	ROM406	Martin Valvur

Field Systems Comments

1 **Parameter:** DasComments

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

2 **Parameter:** ShelterCleanNotes

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

3 **Parameter:** MetSensorComme

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

EEMS Spot Report

Data Compiled: 7/29/2021 13:09:45

SiteVisitDate	Site	Technician
05/15/2021	SAL133	Korey Devins

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	1.00487	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.16171	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.4	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.09	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.09	ppb	**P**

EEMS Spot Report

Data Compiled: 7/29/2021 15:03:23

SiteVisitDate	Site	Technician
05/21/2021	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	0.06	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.07	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98865	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.06176	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.6	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.16	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.33	ppb	**P**
9	Flow Rate average % difference	P	10	5	12	1.99	%	**P**
10	Flow Rate max % difference	P	10	5	12	2.1	%	**P**
11	DAS Voltage average error	P	15	0.003	63	0.0002	V	**P**
12	Shelter Temperature average error	P	5	2	21	0.64	c	**P**
13	Shelter Temperature max error	P	5	2	21	0.75	c	**P**

SiteVisitDate	Site	Technician
05/21/2021	SEK430	Martin Valvur

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

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

2 **Parameter:** ShelterCleanNotes

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

3 **Parameter:** PollAnalyzerCom

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

EEMS Spot Report

Data Compiled: 7/14/2021 17:10:27

SiteVisitDate	Site	Technician
04/08/2021	SHE604	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	0.09	c	**P**
3	Flow Rate average % difference	P	10	5	2	2.04	%	**P**
4	Flow Rate max % difference	P	10	5	2	2.39	%	**P**

SiteVisitDate	Site	Technician
04/08/2021	SHE604	Martin Valvur

Field Systems Comments

1 **Parameter:** DasComments

The site power source is solar and wind with battery storage. The NEMA enclosure has a cooling fan.

2 **Parameter:** SiteOpsProcedures

observations of current meteorological measurements are recorded on a hardcopy checklist for ARS and not on the SSRF.

3 **Parameter:** DocumentationCo

The site operator is supplied with a disc containing the QAPP, operating procedures, and HASP which is kept at his office. A hard copy BLM check list developed by ARS is completed and sent to ARS each week. Standard CASTNET SSRF forms are being used now.

4 **Parameter:** SitingCriteriaCom

The site is located in range land. There is an active rail line with coal trains within one kilometer of the site.

5 **Parameter:** ShelterCleanNotes

NEMA enclosure, wind and solar power

6 **Parameter:** PollAnalyzerCom

The dry deposition filter pack enclosure is not the standard "pot" size as at the other CASTNET sites. The diameter is much smaller. It is not clear if this will impact particle collection efficiency.

7 **Parameter:** MetSensorComme

The site is a small footprint solar powered site that has been operating as part of the WARMS network for more than 10 years. Objects violate the 45 degree rule for the tipping bucket rain gage. The temperature and RH are being measured at 2.5 meters above the ground.

8 **Parameter:** MetOpMaintCom

The accuracy of the DAS was not tested with a voltage source since there were no available test channels.

EEMS Spot Report

Data Compiled: 7/30/2021 13:45:48

SiteVisitDate	Site	Technician
06/15/2021	SHN418	Korey Devins

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	0.10	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.14	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99057	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.11762	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.4	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.1	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.38	ppb	**P**
9	Flow Rate average % difference	P	10	5	14	3.7	%	**P**
10	Flow Rate max % difference	P	10	5	14	3.96	%	**P**
11	Shelter Temperature average error	P	5	2	24	0.79	c	**P**
12	Shelter Temperature max error	P	5	2	24	0.81	c	**P**

SiteVisitDate	Site	Technician
06/15/2021	SHN418	Korey Devins

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

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

2 **Parameter:** ShelterCleanNotes

The shelter is in good condition, clean and well organized

EEMS Spot Report

Data Compiled: 7/30/2021 13:21:55

SiteVisitDate	Site	Technician
06/14/2021	VPI120	Korey Devins

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	15	0.19	c	**P**
2	Temperature max error	P	4	0.5	15	0.34	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99452	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.40728	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.7	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.3	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.34	ppb	**P**
9	Flow Rate average % difference	P	10	5	8	0.65	%	**P**
10	Flow Rate max % difference	P	10	5	8	0.65	%	**P**
11	DAS Voltage average error	P	7	0.003	91	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	21	0.17	c	**P**
13	Shelter Temperature max error	P	5	2	21	0.31	c	**P**

SiteVisitDate	Site	Technician
06/14/2021	VPI120	Korey Devins

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOKNotes

The site was moved to the new location approximately 8/10/2020. There is a significant elevation and land use change.

2 **Parameter:** ShelterCleanNotes

The shelter is clean, neat, and well organized. Floor tiles are loose and the paneling is deteriorating.

EEMS Spot Report

Data Compiled: 6/22/2021 13:16:03

SiteVisitDate	Site	Technician
04/05/2021	WNC429	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	0.61	c	**Fail**
2	Temperature2meter max error	P	5	0.5	3	1.68	c	**Fail**
3	Flow Rate average % difference	P	10	5	2	1.02	%	**P**
4	Flow Rate max % difference	P	10	5	2	1.78	%	**P**
5	DAS Voltage average error	P	1	0.003	21	0.0003	V	**P**
6	Shelter Temperature average error	P	5	2	6	0.67	c	**P**
7	Shelter Temperature max error	P	5	2	6	1.15	c	**P**

SiteVisitDate	Site	Technician
04/05/2021	WNC429	Martin Valvur

Field Performance Comments

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

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

2 **Parameter:** Temperature2meter **SensorComponent:** Blower **CommentCode:** 26

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The general observations section of the SSRF is still not completed. Gloves are not used when handling the filter pack, however the filter bag is used as a glove.

2 **Parameter:** SiteOpsProcedures

The ozone analyzer is operated by the state of South Dakota and the sample train is now 1/4 Teflon with a filter at the inlet 4 meters above the ground.

3 **Parameter:** DocumentationCo

Records of the routine checks performed by the state of SD personnel are kept onsite in a logbook.

4 **Parameter:** ShelterCleanNotes

One shelter houses the ozone monitor and is in good condition and clean. The second shelter houses the flow system and IMPROVE. It is older and not climate controlled.

5 **Parameter:** PollAnalyzerCom

The dry deposition filter is mounted low in the enclosure which changes the particle collection characteristics, and can allow precipitation to enter.

6 **Parameter:** MetOpMaintCom

The temperature sensor signal cable insulation is cracked and showing signs of extreme wear. There are several sections covered with electrical tape.

EEMS Spot Report

Data Compiled: 7/30/2021 12:24:18

SiteVisitDate	Site	Technician
06/12/2021	WSP144	Korey Devins

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	15	0.11	c	**P**
2	Temperature max error	P	4	0.5	15	0.31	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00409	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.41434	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.0	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.32	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.44	ppb	**P**
9	Flow Rate average % difference	P	10	5	2	0.22	%	**P**
10	Flow Rate max % difference	P	10	5	2	0.67	%	**P**
11	DAS Voltage average error	P	7	0.003	84	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	21	0.86	c	**P**
13	Shelter Temperature max error	P	5	2	21	0.99	c	**P**

SiteVisitDate	Site	Technician
06/12/2021	WSP144	Korey Devins

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

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

2 **Parameter:** SitingCriteriaCom

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

3 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, clean, very neat, and well organized but beginning to show signs of wear.

EEMS Spot Report

Data Compiled: 7/28/2021 17:15:40

SiteVisitDate	Site	Technician
05/06/2021	YEL408	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	0.09	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.15	c	**P**
3	Ozone Slope	P	0	1.1	4	0.97127	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.20507	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.3	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.42	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.72	ppb	**P**
9	Flow Rate average % difference	P	10	5	3	1.54	%	**P**
10	Flow Rate max % difference	P	10	5	3	1.81	%	**P**
11	DAS Voltage average error	P	8	0.003	28	0.0002	V	**P**
12	Shelter Temperature average error	P	5	2	24	0.14	c	**P**
13	Shelter Temperature max error	P	5	2	24	0.26	c	**P**

SiteVisitDate	Site	Technician
05/06/2021	YEL408	Martin Valvur

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Gloves are not used to handle the filter pack.

2 **Parameter:** DasComments

The shelter heat and air conditioner run simultaneously.

3 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced and the system is leak tested every two weeks.

4 **Parameter:** SitingCriteriaCom

The site is located at the edge of a tree line. Trees as tall as 8 meters are near the sample inlet. Trees taller than 10 meters are 15 meters from the inlet.

5 **Parameter:** ShelterCleanNotes

The shelter is organized and well maintained.

EEMS Spot Report

Data Compiled: 7/29/2021 14:15:28

SiteVisitDate	Site	Technician
05/17/2021	ZIO433	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	0.25	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.28	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98038	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.27490	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.6	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.58	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.31	ppb	**P**
9	DAS Voltage average error	P	5	0.003	21	0.0001	V	**P**
10	Shelter Temperature average error	P	5	2	6	0.31	c	**P**
11	Shelter Temperature max error	P	5	2	6	0.44	c	**P**

SiteVisitDate	Site	Technician
05/17/2021	ZIO433	Martin Valvur

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Dry deposition samples are not collected at this CASTNET site.

2 **Parameter:** MetOpMaintCom

The inside of the temperature shield is dirty.

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GAS153-Korey Devins-04/15/2021						
1	4/15/2021	DAS	Campbell	000635	CR3000	4934
2	4/15/2021	Ozone	ThermoElectron Inc	000737	49i A1NAA	1105347312
3	4/15/2021	Ozone Standard	ThermoElectron Inc	000215	49i A3NAA	0622717856
4	4/15/2021	Zero air pump	Werther International	06865	C 70/4	000814277

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347312	GAS153	Korey Devins	04/15/2021	Ozone	000737

Slope:	0.98262	**Slope:**	0.00000
Intercept	-0.32048	**Intercept**	0.00000
CorrCoff:	0.99999	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	**Intercept**	0.30550
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.35	0.04	-0.09	ppb		-0.13
primary	2	15.61	15.22	14.72	ppb		-0.5
primary	3	35.88	35.39	34.14	ppb	-3.6	
primary	4	66.97	66.33	64.73	ppb	-2.44	
primary	5	111.55	110.68	108.60	ppb	-1.9	

Sensor Component	Condition	Status
Audit Pressure	736.0 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	True	pass
ADT >100 vehicles further than 50	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Moderately clean	pass
Offset	0.10	pass
Span	1.035	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	95.7 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.65 lpm	pass
Cell A Pressure	698.7 mmHg	pass
Cell A Tmp.	36.3 C	pass
Cell B Freq.	113.7 kHz	pass
Cell B Noise	1.1 ppb	pass
Cell B Flow	0.70 lpm	pass
Cell B Pressure	699.6 mmHg	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
COW137-Korey Devins-04/16/2021						
1	4/16/2021	DAS	Campbell	000401	CR3000	2529
2	4/16/2021	Ozone	ThermoElectron Inc	000728	49i A1NAA	1105347306
3	4/16/2021	Ozone Standard	ThermoElectron Inc	000441	49i A3NAA	CM08200017
4	4/16/2021	Zero air pump	Werther International	06940	C 70/4	000821897

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347306	COW137	Korey Devins	04/16/2021	Ozone	000728

Slope:	1.00232	**Slope:**	0.00000
Intercept	-0.19439	**Intercept**	0.00000
CorrCoff:	0.99997	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	**Intercept**	0.30550
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.42	0.11	-0.09	ppb		-0.2
primary	2	15.48	15.09	15.36	ppb		0.27
primary	3	36.27	35.78	35.16	ppb	-1.75	
primary	4	67.74	67.09	67.00	ppb	-0.13	
primary	5	111.97	111.10	111.30	ppb	0.18	

Sensor Component	Condition	Status
Audit Pressure	698.6 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	95	Fail
ADT >100 vehicles further than 50	95	Fail
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.000	pass
Span	1.009	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	86.0 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	680.2 mmHg	pass
Cell A Tmp.	34.2 C	pass
Cell B Freq.	86.7 kHz	pass
Cell B Noise	0.5 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	680.8 mmHg	pass
System Memo		pass

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CAN407-Martin Valvur-04/22/2021					
1 4/22/2021	DAS	Environmental Sys Corp	None	8864	C2598
2 4/22/2021	Ozone	ThermoElectron Inc	none	49i A3NAA	1030745086
3 4/22/2021	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1030745084
4 4/22/2021	Zero air pump	Twin Tower Engineering	90721	TT70/E4	526297

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030745086	CAN407	Martin Valvur	04/22/2021	Ozone	none

Slope:	0.98941	**Slope:**	0.00000
Intercept	-0.12968	**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	1.00340	**Intercept**	0.02230
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.11	0.08	0.31	ppb		0.23
primary	2	15.84	15.68	15.19	ppb		-0.49
primary	3	37.02	36.68	35.75	ppb	-2.57	
primary	4	66.24	65.65	65.03	ppb	-0.95	
primary	5	115.42	114.40	113.10	ppb	-1.14	

Sensor Component	Condition	Status
Audit Pressure	612 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	85	Fail
ADT >100 vehicles further than 50	85	Fail
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	-0.2	pass
Span	1.001	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	82.5 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.68 lpm	pass
Cell A Pressure	594.4 mmHg	pass
Cell A Tmp.	31.8 C	pass
Cell B Freq.	87.6 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	593.5 mmHg	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
DIN431-Martin Valvur-04/23/2021						
1	4/23/2021	DAS	Environmental Sys Corp	None	8864	C2603
2	4/23/2021	Ozone	ThermoElectron Inc	none	49i A3NAA	1211052490
3	4/23/2021	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460050
4	4/23/2021	Zero air pump	Werther International	none	PC70/4	531395

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1211052490	DIN431	Martin Valvur	04/23/2021	Ozone	none

Slope:	0.97887	**Slope:**	0.00000
Intercept	-0.57366	**Intercept**	0.00000
CorrCoff:	0.99996	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00340	**Intercept**	0.02230
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	-0.03	-0.05	-0.11	ppb		-0.06
primary	2	15.88	15.72	14.34	ppb		-1.38
primary	3	36.93	36.59	34.95	ppb	-4.58	
primary	4	65.87	65.28	63.55	ppb	-2.69	
primary	5	115.48	114.46	111.50	ppb	-2.62	

Sensor Component	Condition	Status
Audit Pressure	638.7 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	120	Fail
ADT >100 vehicles further than 50	230	Fail
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.10	pass
Span	0.999	pass
Zero Voltage	0.0001	pass
Fullscale Voltage	0.9995	pass
Cell A Freq.	84.3 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.68 lpm	pass
Cell A Pressure	620.3 mmHg	pass
Cell A Tmp.	31.2 C	pass
Cell B Freq.	86.8 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	619.7 mmHg	pass
System Memo		pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GRT434-Martin Valvur-05/05/2021						
1	5/5/2021	DAS	Environmental Sys Corp	None	8832	A3755K
2	5/5/2021	Ozone	ThermoElectron Inc	none	49i A3NAA	0703334536
3	5/5/2021	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1023943899
4	5/5/2021	Zero air pump	Werther International	none	C 120/TC	001007354

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	0703334536	GRT434	Martin Valvur	05/05/2021	Ozone	none

Slope:	1.01196	**Slope:**	0.00000
Intercept	0.02390	**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	1.00340	**Intercept**	0.02230
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	-0.02	-0.04	0.07	ppb		0.11
primary	2	14.80	14.65	14.65	ppb		0
primary	3	35.06	34.73	35.15	ppb	1.2	
primary	4	64.75	64.17	65.20	ppb	1.59	
primary	5	110.75	109.77	111.00	ppb	1.11	

Sensor Component	Condition	Status
Audit Pressure	598 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	150 m	Fail
ADT >100 vehicles further than 50	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.1	pass
Span	0.994	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	104.1 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.62 lpm	pass
Cell A Pressure	589.8 mmHg	pass
Cell A Tmp.	32.9 C	pass
Cell B Freq.	78.9 kHz	pass
Cell B Noise	0.5 ppb	pass
Cell B Flow	0.59 lpm	pass
Cell B Pressure	588.9 mmHg	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
BAS601-Martin Valvur-05/07/2021						
1	5/7/2021	DAS	Campbell	none	CR1000	41006
2	5/7/2021	Ozone	ThermoElectron Inc	L0534684	49i A1NAA	1214552973
3	5/7/2021	Ozone Standard	ThermoElectron Inc	none	49i E3CAA	1214552971
4	5/7/2021	Zero air pump	Thomas	none	107CAB18	100800033636

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1214552973	BAS601	Martin Valvur	05/07/2021	Ozone	L0534684

Slope:	1.00409	**Slope:**	0.00000
Intercept	-0.41773	**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	1.00340	**Intercept**	0.02230
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.69	0.66	0.09	ppb		-0.57
primary	2	17.08	16.91	16.73	ppb		-0.18
primary	3	37.01	36.67	36.43	ppb	-0.66	
primary	4	65.83	65.24	65.07	ppb	-0.26	
primary	5	113.58	112.58	112.60	ppb	0.02	

Sensor Component		Condition		Status	
Sensor Component	Audit Pressure	Condition	656 mmHg	Status	pass
Sensor Component	26.6 degree unobstructed rule	Condition	True	Status	pass
Sensor Component	Tree dewline >10m or below inlet	Condition	True	Status	pass
Sensor Component	ADT <100 vehicles further than 20	Condition	122 m	Status	Fail
Sensor Component	ADT >100 vehicles further than 50	Condition	122 m	Status	Fail
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	Inlet Filter Condition	Condition	Clean	Status	pass
Sensor Component	Offset	Condition	0.1	Status	pass
Sensor Component	Span	Condition	1.009	Status	pass
Sensor Component	Zero Voltage	Condition	N/A	Status	pass
Sensor Component	Fullscale Voltage	Condition	N/A	Status	pass
Sensor Component	Cell A Freq.	Condition	103.7 kHz	Status	pass
Sensor Component	Cell A Noise	Condition	0.7 ppb	Status	pass
Sensor Component	Cell A Flow	Condition	0.66 lpm	Status	pass
Sensor Component	Cell A Pressure	Condition	645.1 mmHg	Status	pass
Sensor Component	Cell A Tmp.	Condition	30.8 C	Status	pass
Sensor Component	Cell B Freq.	Condition	69.9 kHz	Status	pass
Sensor Component	Cell B Noise	Condition	0.8 ppb	Status	pass
Sensor Component	Cell B Flow	Condition	0.68 lpm	Status	pass
Sensor Component	Cell B Pressure	Condition	644.5 mmHg	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*
CTH110-Korey Devins-05/10/2021						
1	5/10/2021	DAS	Campbell	000415	CR3000	2510
2	5/10/2021	Ozone	ThermoElectron Inc	000735	49i A1NAA	1105347308
3	5/10/2021	Ozone Standard	ThermoElectron Inc	000447	49i A3NAA	CM08200023
4	5/10/2021	Zero air pump	Werther International	06864	PC70/4	000815261

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347308	CTH110	Korey Devins	05/10/2021	Ozone	000735

Slope:	1.00905	**Slope:**	0.00000
Intercept	0.00355	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	**Intercept**	0.30550
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.36	0.05	0.04	ppb		-0.01
primary	2	15.04	14.66	14.77	ppb		0.11
primary	3	35.87	35.38	35.73	ppb	0.98	
primary	4	66.99	66.35	67.00	ppb	0.97	
primary	5	112.39	111.52	112.50	ppb	0.87	

Sensor Component	Condition	Status
Audit Pressure	715.5 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	78 m	Fail
ADT >100 vehicles further than 50	78 m	Fail
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	-0.1	pass
Span	1.034	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	96.7 kHz	pass
Cell A Noise	1.5 ppb	pass
Cell A Flow	0.57 lpm	pass
Cell A Pressure	681.5 mmHg	pass
Cell A Tmp.	28.2 C	pass
Cell B Freq.	87.0 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	682.1 mmHg	pass
System Memo		pass

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SAL133-Korey Devins-05/15/2021					
1 5/15/2021	DAS	Campbell	000351	CR3000	2129
2 5/15/2021	Ozone	ThermoElectron Inc	000622	49i A1NAA	1009241785
3 5/15/2021	Ozone Standard	ThermoElectron Inc	000371	49i A3NAA	0726124692
4 5/15/2021	Zero air pump	Werther International	06876	C 70/4	000814286

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241785	SAL133	Korey Devins	05/15/2021	Ozone	000622

Slope:	1.00487	**Slope:**	0.00000
Intercept	-0.16171	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	**Intercept**	0.30550
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.38	0.07	-0.02	ppb		-0.09
primary	2	15.39	15.00	14.91	ppb		-0.09
primary	3	35.02	34.54	34.45	ppb	-0.26	
primary	4	66.67	66.03	66.18	ppb	0.23	
primary	5	110.75	109.89	110.30	ppb	0.37	

Sensor Component	Audit Pressure	**Condition**	745 mmHg	**Status**	pass
Sensor Component	26.6 degree unobstructed rule	**Condition**	True	**Status**	pass
Sensor Component	Tree dewline >10m or below inlet	**Condition**	True	**Status**	pass
Sensor Component	ADT <100 vehicles further than 20	**Condition**	True	**Status**	pass
Sensor Component	ADT >100 vehicles further than 50	**Condition**	True	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Offset	**Condition**	0.1	**Status**	pass
Sensor Component	Span	**Condition**	1.017	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	114.6 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.7 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.71 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	706.6 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	36.5 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	95.8 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.72 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	707.2 mmHg	**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*
ARE128-Korey Devins-06/13/2021						
1	6/13/2021	DAS	Campbell	000400	CR3000	2524
2	6/13/2021	Ozone	ThermoElectron Inc	000725	49i A1NAA	1105347326
3	6/13/2021	Ozone Standard	ThermoElectron Inc	000433	49i A3NAA	CM08200009
4	6/13/2021	Zero air pump	Werther International	06866	PC70/4	000815262

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347326	ARE128	Korey Devins	06/13/2021	Ozone	000725

Slope:	0.99887	**Slope:**	0.00000
Intercept	-0.27916	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	**Intercept**	0.30550
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.32	0.01	-0.25	ppb		-0.26
primary	2	15.51	15.12	14.75	ppb		-0.37
primary	3	35.67	35.18	34.93	ppb	-0.71	
primary	4	67.21	66.57	66.21	ppb	-0.54	
primary	5	109.16	108.31	107.90	ppb	-0.38	

Sensor Component	Audit Pressure	**Condition**	735.6 mmHg	**Status**	pass
Sensor Component	26.6 degree unobstructed rule	**Condition**	True	**Status**	pass
Sensor Component	Tree dewline >10m or below inlet	**Condition**	True	**Status**	pass
Sensor Component	ADT <100 vehicles further than 20	**Condition**	140 m	**Status**	Fail
Sensor Component	ADT >100 vehicles further than 50	**Condition**	298 m	**Status**	Fail
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Offset	**Condition**	0.000	**Status**	pass
Sensor Component	Span	**Condition**	1.006	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	85.6 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.3 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.73 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	707.0 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	35.4 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	104.4 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.4 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.71 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	707.6 mmHg	**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*
PSU106-Korey Devins-06/17/2021						
1	6/17/2021	DAS	Campbell	000407	CR3000	2512
2	6/17/2021	Ozone	ThermoElectron Inc	000615	49i A1NAA	1009241787
3	6/17/2021	Ozone Standard	ThermoElectron Inc	000365	49i A3NAA	0726124688
4	6/17/2021	Zero air pump	Werther International	06921	C 70/4	000836216

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241787	PSU106	Korey Devins	06/17/2021	Ozone	000615

Slope:	0.99478	**Slope:**	0.00000
Intercept	-0.26868	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	**Intercept**	0.30550
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.40	0.09	-0.17	ppb		-0.26
primary	2	15.20	14.82	14.33	ppb		-0.49
primary	3	34.77	34.29	33.97	ppb	-0.94	
primary	4	67.87	67.22	66.67	ppb	-0.82	
primary	5	111.78	110.91	110.00	ppb	-0.82	

Sensor Component	Condition	Status
Audit Pressure	729.3 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	165 m	Fail
ADT >100 vehicles further than 50	165 m	Fail
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	-0.1	pass
Span	1.003	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	97.0 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	703.4 mmHg	pass
Cell A Tmp.	34.8 C	pass
Cell B Freq.	97.8 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	704.2 mmHg	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
KEF112-Korey Devins-06/18/2021						
1	6/18/2021	DAS	Campbell	000414	CR3000	2537
2	6/18/2021	Ozone	ThermoElectron Inc	000700	49i A1NAA	1030244793
3	6/18/2021	Ozone Standard	ThermoElectron Inc	000432	49i A3NAA	CM08200008
4	6/18/2021	Zero air pump	Werther International	06932	C 70/4	000829174

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244793	KEF112	Korey Devins	06/18/2021	Ozone	000700

Slope:	0.98837	**Slope:**	0.00000
Intercept	-0.19590	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	**Intercept**	0.30550
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.41	0.10	0.05	ppb		-0.05
primary	2	15.20	14.82	14.30	ppb		-0.52
primary	3	34.95	34.47	33.87	ppb	-1.76	
primary	4	67.77	67.12	66.11	ppb	-1.52	
primary	5	112.22	111.35	109.90	ppb	-1.31	

Sensor Component	Condition	Status
Audit Pressure	706 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	163 m	Fail
ADT >100 vehicles further than 50	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.2	pass
Span	0.986	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	95.9 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.67 lpm	pass
Cell A Pressure	669.7 mmHg	pass
Cell A Tmp.	36.0 C	pass
Cell B Freq.	86.6 kHz	pass
Cell B Noise	0.4 ppb	pass
Cell B Flow	0.68 lpm	pass
Cell B Pressure	670.6 mmHg	pass
System Memo		pass