2019 – 3rd Quarter Report Support for Conducting Systems & Performance Audits of Clean Air Status and Trends Network (CASTNET) Sites and National Atmospheric Deposition Program (NADP) Monitoring Stations - II EPA Contract No. EP-W-18-005

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List of Acronyms and Abbreviations

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

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 84 sites at 82 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 September 2019, 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.

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Precipitation	Response	10 manual tips	1 DAS count per tip
Precipitation	Accuracy	2 introductions of known amounts of water	$\leq \pm 10.0\%$ of input amount
Relative Humidity	Accuracy	Compared to reference instrument or standard solution	\leq ±10.0% RH
Solar Radiation	Accuracy	Compared to WRR traceable standard	$\leq \pm 10.0\%$ of daytime average
Surface Wetness	Response	Distilled water spray mist	Positive response
Surface Wetness	Sensitivity	1% decade resistance	N/A
Temperature	TemperatureAccuracyComparison to 3 NIST measured baths (~ 0° C, ambient, ~ full-scale)		≤±0.5° C
Temperature Difference	Accuracy	Comparison to station temperature sensor	$\leq \pm 0.50^{\circ} \mathrm{C}$

 Table 1. Performance Audit Challenge and Acceptance Criteria

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Shelter Temperature	Accuracy	Comparison to station temperature sensor	$\leq \pm 2.0^{\circ} \mathrm{C}$
Wind Direction	Orientation Accuracy	Parallel to alignment rod/crossarm, or sighted to distant point	$\leq \pm 5^{\circ}$ from degrees true
Wind Direction	Linearity	Eight cardinal points on test fixture	$\leq \pm 5^{\circ}$ mean absolute error
Wind Direction	Response Threshold	Starting torque tested with torque gauge	< 10 g-cm Climatronics; < 20 g-cm R.M. Young
Wind Speed	Accuracy	Shaft rotational speed generated and measured with certified synchronous motor	$\leq \pm 0.5$ mps below 5.0 mps input; $\leq \pm 5.0\%$ of input at or above 5.0 mps
Wind Speed	Starting Threshold	Starting torque tested with torque gauge	< 0.5 g-cm
Mass Flow Controller	Flow Rate	Comparison with Primary Standard	$\leq \pm 5.0\%$ of designated rate
Ozone	Slope	Linear regression of multi-	$0.9000 \le m \le 1.1000$
Ozone	Intercept	point test gas concentration as	-5.0 ppb ≤b ≤5.0 ppb
Ozone	Correlation Coefficient	transfer standard	0.9950 ≤ r
Ozone	zone Percent Comparison with Level 2 Difference standard concentration		$\leq \pm 15.1\%$ of test gas concentration and $\leq \pm 0.003$ ppm actual difference
DAS Accuracy Comparison with certified standard		$\leq \pm 0.003 \text{ VDC}$	

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

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

- Site locations and configurations match those provided in the CASTNET QAPP.
- Meteorological instruments are in good physical and operational condition and are sited to meet EPA ambient monitoring guidelines (EPA-600/4-82-060).
- Sites are accessible, orderly, and if applicable, compliant with OSHA safety standards.
- Sampling lines are free of leaks, kinks, visible contamination, weathering, and moisture.
- Site shelters provide adequate temperature control.

- All ambient air quality instruments are functional, being operated in the appropriate range, and the zero air supply desiccant is unsaturated.
- All instruments are in current calibration.
- Site documentation (maintenance schedules, on-site SOPs, etc.) is current and log book records are complete.
- All maintenance and on-site SOPs are performed on schedule.
- Corrective actions are documented and appropriate for required maintenance/repair activity.
- Site operators demonstrate an adequate knowledge and ability to perform required site activities, including documentation and maintenance activities.

1.3 CASTNET Sites Visited Third Quarter 2019

This report consists of the systems and performance, and other audit results from the CASTNET sites visited during the third quarter (July through September) of 2019. The site locations, visit dates, and parameters audited are included in Table 2.

Side ID	<u>Audit Type</u>	<u>Sponsor</u>	<u>Site Visit Date</u>	Station Name
PND165	FSA	EPA/WSO	7/1/2019	Pinedale
PND165	O ₃ PE	EPA/WSO	7/1/2019	Pinedale
PND165	Flow	EPA/WSO	7/1/2019	Pinedale
WFM105	FSA	EPA	7/2/2019	Whiteface Mountain
WFM105	Flow	EPA	7/2/2019	Whiteface Mountain
YEL408	FSA	NPS	7/2/2019	Yellowstone NP
YEL408	O3 PE	NPS	7/2/2019	Yellowstone NP
YEL408	Flow	NPS	7/2/2019	Yellowstone NP
GLR468	FSA	NPS	7/3/2019	Glacier NP
GLR468	O ₃ PE	NPS	7/3/2019	Glacier NP
GLR468	Flow	NPS	7/3/2019	Glacier NP

Table 2. Site Audit Visits

<u>Side ID</u>	<u>Audit Type</u>	<u>Sponsor</u>	<u>Site Visit Date</u>	Station Name
UND002	FSA	EPA	7/9/2019	Underhill
UND002	Flow	EPA	7/9/2019	Underhill
NIC001	FSA	EPA	7/10/2019	Nick's Lake
NIC001	Flow	EPA	7/10/2019	Nick's Lake
CNT169	FSA	EPA	7/16/2019	Centennial
CNT169	O ₃ PE	EPA	7/16/2019	Centennial
CNT169	Flow	EPA	7/16/2019	Centennial
THR422	FSA	NPS	7/22/2019	Theodore Roosevelt NP
THR422	O ₃ PE	NPS	7/22/2019	Theodore Roosevelt NP
THR422	Flow	NPS	7/22/2019	Theodore Roosevelt NP
NEC602	FSA	WSO	7/23/2019	Newcastle
NEC602	O ₃ PE	WSO	7/23/2019	Newcastle
NEC602	Flow	WSO	7/23/2019	Newcastle
WNC429	FSA	NPS	7/24/2019	Wind Cave NP
WNC429	O ₃ PE	NPS	7/24/2019	Wind Cave NP
WNC429	Flow	NPS	7/24/2019	Wind Cave NP
PED108	FSA	EPA	7/26/2019	Prince Edward
PED108	O ₃ PE	EPA	7/26/2019	Prince Edward
PED108	Flow	EPA	7/26/2019	Prince Edward
ZIO433	Met	NPS	8/3/2019	Zion NP
ZIO433	O ₃ PE	NPS	8/3/2019	Zion NP
CHC432	Met	NPS	8/5/2019	Chiricahua NM

Side ID	<u>Audit Type</u>	<u>Sponsor</u>	<u>Site Visit Date</u>	Station Name
CHC432	FSA	NPS	8/5/2019	Chiricahua NM
CHC432	O ₃ PE	NPS	8/5/2019	Chiricahua NM
GTH161	FSA	EPA	8/6/2019	Gothic
GTH161	O ₃ PE	EPA	8/6/2019	Gothic
GTH161	Flow	EPA	8/6/2019	Gothic
BAS601	FSA	WSO	8/19/2019	Basin
BAS601	O ₃ PE	WSO	8/19/2019	Basin
BAS601	Flow	WSO	8/19/2019	Basin
BUF603	FSA	WSO	8/20/2019	Buffalo
BUF603	Flow	WSO	8/20/2019	Buffalo
SHE604	FSA	WSO	8/20/2019	Sheridan
SHE604	Flow	WSO	8/20/2019	Sheridan
PRK134	FSA	EPA	8/27/2019	Perkinstown
PRK134	O ₃ PE	EPA	8/27/2019	Perkinstown
PRK134	Flow	EPA	8/27/2019	Perkinstown
VOY413	FSA	NPS	8/29/2019	Voyageurs NP
VOY413	O ₃ PE	NPS	8/29/2019	Voyageurs NP
VOY413	Flow	NPS	8/29/2019	Voyageurs NP
ACA416	Met	NPS	9/18/2019	Acadia NP
ACA416	FSA	NPS	9/18/2019	Acadia NP
ACA416	O ₃ PE	NPS	9/18/2019	Acadia NP
ACA416	Flow	NPS	9/18/2019	Acadia NP

Side ID	<u>Audit Type</u>	<u>Sponsor</u>	<u>Site Visit Date</u>	Station Name
VPI120	FSA	EPA	9/24/2019	Horton Station
VPI120	O ₃ PE	EPA	9/24/2019	Horton Station
VPI120	Flow	EPA	9/24/2019	Horton Station
PAR107	FSA	EPA	9/25/2019	Parsons
PAR107	O3 PE	EPA	9/25/2019	Parsons
PAR107	Flow	EPA	9/25/2019	Parsons
LRL117	FSA	EPA	9/26/2019	Laurel Hill St. Park
LRL117	O ₃ PE	EPA	9/26/2019	Laurel Hill St. Park
LRL117	Flow	EPA	9/26/2019	Laurel Hill St. Park

In addition to the sites listed in Table 2 that were visited for complete audits, the sites listed in Table 3 were visited to conduct Through-The-Probe (TTP) Performance Evaluations of gaseous pollutant monitors as indicated in the table.

Table 3.	TTP	Pollutant	PE	Visits	
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<u>Side ID</u>	<u>PE Audit Type</u>	<u>Sponsor</u>	<u>Site Visit Date</u>	Station Name
HWF187	O3 and NOy	EPA	7/5/2019	Huntington Wildlife Forest
NPT006	O3	EPA	7/8/2019	Nez Perce Tribe
CRM435	O3	NPS	7/9/2019	Craters of the Moon (NP)
CTH110	O ₃	EPA	7/15/2019	Connecticut Hill
ARE128	O3	EPA	7/24/2019	Arendtsville
KEF112	O3	EPA	7/24/2019	Kane Experimental Forest
MKG113	O3	EPA	7/25/2019	M. K. Goddard St. Park
PSU106	O3	EPA	7/25/2019	Penn State

Side ID	<u>PE Audit Type</u>	<u>Sponsor</u>	<u>Site Visit Date</u>	Station Name
CND125	O3	EPA	7/31/2019	Candor
CAN407	O3	NPS	8/7/2019	Canyonlands NP
DIN431	O3	NPS	8/8/2019	Dinosaur NM
WST109	O3	EPA	8/19/2019	Woodstock
ANA115	O3	EPA	8/22/2019	Ann Arbor
UVL124	O3	EPA	8/22/2019	Unionville
HOX148	O3	EPA	8/23/2019	Hoxeyville
DEN417	O3	NPS	9/5/2019	Denali NP
ROM206	NOy	EPA	9/10/2019	Rocky Mountain NP
GRB411	O3	NPS	9/16/2019	Great Basin NP
ASH135	O ₃	EPA	9/19/2019	Ashland
ABT147	O3	EPA	9/25/2019	Abington

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.

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 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 located at the Wisconsin State Lab of Hygiene (WSLH) at the University of Wisconsin in Madison. The Mercury Analytical Laboratory (HAL) and the network equipment depot (NED) have been relocated to the WSLH.

2.2 Project Objectives

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

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

2.3 NADP Sites Visited Third Quarter 2019

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

Table 4. Sites Surveyed – Third Quarter 2019

Side ID	<u>Network</u>	<u>Visit Date</u>	Station Name
WY95	AMoN	7/16/2019	Brooklyn Lake
PA72	NTN	7/17/2019	Milford
MD08	NTN/MDN/AMoN	7/23/2019	Piney Reservoir
PA00	AMoN	7/24/2019	Arendtsville
PA29	AMoN	7/24/2019	Kane Experimental Forest
PA56	AMoN	7/25/2019	M. K. Goddard
PA96	AMoN	7/25/2019	Penn State - Fairbrook Park
VA24	AMoN	7/26/2019	Prince Edward
CO10	AMoN	8/6/2019	Gothic
NY59	NTN	8/6/2019	Wanakena
UT09	AMoN	8/7/2019	Canyonlands National Park-Island In The Sky
NY93	NTN	8/13/2019	Paul Smith's
NY22	NTN	8/14/2019	Akwesasne Mohawk-Fort Covington
NH02	AMoN	8/19/2019	Hubbard Brook
WY93	AMoN	8/19/2019	Basin - Big Horn
AB14	MDN	8/20/2019	Genesee
ME08	NTN	8/21/2019	Gilead
MI51	AMoN	8/22/2019	Unionville
MI52	AMoN	8/22/2019	Ann Arbor
MI95	AMoN	8/23/2019	Hoxeyville
MA01	MDN/NTN	8/27/2019	North Atlantic Coastal Lab
ME02	MDN/NTN	8/27/2019	Bridgton
WI35	AMoN	8/27/2019	Perkinstown

Side ID	Network	<u>Visit Date</u>	Station Name			
MD15	NTN	9/4/2019	Smith Island			
MD18	NTN	9/5/2019	Assateague Island National Seashore-Woodcock			
NJ00	NTN	9/9/2019	Edwin B. Forsythe National Wildlife Refuge			
NJ39	NTN	9/10/2019	Cattus Island			
NJ99	NTN	9/10/2019	Washington Crossing			
ME93	AMoN	9/19/2019	Ashland			
ME09	MDN/NTN	9/23/2019	Greenville Station			
ME96	MDN/NTN	9/24/2019	Casco Bay-Wolfe's Neck Farm			
VA13	AMoN	9/24/2019	Horton's Station			
CT15	AMoN	9/25/2019	Abington			
WV18	NTN/AMoN	9/25/2019	Parsons			
PA97	AMoN	9/26/2019	Laurel Hill			

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 Box 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 Vi	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
PND1	65-Martin	v Valvur-07/01/2019				
1	7/1/2019	DAS	Campbell	000403	CR3000	2516
2	7/1/2019	Elevation	Elevation	None	1	None
3	7/1/2019	Filter pack flow pump	Thomas	00534	107CA18	0000162757
4	7/1/2019	Flow Rate	Арех	000549	AXMC105LPMDPCV	illegible
5	7/1/2019	Infrastructure	Infrastructure	none	none	none
6	7/1/2019	Modem	Raven	06608	V4221-V	0844349088
7	7/1/2019	Noy	Teledyne	000795	T200U	101
8	7/1/2019	Ozone	ThermoElectron Inc	000621	49i A1NAA	1009241798
9	7/1/2019	Ozone Standard	ThermoElectron Inc	000435	49i A3NAA	CM08200011
10	7/1/2019	Sample Tower	Aluma Tower	000055	В	AT-81213-J12
11	7/1/2019	Shelter Temperature	Campbell	none	107-L	none
12	7/1/2019	Siting Criteria	Siting Criteria	None	1	None
13	7/1/2019	Temperature	RM Young	06539	41342	14800
14	7/1/2019	Zero air pump	Werther International	06881	C 70/4	000815264

DAS Data Form

DAS Time Max Error: 0.05

Mfg	Serial Nu	mber Site	7	Fechnician	Site Visit Date	Parameter	Use Desc.
Campbell	2516	PND	165	Martin Valvur	07/01/2019	DAS	Primary
Das Date:	6 /30/2019	Audit Date	6 /30/2019	Mfg	HY	Parameter	DAS
Das Time: Das Day:	181	Audit Time Audit Day	181	Serial Number	12010039329	Tfer Desc.	Source generator (D
Low Channel:		High Channel	:	Tfer ID	01322		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0002	0.0004	0.0002	0.0004	Cert Date	6/15/201	4 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740243	Tfer Desc.	DVM
				Tfer ID	01312		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/25/201	9 CorrCoff	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.0001	-0.0002	2 V	V	-0.0001	
7	0.1000	0.0999	0.1001	1 V	V	0.0002	
7	0.3000	0.2998	0.2999	9 V	V	0.0001	
7	0.5000	0.4998	0.4998	8 V	V	0.0000	
7	0.7000	0.7001	0.6997	7 V	V	-0.0004	
7	0.9000	0.8994	0.8996	6 V	V	0.0002	
7	1.0000	1.0000	0.9996	6 V	V	-0.0004	

Flow Data Form

Mfg	Serial Nun	ıber Tag	Site	Тес	chnician	Site Visit Dat	e Param	eter	Owner ID
Apex	illegible		PND165	Ma	artin Valvur	07/01/2019	Flow R	ate	000549
					Mfg Serial Number	BIOS 122974	P:	arameter Flow fer Desc. BIO	v Rate S 220-H
					Tfer ID	01416			
					Slope	1.00	178 Inte	ercept	0.00161
					Cert Date	7/13/2	018 Cor	rCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero	-0.0)4	
A Avg % Diff:	A Max % Dif	A Avg %	Diff A Max	% Dif	Cal Factor F	ull Scale	0.9	96	
1.21%	1.64%				Rotometer R	eading:	3	.7	
Desc.	Test type	Input l/n	n Input Corr_	MfcDisp.	OutputSignal	Output S E In	nputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	-0.03	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	3.040	3.030	3.03	0.000	3.00	l/m	l/m	-0.99%
primary	test pt 2	3.050	3.040	3.03	0.000	3.01	l/m	l/m	-0.99%
primary	test pt 3	3.060	3.050	3.03	0.000	3.00	l/m	l/m	-1.64%
Sensor Comp	onent Leak Tes	t		Conditio	on		Status	pass	
Sensor Comp	onent Tubing C	ondition		Conditio	Good		Status	pass	
Sensor Comp	onent Filter Pos	ition		Conditio	n Good		Status	pass	
Sensor Comp	onent Rotomete	er Conditio	'n	Conditio	Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	resent	Status	pass	
Sensor Comp	onent Filter Dist	ance		Conditio	n 5.5 cm		Status	pass	
Sensor Comp	onent Filter Dep	oth		Conditio	2.5 cm		Status	pass	
Sensor Comp	onent Filter Azir	muth		Conditio	n 350 deg		Status	pass	
Sensor Comp	onent System M	lemo		Conditio	on		Status	pass	

Ozone Data Form

Mfg	Serial Number T	ag Site	Те	chnician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241798	PND165	5 M	artin Valvur	07/01/2019	Ozone	000621
Slope: Intercept CorrCoff: DAS 1: A Avg % Diff: A 1 0.0%	0.95438 Slope: -2.08948 Interce 0.99964 CorrCo DAS Max % Dif A Av 0.0%	pt (0) off: (0) 2: g %Diff A	0.00000 0.00000 0.00000 Max % Dif	Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 49CPS-70008-3 01110 1.0015 10/30/207	Inc Paramete 64 Tfer Des 51 Intercept 18 CorrCoff	er ozone c. Ozone primary stan 0.00666 1.00000
UseDescription primary primary primary primary primary	ConcGroup 1 1 2 3 4 5 5	Tfer Raw 0.08 16.79 37.46 66.41 110.99	Tfer Corr 0.07 16.75 37.39 66.30 110.81	Site -1.24 14.50 32.36 60.00 104.70	Site Unit ppb ppb ppb ppb ppb	RelPerDif -14.42 -9.98 -5.67	AbsDif -1.31 -2.25
Sensor Compon Sensor Compon Sensor Compon	ent Sample Train 22.5 degree rul ent Inlet Filter Cond	e dition	Conditi Conditi Conditi Conditi	on Good on on Clean		StatuspassStatuspassStatuspass	
Sensor Compone	ent Battery Backup	1	Conditi	on N/A		Status pass	
Sensor Compon	ent Offset		Conditi	on 0.999		Status pass	
Sensor Compon	ent Zero Voltage		Conditi	on N/A		Status pass	
Sensor Compone	ent Fullscale Voltag	ge	Conditi	on N/A		Status pass	
Sensor Compone	ent Cell A Freq.		Conditi	on 97.0 kHz		Status pass	
Sensor Compone	ent Cell A Noise		Conditi	on 0.6 ppb		Status pass	
Sensor Compone	ent Cell A Flow		Conditi	on 0.63 lpm		Status pass	
Sensor Compone	ent Cell A Pressure	;	Conditi	on 565.7 mmHg		Status pass	
Sensor Compone	ent Cell A Tmp.		Conditi	on 33.3 C		Status pass	
Sensor Compone	ent Cell B Freq.		Conditi	on 96.7 kHz		Status pass	
Sensor Compone	ent Cell B Noise		Conditi	on 0.8 ppb		Status pass	
Sensor Compone	ent Cell B Flow		Conditi	on 0.63 lpm		Status pass	
Sensor Compone	ent Cell B Pressure	;	Conditi	on 565.4 mmHg		Status pass	
Sensor Compone	ent Cell B Tmp.		Conditi	on N/A		Status pass	
Sensor Compone	ent Line Loss		Conditi	on Not tested		Status pass	
Sensor Compone	ent System Memo		Conditi	on		Status pass	

Temperature Data Form

Mfg	Serial Number	Tag Site]	Fechni	ician	Site V	isit Date	Param	eter	Owner ID
RM Young	14800	PND165		Martin	Valvur	07/01	/2019	Temper	ature	06539
				Mf	`g	Fluke		Pa	rameter Te	mperature
				Ser	rial Number	32751	43	Tf	er Desc. R	D
				Tfe	er ID	01229	1			
DAS 1:	DAS	S 2:		Slo	pe		0.9998	9 Inte	rcept	-0.00649
Abs Avg Err	Abs Max Err Abs	Avg Err Abs	Max Err	Cei	rt Date		1/23/201	9 Cor	rCoff	1.00000
0.04	0.07			L						
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference
primary	Temp Low Range	0.02	0.03		0.000		0.0)	С	-0.02
primary	Temp Mid Range	24.58	24.59)	0.000		24.	5	С	-0.07
primary	Temp High Range	47.69	47.70)	0.000		47.	7	С	-0.04
Sensor Com	ponent Shield		Condi	ition C	Clean			Status	pass	
Sensor Com	ponent Blower		Condi	ition F	unctioning			Status	pass	
Sensor Com	ponent Blower Status	Switch	Condi	ition N	N/A			Status	pass	
Sensor Com	ponent System Memo)	Cond	ition				Status	pass	

Infrastructure Data For

Site ID	PND165	Technician Martin Va	alvur Site Visit Date 07/01/2019
Shelter	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2149-22)	640 cuft
and the second			

Sensor Component San	nple Tower Type	Condition	Туре В	Status	pass
Sensor Component Cor	nduit	Condition	Good	Status	pass
Sensor Component Met	Tower	Condition	Good	Status	pass
Sensor Component Moi	sture Trap	Condition	Installed	Status	pass
Sensor Component Pow	ver Cables	Condition	Good	Status	pass
Sensor Component She	elter Temp Control	Condition	Functioning	Status	pass
Sensor Component Rote	ometer	Condition	Installed	Status	pass
Sensor Component San	nple Tower	Condition	Good	Status	pass
Sensor Component She	elter Condition	Condition	Fair	Status	pass
Sensor Component She	elter Door	Condition	Good	Status	pass
Sensor Component She	elter Roof	Condition	Poor	Status	pass
Sensor Component She	elter Floor	Condition	Fair	Status	pass
Sensor Component Sign	nal Cable	Condition	Good	Status	pass
Sensor Component Tub	ing Type	Condition	3/8 teflon	Status	pass
Sensor Component San	nple Train	Condition	Good	Status	pass

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.

3 Parameter: MetOpMaintCom

Only the temperature sensor is included in the site assessment.

4 Parameter: MetSensorComme

Met sensors audits are no longer included under the contract.

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	PND165	Martin Valvur	07/01/2019	Shelter Temperatu	renone
DAS 1:	DAS 2:		Mfg	Fluke	Parameter S	helter Temperature
Abs Avg Err Abs	Max Err Abs Avg	Err Abs Max Err	Serial Number	3275143	Tfer Desc. R	TD
			Tfer ID	01229		
			Slope	0.9998	89 Intercept	-0.00649
			Cert Date	1/23/201	19 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.57	26.58	0.000	25.7	С	-0.86
primary	Temp Mid Range	25.70	25.71	0.000	25.9	С	0.19
primary	Temp Mid Range	26.14	26.15	0.000	25.0	С	-1.14
Sensor Component System Memo Condition Status							

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID PND165	Technician Martin Valvur	Site Visit Date 07/01/2019				
		USCS Map	Fremont Lake South			
Site Sponsor (agency)	EPA	USGS Map				
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	Present				
Zip Code	82941	Fire Extinguisher 🔽	New in 2015			
Time Zone	Mountain	First Aid Kit				
Primary Operator		Safety Glasses				
Primary Op. Phone #		Safety Hard Hat				
Primary Op. E-mail		Climbing Belt				
Backup Operator		Security Fence				
Backup Op. Phone #		Secure Shelter				
Backup Op. E-mail		Stable Entry Steps ✓				
Shelter Working Room	Make Ekto Mo	odel 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 sit is visible on a ridge on the right. There is a dirt access road to the site in the summer.						

Field Systems Data Form

PND165

F-02058-1500-S2-rev002

Site ID

Technician Martin Valvur

Site Visit Date 07/01/2019

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

Siting Distances OK

Siting Criteria Comment

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

Field Systems Data Form						F-02058-1500-S3-rev002		
Site	e ID	PND165	Technician	Martin Valvur		Site Visit Date 07/01/2019		
1	Are wind being in	d speed and direction fluenced by obstructio	sensors sited so ons?	as to avoid	✓	N/A		
2 Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)						N/A		
3	Are the	tower and sensors plu	mb?		✓	N/A		
4	Are the avoid ra	temperature shields p diated heat sources su	ointed north or Ich as buildings	positioned to , walls, etc?		Over shelter		
5	Are tem conditio surface a standing	perature and RH sens ns? (i.e. ground below and not steeply sloped swater should be avoi	sors sited to avo y sensors should l. Ridges, hollow ded)	id unnatural be natural vs, and areas of		Over shelter		
6	Is the so	lar radiation sensor p	lumb?		✓	N/A		
7	Is it sited	d to avoid shading, or	any artificial o	r reflected light?	✓	N/A		
8	Is the ra	in gauge plumb?			✓	N/A		
9	Is it sited towers, o	d to avoid sheltering e etc?	ffects from bui	ldings, trees,	✓	N/A		
10	Is the su facing n	rface wetness sensor s orth?	sited with the g	rid surface	✓	N/A		
11	Is it inc	lined approximately 3	0 degrees?			N/A		

Provide any additional 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 sensors audits are no longer included under the contract.

Field Systems Data Form

F-02058-1500-S4-rev002

Site	ID	PND165	Technician	Martin Valvur		Site Visit Date 0	7/01/2019	
1	Do all th condition	e meterological sensor 1, and well maintained	rs appear to be l?	intact, in good		Temperature only		
2	Are all the reporting	he meteorological sens g data?	ors operationa	l online, and	✓	N/A		
3	Are the s	shields for the tempera	ature and RH s	ensors clean?	✓			
4	Are the a	aspirated motors work	king?		✓			
5	Is the sol scratche	ar radiation sensor's	lens clean and f	free of	✓	N/A		
6	Is the su	rface wetness sensor g	rid clean and u	indamaged?		N/A		
7	Are the s condition	sensor signal and pow n, and well maintained	er cables intact l?	, in good	✓			
8	Are the s from the	ensor signal and power elements and well ma	er cable connec iintained?	tions protected	✓			

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

Only the temperature sensor is included in the site assessment.

Field Systems Data Form					8-1500-85-rev002			
Site	e ID	PND165	Technician	Martin Valvur		Site Visit Date	07/01/2019	
	<u>Siting C</u>	riteria: Are the pollut	ant analyzers a	nd deposition eq	<u>uipn</u>	nent sited in accord	ance with 40 C	FR 58, Appendix E
1	Do the s unrestri	ample inlets have at le cted airflow?	east a 270 degre	e arc of				
2	Are the	sample inlets 3 - 15 m	eters above the	ground?	✓			
3	Are the and 20 m	sample inlets > 1 mete neters from trees?	r from any maj	or obstruction,				
	<u>Pollutan</u>	t analyzers and depos	ition equipmen	t operations and	mai	<u>ntenance</u>		
1	Do the a conditio	nalyzers and equipme n and well maintained	ent appear to be ?	in good				
2	Are the reportin	analyzers and monitor g data?	rs operational, o	on-line, and	✓			
3	Describe	e ozone sample tube.				1/4 teflon by 12 mete	ers	
4	Describe	e dry dep sample tube.				3/8 teflon by 12 met	ers	
5	Are in-li indicate	ine filters used in the o location)	zone sample lin	e? (if yes		At inlet only		
6	Are sam obstruct	ple lines clean, free of ions?	kinks, moistur	e, and	✓			
7	Is the ze	ro air supply desiccan	t unsaturated?		✓			
8	Are ther	e moisture traps in th	e sample lines?					
9	Is there clean?	a rotometer in the dry	deposition filte	er line, and is it		Clean and dry		

Field Systems Data Form							F-0	2058-15	00-S6-rev002
Sit	e ID	PND165	Technician	Martin Valvur		Site Visit l	Date 07/01/201	9	
	DAS, se	ensor translators, and	<u>peripheral equi</u>	pment operation	<u>ns ar</u>	id maintenanc	<u>e</u>		
1	Do the well ma	DAS instruments appo aintained?	ear to be in good	d condition and					
2	Are all modem	the components of the , backup, etc)	DAS operation	al? (printers,	✓				
3	Do the lightnir	analyzer and sensor si 1g protection circuitry	gnal leads pass ?	through	✓	Met sensors or	nly		
4	Are the well ma	e signal connections pr aintained?	otected from th	e weather and					
5	Are the	e signal leads connected	d to the correct	DAS channel?	✓				
6	Are the ground	e DAS, sensor translate ed?	ors, and shelter	properly					
7	Does th	e instrument shelter h	ave a stable pov	ver source?	✓				
8	Is the in	nstrument shelter temj	perature contro	lled?					
9	Is the n	net tower stable and g	counded?			Stable		Grounded	
10	Is the s	ample tower stable and	d grounded?						
11	Tower	comments?							

Field Sy	ystems Data	Fo	rm			F-02	.058-	-1500-S7-rev002
Site ID	PND165		Technician Martin Val		Martin Valvur Site Visit Date)7/01/2019		
Documen	<u>tation</u>							
Does the	site have the requi	ed in	strument	t and	<u>equipment manuals?</u>			
Wind speed Wind direct	sensor ion sensor	Yes		N/. <hr/> <hr/> <	A Data logger Data logger	Yes	No ✓	N/A □ ✓
Temperatur Relative hur Solar radiat	e sensor nidity sensor ion sensor			 ✓ 	Strip chart recorder Computer Modem			
Surface weth Wind sensor	ness sensor r translator			✓	Printer Zero air pump Eilter flow pump			
Humidity se Solar radiat	nsor translator ion translator			× × ×	Surge protector UPS			
Tipping buc Ozone analy	ket rain gauge /zer				Lightning protection device Shelter heater			
Filter pack f Filter pack I	flow controller MFC power supply		\checkmark		Shelter air conditioner	V		
Does the	e site have the requ	ired a	<u>ind most</u>	rece	nt QC documents and report forms?			
		Pres	sent			Curre	nt	

-

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

Field Systems Data Form

PND165 Technician Martin Valvur Site Visit Date 07/01/2019 Site ID Site operation procedures Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

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

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

00	Check	Performed
VU.	CHECK	I el loi meu

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

Frequency	Co
Semiannually	
Daily	 ✓
N/A	 ✓
Daily	 ✓
N/A	
Every 2 weeks	 ✓
Every 2 weeks	 ✓
N/A	 ✓
Weekly	
Weekly	

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

Unknown
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:

١

Compliant

F-02058-1500-S8-rev002

Fi	eld Sy	stems Data Form				F-02058-1500-S9-rev0(
Sit	e ID	PND165 Tec	hnician Martin Valvur		Site Visit Dat	e 07/01/2019]		
	<u>Site ope</u>	ration procedures							
1	Is the fil	ter pack being changed ever	y Tuesday as scheduled?		Filter changed afte	ernoons approximately 8	0%		
2	Are the correctly	Site Status Report Forms be y?	ing completed and filed	✓					
3	Are data schedule	a downloads and backups be ed?	ing performed as		No longer required	t			
4	Are gen	eral observations being made	e and recorded? How?	✓	SSRF				
5	Are site fashion?	supplies on-hand and replen	ished in a timely						
6	Are sam	ple flow rates recorded? Ho	w?	✓	SSRF, call-in				
7	Are sam fashion?	ples sent to the lab on a regu	ılar schedule in a timely						
8	Are filte and ship	rs protected from contamina pping? How?	ation during handling	✓					
9	Are the operation	site conditions reported reguns manager or staff?	larly to the field	✓					
QC	Check Po	erformed	Frequency			Compliant			
I	Multi-poir	nt MFC Calibrations	 Semiannually 						
]	Flow Syste	em Leak Checks	✓ Weekly			\checkmark			
]	Filter Pac	k Inspection							
]	Flow Rate	Setting Checks	✓ Weekly						
	Visual Ch	eck of Flow Rate Rotometer	✓ Weekly						
1	In-line Fil	ter Inspection/Replacement	 Semiannually 						
5	Sample Li	ne Check for Dirt/Water	✓ Weekly						

Field Systems Data Form

PND165

F-02058-1500-S10-rev002

Techni

Technician Martin Valvur

Site Visit Date 07/01/2019

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	000549
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0844349088	06608
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		
WFM105-Korey Devins-07/02/2019								
1	7/2/2019	DAS	Campbell	none	CR850	23270		
2	7/2/2019	elevation	Elevation	none	none	none		
3	7/2/2019	Filter pack flow pump	Permotec	none	BL30EB	Illegible		
4	7/2/2019	Flow Rate	Арех	000651	AXMC105LPMDPCV	illegible		
5	7/2/2019	Infrastructure	Infrastructure	none	none	none		
6	7/2/2019	Modem	Sierra wireless	06983	unknown	unknown		
7	7/2/2019	siting criteria	Siting Criteria	none	none	None		
8	7/2/2019	Temperature	RM Young	04683	41342VC	6697		

Flow Data Form

Mfg	Serial Nun	Serial Number Tag Site		Te	chnician	Site Visit D	ate Param	eter	Owner ID
Apex	illegible		WFM105	Ko	orey Devins	07/02/2019	Flow R	ate	000651
					Mfg	BIOS	P	arameter Flo	ow Rate
					Serial Number	148613	Т	fer Desc. Blo	OS 220-H
					Tfer ID	01421			
					Slope	1.0	00000 Inte	ercept	0.00000
					Cert Date	3/4	/2019 Cor	rCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero		0	
A Avg % Diff:	A Max % Dif	A Avg %	Diff A Max	% Dif	Cal Factor F	ull Scale		0	
1.46%	1.69%				Rotometer R	eading:		3	
Desc.	Test type	Input l/n	n Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignal	I PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.06	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	2.950	2.950	2.75	0.000	3.00	l/m	l/m	1.69%
primary	test pt 2	2.955	2.960	2.76	0.000	3.00	l/m	l/m	1.35%
primary	test pt 3	2.957	2.960	2.75	0.000	3.00	l/m	l/m	1.35%
Sensor Comp	onent Leak Tes	st		Conditio	on		Status	pass	
Sensor Comp	onent Tubing C	ondition		Conditio	Condition Good			pass	
Sensor Comp	onent Filter Pos	sition		Conditio	Condition Good			pass	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	Condition Clean and dry			pass	
Sensor Component Moisture Present		Conditio	Condition No moisture preser		Status pass				
Sensor Component Filter Distance		Conditio	Condition 4.0 cm			pass			
Sensor Component Filter Depth		Conditio	n 1.0 cm		Status	pass			
Sensor Component Filter Azimuth		Conditio	on 150 deg	Status	pass				
Sensor Component System Memo				Conditio	on		Status	pass	

Temperature Data Form

Mfg	Serial Number	Tag Site	I	[echni	ician	Site V	isit Date	Param	eter	Owner ID
RM Young	6697	WFM105		Korey	Devins	07/02	/2019	Temper	ature	04683
				Mfg		Extect	Extech Pa		arameter Temperature	
				Serial Number		H232734 Tf		fer Desc. RTD		
				Tfer ID		01227				
DAS 1:	DAS	2:		Slope		1.00733 Intercept		rcept	0.14497	
Abs Avg Err Abs Max Err Abs Avg Err Abs Ma		Max Err	Err Cert Date			2/12/2019 CorrCoff		rCoff	1.00000	
0.12	0.18									
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference
primary Te	emp Low Range	0.16	0.01		0.000		0.2	2	C	0.14
primary Te	emp Mid Range	26.45	26.11		0.000		26.	2	С	0.05
primary Te	emp High Range	47.71	47.22	2	0.000		47.	4	С	0.18
Sensor Component Shield				Condition Clean				Status	pass	
Sensor Component Blower			Condi	Condition N/A				Status	pass	
Sensor Component Blower Status Switch			Condi	Condition N/A				Status	pass	
Sensor Component System Memo				Condition				Status	pass	
Infrastructure Data For

Site ID	WFM105	Technician	Korey Devins	Site Visit Date	07/02/2019
Shelter M	ake	Shelter Model	Shelt	er Size	

Sensor Component Sample Tower Ty	vpe Condition	Type B S	Status pass
Sensor Component Conduit	Condition	N/A S	Status pass
Sensor Component Met Tower	Condition	N/A S	Status pass
Sensor Component Moisture Trap	Condition	Not installed S	Status pass
Sensor Component Power Cables	Condition	Good	Status pass
Sensor Component Shelter Temp Co	ntrol Condition	N/A S	Status pass
Sensor Component Rotometer	Condition	Installed	Status pass
Sensor Component Sample Tower	Condition	Good	Status pass
Sensor Component Shelter Condition	Condition	N/A S	Status pass
Sensor Component Shelter Door	Condition	N/A S	Status pass
Sensor Component Shelter Roof	Condition	N/A S	Status pass
Sensor Component Shelter Floor	Condition	N/A S	Status pass
Sensor Component Signal Cable	Condition	Good	Status pass
Sensor Component Tubing Type	Condition	3/8 teflon S	Status pass
Sensor Component Sample Train	Condition	Good	Status pass

Field Systems Comments

1 Parameter: DasComments

Single tower, with filter pack at 10 meters and temperature at 9 meters.

2 Parameter: SitingCriteriaCom

The site is located at the Atmospheric Science Research Center (ASRC) operated by the NY University (SUNY) system.

3 Parameter: ShelterCleanNotes

Small footprint site with no shelter. Equipment housed in enclosure on sample tower.

F-02058-1500-S1-rev002

Site ID WFM105	Technician Korey Devins	Site Visit Date 07/02	/2019
		USCS Mon	
Site Sponsor (agency)	EPA		
Operating Group	SUNY	Map Scale	
AQS #		Map Date	
Meteorological Type			
Air Pollutant Analyzer		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	44.39322
Site Address 1		Audit Longitude	-73.85874
Site Address 2		Audit Elevation	608
County		Audit Declination	
City, State	Wilmington, NY	Present	
Zip Code	12997	Fire Extinguisher ☑	
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 Mo	odel	Shelter Size
Shelter Clean	Notes Small footprint site with no she	ter. Equipment housed in enclo	osure on sample tower.
Site OK	Notes		
Driving Directions			

WFM105

F-02058-1500-S2-rev002

Site ID

Technician Korey Devins

Site Visit Date 07/02/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		
Major industrial complex	10 to 20 km		
City > 50,000 population	40 km		
City 10,000 to 50,000 population	10 km		
City 1,000 to 10,000 population	5 km		
Major highway, airport or rail yard	2 km		
Secondary road, heavily traveled	500 m		
Secondary road, lightly traveled	200 m		
Feedlot operations	500 m		
Intensive agricultural ops (including aerial spraying)	500 m		
Limited agricultural operations	200 m		
Large parking lot	200 m		
Small parking lot	100 m	75 m	
Tree line	50 m	25 m	
Obstacles to wind	10 times obstacle height		\checkmark

Siting Distances OK

Siting Criteria Comment

The site is located at the Atmospheric Science Research Center (ASRC) operated by the NY University (SUNY) system.

Field Systems Data Form							F-020	58-1	500-S3·	-rev002
Site	e ID	WFM105	Technician	Korey Devins		Site Visit Date	07/02/2019]	
1	Are win being in	d speed and direction fluenced by obstructio	sensors sited so	as to avoid	✓	N/A				
2	Are win (i.e. win horizon tower in	d sensors mounted so d sensors should be m tally extended boom > to the prevailing wind	as to minimize ounted atop the 2x the max dian l)	tower effects? e tower or on a meter of the		N/A				
3	Are the	tower and sensors plu	mb?		✓	N/A				
4 Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?				positioned to , walls, etc?	✓					
5	Are tem conditio surface standing	perature and RH sens ns? (i.e. ground below and not steeply sloped g water should be avoi	sors sited to avo y sensors should l. Ridges, hollow (ded)	id unnatural be natural vs, and areas of						
6	Is the so	lar radiation sensor p	lumb?		✓	N/A				
7	Is it site	d to avoid shading, or	any artificial o	r reflected light?	✓	N/A				
8	Is the ra	in gauge plumb?			✓	N/A				
9	Is it site towers,	d to avoid sheltering e etc?	ffects from bui	ldings, trees,	✓	N/A				
10	Is the su facing n	urface wetness sensor s orth?	sited with the g	rid surface	✓	N/A				
11	Is it inc	lined approximately 3	0 degrees?			N/A				
						<u>.</u>				

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Site	e ID	WFM105	Technician	Korey Devins		Site Visit Date 07/02/2019
 Do all the meterological sensors appear to be intact, in good condition, and well maintained? Are all the meteorological sensors operational online, and reporting data? Are the shields for the temperature and RH sensors clean? Are the aspirated motors working? 				intact, in good l online, and ensors clean?	> >	Temperature only Temperature only
4	Are the a	aspirated motors worl	king?		✓	N/A
5	Is the sol scratches	ar radiation sensor's s?	lens clean and f	free of	✓	N/A
6	Is the sur	rface wetness sensor g	grid clean and u	indamaged?	✓	N/A
7 8	 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? 			, in good tions protected	✓	

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev002
Site	e ID	WFM105	Technician	Korey Devins		Site Visit Date 07/02/2019
	Siting C	Criteria: Are the pollut	ant analyzers a	nd deposition eq	<u>uipr</u>	ment sited in accordance with 40 CFR 58, Appendix E
1	Do the s unrestri	sample inlets have at le icted airflow?	east a 270 degre	e arc of	✓	
2	Are the	sample inlets 3 - 15 m	eters above the	ground?	✓	
3	Are the and 20 i	sample inlets > 1 mete meters from trees?	er from any maj	or obstruction,		
	<u>Pollutar</u>	nt analyzers and depos	sition equipmen	t operations and	mai	<u>intenance</u>
1	Do the a condition	analyzers and equipme on and well maintained	ent appear to be l?	e in good		
2	Are the reportir	analyzers and monitoning data?	rs operational, o	on-line, and	✓	
3	Describ	e ozone sample tube.				N/A
4	Describ	e dry dep sample tube	•			3/8 Teflon by 10 meters
5	Are in-l indicate	ine filters used in the o location)	ozone sample lir	ne? (if yes		N/A
6	Are san obstruc	<pre>nple lines clean, free of tions?</pre>	[°] kinks, moistur	e, and	✓	
7	Is the ze	ero air supply desiccan	nt unsaturated?		✓	N/A
8	Are the	re moisture traps in th	e sample lines?			Not present
9	Is there clean?	a rotometer in the dry	y deposition filte	er line, and is it		

Field Systems Data Form						F-0 2	2058-15	00-S6-rev002	
Site	e ID	WFM105	Technician	Korey Devins		Site Visit Date	07/02/2019	9	
	DAS, se	msor translators, and	peripheral equi	pment operation	ns and	<u>l maintenance</u>			
1	Do the l well ma	DAS instruments appe intained?	ar to be in good	l condition and					
2	Are all modem	the components of the , backup, etc)	DAS operation	al? (printers,					
3	Do the a lightnin	analyzer and sensor sig g protection circuitry	gnal leads pass † ?	through					
4	Are the well ma	signal connections pro intained?	otected from the	e weather and					
5	Are the	signal leads connected	l to the correct	DAS channel?					
6	Are the ground	DAS, sensor translato ed?	ors, and shelter	properly					
7	Does th	e instrument shelter h	ave a stable pov	ver source?					
8	Is the ir	strument shelter temp	perature contro	lled?		I/A			
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	ample tower stable and	l grounded?						
11	Tower	comments?						V	

Single tower, with filter pack at 10 meters and temperature at 9 meters.

Field	Systems Data	Fo	rm				F-0 2	2058-	1500-S7-rev002
Site ID	WFM105		Technie	cian	Korey Devins	Site Visit Date)7/02/2019)	
<u>Docum</u>	<u>ientation</u>								
Does t	he site have the requi	i <mark>red in</mark>	strument	and	equipment manuals?				
		Yes	No	N/ /	4		Yes	No	N/A
Wind spe	ed sensor				Data logge	er			
Wind dir	ection sensor				Data logge	er			
Tempera	ture sensor				Strip char	t recorder			
Relative I	numidity sensor				Computer	•			
Solar rad	iation sensor				Modem				
Surface w	vetness sensor				Printer				
Wind sen	sor translator				Zero air p	ump			
Temperat	ture translator				Filter flow	y pump			
Humidity	sensor translator				Surge pro	tector			
Solar rad	iation translator				UPS				
Tipping b	oucket rain gauge				Lightning	protection device			
Ozone an	alyzer				Shelter he	ater			
Filter pac	k flow controller				Shelter air	conditioner			
Filter pac	k MFC power suppl	y							
Does	the site have the requ	uired a	and most	rece	nt QC documents and	<u>report forms?</u>			
		Pres	sent				Curre	ent	
Station L	og						\checkmark		
SSRF							\checkmark		
Site Ops I	Manual								
HASP									
Field Ops	Manual								
Calibrati	on Reports								
Ozone z/s	/p Control Charts								
Preventiv	e maintenance sched	ule							
1 Is th	e station log properly	y comp	oleted du	ring	every site visit? 🔽				
2 Are curr	the Site Status Repor ent?	rt Forn	ns being	comp	oleted and				
3 Are samp	the chain-of-custody ple transfer to and fr	forms om lat	properly ?	v used	l to document 🔽				
4 Are curr	ozone z/s/p control cl ent?	harts p	oroperly	comp	leted and	I/A			
Provide a natural o	ny additional explan r man-made, that ma	ation (ay affe	photogra ct the mo	aph o nitor	r sketch if necessary) ing parameters:	regarding condition	ons listed	above,	or any other features,

WFM105 Technician Korey Devins Site Visit Date 07/02/2019 Site ID Site operation procedures Trained onsite by AMEC personnel Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations		N/A	
Automatic Zero/Span Tests		N/A	\checkmark
Manual Zero/Span Tests		N/A	\checkmark
Automatic Precision Level Tests		N/A	\checkmark
Manual Precision Level Test		N/A	\checkmark
Analyzer Diagnostics Tests		N/A	\checkmark
In-line Filter Replacement (at inlet)		N/A	\checkmark
In-line Filter Replacement (at analyze		N/A	\checkmark
Sample Line Check for Dirt/Water		N/A	\checkmark
Zero Air Desiccant Check		N/A	\checkmark
1 De multi neint cellibration generate three	-h 4h a		

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

✓	N/A
✓	N/A
✓	N/A

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

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Field Systems Data Form	F-02058-1500-S9-rev002

Sit	e ID	WFM105	Technician	Korey Devins		Site Visit Date	07/02/2019			
	<u>Site opei</u>	ation procedures								
1	Is the file	ter pack being change	d every Tuesda	y as scheduled?	✓	Filter changed morn	ings			
2	Are the s correctly	Site Status Report For 7?	ms being comp	leted and filed						
3	Are data schedule	downloads and backud?	ips being perfo	rmed as	✓	No longer required				
4	Are gene	eral observations being	g made and rec	orded? How?	✓	SSRF, logbook				
5	Are site fashion?	supplies on-hand and	replenished in	a timely	✓					
6	Are sam	ple flow rates recorded	d? How?		✓	SSRF, logbook				
7	Are sam fashion?	ples sent to the lab on	a regular scheo	lule in a timely						
8	Are filte and ship	rs protected from cont ping? How?	amination dur	ing handling	✓	Clean gloves on and off				
9	Are the soperation	site conditions reportens manager or staff?	d regularly to t	he field						
QC	Check Pe	rformed	Freq	uency			Compliant			
1	Multi-poin	t MFC Calibrations	✓ Sem	iannually						
J	Flow Syste	m Leak Checks	✓ Wee	kly			\checkmark			
]	Filter Pack	x Inspection	✓ Wee	kly						
]	Flow Rate	Setting Checks	✓ Wee	kly			\checkmark			
1	Visual Che	eck of Flow Rate Rotor	meter 🗹 Wee	kly			\checkmark			
]	n-line Filt	er Inspection/Replace	ment 🗹 As no	eeded						
5	Sample Li	ne Check for Dirt/Wat	er 🗹 Wee	kly						

Field Systems Data Form F-02058-1500-S10-rev002 Site ID WFM105 Technician Korey Devins Site Visit Date 07/02/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR850	23270	none
elevation	Elevation	none	none	none
Filter pack flow pump	Permotec	BL30EB	Illegible	none
Flow Rate	Арех	AXMC105LPMDPC	illegible	000651
Infrastructure	Infrastructure	none	none	none
Modem	Sierra wireless	unknown	unknown	06983
siting criteria	Siting Criteria	none	None	none
Temperature	RM Young	41342VC	6697	04683

Site Inventory by Site Visit

Site V	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
YEL40)8-Martin	Valvur-07/02/2019				
1	7/2/2019	DAS	Environmental Sys Corp	None	8832	A4888K
2	7/2/2019	Elevation	Elevation	None	1	None
3	7/2/2019	Filter pack flow pump	Thomas	none	107CA18B	120000014912
4	7/2/2019	Flow Rate	Alicat	none	MC-10SLPM-D-PCV	Illgeible
5	7/2/2019	Infrastructure	Infrastructure	none	none	none
6	7/2/2019	Met tower	Climatronics	01362	14 inch taper	illegible
7	7/2/2019	Ozone	ThermoElectron Inc	none	49i A3NAA	1172090002
8	7/2/2019	Ozone Standard	ThermoElectron Inc	none	49i A1NAB	0926938297
9	7/2/2019	Printer	Hewlett Packard	none	840C	unknown
10	7/2/2019	Sample Tower	Aluma Tower	illegible	В	none
11	7/2/2019	Shelter Temperature	ARS	none	none	none
12	7/2/2019	Siting Criteria	Siting Criteria	None	1	None
13	7/2/2019	Temperature2meter	RM Young	none	41342VC	029239
14	7/2/2019	Zero air pump	Werther International	none	PC 70/4	000836215

DAS Data Form

DAS Time Max Error: 0.08

Mfg	Ifg Serial Number		ſ	Fechnician	Site Visit Date	Parameter	Use Desc.
Environmental S	Sys A4888K	YEL4	408	Martin Valvur	07/02/2019	DAS	Primary
Das Date:	7 /2 /2019	Audit Date	7 /2 /2019	Mfg	HY	Parameter	DAS
Das Time:	07:00:00	Audit Time	07:00:05	Serial Number	12010039329	Tfer Desc.	Source generator (D
Das Day:	183	Audit Day	183				
Low Channel:		High Channels	:	Tfer ID	01322		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0003	0.0004	0.0003	0.0004	Cert Date	6/15/201	4 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740243	Tfer Desc.	DVM
				Tfer ID	01312		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/25/201	9 CorrCoff	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
8	0.0000	-0.0004	-0.0003	3 V	V	0.0001	
8	0.1000	0.0998	0.1000) V	V	0.0002	
8	0.3000	0.2996	0.2999	9 V	V	0.0003	
8	0.5000	0.4999	0.4997	7 V	V	-0.0002	
8	0.7000	0.6998	0.7002	2 V	V	0.0004	
8	0.9000	0.8999	0.8995	5 V	V	-0.0004	
8	1.0000	1.0000	0.9996	5 V	V	-0.0004	

Flow Data Form

Mfg	Serial Number Tag Site		Тес	chnician	Site Visit	Date Paran	neter	Owner ID	
Alicat	Illgeible		YEL408	Ma	artin Valvur	07/02/201	9 Flow R	late	none
					Mfg	BIOS	P	arameter Flow	w Rate
					Serial Number	122974	Т	fer Desc. BIO	S 220-H
					Tfer ID	01416			
					Slope	1	.00178 Int	ercept	0.00161
					Cert Date	7/1	3/2018 Co	rrCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero	-0.	02	
A Avg % Diff:	A Max % Dif	A Avg %	Diff A Max	% Dif	Cal Factor F	ull Scale	5.	03	
0.54%	0.64%				Rotometer R	eading:	3.	65	
Desc.	Test type	Input l/n	n Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.02	0.000	0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.06	0.000	0.07	l/m	l/m	
primary	test pt 1	2.984	2.980	2.99	0.000	3.00	l/m	l/m	0.50%
primary	test pt 2	2.984	2.980	2.99	0.000	2.99	l/m	l/m	0.47%
primary	test pt 3	2.991	2.980	2.99	0.000	3.00	l/m	l/m	0.64%
Sensor Comp	onent Leak Tes	t		Conditio	on		Statu	s pass	
Sensor Comp	onent Tubing C	ondition		Conditio	Good		Statu	s pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	Clean and dry		Statu	s pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	resent	Statu	s pass	
Sensor Comp	onent Filter Dis	tance		Conditio	n 5.0 cm		Statu	s pass	
Sensor Component Filter Depth			Conditio	ondition 2.0 cm			s pass		
Sensor Comp	onent Filter Azi	muth		Conditio	dition 45 deg			s pass	
Sensor Comp	onent System N	/lemo		Conditio	n		Statu	s pass	

Ozone Data Form

Mfg		Serial Number	r Tag Site	Те	chnician	Site Visit Date	Parameter	Owner ID
ThermoElec	ctron Inc	1172090002	YEL408	Μ	artin Valvur	07/02/2019	Ozone	none
Slope: Intercept CorrCoff: DAS 1: A Avg % D 0.		.00478 Slope .10150 Inter .99999 Corr DA (ax % Dif A) 0.0%	e: () ccept () Coff: () AS 2: Avg %Diff A	0.00000 0.00000 0.00000 Max % Dif	Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 49CPS-70008-3 01110 1.0015 10/30/201	Inc Paramete 64 Tfer Desc 51 Intercept 18 CorrCoff	Ozone 0.00666 1.00000
UseDescr	iption	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
prima	ry rv	1	0.10	0.09	0.19	ppb ppb		-0.31
prima	ry	3	35.48	35.41	35.41	ppb	0	-0.31
prima	ry	4	66.78	66.67	67.10	ppb	0.64	
prima	ry	5	118.09	117.90	118.30	ppb	0.34	
Sensor C	ompone	nt Sample Irai	n	Conditi	on Good		Status pass	
Sensor C	ompone	nt 22.5 degree	rule	Conditi	on		Status Fail	
Sensor C	ompone	nt Inlet Filter Co	ondition	Conditi	on Clean		Status pass	
Sensor C	ompone	nt Battery Back	kup	Conditi	on N/A		Status pass	
Sensor C	ompone	nt Offset		Conditi	on -0.30		Status pass	
Sensor C	ompone	nt Span		Conditi	on 0.986		Status pass	
Sensor C	ompone	nt Zero Voltage)	Conditi	on N/A		Status pass	
Sensor C	ompone	nt Fullscale Vol	ltage	Conditi	on N/A		Status pass	
Sensor C	ompone	nt Cell A Freq.		Conditi	on 120.3 kHz		Status pass	
Sensor C	ompone	nt Cell A Noise		Conditi	on 0.9 ppb		Status pass	
Sensor C	ompone	nt Cell A Flow		Conditi	on 0.63 lpm		Status pass	
Sensor C	ompone	nt Cell A Press	ure	Conditi	on 557.0 mmHg		Status pass	
Sensor C	ompone	nt Cell A Tmp.		Conditi	on 35.5 C		Status pass	
Sensor C	ompone	nt Cell B Freq.		Conditi	on 80.1 kHz		Status pass	
Sensor C	ompone	nt Cell B Noise		Conditi	on 0.9 ppb		Status pass	
Sensor C	ompone	nt Cell B Flow		Conditi	on 0.66 lpm		Status pass	
Sensor C	ompone	nt Cell B Press	ure	Conditi	on 556.4 mmHg		Status pass	
Sensor C	ompone	nt Cell B Tmp.		Conditi	on N/A		Status pass	
Sensor C	ompone	nt Line Loss		Conditi	on Not tested		Status pass	
Sensor C	ompone	nt System Men	no	Conditi	on		Status pass	

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number	Tag Site]	Fechnicia	n	Site Vis	it Date	Paramete	er	Owner ID
RM Young	029239	YEL408		Martin Va	llvur	07/02/2	019	Temperati	ure2meter	none
				Mfg		Fluke		Para	meter Tem	perature
				Serial	Number	3275143	3	Tfer	Desc. RTD	
				Tfer I	D	01229]		
DAS 1:	DA	S 2:		Slope			0.99989	Interco	ept	-0.00649
Abs Avg Err	Abs Max Err Ab	s Avg Err Ab	s Max Err	Cert I	Date		1/23/2019	CorrC	off	1.00000
0.29	0.41									
UseDescription	Test type	InputTmpRaw	InputTmpC	orrected	OutputTm	pSignal	OutputSi	gnalEng	OSE Unit	Difference
primary	Temp Low Rang	0.06		0.07		0.000		-0.17	С	-0.24
primary	Temp Mid Range	24.18		24.19		0.000		23.98	С	-0.21
primary	Temp High Rang	48.11		48.12		0.000		47.71	С	-0.41
Sensor Compo	nent Properly Site	d	Condi	ition Prop	perly sited			Status pa	ass	
Sensor Compo	nent Shield		Condi	ition Clea	an			Status pa	ass	
Sensor Compo	Sensor Component Blower			ition Fun	ctioning			Status pa	ass	
Sensor Compo	Sensor Component Blower Status Switch			Condition N/A				Status pa	ass	
Sensor Compo	nent System Mem	0	Condi	Condition				Status pa	ass	

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	YEL408	Martin Valvur	07/02/2019	Shelter Temperate	ure none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter	Shelter Temperature
Abs Avg Err Abs 0.86	s Max Err Abs Avg 1.17	Err Abs Max Err	Serial Number	3275143	Tfer Desc.	RTD
			Tfer ID	01229		
			Slope	0.9998	9 Intercept	-0.00649
			Cert Date	1/23/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.88	22.89	0.000	24.1	С	1.17
primary	Temp Mid Range	29.96	29.97	0.000	28.9	С	-1.09
primary	Temp Mid Range	23.18	23.19	0.000	22.9	С	-0.32
Sensor Con	nponent System Memo		Condition		Status	pass	

Infrastructure Data For

Site ID	YEL408	Technician Martin V	alvur Site Visit Date 07/02/2019
Shelter 1	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2880-1)	640 cuft
Contractor Barriero Sa			

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

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.

6 Parameter: MetOpMaintCom

The recorded temperature is now being measured at approximately 2 meters above the ground.

F-02058-1500-S1-rev002

Site ID	YEL408		Technician Martin V	alvur	Site Visit I	Date 07/02	2/2019		
					USCS Mon		اعلام		
Site Sponsor ((agency)	NPS			USGS Map				
Operating Gr	oup	NPS			Map Scale				
AQS #		56-039-1	011		Map Date	Map Date			
Meteorologica	al Type	Climatror	lics						
Air Pollutant	Analyzer	Ozone, II	MPROVE		QAPP Latitude		44.5597		
Deposition Me	easurement	dry			QAPP Longitude		-110.4006		
Land Use		woodland	I - evergreen		QAPP Elevation N	Meters	2400		
Terrain		complex			QAPP Declination	n			
Conforms to I	MLM	Marginall	У		QAPP Declination	n Date			
Site Telephon	ie	(307) 242-2410			Audit Latitude			44	.565356
Site Address	1	Lake Rar	nger Station		Audit Longitude			-110	.400338
Site Address 2	2	route 14			Audit Elevation				2430
County		Teton			Audit Declination	l	11.9		
City, State		Yellowsto	one National Park, WY		I	Present			
Zip Code		82190			Fire Extinguisher		New in 2017		
Time Zone		Mountain			First Aid Kit				
Primary Oper	rator				Safety Glasses				
Primary Op.	Phone #				Safety Hard Hat				
Primary Op.	E-mail				Climbing Belt	\checkmark			
Backup Opera	ator				Security Fence				
Backup Op. 1	Phone #				Secure Shelter	\checkmark			
Backup Op. 1	E-mail				Stable Entry Step	s ✓			
Shelter Work	ing Room 🗹	Make	Ekto	Μ	odel 8810 (s/n 2880)-1)	Shelter Size	640 cuft	
Shelter Clean	\checkmark	Notes	The shelter is organized	d and w	ell maintained.				
Site OK	\checkmark	Notes							
Driving Direc	tions From Yellov Conti tank f	Jackson ta wstone Lak nue throug or the com	ake route 191 / 89 north ce. Turn left just past the h the compound past the pound.	to Yell e Lake e housi	owstone National Pai Area (and hotel) into ng area. The site is u	rk. At Thu the park re up the hill t	Imb Junction take esidence and offi through the gate	e 14 east around ce compound. to the water sup	t oply

YEL408

F-02058-1500-S2-rev002

Site ID

Technician Martin Valvur

Site Visit Date 07/02/2019

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

Siting Distances OK

Siting Criteria Comment

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.

Site ID YEL408 Technician Martin Valvur Site Visit Date 07/02/2019 1 Are wind speed and direction sensors sited so as to avoid being influenced by obstructions? ✓ N/A 2 Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind) N/A	rev002
 Are wind speed and direction sensors sited so as to avoid being influenced by obstructions? Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind) 	
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?	
4 Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc? ✓	
5 Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	
6 Is the solar radiation sensor plumb?	
7 Is it sited to avoid shading, or any artificial or reflected light? 🗹 N/A	
8 Is the rain gauge plumb?	
9 Is it sited to avoid sheltering effects from buildings, trees, towers, etc? ►	
10 Is the surface wetness sensor sited with the grid surface facing north? Image: N/A	
11 Is it inclined approximately 30 degrees? ✓ N/A	

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Site	e ID	YEL408	Technician	Martin Valvur		Site Visit Date	07/02/2019	
1 2 3	Do all the condition Are all the reporting Are the s	e meterological senso a, and well maintained ae meteorological sens g data? hields for the temper	rs appear to be 1? sors operational ature and RH so	intact, in good online, and ensors clean?	> > >			
4	Are the a	spirated motors worl	king?		✓			
5	5 Is the solar radiation sensor's lens clean and free of scratches?				✓	N/A		
6	Is the sur	rface wetness sensor g	rid clean and u	ndamaged?	✓	N/A		
7 8	Are the s condition Are the s from the	ensor signal and pow a, and well maintained ensor signal and pow elements and well ma	er cables intact, 1? er cable connec iintained?	in good tions protected				
	ii oin the	cronicities and wen int						

Provide any additional 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 now being measured at approximately 2 meters above the ground.

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev002
Site	e ID	YEL408	Technician	Martin Valvur		Site Visit Date 07/02/2019
	Siting C	riteria: Are the pollut	ant analyzers a	nd deposition eq	<u>uipr</u>	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the s unrestri	ample inlets have at le cted airflow?	east a 270 degre	e arc of	✓	
2	Are the	sample inlets 3 - 15 m	eters 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
	<u>Pollutar</u>	nt analyzers and depos	ition equipmen	t operations and	mai	intenance
1	Do the a conditio	nalyzers and equipme n and well maintained	ent appear to be l?	in good	✓	
2	Are the reportin	analyzers and moniton ng data?	rs operational, o	on-line, and	✓	
3	Describ	e ozone sample tube.				1/4 teflon by 12 meters
4	Describ	e dry dep sample tube				3/8 teflon by 9 meters
5	Are in-li indicate	ine filters used in the c location)	ozone sample lin	e? (if yes		At inlet only
6	Are sam obstruct	ple lines clean, free of tions?	' kinks, moistur	e, and	✓	
7	Is the ze	ero air supply desiccan	t unsaturated?		✓	
8	Are the	re moisture traps in th	e sample lines?		✓	Flow line only
9	Is there clean?	a rotometer in the dry	v deposition filte	er line, and is it		Clean and dry

Field Systems Data Form								F-02	058-15	00-S6-rev002
Sit	e ID	YEL408	Technician	Martin Valvur		Site Visi	t Date	07/02/2019		
	DAS, se	nsor translators, and	peripheral equi	pment operation	<u>15 ai</u>	<u>nd maintena</u>	<u>nce</u>			
1	Do the I well mai	DAS instruments appe intained?	ear to be in good	l condition and	✓					
2	2 Are all the components of the DAS operational? (printers, modem, backup, etc)									
3	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 grounde	DAS, sensor translato ed?	ors, and shelter	properly	✓					
7	Does the	e instrument shelter h	ave a stable pov	ver source?						
8	Is the in	strument shelter temp	perature control	lled?	✓					
9	Is the m	et tower stable and gr	ounded?			Stable			Grounded	
10	Is the sa	mple tower stable and	d grounded?							
11	Tower c	omments?								

The shelter heat and air conditioner run simultaneously.

Field Sy	ystems Data F	orn	n				F-02	058-	1500-S7-rev0	02
Site ID	YEL408	T	echnicia	an Martin V	alvur	Site Visit Date	07/02/2019			
Documer	<u>itation</u>									
Does the	site have the required	instru	<u>ument a</u>	nd equipme	ent manuals?					
Wind speed	Ye sensor	s	No	N/A ✓	Data logge	r	Yes	No	N/A	
Wind direct	ion sensor	_			Data logge	r				
Temperatur	e sensor				Strip chart	recorder				
Relative hu	midity sensor				Computer			\checkmark		
Solar radiat	ion sensor				Modem			\checkmark		
Surface wet	ness sensor				Printer					
Wind senso	r translator				Zero air pu	ımp		\checkmark		
Temperatur	e translator				Filter flow	pump		\checkmark		
Humidity se	ensor translator			\checkmark	Surge prot	ector				
Solar radiat	ion translator			\checkmark	UPS					
Tipping buc	ket rain gauge			\checkmark	Lightning	protection device				
Ozone analy	zer		\checkmark		Shelter hea	iter		\checkmark		
Filter pack	flow controller				Shelter air	conditioner	\checkmark			
Filter pack	MFC power supply		\checkmark							
Does the	e site have the required	d and	most r	ecent QC do	ocuments and	<u>report forms?</u>				
	Pi	resent	t				Curre	nt		
Station Log		\checkmark	Data	View2			\checkmark			
SSRF		\checkmark					\checkmark			
Site Ops Ma	nual	\checkmark	July	2016			\checkmark			
HASP		\checkmark	July	2016			\checkmark			
Field Ops M	Ianual	✓	July	2016			\checkmark			
Calibration	Reports	✓	Not	current						
Ozone z/s/p	Control Charts									
Preventive r	naintenance 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:

✓

YEL408 Technician Martin Valvur Site Visit Date 07/02/2019 Site ID Site operation procedures Trained by ARS on site Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

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

✓

 \checkmark

✓

✓

 \checkmark

✓

Frequency

Every 2 weeks

Alarm values only

Daily

Daily

Monthly and semiannually

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

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

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

ement (at inlet)	\checkmark	Every 2 weeks
ement (at analyze		N/A
for Dirt/Water		
Check	\checkmark	Weekly
alibration gases go thro	moh the	complete 🗹

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

✓ Dataview

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

✓

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

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Compliant

✓

 \checkmark

✓

 \checkmark

✓

✓ ...

Field Systems Data Form	F-02058-1500-S9-rev002

Site	ID	YEL408	Technicia	an Martin Valvur		Site Visit Date	07/02/2019	
	<u>Site oper</u>	ation procedures						
1	Is the filt	ter pack being change	ed every Tue	sday as scheduled	? 🗸	Filter changed morir	nings	
2	Are the S correctly	Site Status Report For ?	rms being co	mpleted and filed	✓			
3	Are data schedule	downloads and back d?	ups being po	erformed as		No longer required		
4	Are gene	eral observations bein	g made and	recorded? How?	✓	Dataview, SSRF		
5	Are site fashion?	supplies on-hand and	replenished	in a timely	✓			
6	Are sam	ple flow rates recorde	d? How?		✓	SSRF		
7	Are sam fashion?	ples sent to the lab on	a regular so	chedule in a timely				
8	Are filter and ship	rs protected from con ping? How?	tamination (during handling				
9	Are the soperation	site conditions reporte ns manager or staff?	ed regularly	to the field				
QC	Check Pe	rformed	F	requency			Compliant	
N	Iulti-poin	t MFC Calibrations	✓ s	emiannually			\checkmark	
F	low Syste	m Leak Checks	✓ v	/eekly				
F	ilter Pack	Inspection						
F	low Rate	Setting Checks	✓ V	leekly				
V	isual Che	eck of Flow Rate Roto	meter 🗹 🗸	leekly				
I	n-line Filt	er Inspection/Replace	ement					
S	ample Li	ne Check for Dirt/Wa	ter					
Prov	ide anv a	dditional explanation	(photograp)	ı or sketch if nece	sarv) regarding condition	ons listed above, or ar	v other features,

Gloves are not used to handle the filter pack.

YEL408

F-02058-1500-S10-rev002

Site ID

Tech

Technician Martin Valvur

Site Visit Date 07/02/2019

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	120000014912	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	В	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 V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
GLR4	68-Martin	n Valvur-07/03/2019				
1	7/3/2019	Computer	Hewlett Packard	none	6560 b	5CB1520H65
2	7/3/2019	DAS	Environmental Sys Corp	90647	8816	2560
3	7/3/2019	Elevation	Elevation	None	1	None
4	7/3/2019	Filter pack flow pump	Thomas	none	107CAB11A	109500000039
5	7/3/2019	Flow Rate	Tylan	none	FC280	AW9710138
6	7/3/2019	Infrastructure	Infrastructure	none	none	none
7	7/3/2019	MFC power supply	Tylan	03687	RO-32	FP9403014
8	7/3/2019	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943901
9	7/3/2019	Ozone Standard	ThermoElectron Inc	none	49i A3NAA	0733726104
10	7/3/2019	Sample Tower	Aluma Tower	none	В	none
11	7/3/2019	Shelter Temperature	ARS	77	none	none
12	7/3/2019	Siting Criteria	Siting Criteria	None	1	None
13	7/3/2019	Temperature2meter	RM Young	none	41342	17625
14	7/3/2019	Zero air pump	Werther International	none	PC70/4	000756725

DAS Data Form

DAS Time Max Error: 0.67

Mfg	Serial	Number Sit	e	Technician	Site Visit Date	Parameter	Use Desc.
Environmental	Sys 2560	GI	_R468	Martin Valvur	07/03/2019	DAS	Primary
Das Date:	7 /3 /2019	Audit Date	7 /3 /2019	Mfg	HY	Parameter	DAS
Das Time:	08:52:45	Audit Time	08:53:25	Serial Number	12010039329	Tfer Desc.	Source generator (D
Low Channel	:	High Chanr	104	Tfer ID	01322]	
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0002	2 0.0	0005 0.000	0.0005	Cert Date	6/15/201	4 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740243	Tfer Desc.	DVM
				Tfer ID	01312		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/25/201	9 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
15	0.0000	-0.0005	-0.000	3 V	V	0.0002	
15	0.1000	0.1002	0.100	2 V	V	0.0000	
15	0.3000	0.3000	0.299	8 V	V	-0.0002	
15	0.5000	0.4998	0.499	7 V	V	-0.0001	
15	0.7000	0.6999	0.699	8 V	V	-0.0001	
15	0.9000	0.9000	0.899	9 V	V	-0.0001	
15	1.0000	1.0002	0.999	7 V	V	-0.0005	

Flow Data Form

Mfg	Serial Nun	nber Tag S	Site	Tec	chnician	Site Visit D	ate Paran	neter	Owner ID
Tylan	AW971013	38	GLR468	Ma	artin Valvur	07/03/2019	Flow R	ate	none
Mfg	Tylan				Mfg	BIOS	Р	arameter Flo	w Rate
SN/Owner ID	FP9403014	03687			Serial Number	122974	Т	fer Desc. BIC	S 220-H
Parameter:	MFC power sur	oply			Tfer ID	01416			
					Slope	1.(00178 Int	ercept	0.00161
					Cert Date	7/13	/2018 Co	rrCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero	0.3	93	
A Avg % Diff:	A Max % Dif	A Avg %l	Diff A Max	% Dif	Cal Factor F	ull Scale	5.8	74	
0.33%	0.33%				Rotometer R	eading:	3	9.3	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.37	0.0000	0.02	l/m	l/m	
primary	leak check	0.000	0.000	-0.37	0.0000	0.03	l/m	l/m	
primary	test pt 1	3.020	3.010	2.37	0.0000	3.00	l/m	l/m	-0.33%
primary	test pt 2	3.020	3.010	2.38	0.0000	3.00	l/m	l/m	-0.33%
primary	test pt 3	3.020	3.010	2.37	0.0000	3.00	l/m	l/m	-0.33%
Sensor Comp	onent Leak Tes	it		Conditio	on		Statu	s pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Rotomete	er Condition	I	Conditio	Clean and dry		Statu	s pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	resent	Statu	s pass	
Sensor Comp	onent Filter Dis	tance		Conditio	n 5.5 cm		Statu	s pass	
Sensor Comp	onent Filter Dep	oth		Conditio	n 1.0 cm		Statu	s pass	
Sensor Comp	onent Filter Azir	muth		Conditio	n 360 deg		Statu	s pass	
Sensor Comp	onent System N	/lemo		Conditio	n		Statu	s pass	

Ozone Data Form

Mfg	Serial Numb	er Tag Site	Te	chnician	Site Visit Date	Parameter	Owner ID	
ThermoElectron	nc 1023943901	GLR468	B Ma	artin Valvur	07/03/2019	Ozone	none	
Slope: Intercept CorrCoff: DAS 1: A Avg % Diff: 0.0%	1.03800 Slop -0.52100 Inte 0.99997 Cor D Max % Dif A A.0.0%	pe: ercept rCoff: AS 2: Avg %Diff A	0.00000 0.00000 0.00000 Max % Dif	Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 49CPS-70008-3 01110 1.0015 10/30/201	Inc Paramete 64 Tfer Dese 51 Intercept 18 CorrCoff	er ozone c. Ozone primary stan 0.00666 1.00000	
UseDescription primary primary primary primary primary	 ConcGroup 1 2 3 4 5 	Tfer Raw 0.40 15.07 35.04 65.02 112.10	Tfer Corr 0.39 15.04 34.98 64.91 111.92	Site 0.31 15.00 35.41 66.65 115.90	Site Unit ppb ppb ppb ppb ppb	RelPerDif 1.22 2.65 3.49	AbsDif -0.08 -0.04	
Sensor Comp Sensor Comp Sensor Comp	onent Sample Tra onent 22.5 degree onent Inlet Filter (in e rule Condition	Condition Condition Condition	on Good on on Clean		StatuspassStatuspassStatuspass		
Sensor Comp	onent Battery Bac	kup	Conditio	on N/A		Status pass		
Sensor Comp	onent Offset		Conditio	on -0.1		Status pass		
Sensor Comp	onent Span		Conditio	on 1.012		Status pass		
Sensor Comp	onent Zero Voltag	je	Conditio	on 0.0004		Status pass		
Sensor Comp	onent Fullscale V	oltage	Conditio	on 1.0004		Status pass		
Sensor Comp	onent Cell A Freq	•	Conditio	on 100.7 kHz		Status pass		
Sensor Comp	onent Cell A Nois	e	Conditio	on 0.4 ppb		Status pass		
Sensor Comp	onent Cell A Flow	,	Conditio	on 0.55 lpm		Status pass		
Sensor Comp	onent Cell A Pres	sure	Conditio	on 669.6 mmHg		Status pass		
Sensor Comp	onent Cell A Tmp		Conditio	on 30.3 C		Status pass		
Sensor Comp	onent Cell B Freq	•	Conditio	on 92.7 kHz		Status pass		
Sensor Comp	onent Cell B Nois	e	Conditio	on 0.8 ppb		Status pass		
Sensor Comp	onent Cell B Flow	,	Conditio	on 0.55 lpm		Status pass		
Sensor Comp	onent Cell B Pres	sure	Conditio	on 669.3 mmHg		Status pass		
Sensor Comp	onent Cell B Tmp		Conditio	on N/A		Status pass		
Sensor Comp	onent Line Loss		Conditio	on Not tested		Status pass		
Sensor Comp	onent System Me	mo	Conditio	on		Status pass		

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number	r Tag Site	1	Fechnicia	n	Site Vis	it Date 1	Paramete	er	Owner ID
RM Young	17625	GLR468		Martin Va	alvur	07/03/2	019	Temperati	ure2meter	none
				Mfg		Fluke		Para	meter Tem	perature
				Serial	Number	3275143	3	Tfer	Desc. RTD	
				Tfer I	D	01229]		
DAS 1:	DA	S 2:		Slope			0.99989	Interco	ept	-0.00649
Abs Avg Err	Abs Max Err Ab	s Avg Err Ab	os Max Err	Cert I	Date		1/23/2019	CorrC	off	1.00000
0.23	0.31									
UseDescription	Test type	InputTmpRaw	InputTmpCo	orrected	OutputTm	pSignal	OutputSi	gnalEng	OSE Unit	Difference
primary	Temp Low Rang	0.11		0.12		0.0000		0.38	С	0.26
primary	Temp Mid Range	24.81		24.82		0.0000		25.13	С	0.31
primary	Temp High Rang	46.97		46.98		0.0000		47.11	С	0.13
Sensor Compo	onent Properly Site	d	Condi	tion Prop	perly sited			Status pa	ass	
Sensor Compo	onent Shield		Condi	tion Clea	an			Status pa	ass	
Sensor Compo	onent Blower		Condi	tion Fun	ctioning			Status pa	ass	
Sensor Compo	onent Blower Statu	s Switch	Condi	tion N/A				Status pa	ass	
Sensor Compo	onent System Mem	10	Condi	tion				Status Pa	ass	

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	GLR468	Martin Valvur	07/03/2019	Shelter Temperatu	re 77
DAS 1:	DAS 2:		Mfg	Fluke	Parameter S	helter Temperature
Abs Avg ErrAb0.99	s Max Err Abs Avg 1.09	Err Abs Max Err	Serial Number	3275143	Tfer Desc. R	TD
			Tfer ID	01229		
			Slope	0.9998	9 Intercept	-0.00649
			Cert Date	1/23/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference	
primary	Temp Mid Range	22.30	22.31	0.000	21.4	С	-0.9	
primary	Temp Mid Range	22.70	22.71	0.000	21.6	С	-1.09	
primary	Temp Mid Range	21.32	21.33	0.000	20.3	С	-0.99	
Sensor Con	Sensor Component System Memo Condition Status pass							
Infrastructure Data For

Site ID	GLR468	Technician Martin Va	alvur Site Visit Date 07/03/2019
Shelter 1	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2149-20)	640 cuft
110 110 110			

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

Field Systems Comments

1 Parameter: SitingCriteriaCom

The site is located in a small clearing within 100 meters of a horse stable. There is a plywood and aluminum processing plant within 20 km of the site.

2 Parameter: ShelterCleanNotes

The shelter is in fair condition. Evidence of repairs to roof leaks attempted. Some floor tiles are loose.

3 Parameter: MetSensorComme

The recorded temperature data at this site is measured at approximately 2 meters above the ground.

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Site ID GLR468	Technician Martin Valvur	Site Visit Date 07/03	3/2019				
Site Sponsor (agancy)	NPS	USGS Map	Lake McDonald West				
Or sponsor (agency)		Man Scale					
Operating Group							
AQS #	30-029-8001	Map Date					
Meteorological Type	R.M. Young						
Air Pollutant Analyzer	Ozone, IMPROVE	QAPP Latitude	48.5103				
Deposition Measurement	dry, wet, Hg	QAPP Longitude	-113.9956				
Land Use	woodland - mixed	QAPP Elevation Meters	976				
Terrain	complex	QAPP Declination	18				
Conforms to MLM	No	QAPP Declination Date	12/27/2004				
Site Telephone	(406) 888-7983	Audit Latitude	48.510301				
Site Address 1	Horse Stables	Audit Longitude	-113.996807				
Site Address 2	Quarter Circle Bridge Rd	Audit Elevation	964				
County	Flathead	Audit Declination	14.1				
City, State	West Glacier, MT	Present					
Zip Code	59936	Fire Extinguisher 🔽	Inspected June 2011				
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 Me	odel 8810 (s/n 2149-20)	Shelter Size 640 cuft				
Shelter Clean	Notes The shelter is in fair condition. loose.	tes The shelter is in fair condition. Evidence of repairs to roof leaks attempted. Some floor tiles are loose.					
Site OK	Notes						
Driving Directions From Kalispell proceed north on route 2 to West Glacier. Turn left onto Going To The Sun Road into Glacier National Park. Proceed approximately 0.2 miles past the entrance and fee station, and turn left toward the horse stables. Bear right at the fork and continue through the gate past the stables. The site is visible in the clearing on the left.							

GLR468

F-02058-1500-S2-rev002

Site ID

Technician Martin Valvur

Site Visit Date 07/03/2019

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

Siting Distances OK

Siting Criteria Comment

The site is located in a small clearing within 100 meters of a horse stable. There is a plywood and aluminum processing plant within 20 km of the site.

Fi	eld Systems Data Form		F-02058-1500-S3-rev00				
Site	ID GLR468 Technician Martin Valvur		Site Visit Date 07/03/2019				
1 2	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions? Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	✓	N/A 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)		Temperature now at 2 meters				
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				

The recorded temperature data at this site is measured at approximately 2 meters above the ground.

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Site	e ID	GLR468	Technician	Martin Valvur		Site Visit Date	07/03/2019	
 Do all the meterological sensors appear to be intact, in good condition, and well maintained? Are all the meteorological sensors operational online, and reporting data? 								
3	Are the s	hields for the tempera	ature and RH s	ensors clean?				
4	Are the a	spirated motors worl	king?					
5	Is the sol scratches	ar radiation sensor's	lens clean and f	ree of				
6	Is the sur	rface wetness sensor g	rid clean and u	ndamaged?		N/A		
7 8	Are the s condition Are the s from the	ensor signal and pow a, and well maintained ensor signal and pow elements and well ma	er cables intact 1? er cable connec intained?	, in good tions protected				

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Sit	e ID GLR468 Technician Martin Valvur		Site Visit Date 07/03/2019
	Siting Criteria: Are the pollutant analyzers and deposition ec	<u>luipr</u>	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	✓	
2	Are the sample inlets 3 - 15 meters above the ground?	✓	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	✓	
	Pollutant analyzers and deposition equipment operations and	l mai	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?		
2	Are the analyzers and monitors operational, on-line, and reporting data?		
3	Describe ozone sample tube.		1/4 teflon by 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?		
9	Is there a rotometer in the dry deposition filter line, and is it	✓	Clean and dry

clean?

Field Systems Data Form						F-0 2	2058-15	00-S6-rev002
Sit	e ID	GLR468	Technician Martin Valvur		Site Visit I	Date 07/03/201	9	
	<u>DAS, se</u>	ensor translators, and	peripheral equipment operation	<u>ns ai</u>	nd maintenanc	<u>e</u>		
1	Do the I well ma	DAS instruments appo intained?	ear to be in good condition and	✓				
2	2 Are all the components of the DAS operational? (printers, modem, backup, etc)							
3	Do the a lightnin	analyzer and sensor signal protection circuitry	gnal leads pass through ?		Met sensors or	nly		
4	Are the well ma	signal connections pro intained?	otected from the weather and	✓				
5	Are the	signal leads connected	d to the correct DAS channel?	✓				
6	Are the grounde	DAS, sensor translate ed?	ors, and shelter properly	✓				
7	Does the	e instrument shelter h	ave a stable power source?	✓				
8	Is the in	nstrument shelter temj	perature controlled?					
9	Is the m	net tower stable and gr	ounded?		Stable		Grounded	
10	Is the sa	ample tower stable and	d grounded?					
11	Tower o	comments?						

Fiel	d Systems Data	ı Foi	rm				F-02	2058-	-1500-S7-rev002
Site II	D GLR468		Tech	<mark>nician</mark> Marti	n Valvur	Site Visit Date 0	7/03/2019)	
Doc	<u>cumentation</u>								
Doe	es the site have the requi	ired in	strume	ent and equi	oment manuals?				
Wind	speed sensor	Yes	No	N/A ✓	Data logge	er	Yes	No	N/A
Wind	direction sensor			\checkmark	Data logge	er			
Tempe	erature sensor				Strip char	t recorder			
Relativ	ve humidity sensor			\checkmark	Computer	•			
Solar 1	radiation sensor			\checkmark	Modem			\checkmark	
Surfac	e wetness sensor			\checkmark	Printer				
Wind	sensor translator			\checkmark	Zero air p	ump			
Tempe	erature translator			\checkmark	Filter flow	v pump			
Humic	lity sensor translator			\checkmark	Surge pro	tector			
Solar 1	radiation translator			\checkmark	UPS				
Tippin	ng bucket rain gauge			\checkmark	Lightning	protection device			
Ozone	analyzer		\checkmark		Shelter he	ater		\checkmark	
Filter	pack flow controller		\checkmark		Shelter air	r conditioner			
Filter	pack MFC power supply	у 🗌	\checkmark						
De	oes the site have the req	uired a	und mo	ost recent QC	C documents and	l report forms?			
		Pres	sent				Curre	nt	
Station	n Log		\checkmark	Dataview			\checkmark		
SSRF			\checkmark				\checkmark		
Site O	ps Manual		\checkmark	Oct 2016			\checkmark		
HASP			\checkmark	April 2004					
Field (Ops Manual		\checkmark	April 2004					
Calibr	ation Reports		\checkmark						
Ozone	z/s/p Control Charts								
Prever	ntive maintenance sched	ule							
1 Is	s the station log properly	y comp	oleted o	luring every	site visit? ✔	Dataview			
2 A	re the Site Status Repor urrent?	rt Forn	ns beir	ig completed	and 🗸				

- 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:

✓

GLR468 Technician Martin Valvur Site Visit Date 07/03/2019 Site ID Site operation procedures Trained by previous site operator Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

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

Frequency

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

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

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

\checkmark	Semiannually	\checkmark
✓	Daily	\checkmark
✓	Every 2 weeks	\checkmark
✓	Daily	\checkmark
✓	Alarm values only	
✓	Every 2 weeks	\checkmark
	N/A	\checkmark
✓	Weekly	\checkmark

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

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

	Unknown
✓	Dataview

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

Compliant

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Field Systems Data Form	F-02058-1500-S9-rev002
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Sit	e ID	GLR468	Technician	Martin Valvur		Site Visit Date	07/03/2019		
	Site operation procedures								
1	Is the f	ilter pack being changed	every Tuesda	y as scheduled?	✓ F	ilter changed vario	us times		
2	Are the correct	Site Status Report Form ly?	ns being comp	leted and filed					
3	Are dat schedu	a downloads and backu ed?	ps being perfo	rmed as	□ N	No longer required			
4	Are gei	neral observations being	made and rec	orded? How?	✓ D	Dataview			
5	Are site fashion	e supplies on-hand and r ?	eplenished in a	a timely					
6	Are sample flow rates recorded? How?					SSRF			
7	Are sar fashion	nples sent to the lab on a ?	regular scheo	lule in a timely					
8	Are filt and shi	ers protected from conta pping? How?	mination dur	ing handling	✓ 0	ne set of gloves or	nly		
9	Are the operati	site conditions reported ons manager or staff?	regularly to t	he field					
QC	Check F	erformed	Freq	uency			Compliant		
I	Aulti-po i	nt MFC Calibrations	Semi	iannually			\checkmark		
I	Flow System Leak Checks								
I	Filter Pac	k Inspection							
I	Flow Rat	e Setting Checks	✓ Wee	kly			\checkmark		
	Visual Cl	neck of Flow Rate Roton	eter 🗹 Wee	kly					
Ι	n-line Fi	lter Inspection/Replacen	nent 🗹 As ne	eeded					
5	Sample Line Check for Dirt/Water								

GLR468

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Site ID

Techn

Technician Martin Valvur

Site Visit Date 07/03/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB1520H65	none
DAS	Environmental Sys Corp	8816	2560	90647
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB11A	10950000039	none
Flow Rate	Tylan	FC280	AW9710138	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP9403014	03687
Ozone	ThermoElectron Inc	49i A3NAA	1023943901	none
Ozone Standard	ThermoElectron Inc	49i A3NAA	0733726104	none
Sample Tower	Aluma Tower	В	none	none
Shelter Temperature	ARS	none	none	77
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	17625	none
Zero air pump	Werther International	PC70/4	000756725	none

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
UND	0002-Korey	Devins-07/09/2019				
1	7/9/2019	DAS	Campbell	000802	CR850	23269
2	7/9/2019	elevation	Elevation	none	none	none
3	7/9/2019	Filter pack flow pump	Permotec	none	BL30EB	Illegible
4	7/9/2019	Flow Rate	Арех	000658	AXMC105LPMDPCV	unknown
5	7/9/2019	Infrastructure	Infrastructure	none	none	none
6	7/9/2019	Modem	Sierra wireless	06982	unknown	unknown
7	7/9/2019	Sample Tower	Aluma Tower	000778	В	AT-212125X77
8	7/9/2019	siting criteria	Siting Criteria	none	none	None
9	7/9/2019	Temperature	RM Young	04688	41342	6702

Flow Data Form

Mfg	Serial Num	ber Tag	Site	Тес	chnician	Site Visit Date	Paran	neter	Owner ID
Арех	unknown		UND002	Ko	orey Devins	07/09/2019	Flow R	late	000658
					Mfg	BIOS	P	arameter Flow	v Rate
					Serial Number	148613	Т	fer Desc. BIO	S 220-H
					Tfer ID	01421			
					Slope	1.0000	00 Inte	ercept	0.00000
					Cert Date	3/4/201	19 <mark>Co</mark>	rrCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero		0	
A Avg % Diff:	A Max % Dif	A Avg %	Diff A Max	x % Dif	Cal Factor F	ull Scale		0	
1.21%	1.32%				Rotometer R	eading:		3	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E Inp	utUnit	OutputSignal	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.00	l/m	l/m	
primary	test pt 1	3.034	3.030	2.98	0.000	3.00	l/m	l/m	-0.99%
primary	test pt 2	3.044	3.040	2.98	0.000	3.00	l/m	l/m	-1.32%
primary	test pt 3	3.037	3.040	2.98	0.000	3.00	l/m	l/m	-1.32%
Sensor Comp	onent Leak Tes	t		Conditio	on		Statu	s pass	
Sensor Comp	onent Tubing C	ondition		Conditio	on Good		Statu	s pass	
Sensor Comp	onent Filter Pos	ition		Conditio	Good		Statu	s pass	
Sensor Comp	onent Rotomete	er Conditior	ו	Conditio	Clean and dry		Statu	s pass	
Sensor Comp	onent Moisture	Present		Conditio	See comments	3	Statu	s pass	
Sensor Comp	onent Filter Dist	ance		Conditio	n 4.0 cm		Statu	s pass	
Sensor Comp	onent Filter Dep	oth		Conditio	n 1.0 cm		Statu	s pass	
Sensor Comp	onent Filter Azir	nuth		Conditio	n 150 deg		Statu	s pass	
Sensor Comp	onent System M	lemo		Conditio	n		Statu	s pass	

Temperature Data Form

Mfg	Serial Number	Tag Site	Т	echni	ician	Site V	isit Date	Param	eter	Owner ID	
RM Young	6702	UND002		Korey	Devins	07/09	/2019	Temper	ature	04688	
				Mf	g	Extech	ı	Pa	rameter Te	mperature	
				Ser	rial Number	H2327	'34	Tf	er Desc. R	D	
				Tfe	er ID	01227					
DAS 1:	DAS	5 2:		Slo	ре		1.0073	3 Inte	rcept	0.14497	
Abs Avg Err	Abs Max Err Abs	Avg Err Abs	Max Err	Cer	rt Date		2/12/201	9 Cor	rCoff	1.00000	
0.19	0.38										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary	Temp Low Range	0.21	0.06		0.000		0.4	1	С	0.38	
primary	Temp Mid Range	26.40	26.06	j	0.000		26.	0	С	-0.06	
primary	Temp High Range	48.76	48.26	i	0.000		48.	1	С	-0.14	
Sensor Com	Sensor Component Shield				Condition Clean			Status	pass		
Sensor Com	ponent Blower		Condi	tion N	J/A			Status	pass		
Sensor Com	ponent Blower Status	Switch	Condi	tion N	I/A			Status	pass		
Sensor Com	ponent System Memo)	Condi	tion				Status	pass		

Infrastructure Data For

Site ID UND002	Technician Korey Devins	Site Visit Date 07/09/2019
Shelter Make	Shelter Model	Shelter Size

Sensor Component Sample Tower Ty	vpe Condition	Type B S	Status pass
Sensor Component Conduit	Condition	N/A S	Status pass
Sensor Component Met Tower	Condition	N/A S	Status pass
Sensor Component Moisture Trap	Condition	Not installed S	Status pass
Sensor Component Power Cables	Condition	Good	Status pass
Sensor Component Shelter Temp Co	ntrol Condition	N/A S	Status pass
Sensor Component Rotometer	Condition	Installed	Status pass
Sensor Component Sample Tower	Condition	Good	Status pass
Sensor Component Shelter Condition	Condition	N/A S	Status pass
Sensor Component Shelter Door	Condition	N/A S	Status pass
Sensor Component Shelter Roof	Condition	N/A S	Status pass
Sensor Component Shelter Floor	Condition	N/A S	Status pass
Sensor Component Signal Cable	Condition	Good	Status pass
Sensor Component Tubing Type	Condition	3/8 teflon S	Status pass
Sensor Component Sample Train	Condition	Good	Status pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	UND002	Korey Devins	07/09/2019	Moisture Present	Apex	3972		
The filter sample tubing has drops of moisture in low sections outside the shelter.								

Field Systems Comments

1 Parameter: DasComments

Single tower with filer pack mounted at 10 meters and temperature mounted at 9 meters.

2 Parameter: DocumentationCo

Although there is no CASTNET logbook present onsite, the site operator records CASTNET information in the VT Monitoring Coop logbook.

3 Parameter: ShelterCleanNotes

Small footprint site with no shelter. Equipment housed in enclosure on sample tower.

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Site ID UND002	Technician Korey Devins	Site Visit Date 07/09	/2019
Site Sponsor (agency)	EPA	USGS Map	
Operating Group	VT Monitoring Coop	Map Scale	
AQS #		Map Date	
Meteorological Type			
Air Pollutant Analyzer		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	44.52843
Site Address 1		Audit Longitude	-72.86804
Site Address 2		Audit Elevation	402
County	Chittenden	Audit Declination	
City, State	Underhill Center, VT	Present	
Zip Code	05489	Fire Extinguisher	
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 Mo	odel	Shelter Size
Shelter Clean	Notes Small footprint site with no she	ter. Equipment housed in enclo	osure on sample tower.
Site OK	Notes		
Driving Directions			

UND002

F-02058-1500-S2-rev002

Site ID

Technician Korey Devins

Site Visit Date 07/09/2019

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

Siting Distances OK

Siting Criteria Comment

Fi	eld Systems Data Form		F-02058-1500-S3-rev002					
Site	UND002 Technician Korey Devins		Site Visit Date 07/09/2019					
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?		N/A					
2	(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?	✓	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					
			L					

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Site	e ID	UND002	Technician	Korey Devins		Site Visit Date 07/09/2019
1 2	Do all th condition Are all th reporting	e meterological senso 1, and well maintained 1e meteorological sens g data?	rs appear to be 1? sors operationa	intact, in good l online, and	✓	Temperature only Temperature only
3	Are the s	hields for the temper	ature and RH s	ensors clean?	✓	
4	Are the a	spirated motors worl	king?			N/A
5	Is the sol scratches	ar radiation sensor's s?	lens clean and f	ree of	✓	N/A
6	Is the su	rface wetness sensor g	grid clean and u	ndamaged?	✓	N/A
7 8	Are the s condition Are the s from the	ensor signal and pow n, and well maintained ensor signal and pow elements and well ma	er cables intact 1? er cable connec intained?	, in good tions protected	>	
	ii oni the	createring and well int				

Fi	eld Sy	stems Data Fo	orm				F-02058-1500-S5-rev		
Sit	e ID	UND002	Technician	Korey Devins		Site Visit Date	07/09/2019		
	Siting C	riteria: Are the pollut	ant analyzers a	nd deposition eq	uipr	nent sited in accord	dance with 40 C	CFR 58, Appendi	<u>x E</u>
1	Do the s unrestri	ample inlets have at le cted airflow?	east a 270 degre	e arc of	✓				
2	Are the	sample inlets 3 - 15 m	eters above the	ground?	✓				
3	Are the and 20 r	sample inlets > 1 meten neters from trees?	er from any maj	or obstruction,					
	Pollutar	t analyzers and depos	ition equipmen	t operations and	mai	intenance			
1	Do the a conditio	nalyzers and equipme n and well maintained	ent appear to be l?	e in good	✓				
2	Are the reportin	analyzers and monito g data?	rs operational, o	on-line, and	✓				
3	Describe	e ozone sample tube.				N/A			
4	Describe	e dry dep sample tube				3/8 Teflon by 10 me	eters		
5	Are in-li indicate	ine filters used in the o location)	ozone sample lir	ne? (if yes	✓	N/A			
6	Are sam obstruct	ple lines clean, free of ions?	' kinks, moistur	e, and					
7	Is the ze	ro air supply desiccan	t unsaturated?		✓	N/A			
8	Are the	re moisture traps in th	e sample lines?			Not present			
9	Is there clean?	a rotometer in the dry	deposition filte	er line, and is it					

Fi	eld Sy	stems Data Fo	orm				F-0 2	2058-15	00-S6-rev002
Site	e ID	UND002	Technician	Korey Devins		Site Visit Dat	te 07/09/201	9	
	DAS, se	nsor translators, and	peripheral equi	pment operation	<u>ns ar</u>	nd maintenance			
1	Do the I well mai	DAS instruments appe intained?	ear to be in good	l condition and	✓				
2	Are all t modem,	he components of the backup, etc)	DAS operation	al? (printers,	✓				
3	Do the a lightning	nalyzer and sensor sig g protection circuitry	gnal leads pass (?	through	✓				
4	Are the well mai	signal connections pro intained?	otected from the	e weather and	✓				
5	Are the	signal leads connected	l to the correct	DAS channel?	✓				
6	Are the grounde	DAS, sensor translato ed?	ors, and shelter	properly	✓				
7	Does the	e instrument shelter h	ave a stable pov	ver source?	✓	GFI circuit breake	r trips freque	ntly	
8	Is the in	strument shelter temp	perature control	lled?		N/A			
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	l grounded?						
11	Tower c	omments?							

Single tower with filer pack mounted at 10 meters and temperature mounted at 9 meters.

Fie	ld Sy	stems Data	Fo	rm				F-	02058	8-1500- S7-rev0 02
Site	ID	UND002		Techn	ician Koi	ey Devins	Site Visit D	Date 07/09/2	019	
De	ocumen	tation								
De	oes the s	ite have the requir	ed in	<u>strumen</u>	t and equ	upment manua	<u>lls?</u>			
Wind Wind Temj Relat Solar Surfa Wind Temj Hum Solar Tipp Ozon Filter	l speed a l directi perature tive hun r radiati ace wetr l sensor perature idity sen r radiati ing buck ne analy r pack f	sensor on sensor e sensor nidity sensor on sensor translator e translator esor translator on translator on translator ket rain gauge zer	Yes			Data lo Data lo Strip cl Compu Modem Printer Zero ai Filter fl Surge p UPS Lightni Shelter Shelter	gger gger hart recorder iter r pump low pump protector ing protection de heater air conditioner	Yes		N/A V V V V V V V V V V V V V V V V V V
Filter	r pack I	AFC nower supply				Shelter	all conditioner			V
The		ite here the rearry				C de sum en te a		.0		
1	Joes the	<u>site nave the requi</u>	irea a	and mos	t recent C	oc documents a	and report forms	<u>86</u>		
Static SSRI Site (HAS Field Calif Ozon Preve	on Log F Ops Ma P Ops M oration I ne z/s/p (entive n	nual anual Reports Control Charts naintenance schedu	Pres	sent ✓				Cu	rrent ✓	
1	Is the st	ation log properly	comp	pleted du	ring ever	y site visit? 🔽]			
2	Are the current Are the	Site Status Report ? chain-of-custody f	Form	ns being	complete	ed and 🔽] 			
5	sample	transfer to and from	m lab)?	y useu to					
4	Are ozo current	ne z/s/p control cha ?	arts p	oroperly	complete	d and 🗸] N/A			
Drow	ide env	additional explana	tion (nhotogr	onh or d	atch if nacessa	ry) regarding co	nditions list	ad above	or any other features

Although there is no CASTNET logbook present onsite, the site operator records CASTNET information in the VT Monitoring Coop logbook.

Site ID UND002 Technician Korey Devins Site Visit Date 07/09/2019 Site operation procedures Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

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

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

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

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

\checkmark	N/A
✓	N/A
✓	N/A

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

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Site	e ID	UND002	Technic	ian	Korey Devins		Site Visit Date	07/09/2019	
	<u>Site oper</u>	ration procedures							
1	Is the fil	ter pack being changed	l every Tu	esd	ay as scheduled?		Filter changed morni	ings	
2	Are the correctly	Site Status Report Form ?	ms being o	com	pleted and filed	✓			
3	Are data schedule	downloads and backu	ps being	perf	ormed as	✓	No longer required		
4	Are gen	eral observations being	made an	d re	corded? How?	✓	SSRF, logbook		
5	Are site fashion?	supplies on-hand and r	eplenishe	d in	a timely	✓			
6	Are sam	ple flow rates recorded	l? How?			✓	SSRF, logbook		
7	Are sam fashion?	ples sent to the lab on a	a regular	sche	edule in a timely	✓			
8	Are filte and ship	rs protected from conta ping? How?	aminatior	du	ring handling	✓	Clean gloves on and	loff	
9	Are the soperatio	site conditions reported ns manager or staff?	l regularl	y to	the field				
QC	Check Pe	erformed		Fre	quency			Compliant	
N	Aulti-poin	t MFC Calibrations	\checkmark	Sen	niannually				
F	Flow Syste	em Leak Checks	\checkmark	We	ekly				
F	Filter Pacl	x Inspection	\checkmark	We	ekly				
F	low Rate	Setting Checks	\checkmark	We	ekly				
V	isual Ch	eck of Flow Rate Roton	neter 🗹	We	ekly				
Ι	n-line Filt	er Inspection/Replacer	ment 🗹	As ı	needed				
S	Sample Li	ne Check for Dirt/Wat	er 🗸	We	ekly				

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Field Sy	stems Data Fo	orm			F-02058-15 0	0-S10-rev002
Site ID	UND002	Technician	Korey Devins	Site Visit Date	07/09/2019	

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR850	23269	000802
elevation	Elevation	none	none	none
Filter pack flow pump	Permotec	BL30EB	Illegible	none
Flow Rate	Apex	AXMC105LPMDPC	unknown	000658
Infrastructure	Infrastructure	none	none	none
Modem	Sierra wireless	unknown	unknown	06982
Sample Tower	Aluma Tower	В	AT-212125X77	000778
siting criteria	Siting Criteria	none	None	none
Temperature	RM Young	41342	6702	04688

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
NICO)01-Korey I	Devins-07/10/2019				
1	7/10/2019	DAS	Campbell	000801	CR850	23268
2	7/10/2019	elevation	Elevation	none	none	none
3	7/10/2019	Filter pack flow pump	Permotec	none	BL30EB	Illegible
4	7/10/2019	Flow Rate	Apex	000594	AXMC105LPMDPCV	unknown
5	7/10/2019	Infrastructure	Infrastructure	none	none	none
6	7/10/2019	Modem	Sierra wireless	06989	GX440	Unknown
7	7/10/2019	Sample Tower	Aluma Tower	000785	В	AT-212125X73
8	7/10/2019	siting criteria	Siting Criteria	none	none	None
9	7/10/2019	Temperature	RM Young	04943	41342	none

Flow Data Form

Mfg	Serial Num	ber Tag	Site	Тес	chnician	Site Visit Date	Paran	neter	Owner ID
Арех	unknown		NIC001	Ko	rey Devins	07/10/2019	Flow R	late	000594
					Mfg	BIOS	Р	arameter Flow	w Rate
					Serial Number	148613	Т	fer Desc. BIC	S 220-H
					Tfer ID	01421			
					Slope	1.000	00 Inte	ercept	0.00000
					Cert Date	3/4/20	19 Co	rrCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero		0	
A Avg % Diff:	A Max % Dif	A Avg %	Diff A Max	: % Dif	Cal Factor F	ull Scale		0	
0.11%	0.33%				Rotometer R	eading:		3	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E In	outUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.06	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	-0.05	l/m	l/m	
primary	test pt 1	2.997	3.000	3.00	0.000	3.00	l/m	l/m	0.00%
primary	test pt 2	2.997	3.000	3.00	0.000	3.00	l/m	l/m	0.00%
primary	test pt 3	3.007	3.010	3.00	0.000	3.00	l/m	l/m	-0.33%
Sensor Comp	onent Leak Tes	t		Conditio	on		Statu	s pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Filter Pos	ition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Rotomete	er Condition	ו	Conditio	Clean and dry		Statu	s pass	
Sensor Comp	onent Moisture	Present		Conditio	n See comments	3	Statu	s pass	
Sensor Comp	onent Filter Dist	ance		Conditio	n 4.0 cm		Statu	s pass	
Sensor Comp	onent Filter Dep	oth		Conditio	n 1.5 cm		Statu	s pass	
Sensor Comp	onent Filter Azir	nuth		Conditio	n 340 deg		Statu	s pass	
Sensor Comp	onent System M	1emo		Conditio	on		Statu	s pass	

Temperature Data Form

Mfg	Serial Number	Tag Site	1	ſechni	ician	Site V	isit Date	Param	eter	Owner ID	
RM Young	none	NIC001		Korey	Devins	07/10	/2019	Temper	ature	04943	
				Mf	g	Extech	1	Ра	rameter Te	mperature	
				Ser	ial Number	H2327	'34	Tf	er Desc. R	ſD	
				Tfe	er ID	01227					
DAS 1:	DA	S 2:		Slo	ре		1.0073	3 Inte	rcept	0.14497	
Abs Avg Err Abs Max Err Abs Avg Err Abs Ma		Max Err	Err Cert Date 2/12/20		2/12/201	19 CorrCoff 1.00000					
0.06	õ 0.09										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary	Temp Low Range	0.26	0.11		0.000		0.1	l	С	-0.01	
primary	Temp Mid Range	25.13	24.80)	0.000		24.	7	С	-0.07	
primary	Temp High Range	47.18	46.69)	0.000		46.	8	С	0.09	
Sensor Con	Sensor Component Shield C			ondition Moderately clean				Status	s pass		
Sensor Component Blower			Condi	Condition N/A				Status	s pass		
Sensor Component Blower Status Switch			Condi	Condition N/A				Status	s pass		
Sensor Con	ponent System Memo)	Condi	Condition			Status	IS pass			

Infrastructure Data For

Site ID	NIC001	Technician	Korey Devins	Site Visit Date	07/10/2019
Shelter M	ake	Shelter Model	Shelte	r Size	

Sensor Component Sample Tower Ty	vpe Condition	Type B S	Status	pass
Sensor Component Conduit	Condition	N/A S	Status	pass
Sensor Component Met Tower	Condition	N/A S	Status	pass
Sensor Component Moisture Trap	Condition	Not installed S	Status	pass
Sensor Component Power Cables	Condition	Good	Status	pass
Sensor Component Shelter Temp Co	ntrol Condition	N/A S	Status	pass
Sensor Component Rotometer	Condition	Installed	Status	pass
Sensor Component Sample Tower	Condition	Good	Status	pass
Sensor Component Shelter Condition	Condition	N/A S	Status	pass
Sensor Component Shelter Door	Condition	N/A S	Status	pass
Sensor Component Shelter Roof	Condition	N/A S	Status	pass
Sensor Component Shelter Floor	Condition	N/A S	Status	pass
Sensor Component Signal Cable	Condition	Good S	Status	pass
Sensor Component Tubing Type	Condition	3/8 teflon S	Status	pass
Sensor Component Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem	
Flow Rate	NIC001	Korey Devins	07/10/2019	Moisture Present	Apex	3963			
The filter sample tubing has drops of moisture in low sections outside the shelter.									

Field Systems Comments

1 Parameter: DasComments

Single tower with filter pack mounted at 10 meters and temperature mounted at 9 meters.

2 Parameter: DocumentationCo

There is no logbook onsite to record information regarding site status or filter information.

3 Parameter: ShelterCleanNotes

Small footprint site with no shelter. Equipment housed in enclosure on sample tower. The NY DEC operators a full monitoring shelter at the same location.

4 Parameter: PollAnalyzerCom

There is water accumulating in a low section of the filter pack tubing below the enclosure.

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Site ID NIC001	Technician Korey Devins	Site Visit Date 07/10/	2019
Site Sponsor (agency)	EPA	USGS Map	
Operating Group	NY DEC	Map Scale	
AOS #		Map Date	
Meteorological Type		-	
Air Pollutant Analyzer		OAPP Latitude	
Deposition Measurement	dry	OAPP Longitude	
Land Use	Woodland - mixed	OAPP Elevation Meters	
Terrain	Complex	OAPP Declination	
Conforms to MLM	No	QAPP Declination Date	
Site Telephone		Audit Latitude	43,68596
Site Address 1		Audit Longitude	-74 9857
Site Address 2		Audit Elevation	526
County	Herkimer	Audit Declination	
City State		Audit Decimation	
Zin Code	13/20	Present	
Zip Code	Factors	Fire Extinguisher	
		Sefetre Cleaners	
Primary Operator		Safety Glasses	
Primary Op. Phone #		Safety Hard Hat	
Primary Op. E-mail			
Backup Operator		Security Fence ►	
Backup Op. Phone #		Secure Shelter	
Backup Op. E-mail		Stable Entry Steps ✓	
Shelter Working Room	Make M	bdel	Shelter Size
Shelter Clean	Notes Small footprint site with no she operators a full monitoring she	Iter. Equipment housed in enclo Iter at the same location.	sure on sample tower. The NY DEC
Site OK	Notes		
Driving Directions			

NIC001

F-02058-1500-S2-rev002

Site ID

Technician Korey Devins

Site Visit Date 07/10/2019

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

Siting Distances OK

Siting Criteria Comment
Fi	eld Systems Data Form		F-02058-1500-S3-rev002
Site	NIC001 Technician Korey Devins		Site Visit Date 07/10/2019
1 2 3 4	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions? Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind) Are the tower and sensors plumb? Are the temperature shields pointed north or positioned to	 > > > 	N/A N/A N/A
5	avoid radiated heat sources such as buildings, walls, etc? 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

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Site	e ID	NIC001	Technician	Korey Devins		Site Visit Date	07/10/2019	
1 2 3	Do all th condition Are all th reporting Are the s	e meterological sensor n, and well maintained ne meteorological sens g data? shields for the temper	rs appear to be 1? sors operational ature and RH so	intact, in good online, and ensors clean?	> > >	N/A		
1	Are the a	ispirated motors wor	xing.					
5	Is the sol scratches	ar radiation sensor's s?	lens clean and f	ree of		N/A		
6	Is the su	rface wetness sensor g	grid clean and u	ndamaged?		N/A		
7	Are the s condition	ensor signal and pow 1, and well maintained	er cables intact, 1?	in good	✓			
8	Are the s from the	ensor signal and pow elements and well ma	er cable connec aintained?	tions protected	✓			

Fi	eld Sy	stems Data Fo	rm			F-02058-15	00-S5-rev002
Site	e ID	NIC001	Technician	Korey Devins		Site Visit Date 07/10/2019	
	Siting C	riteria: Are the polluta	ant analyzers a	nd deposition eq	<u>uipr</u>	nent sited in accordance with 40 CFR 58	3, Appendix E
1	Do the s unrestri	ample inlets have at lea cted airflow?	ast a 270 degre	e arc of	✓		
2	Are the	sample inlets 3 - 15 me	ters above the	ground?	✓		
3	Are the and 20 n	sample inlets > 1 meter neters from trees?	r from any maj	or obstruction,			
	Pollutan	t analyzers and deposi	tion equipmen	t operations and	mai	intenance	
1	Do the a conditio	nalyzers and equipment n and well maintained	nt appear to be ?	in good	✓		
2	Are the reportin	analyzers and monitor g data?	rs operational, o	on-line, and	✓		
3	Describe	e ozone sample tube.				N/A	
4	Describe	e dry dep sample tube.				3/8 Teflon by 10 meters	
5	Are in-li indicate	ne filters used in the or location)	zone sample lin	ne? (if yes	✓	N/A	
6	Are sam obstruct	ple lines clean, free of ions?	kinks, moistur	e, and	✓	Water in low section of tubing	
7	Is the ze	ro air supply desiccant	t unsaturated?		✓	N/A	
8	Are then	e moisture traps in the	e sample lines?			Not present	
9	Is there clean?	a rotometer in the dry	deposition filte	er line, and is it	✓		

Provide any additional 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 water accumulating in a low section of the filter pack tubing below the enclosure.

Fi	eld Sy	stems Data Fo	orm				F-02	058-15	00-S6-rev002
Site	e ID	NIC001	Technician	Korey Devins		Site Visit Date	07/10/2019		
	DAS, se	ensor translators, and	<u>peripheral equi</u>	pment operation	<u>ıs an</u>	d maintenance			
1	Do the l well ma	DAS instruments appe intained?	ear to be in good	l condition and					
2	Are all modem	the components of the , backup, etc)	DAS operation	al? (printers,					
3	Do the a lightnin	analyzer and sensor signal sensor sensor signal sensor signal sensor sensor signal sensor signal sensor signal sensor signal sensor senso	gnal leads pass ?	through					
4	Are the well ma	signal connections pro intained?	otected from the	e weather and					
5	Are the	signal leads connected	l to the correct	DAS channel?					
6	Are the ground	DAS, sensor translato ed?	ors, and shelter	properly					
7	Does th	e instrument shelter h	ave a stable pov	ver source?					
8	Is the in	nstrument shelter temp	perature contro	lled?		N/A			
9	Is the m	net tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	ample tower stable and	l grounded?						
11	Tower o	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:

Single tower with filter pack mounted at 10 meters and temperature mounted at 9 meters.

Fie	eld Systems Data	Fo	rm				F-02	2058-	-1500-S7-rev	002
Site	NIC001		Tech	nician Kore	ey Devins	Site Visit Date	07/10/2019	€		
D	ocumentation									
D	Percent State Form F-02058-1500-S7-rev002 ID NIC001 Technician Korey Devins Site Visit Date 07/10/2019 commentation									
		Yes	No	N/A			Yes	No	N/A	
Win	d speed sensor				Data logge	er				
Win	d direction sensor				Data logge	er				
Tem	perature sensor				Strip char	t recorder				
Rela	tive humidity sensor				Computer					
Sola	r radiation sensor				Modem					
Surf	ace wetness sensor				Printer					
Win	d sensor translator				Zero air p	ump				
Tem	perature translator				Filter flow	pump				
Hun	nidity sensor translator				Surge prot	tector				
Sola	r radiation translator				UPS					
Tipp	bing bucket rain gauge				Lightning	protection device				
UZO	ne analyzer				Shelter he	ater				
FILE	er pack now controller				Sneller all	conditioner				
rnte	er pack wirt power supply		_	V						
	Does the site have the requ	ired a	and mo	<u>st recent Q</u>	<u>C documents and</u>	<u>report forms?</u>				
		Pres	sent				Curre	ent		
Stat	ion Log			No logbook						
SSR	F									
Site	Ops Manual									
HAS	or I One Menuel									
Cali	h Ops Manual									
Call	no glain Control Charta									
Drox	ne 2/8/p Control Charts	alo								
110	entive manitenance scheut	inc								
1	Is the station log properly	comp	oleted d	luring every	y site visit? 🔲 🛛	lo logbook				
2	Are the Site Status Report current?	t Forn	ns bein	g completed	d and 🗹					
3	Are the chain-of-custody f sample transfer to and fro	forms om lat	prope o?	rly used to d	locument 🗹					
4	Are ozone z/s/p control ch current?	arts p	oroperl	y completed	l and 🔽 N	I/A				
Prov natu	vide any additional explana Iral or man-made, that may	ation (y affe	photog ct the r	graph or ske nonitoring j	etch if necessary) parameters:	regarding condit	ions listed	above,	or any other feature	' S,
Thor	o is no logbook opsite to rea	ord inf	ormotic	n rogarding	oito ototuo or filtor	information				

There is no logbook onsite to record information regarding site status or filter information.

NIC001 Technician Korey Devins Site Visit Date 07/10/2019 Site ID Site operation procedures Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

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

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

QC Check Performed	Frequency	Compliant
Multi-point Calibrations	□ N/A	
Automatic Zero/Span Tests	N/A	
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-noint calibration gases go through	the complete 🔽 N/A	

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

✓	N/A
✓	N/A
	N/A

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

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Compliant

Field S	Systems Data Fo	orm	F-02058-1500-S9-rev002
Site ID	NIC001	Technician Korey Devins	Site Visit Date 07/10/2019

Site

	Site operation procedures				
1	Is the filter pack being changed every	7 Tuesday as scheduled?		Filter changed mornings	s
2	Are the Site Status Report Forms bei correctly?	ng completed and filed			
3	Are data downloads and backups bei scheduled?	ng performed as	✓	No longer required	
4	Are general observations being made	and recorded? How?	✓	SSRF	
5	Are site supplies on-hand and repleni fashion?	shed in a timely			
6	Are sample flow rates recorded? How	v?	✓	SSRF	
7	Are samples sent to the lab on a regu fashion?	lar schedule in a timely	✓		
8	Are filters protected from contamina and shipping? How?	tion during handling	✓	Clean gloves on and off	F
9	Are the site conditions reported reguloperations manager or staff?	larly to the field			
QC	Check Performed	Frequency		Co	mpliant
	Multi-point MFC Calibrations	Semiannually			
	Flow System Leak Checks	✓ Weekly			
1	Filter Pack Inspection	✓ Weekly		\checkmark	
]	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			

Field Sys	stems Data Fo	rm			F-02058-15 0	0-S10-rev002
Site ID	NIC001	Technician	Korey Devins	Site Visit Date	07/10/2019	

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR850	23268	000801
elevation	Elevation	none	none	none
Filter pack flow pump	Permotec	BL30EB	Illegible	none
Flow Rate	Apex	AXMC105LPMDPC	unknown	000594
Infrastructure	Infrastructure	none	none	none
Modem	Sierra wireless	GX440	Unknown	06989
Sample Tower	Aluma Tower	В	AT-212125X73	000785
siting criteria	Siting Criteria	none	None	none
Temperature	RM Young	41342	none	04943

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CNT	169-Martin	Valvur-07/16/2019				
1	7/16/2019	Computer	Dell	07038	Inspiron 15	Unknown
2	7/16/2019	DAS	Campbell	000427	CR3000	2526
3	7/16/2019	Elevation	Elevation	None	1	None
4	7/16/2019	Filter pack flow pump	Thomas	02753	107CAB18	1192001900
5	7/16/2019	Flow Rate	Арех	000559	AXMC105LPMDPCV	illegible
6	7/16/2019	Infrastructure	Infrastructure	none	none	none
7	7/16/2019	Ozone	ThermoElectron Inc	000620	49i A1NAA	1009241793
8	7/16/2019	Ozone Standard	ThermoElectron Inc	000687	49i A3NAA	1030244809
9	7/16/2019	Sample Tower	Aluma Tower	000179	В	unknown
10	7/16/2019	Shelter Temperature	Campbell	none	107-L	none
11	7/16/2019	Siting Criteria	Siting Criteria	None	1	None
12	7/16/2019	Temperature	RM Young	06501	41342	14606
13	7/16/2019	Zero air pump	Werther International	06925	C 70/4	000836220

DAS Data Form

DAS Time Max Error: 0.08

Mfg	Serial N	Number Site	ſ	Fechnician	Site Visit Date	Parameter	Use Desc.
Campbell	2526	CN	T169	Martin Valvur	07/16/2019	DAS	Primary
Das Date:	7 /16/2019	Audit Date	7 /16/2019	Mfg	HY	Parameter	DAS
Das Time: Das Day:	197	Audit Time Audit Day	197	Serial Number	12010039329	Tfer Desc.	Source generator (D
Low Channe	d:	High Channe	:	Tfer ID	01322		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.000	0.00	03 0.000	0.0003	Cert Date	6/15/201	4 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740243	Tfer Desc.	DVM
				Tfer ID	01312		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/25/201	9 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.0004	-0.0003	3 V	V	0.0001	
7	0.1000	0.0998	0.0997	7 V	V	-0.0001	
7	0.3000	0.2993	0.2992	2 V	V	-0.0001	
7	0.5000	0.4998	0.4997	7 V	V	-0.0001	
7	0.7000	0.6997	0.6994	4 V	V	-0.0003	
7	0.9000	0.8992	0.8990) V	V	-0.0002	
7	1.0000	1.0001	1.0000) V	V	-0.0001	

Flow Data Form

Mfg	MfgSerial Number Tag SiteTechnology		chnician	Site Visit Date	e Paran	neter	Owner ID			
Арех	illegible		CNT169	Ma	artin Valvur	07/16/2019	Flow R	late	000559	
					Mfg	BIOS	P	arameter Flo	w Rate	
				Serial Number	122974	Т	fer Desc. BIC	S 220-H		
					Tfer ID	01416				
					Slope	1.001	78 Inte	ercept	0.00161	
					Cert Date)18 <mark>Co</mark> l	rrCoff	1.00000		
DAS 1:		DAS 2:			Cal Factor Z	ero	-0.0	01		
A Avg % Diff:	A Max % Dif	A Avg %	Diff A Max	x % Dif	Cal Factor F	ull Scale	1.0	11		
0.77%	0.99%				Rotometer R	eading:	3.8	85		
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E In	putUnit	OutputSignalI	PctDifference	
primary	pump off	0.000	0.000	0.00	0.000	-0.02	l/m	l/m		
primary	leak check	0.000	0.000	0.00	0.000	0.01	l/m	l/m		
primary	test pt 1	3.030	3.020	2.95	0.000	2.99	l/m	l/m	-0.99%	
primary	test pt 2	3.020	3.010	2.95	0.000	2.99	l/m	l/m	-0.66%	
primary	test pt 3	3.030	3.020	2.95	0.000	3.00	l/m	l/m	-0.66%	
Sensor Comp	onent Leak Tes	st		Conditio	Condition			Status pass		
Sensor Comp	onent Tubing C	ondition		Conditio	on Good		Statu	s pass		
Sensor Comp	onent Filter Pos	sition		Conditio	on Good		Statu	s pass		
Sensor Comp	onent Rotomete	er Conditio	١	Conditio	Clean and dry		Statu	s pass		
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	esent	Statu	s pass		
Sensor Component Filter Distance					5.5 cm		Statu	<mark>s</mark> pass		
Sensor Comp	onent Filter Dep	oth		Conditio	on 0.5 cm		Status pass			
Sensor Comp	onent Filter Azi	muth		Conditio	on 350 deg		Statu	s pass		
Sensor Comp	onent System M	Nemo		Conditio	on	Status pas		s pass		

Ozone Data Form

Mfg		Serial Numbe	er Tag	Site	1	Tech	nician	Site Visit Date	Parameter	Owner ID
ThermoElec	tron Inc	1009241793		CNT169		Mar	tin Valvur	07/16/2019	Ozone	000620
Slope: Intercept CorrCoff:	Slope:1.03170Slope:ntercept0.05684InterceptCorrCoff:1.00000CorrCoff:		e: [rcept [rCoff: [0.00000 0.00000 0.00000		N S T	Afg Serial Number Sfer ID	ThermoElectron 49CPS-70008-30 01110	Inc Paramo	eter ozone
DAS 1: A Avg % D)iff: A N 0%	D. 1 ax % Dif A 0.0%	AS 2: Avg %	Diff A	Max % Dif	S C	llope Cert Date	1.0015	1 Intercept 8 CorrCoff	0.00666
UseDescri primat primat primat primat primat	iption ry	ConcGroup 1 2 3 4 5	Tfer 0. 15 35 65 110	Raw 20 .04 .33 .53 0.38	Tfer Cor 0.19 15.01 35.26 65.42 110.20	r	Site 0.22 15.40 36.67 67.54 113.70	Site Unit ppb ppb ppb ppb ppb	RelPerDif 3.9 3.1 3.1	AbsDif 0.03 0.39 2 9 3
Sensor C Sensor C Sensor C	ompone ompone ompone	nt Sample Tra nt 22.5 degree nt Inlet Filter C	in e rule Conditior	1	Cond	lition lition lition	Good Clean		StatuspassStatuspassStatuspass	
Sensor Component Battery Backup		kup	Condition		lition lition	N/A		Status pass		
Sensor C	ompone	nt Span			Conditio		1.011		Status pass	;
Sensor C	ompone	nt Zero Voltag	e		Condition N/A		N/A		Status pass	;
Sensor C	ompone	nt Fullscale Vo	oltage		Cond	lition	N/A	V/A		
Sensor C	ompone	Cell A Freq			Cond	lition	1 90.7 kHz		Status pass	
Sensor C	ompone	nt Cell A Flow	÷		Cond	lition	0.9 ppb		Status pass	
Sensor C	ompone	nt Cell A Press	sure		Cond	lition	506.4 mmHg		Status pass	·
Sensor C	ompone	nt Cell A Tmp.			Cond	lition	36.4 C		Status pass	
Sensor C	ompone	nt Cell B Freq	1		Cond	lition	102.1 kHz		Status pass	;
Sensor C	ompone	ent Cell B Noise	Э		Cond	lition	0.6 ppb		Status pass	;
Sensor C	ompone	nt Cell B Flow			Cond	lition	0.58 lpm		Status pass	
Sensor C	ompone	nt Cell B Pres	sure		Cond	lition	506.1 mmHg		Status pass	
Sensor C	ompone	nt Cell B Tmp.			Cond	lition	N/A		Status pass	
Sensor C	ompone	nt Line Loss			Cond	lition	Not tested		Status pass	
Sensor C	ompone	nt System Me	mo		Cond	lition	1		Status pass	i

Temperature Data Form

Mfg	IfgSerial Number Tag SiteT		Fechnician		Site V	isit Date	Param	eter	Owner ID		
RM Young	14606	CNT169		Martin	Valvur	07/16	/2019	Temper	ature	06501	
				Mfg				Pa	arameter Te	emperature	
				Serial Number		32751	43	Tf	er Desc. R	ſD	
				Tfe	er ID	01229					
DAS 1:	DAS 1: DAS 2:				ре		0.99989 Intercept		rcept	-0.00649	
Abs Avg Err	Abs Avg Err Abs Max Err Abs Avg Err Abs Ma				x Err Cert Date			9 Cor	rCoff	1.00000	
0.07	0.12										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary	Temp Low Range	0.05	0.06		0.000		0.2	2	С	0.12	
primary	Temp Mid Range	24.18	24.19)	0.000		24.	2	С	-0.02	
primary	Temp High Range	46.94	46.95	5	0.000		47.	0	С	0.06	
Sensor Com	ponent Shield		Condi	ition C	Clean			Status	pass		
Sensor Component Blower				Condition N/A				Status	s pass		
Sensor Component Blower Status Switch				Condition N/A				Status	us pass		
Sensor Com	ponent System Memo)	Condi	Condition				Status	us pass		

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID	
Campbell	none	CNT169	Martin Valvur	07/16/2019	Shelter Temperature	none	
DAS 1:	DAS 2:		Mfg	Fluke	Parameter She	elter Temperature	
Abs Avg Err Abs	Max Err Abs Avg 0.41	Err Abs Max Err	Serial Number	3275143	Tfer Desc. RTI)	
			Tfer ID	01229			
			Slope	0.9998	39 Intercept	-0.00649	
			Cert Date	1/23/201	9 CorrCoff	1.00000	

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.00	25.01	0.000	25.0	С	-0.03
primary	Temp Mid Range	26.36	26.37	0.000	26.0	С	-0.41
primary	Temp Mid Range	26.69	26.70	0.000	26.8	С	0.05
Sensor Component System Memo Condition Status pass							

Infrastructure Data For

Site ID	CNT169	Technician Martin Va	alvur Site Visit Date 07/16/2019
Shelter	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2149-19)	640 cuft
10 Jacob Roberts			

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

Field Systems Comments

1 Parameter: SiteOpsProcedures

The ozone inlet filter is changed once each month.

2 Parameter: ShelterCleanNotes

The shelter is dirty. Many floor tiles are old and broken, the floor is deteriorating.

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Site ID	CNT169	Technician Martin Valvur	Site Visit Date 07/1	6/2019					
			LICCE Man	Contonnial					
Site Sponsor	(agency)	EPA	USGS Map	Centerma					
Operating Gr	roup	Forest Service	Map Scale						
AQS #		56-001-9991	Map Date						
Meteorologica	al Type	R.M. Young							
Air Pollutant	Analyzer	Ozone	QAPP Latitude	41.3722					
Deposition M	easurement	dry, wet	QAPP Longitude	-106.2422					
Land Use		woodland - evergreen	QAPP Elevation Meters	3178					
Terrain		complex	QAPP Declination	10.9					
Conforms to 3	MLM	Marginally	QAPP Declination Date	12/28/2004					
Site Telephone		(307) 742-7229	Audit Latitude	41.364531					
Site Address 1		Brooklyn Lake Guard Station	Audit Longitude	-106.24002					
Site Address 2		Medicine Bow National Forest	Audit Elevation	3175					
County		Albany	Audit Declination	9.5					
City, State		Centennial, WY	Present						
Zip Code		82055	Fire Extinguisher 🗹	New in 2015					
Time Zone		Mountain	First Aid Kit						
Primary Ope	rator		Safety Glasses						
Primary Op.	Phone #		Safety Hard Hat						
Primary Op.	E-mail		Climbing Belt						
Backup Oper	ator		Security Fence						
Backup Op.	Phone #		Secure Shelter						
Backup Op.	E-mail		Stable Entry Steps						
Shelter Work	ting Room 🗹	Make Ekto M	odel 8810 (s/n 2149-19)	Shelter Size 640 cuft					
Shelter Clean		Notes The shelter is dirty. Many floo	r tiles are old and broken, the fl	oor is deteriorating.					
Site OK	\checkmark	Notes							
Driving Direc	Ite OK Ite Notes Priving Directions From Laramie take route 130 west to Centennial. Continue through town and into the Medicine Bow National Forest. Turn right near the summit onto a dirt road at the sign for Brooklyn Lake Campground. Continue approximately 1.5 miles to Little Brooklyn Lake. There will be a small chapel on the right. Park at the chapel and walk approximately 200 meters up the hill past the chapel to the site								

CNT169

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Site ID

Technician Martin Valvur

Site Visit Date 07/16/2019

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

Siting Distances OK

Siting Criteria Comment

Fie	eld Sy	stems Data Fo	orm			F-0205 8	8-1500-S3-rev002
Site	e ID	CNT169	Technician	Martin Valvur		Site Visit Date 07/16/2019	
1	Are wind being inf	d speed and direction fluenced by obstructio	sensors sited so	as to avoid	✓	N/A	
2 Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)						N/A	
3	Are the	tower and sensors plu	mb?		✓	N/A	
4	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 so	lar radiation sensor p	lumb?			N/A	
7	Is it site	l to avoid shading, or	any artificial o	r reflected light?	✓	N/A	
8	Is the ra	in gauge plumb?				N/A	
9	Is it sited towers, o	l to avoid sheltering e etc?	ffects from buil	ldings, trees,	✓	N/A	
10	Is the su facing n	rface wetness sensor s orth?	sited with the g	rid surface		N/A	
11	Is it inc	lined approximately 3	0 degrees?			N/A	
						L	

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Site	ID	CNT169	Technician	Martin Valvur		Site Visit Date 07/16/2019
1	Do all the	e meterological sensor	s appear to be	intact, in good		Temperature only
	condition	n, and well maintained	!?		_	
2	Are all th reporting	ne meteorological sens g data?	ors operational	l online, and		
3	Are the s	hields for the tempera	ature and RH s	ensors clean?	✓	
4	Are the aspirated motors working?					N/A
5	Is the sol scratches	ar radiation sensor's l	ens clean and f	ree of		N/A
6	Is the sur	face wetness sensor g	rid clean and u	ndamaged?	✓	N/A
7	Are the s condition	ensor signal and powe	er cables intact, ?	, in good		
8	Are the s from the	ensor signal and powe elements and well ma	er cable connec intained?	tions protected	✓	

Fi	eld Sys	stems Data Fo	orm			F-02058-1500-S5-rev002
Sit	e ID	CNT169	Technician	Martin Valvur		Site Visit Date 07/16/2019
	Siting Cr	iteria: Are the pollut	ant analyzers an	nd deposition equ	uipn	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the sa unrestric	mple inlets have at le ted airflow?	east a 270 degree	e arc of		
2	Are the sa	ample inlets 3 - 15 m	eters above the g	ground?	✓	
3	Are the sa and 20 m	ample inlets > 1 mete leters from trees?	er from any maje	or obstruction,	✓	
	Pollutant	t analyzers and depos	ition equipment	operations and	mai	intenance
1	Do the an condition	nalyzers and equipme a and well maintained	ent appear to be	in good		
2	Are the a reporting	nalyzers and monitor g data?	rs operational, o	n-line, and		
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-lin indicate l	ne filters used in the o location)	ozone sample lin	e? (if yes		At inlet only
6	Are samp obstruction	ple lines clean, free of ons?	' kinks, moisture	, and	✓	
7	Is the zer	o air supply desiccan	t unsaturated?		✓	
8	Are there	e moisture traps in th	e sample lines?		✓	Flow line only
9	Is there a clean?	n rotometer in the dry	v deposition filte	r line, and is it		Clean and dry

Fi	eld Sy	stems Data Fo	orm				F-02	058-15	00-S6-rev002
Site	e ID	CNT169	Technician	Martin Valvur		Site Visit Date	07/16/2019		
	DAS, se	nsor translators, and	peripheral equi	pment operation	ns ai	nd maintenance			
1	Do the l well ma	DAS instruments appe intained?	ear to be in good	l condition and	✓				
2	Are all modem,	the components of the , backup, etc)	DAS operation	al? (printers,	✓				
3	Do the a lightnin	analyzer and sensor signalyzer and sensor signaly and sensor signal sensor signal sensor signal sensor signals	gnal leads pass (?	through	✓	Met sensors only			
4	Are the signal connections protected from the weather and well maintained?								
5	Are the	signal leads connected	l to the correct	DAS channel?	✓				
6	Are the ground	DAS, sensor translate ed?	ors, and shelter j	properly	✓				
7	Does the	e instrument shelter h	ave a stable pow	ver source?	✓				
8	Is the in	strument shelter temp	perature control	lled?					
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	d grounded?						
11	Tower o	comments?							

Field Systems Data	Fo	rm			F-	02058	-1500-S7-rev002
Site ID CNT169	CNT169		nician	Martin Valvur Site Visit	Date 07/16/20		
Documentation							
Does the site have the requi	red in	strume	nt and	<u>equipment manuals?</u>			
	Yes	No	N/	A	Yes	No	N/A
Wind speed sensor			\checkmark	Data logger		\checkmark	
Wind direction sensor			\checkmark	Data logger			\checkmark
Temperature sensor	✓			Strip chart recorder			
Relative humidity sensor			\checkmark	Computer	\checkmark		
Solar radiation sensor			\checkmark	Modem		\checkmark	
Surface wetness sensor				Printer			\checkmark
Wind sensor translator			\checkmark	Zero air pump		\checkmark	
Temperature translator			\checkmark	Filter flow pump		\checkmark	
Humidity sensor translator			\checkmark	Surge protector			
Solar radiation translator			\checkmark	UPS			
Tipping bucket rain gauge			\checkmark	Lightning protection d	evice		
Ozone analyzer		\checkmark		Shelter heater			
Filter pack flow controller	\checkmark			Shelter air conditioner		\checkmark	
Filter pack MFC power supply	7		\checkmark				
Does the site have the requ	iired a	und mo	st rece	nt QC documents and report form	<u>18?</u>		
	Pres	sent			Cui	rent	
Station Log		✓				✓	
SSRF		✓				✓	

Station Log			
SSRF			<u>.</u>
Site Ops Manual	\checkmark	March 2015	_
HASP		March 2015	
Field Ops Manual		March 2019	
Calibration Reports	\checkmark		_
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

✓

✓

CNT169 Technician Martin Valvur Site Visit Date 07/16/2019 Site ID Site operation procedures Trained by previous operator Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

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

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

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

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

Frequency	Compliant
Semiannually	
Daily	
As needed	
Daily	
As needed	
Weekly	
Monthly	
N/A	
Weekly	
Weekly	\checkmark

- Do multi-point calibration gases go through the complete 1 sample train including all filters?
- 2 Do automatic and manual z/s/p gasses go through the complete sample train including all filters?
- Are the automatic and manual z/s/p checks monitored and 3 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 changed once each month.

F-02058-1500-S8-rev002

Fi	eld Sy	stems Data Fo	rm				F-02058-1	500-S9-rev002
Sit	e ID	CNT169	Technicia	Martin Valvur		Site Visit Date	07/16/2019]
	<u>Site ope</u>	eration procedures						
1	Is the fi	lter pack being changed	every Tuese	lay as scheduled		filter changed aftern	noons, 80% of the time	
2	2 Are the Site Status Report Forms being completed and filed correctly?							
3	Are data downloads and backups being performed as scheduled?					No longer required		
4	Are general observations being made and recorded? How?				✓	SSRF, logbook		
5	Are site supplies on-hand and replenished in a timely fashion?				✓			
6	Are san	pple flow rates recorded	? How?		✓	SSRF, call-in		
7	Are san fashion	nples sent to the lab on a ?	a regular sch	edule in a timely	✓			
8	Are filte and shij	ers protected from conta pping? How?	amination du	ıring handling	✓	Clean gloves on and	d off	
9	9 Are the site conditions reported regular operations manager or staff?		l regularly to) the field				
QC	Check P	erformed	Fr	equency			Compliant	
I	Multi-poi	nt MFC Calibrations	✓ Se	miannually				
]	Flow Syst	em Leak Checks	✓ We	ekly				
]	Filter Pac	k Inspection						
]	Flow Rate	e Setting Checks	✓ We	ekly				
	Visual Ch	eck of Flow Rate Roton	neter 🗹 We	ekly				
]	In-line Fil	ter Inspection/Replacen	nent 🗹 Se	miannually				
5	Sample Li	ine Check for Dirt/Wate	er 🗹 We	ekly				

CNT169

F-02058-1500-S10-rev002

Site ID	
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Techn

Technician Martin Valvur

Site Visit Date 07/16/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07038
DAS	Campbell	CR3000	2526	000427
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	1192001900	02753
Flow Rate	Apex	AXMC105LPMDPC	illegible	000559
Infrastructure	Infrastructure	none	none	none
Ozone	ThermoElectron Inc	49i A1NAA	1009241793	000620
Ozone Standard	ThermoElectron Inc	49i A3NAA	1030244809	000687
Sample Tower	Aluma Tower	В	unknown	000179
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14606	06501
Zero air pump	Werther International	C 70/4	000836220	06925

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
THR	422-Martin	v Valvur-07/22/2019				
1	7/22/2019	Computer	Hewlett Packard	none	65606	5CB1520H68
2	7/22/2019	DAS	Environmental Sys Corp	90656	8816	2600
3	7/22/2019	Elevation	Elevation	None	1	None
4	7/22/2019	Filter pack flow pump	Thomas	03634	107CAB18	049400004441
5	7/22/2019	flow rate	Tylan	02170	FC280SAV	AW901295
6	7/22/2019	Infrastructure	Infrastructure	none	none	none
7	7/22/2019	Mainframe	Climatronics	none	100081	1911
8	7/22/2019	Mainframe power supply	Climatronics	none	101074	unknown
9	7/22/2019	Met tower	Rohn	none	unknown	none
10	7/22/2019	MFC power supply	Tylan	03870	RO-32	FP9508008
11	7/22/2019	Ozone	ThermoElectron Inc	E00051	49i A1NAA	1153170017
12	7/22/2019	Sample Tower	Aluma Tower	none	В	AT-81077-J5
13	7/22/2019	Shelter Temperature	ARS	none	none	none
14	7/22/2019	Siting Criteria	Siting Criteria	None	1	None
15	7/22/2019	Temperature Translator	Climatronics	01545	100088-2	217
16	7/22/2019	Temperature2meter	Climatronics	none	100093	7974
17	7/22/2019	Zero air pump	Thomas	none	607CA22C	039500000348

DAS Data Form

DAS Time Max Error:

1.1

Mfg	Serial Nu	mber Site	Т	echnician	Site Visit Date	Parameter	Use Desc.
Environmental S	Sys 2600	THR	422 N	Martin Valvur	07/22/2019	DAS	Primary
Das Date:	7 /22/2019	Audit Date	7 /22/2019	Mfg	HY	Parameter	DAS
Das Day:	203	Audit Time	203	Serial Number	12010039329	Tfer Desc.	Source generator (D
Low Channel:		High Channel	:	Tfer ID	01322		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0002	0.0004	0.0002	0.0004	Cert Date	6/15/201	4 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740243	Tfer Desc.	DVM
				Tfer ID	01312		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/25/201	9 CorrCoff	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
15	0.0000	-0.0003	-0.0002	V	V	0.0001	
15	0.1000	0.0995	0.0997	V	V	0.0002	
15	0.3000	0.2994	0.2996	V	V	0.0002	
15	0.5000	0.4994	0.4995	V	V	0.0001	
15	0.7000	0.6998	0.7002	V	V	0.0004	
15	0.9000	0.9000	0.9002	V	V	0.0002	
15	1.0000	1.0002	1.0005	V	V	0.0003	

Flow Data Form

Mfg	Serial Num	ıber Tag Si	te	Te	chnician	Site Visit I	Date Paran	neter	Owner ID
Tylan	AW901295	Т	HR422	Ma	artin Valvur	07/22/2019	9 flow ra	te	02170
Mfg	Tylan				Mfg	BIOS	P	arameter	Flow Rate
SN/Owner ID	FP9508008	03870			Serial Number	148613	Г	fer Desc.	BIOS 220-H
Parameter:	MFC power sup	oply			Tfer ID	01421			
					Slope	1	.00000 Int	ercept	0.00000
					Cert Date	3/	/4/2019 Co	rrCoff	1.00000
					Mfg	BIOS	P	arameter	Flow Rate
					Serial Number	122974	T	fer Desc.	BIOS 220-H
					Tfer ID	01416			
					Slope	1	.00178 Int	ercept	0.00161
					Cert Date	7/1	3/2018 Co	rrCoff	1.00000
DAS 1.		DAS 2.			Cal Factor 7	ero	-0.0	94	
A Avg % Diff:	A Max % Dif	A Avg %D	iff A Max	% Dif	Cal Factor E	ull Scale	5.	33	
0.76%	1.31%				Rotometer R	eading:	3	3.5	
Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSign	all PctDifference
primary	pump off	0.000	0.000	0.01	0.000	-0.07	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	3.050	3.050	2.92	0.000	3.09	l/m	l/m	1.31%
primary	test pt 2	3.053	3.050	2.91	0.000	3.05	l/m	l/m	0.00%
primary	test pt 3	3.049	3.050	2.91	0.000	3.08	l/m	l/m	0.98%
Sensor Comp	onent Leak Tes	t		Conditio	on		Statu	<mark>s</mark> pass	
Sensor Comp	onent Tubing C	ondition		Conditio	on Good		Statu	<mark>s</mark> pass	
Sensor Comp	onent Filter Pos	ition		Conditio	Good		Statu	<mark>s</mark> pass	
Sensor Comp	onent Rotomete	er Condition		Conditio	Clean and dry		Statu	<mark>s</mark> pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture p	resent	Statu	s pass	
Sensor Comp	onent Filter Dist	ance		Conditio	5.0 cm		Statu	<mark>s</mark> pass	
Sensor Comp	onent Filter Dep	oth		Conditio	0.2 cm		Statu	<mark>s</mark> pass	
Sensor Comp	onent Filter Azir	nuth		Conditio	270 deg		Statu	<mark>s</mark> pass	
Sensor Comp	onent System M	lemo		Conditio	on		Statu	s pass	

Ozone Data Form

Mfg		Serial Numbe	r Tag Site	Т	echnician	Site Visit Date	Parameter	Owner ID
ThermoElectro	n Inc	1153170017	THR422		Martin Valvur	07/22/2019	Ozone	E00051
Slope: Intercept CorrCoff: DAS 1: A Avg % Diff 0.0%	- - - -	0.96757 Slop 1.34024 Inter 0.99998 Corr DA Iax % Dif A 0.0%	e: () rcept () Coff: () AS 2: Avg %Diff A	0.00000 0.00000 0.00000 Max % Dif	Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 49CPS-70008-3 01110 1.001 10/30/20	Inc Parameter 364 Tfer Desc 51 Intercept 18 CorrCoff	er ozone c. Ozone primary stan 0.00666 1.00000
UseDescripti primary primary primary primary primary	ion	ConcGroup 1 2 3 4 5	Tfer Raw 0.19 17.34 34.66 67.90 113.99	Tfer Corr 0.18 17.30 34.60 67.79 113.81	Site -1.00 15.60 31.80 64.00 109.00	Site Unit ppb ppb ppb ppb ppb	RelPerDif -8.43 -5.75 -4.32	AbsDif -1.18 -1.7
Sensor Com Sensor Com Sensor Com	ipone ipone ipone	nt Sample Trai 22.5 degree nt Inlet Filter C	n rule ondition	Condia	tion Good tion tion Clean		StatuspassStatuspassStatuspass	
Sensor Com	- 1pone	nt Battery Back	kup	Condi	tion N/A		Status pass	
Sensor Com	ipone	nt Offset		Condi	tion 1.1		Status pass	
Sensor Com	ipone	nt Span		Condi	tion 0.960		Status pass	
Sensor Com	ipone	nt Zero Voltage	Э	Condi	tion 0.02		Status pass	
Sensor Com	ipone	nt Fullscale Vo	ltage	Condi	tion 1.02		Status pass	
Sensor Com	ipone	nt Cell A Freq.		Condi	tion 47.9 kHz		Status Fail	
Sensor Com	ipone	nt Cell A Noise	•	Condi	tion 0.7 ppb		Status pass	
Sensor Com	ipone	nt Cell A Flow		Condi	tion 0.54 lpm		Status pass	
Sensor Com	ipone	nt Cell A Press	sure	Condi	tion 545.3 mmHg		Status Fail	
Sensor Com	ipone	nt Cell A Tmp.		Condi	tion 31.6 C		Status pass	
Sensor Com	ipone	nt Cell B Freq.		Condi	tion 73.6 kHz		Status pass	
Sensor Com	ipone	nt Cell B Noise	9	Condi	tion 0.8 ppb		Status pass	
Sensor Com	ipone	nt Cell B Flow		Condi	tion 0.53 lpm		Status pass	
Sensor Com	ipone	nt Cell B Press	sure	Condi	tion 545.0 mmHg		Status Fail	
Sensor Com	ipone	nt Cell B Tmp.		Condi	tion N/A		Status pass	
Sensor Com	npone	nt Line Loss		Condi	tion Not tested		Status pass	
Sensor Com	ipone	nt System Men	no	Condi	tion See commen	ts	Status pass	

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Num	ber Tag	Site		T	echnicia	an	Site Vis	sit Date	Paramete	er	Owner ID
Climatronics	7974		THR422	2	Ν	lartin Va	alvur	07/22/2	2019	Temperat	ure2meter	none
Mfg	Climatronics					Mfg		Fluke		Para	meter Tem	perature
SN/Owner ID	217	01545				Seria	l Number	3275143	3	Tfer	Desc. RTD	
Parameter:	Temperature Tra	anslator				Tfer l	D	01229				
DAS 1:]	DAS 2:				Slope			0.9998	9 Interc	ept	-0.00649
Abs Avg Err	Abs Max Err	Abs Avg	Err A	bs Max	Err	Cert]	Date		1/23/201	9 CorrC	off	1.00000
0.06	0.14											
UseDescription	Test type	Inpuť	TmpRaw	Inpuť	ГтрСо	rrected	OutputTm	npSignal	OutputS	ignalEng	OSE Unit	Difference
primary	Temp Low Rar	g	0.19)		0.20)	0.000		0.34	С	0.14
primary	Temp Mid Ran	ge	23.83	3		23.84	Ļ	0.000		23.80	С	-0.04
primary	Temp High Rai	ng	46.98	3		46.99		0.000		47.00	С	0.01
Sensor Comp	onent Properly S	ited			Condit	ion Pro	perly sited			Status Pa	ass	
Sensor Comp	onent Shield				Condit	ion Clea	an			Status Pa	ass	
Sensor Comp	onent Blower				Condit	ion Fun	octioning			Status Pa	ass	
Sensor Comp	onent Blower Sta	atus Swite	ch		Condit	ion N/A				Status Pa	ass	
Sensor Comp	onent System M	emo			Condit	ion				Status Pa	ass	

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	THR422	Martin Valvur	07/22/2019	Shelter Temperatu	ire none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter S	Shelter Temperature
Abs Avg Err Abs	2.14 Abs Avg	Err Abs Max Err	Serial Number	3275143	Tfer Desc.	RTD
			Tfer ID	01229		
			Slope	0.9998	9 Intercept	-0.00649
			Cert Date	1/23/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.82	23.83	0.000	25.9	С	2.09
primary	Temp Mid Range	25.35	25.36	0.000	26.2	С	0.88
primary	Temp Mid Range	23.99	24.00	0.000	26.1	С	2.14
Sensor Component System Memo Condition Status pass							

Infrastructure Data For

Site ID	THR422	Technician Martin V	alvur Site Visit Date 07/22/2019
Shelter 1	Make	Shelter Model	Shelter Size
Ekto		8814 (s/n 3028-1)	896 cuft

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone This analyzer diagnostic o	THR422 check is outside	Martin Valvur the manufacturer's r	07/22/2019 recommended va	Cell B Pressure alue.	ThermoElectron	4382		
Ozone This analyzer diagnostic o	THR422 check is outside	Martin Valvur the manufacturer's r	07/22/2019 recommended va	Cell A Pressure alue.	ThermoElectron	4382		
Ozone This analyzer diagnostic o	THR422 check is outside	Martin Valvur the manufacturer's r	07/22/2019 recommended va	Cell A Freq. alue.	ThermoElectron	4382		

Field Systems Comments

1 Parameter: SiteOpsProcComm

Gloves are not used to handle the filter pack. The filter bag is used as a glove.

2 Parameter: SiteOpsProcedures

The ozone sample train does not have a means to introduce test gas at the sample inlet. Results of routine zero, span, precision, and any multipoint calibration checks are maintained by the state personnel who perform the tests. The two inlet filters in the sample train are creating a large pressure drop.

3 Parameter: SitingCriteriaCom

The site is located 200 meters from an interstate rest area, and 300 meters from interstate 94. The rest area can have parked and idling vehicles for extended periods.

4 Parameter: PollAnalyzerCom

The ozone analyzer is operated by the state of North Dakota. The sample train contains a glass manifold. There is no means to introduce on-site generated test gas at the sample inlet. A through-the-probe audit was conducted using the EEMS system.

5 Parameter: ShelterCleanNotes

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

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Site ID THR422	Technician Martin Valvur	Site Visit Date 07/22	2/2019
Site Sponsor (agency)	NPS	USGS Map	
Operating Group	NPS and state of ND	Map Scale	
AQS #	38-007-0002	Map Date	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, SO2, IMPROVE, PM2.5	QAPP Latitude	46.8947
Deposition Measurement	dry, wet	QAPP Longitude	-103.3778
Land Use	prairie	QAPP Elevation Meters	850
Terrain	rolling - complex	QAPP Declination	
Conforms to MLM	Marginally	QAPP Declination Date	
Site Telephone		Audit Latitude	46.894844
Site Address 1	Painted Canyon Visitor Center	Audit Longitude	-103.377719
Site Address 2	Exit 32 Interstate 94	Audit Elevation	840
County	Billings	Audit Declination	8.2
City, State	Medora, ND	Present	
Zip Code	58645	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 Me	odel 8814 (s/n 3028-1)	Shelter Size 896 cuft
Shelter Clean	Notes The shelter is in good condition	n, clean and well organized.	
Site OK	Notes		
Driving Directions From lot on	Interstate 94 take exit 32 to the Painted C a gravel road.	anyon rest area and visitor cer	ter. The site is just east of the parking
THR422

F-02058-1500-S2-rev002

Site ID

Technician Martin Valvur

Site Visit Date 07/22/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		✓
Major industrial complex	10 to 20 km		
City > 50,000 population	40 km		
City 10,000 to 50,000 population	10 km		
City 1,000 to 10,000 population	5 km		
Major highway, airport or rail yard	2 km	300 m	
Secondary road, heavily traveled	500 m		
Secondary road, lightly traveled	200 m		
Feedlot operations	500 m		\checkmark
Intensive agricultural ops (including aerial spraying)	500 m		\checkmark
Limited agricultural operations	200 m		
Large parking lot	200 m	200 m	
Small parking lot	100 m		
Tree line	50 m	_	\checkmark
Obstacles to wind	10 times obstacle height		

Siting Distances OK

Siting Criteria Comment

The site is located 200 meters from an interstate rest area, and 300 meters from interstate 94. The rest area can have parked and idling vehicles for extended periods.

Fie	eld Sy	stems Data Fo	orm				500-S3-rev002		
Site	e ID	THR422	Technician	Martin Valvur		Site Visit Date	07/22/2019		
1	Are wine being in	d speed and direction fluenced by obstructio	sensors sited so ons?	as to avoid	✓	N/A			
2	Are wind (i.e. wind horizont tower in	d sensors mounted so d sensors should be m ally extended boom > to the prevailing wind	as to minimize t ounted atop the 2x the max dian l)	tower effects? tower or on a neter of the		N/A			
3	Are the	tower and sensors plu	mb?		✓	N/A			
4	Are the avoid ra	temperature shields p diated heat sources su	ointed north or 1ch as buildings	positioned to , walls, etc?	✓				
5	Are tem conditio surface a standing	perature and RH sens ns? (i.e. ground below and not steeply sloped s water should be avoi	sors sited to avo y sensors should l. Ridges, hollow (ded)	id unnatural be natural 7s, and areas of					
6	Is the so	lar radiation sensor p	lumb?		✓	N/A			
7	Is it site	d to avoid shading, or	any artificial or	reflected light?	✓	N/A			
8	Is the ra	in gauge plumb?			✓	N/A			
9	Is it site towers, o	d to avoid sheltering e etc?	ffects from buil	dings, trees,	✓	N/A			
10	Is the su facing n	rface wetness sensor s orth?	sited with the gr	id surface	✓	N/A			
11	Is it inc	lined approximately 3	0 degrees?		✓	N/A			
						L			

F-02058-1500-S4-rev002

Site	e ID	THR422	Technician	Martin Valvur		Site Visit Date	07/22/2019	
1 2 3	Do all th condition Are all th reporting Are the s	e meterological sensor 1, and well maintained he meteorological sens g data? shields for the temper	rs appear to be 1? sors operational ature and RH so	intact, in good online, and ensors clean?	>			
4	Are the a	aspirated motors worl	king?					
5	Is the sol scratches	ar radiation sensor's s?	lens clean and f	ree of		N/A		
6	Is the su	rface wetness sensor g	grid clean and u	ndamaged?	✓	N/A		
7	Are the s condition	ensor signal and pow 1, and well maintained	er cables intact, 1?	in good		Signs of wear		
8	Are the s from the	ensor signal and pow elements and well ma	er cable connec aintained?	tions protected				

Field Sy	stems Data Fo	rm			F-02058-1500-S5-rev002	2
Site ID	THR422	Technician	Martin Valvur	Site Visit Date	07/22/2019	

	Siting Criteria: Are the pollutant analyzers and deposition eq	uipn	<u>nent sited in accordance with 40 CFR 58, Appendix E</u>
1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	✓	
2	Are the sample inlets 3 - 15 meters above the ground?	✓	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	✓	
	Pollutant analyzers and deposition equipment operations and	l mai	ntenance
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.		3/8 teflon by 10 meters and glass manifold
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 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:

The ozone analyzer is operated by the state of North Dakota. The sample train contains a glass manifold. There is no means to introduce onsite generated test gas at the sample inlet. A through-the-probe audit was conducted using the EEMS system.

Fi	eld Sy	stems Data Fo	orm				F-0 2	2058-15	00-S6-rev002
Sit	e ID	THR422	Technician	Martin Valvur		Site Visit Date	07/22/2019	Э	
	DAS, sei	nsor translators, and j	peripheral equi	oment operation	ns ai	nd maintenance			
1	Do the E well mai	OAS instruments appe ntained?	ar to be in good	condition and	✓				
2	Are all t modem,	he components of the backup, etc)	DAS operation	al? (printers,	✓				
3	Do the a lightning	nalyzer and sensor sig g protection circuitry	gnal leads pass t	hrough	✓	Met sensors only			
4	Are the swell mai	signal connections pro ntained?	otected from the	e weather and	✓				
5	Are the	signal leads connected	to the correct	DAS channel?	✓				
6	Are the grounde	DAS, sensor translato d?	rs, and shelter j	properly	✓				
7	Does the	instrument shelter h	ave a stable pow	ver source?	✓				
8	Is the in	strument shelter temp	erature control	led?					
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	l grounded?						
11	Tower c	omments?							

Field Sy	ystems Data	Fo	rm			F-02	058	-1500-S7-rev
Site ID	THR422		Technici	an	artin Valvur Site Visit Date	07/22/2019		
Documer	itation							
Does the	site have the requir	ed in	strument s	nd	uinment manuals?			
Does the	site nave the require	<u>Ves</u>	No	N//	<u>upment manuals.</u>	Ves	No	N/A
Wind speed	sensor				Data logger			
Wind direct	ion sensor			✓	Data logger			
Femperatui	e sensor	✓			Strip chart recorder			
Relative hu	midity sensor			✓	Computer		\checkmark	
olar radiat	ion sensor			✓	Modem		\checkmark	
urface wet	ness sensor			✓	Printer			\checkmark
Vind senso	r translator			✓	Zero air pump			
emperatur	e translator	✓			Filter flow pump		\checkmark	
Iumidity se	ensor translator			✓	Surge protector			
olar radiat	ion translator			✓	UPS			
ipping buc	ket rain gauge			✓	Lightning protection device			
Dzone analy	vzer				Shelter heater			
'ilter pack f	flow controller		\checkmark		Shelter air conditioner	\checkmark		
ilter pack	MFC power supply		\checkmark					
Does th	e site have the requi	ired a	and most r	ece	OC documents and report forms?			
	<u>.</u>	Pres	sent		·····	Curre	nt	
tation Log			✓ Data	avie				
SRF								
lite Ops Ma	nual							
IASP								
Field Ops M	Ianual							
Calibration	Reports							
Dzone z/s/p	Control Charts							
Preventive 1	naintenance schedu	le						
1 Is the s	tation log properly	comp	oleted duri	ng (ery site visit? 🔽 Dataview			
2 Are the curren	e Site Status Report t?	Forr	ns being co	omp	ted and V Flow section only			
3 Are the sample	e chain-of-custody fo transfer to and from	orms m lat	properly ()?	isec	o document 🔽			
4 Are ozo curren	one z/s/p control cha t?	arts p	oroperly co	mp	ced and Control charts not us	ed		
Provide any	additional explanat	tion (photograp	oh o	sketch if necessary) regarding condition	ons listed a	bove,	or any other feature

THR422 Technician Martin Valvur Site Visit Date 07/22/2019 Site ID Site operation procedures Has the site operator attended a formal CASTNET training Trained by previous site operator 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	✓	Semiannually	
Automatic Zero/Span Tests		N/A	\checkmark
Manual Zero/Span Tests	✓	Every 2 weeks	
Automatic Precision Level Tests		N/A	
Manual Precision Level Test	\checkmark	Every 2 weeks	
Analyzer Diagnostics Tests	\checkmark	Semiannually	
In-line Filter Replacement (at inlet)	\checkmark	every 2 months	
In-line Filter Replacement (at analyze	\checkmark	every 2 months	
Sample Line Check for Dirt/Water			
Zero Air Desiccant Check	✓	Every 2 weeks	\checkmark
1 Do multi-point calibration gases go throu	igh the	complete Not performed	

- **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?

Provide any additional 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 sample train does not have a means to introduce test gas at the sample inlet. Results of routine zero, span, precision, and any multipoint calibration checks are maintained by the state personnel who perform the tests. The two inlet filters in the sample train are creating a large pressure drop.

Not performed

F-02058-1500-S8-rev002

Field Systems Data FormF-02058-1500-S9-rev002

Site	ID	THR422	Technic	tian Martin Valvur		Site Visit Date 07/22/2019
	Site oper	ration procedures				
1	Is the fil	ter pack being changed (every Tu	esday as scheduled	<u>?</u> 🔽	Filter changed various times
2	Are the correctly	Site Status Report Form y?	s being (completed and filed	✓	
3	Are data schedule	a downloads and backup ed?	s being]	performed as		No longer required
4	Are gen	eral observations being r	nade an	d recorded? How?	✓	SSRF
5	Are site fashion?	supplies on-hand and re	plenishe	d in a timely	✓	
6	Are sam	ple flow rates recorded?	How?		✓	SSRF
7	Are sam fashion?	ples sent to the lab on a	regular	schedule in a timely	✓	
8	Are filte and ship	rs protected from contar pping? How?	ninatior	during handling	✓	
9	Are the soperation	site conditions reported not manager or staff?	regularl	y to the field		
QC	Check Pe	erformed		Frequency		Compliant
N	Iulti-poin	nt MFC Calibrations	\checkmark	Semiannually		
F	low Syste	em Leak Checks	\checkmark	Weekly		
F	ilter Pacl	k Inspection				
F	low Rate	Setting Checks	\checkmark	Weekly		
V	isual Ch	eck of Flow Rate Rotome	eter 🗹	Weekly		
I	n-line Filt	ter Inspection/Replaceme	ent 🗹	As needed		
S	ample Li	ne Check for Dirt/Water	•			
Prov	ide anv a	dditional explanation (p	hotogra	oh or sketch if neces	sarv	ry) regarding conditions listed above or any other features

Provide any additional explanation (photograph or sketch if necessary) reg natural or man-made, that may affect the monitoring parameters:

Gloves are not used to handle the filter pack. The filter bag is used as a glove.

THR422

F-02058-1500-S10-rev002

Site ID

Techn

Technician Martin Valvur

Site Visit Date 07/22/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	65606	5CB1520H68	none
DAS	Environmental Sys Corp	8816	2600	90656
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	049400004441	03634
flow rate	Tylan	FC280SAV	AW901295	02170
Infrastructure	Infrastructure	none	none	none
Mainframe	Climatronics	100081	1911	none
Mainframe power supply	Climatronics	101074	unknown	none
Met tower	Rohn	unknown	none	none
MFC power supply	Tylan	RO-32	FP9508008	03870
Ozone	ThermoElectron Inc	49i A1NAA	1153170017	E00051
Sample Tower	Aluma Tower	В	AT-81077-J5	none
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature Translator	Climatronics	100088-2	217	01545
Temperature2meter	Climatronics	100093	7974	none
Zero air pump	Thomas	607CA22C	039500000348	none

Site Inventory by Site Visit

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
NEC	502-Martin	n Valvur-07/23/2019				
1	7/23/2019	DAS	Campbell	none	CR1000	41007
2	7/23/2019	elevation	Elevation	none	none	none
3	7/23/2019	Filter pack flow pump	Thomas	none	107CAB18	061200041880
4	7/23/2019	Flow Rate	Omega	none	FMA6518ST-RS232	324333-1
5	7/23/2019	Infrastructure	Infrastructure	none	none	none
6	7/23/2019	MFC power supply	Sceptre	none	FMA65PWC	295106-8
7	7/23/2019	Ozone	ThermoElectron Inc	none	49i A1NAA	1214552974
8	7/23/2019	Ozone Standard	ThermoElectron Inc	L0534683	49i E3CAA	1214552972
9	7/23/2019	Sample Tower	Unknown	none	Unknown	None
10	7/23/2019	Shelter Temperature	ARS	none	Thermocouple	none
11	7/23/2019	siting criteria	Siting Criteria	none	none	None
12	7/23/2019	Temperature2meter	Vaisala	none	HMP45AC	E3720077
13	7/23/2019	Zero air pump	Thomas	none	107CAB18	079600005244

Flow Data Form

Mfg	Serial Nun	nber Tag S	ite	Те	chnician	Site Visit D	Date Paran	neter	Owner ID
Omega	324333-1		NEC602	Ma	artin Valvur	07/23/2019	Flow F	Rate	none
Mfg	Sceptre				Mfg	BIOS	Ι	Parameter F	Flow Rate
SN/Owner ID	295106-8	none			Serial Number	148613]	fer Desc.	3IOS 220-H
Parameter:	MFC power sup	oply			Tfer ID	01421			
					Slope	1.	00000 Int	ercept	0.00000
					Cert Date	3/4	4/2019 <mark>Co</mark>	rrCoff	1.00000
					Mfg	BIOS	I	Parameter F	Flow Rate
					Serial Number	122974]	fer Desc.	BIOS 220-H
					Tfer ID	01416			
					Slope	1.	00178 Int	ercept	0.00161
					Cert Date	7/1:	3/2018 Co	rrCoff	1.00000
DAS 1:		DAS 2:		l	Cal Factor Z	ero	0.3	24	
A Avg % Diff:	A Max % Dif	A Avg %I	Diff A Max	% Dif	Cal Factor F	ull Scale	1.2	59	
3.64%	3.85%				Rotometer R	eading:		0	
Desc.	Test type	Input 1/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSign	all PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.32	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.32	l/m	1/m	
primary	test pt 1	3.120	3.120	0.00	0.000	3.00	l/m	l/m	-3.85%
primary	test pt 2	3.120	3.120	0.00	0.000	3.00	l/m	1/m	-3.85%
primary	test pt 3	3.110	3.110	0.00	0.000	3.01	l/m	l/m	-3.22%
Sensor Comp	onent Leak Tes	it		Conditio	on		Statu	s pass	
Sensor Comp	onent Tubing C	ondition		Conditio	on Good		Statu	s pass	
Sensor Comp	onent Filter Pos	sition		Conditio	Poor		Statu	s fail	
Sensor Comp	onent Rotomete	er Condition		Conditio	n/A		Statu	s pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	resent	Statu	s pass	
Sensor Comp	onent Filter Dis	tance		Conditio)n 5.0 cm		Statu	s pass	
Sensor Comp	onent Filter Dep	oth		Conditio	n -0.3 cm	Statu	<mark>s</mark> fail		
Sensor Comp	onent Filter Azi	muth		Conditio	tion 70 deg Status pass				
Sensor Comp	onent System N	/lemo		Conditio	See comments	3	Statu	s pass	

Ozone Data Form

Mfg	Serial Number	Tag Site	Te	chnician	Site Visit Date	Parameter	Owner ID
ThermoElectron In	c 1214552974	NEC602	Ma	artin Valvur	07/23/2019	Ozone	none
Slope: Intercept CorrCoff: DAS 1: A Avg % Diff: A 0.0%	0.97785 Slope: -1.07778 Interc 0.99981 CorrC DAS Max % Dif A A 0.0%	ept 0 Coff: 0 S 2: vg %Diff A	0.00000 0.00000 0.00000 Max % Dif	Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 49CPS-70008-3 01110 1.0015 10/30/207	Inc Paramete 64 Tfer Dese 51 Intercept 18 CorrCoff	c. Ozone primary stan 0.00666 1.00000
UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.31	0.30	0.31	ppb ppb		0.01
primary	3	36.32	36.25	33.79	ppb	-7.02	-1.01
primary	4	64.54	64.43	61.10	ppb	-5.31	
primary	5	111.61	111.43	108.60	ppb	-2.57	
Sensor Compon	ent Sample Train		Condition	on Good		Status pass	
Sensor Compo	tent 22.5 degree ru	ule	Condition	on		Status pass	
Sensor Compo	nent Inlet Filter Cor	ndition	Condition	on Clean		Status pass	
Sensor Compo	nent Battery Backu	ip	Condition	on N/A		Status pass	
Sensor Compo	nent Offset		Condition	on 0.1		Status pass	
Sensor Compo	lent Span		Conditio	on 1.029		Status pass	
Sensor Compo	ent Zero Voltage		Condition	on N/A		Status pass	
Sensor Compo	ent Fullscale Volta	age	Condition	on N/A		Status pass	
Sensor Compo	tent Cell A Freq.		Condition	on 102.6 kHz		Status pass	
Sensor Compo	tent Cell A Noise		Condition	on 0.9 ppb		Status pass	
Sensor Compo	tent Cell A Flow		Conditio	on 0.64 lpm		Status pass	
Sensor Compo	tent Cell A Pressu	re	Conditio	on 598.4 mmHg		Status pass	
Sensor Compo	tent Cell A Tmp.		Condition	on 33.8 C		Status pass	
Sensor Compo	tent Cell B Freq.		Condition	on 88.8 kHz		Status pass	
Sensor Compo	tent Cell B Noise		Condition	on 0.9 ppb		Status pass	
Sensor Compo	tent Cell B Flow		Condition	on 0.66 lpm		Status pass	
Sensor Compo	ent Cell B Pressu	re	Condition	on 597.9 mmHg		Status pass	
Sensor Compo	tent Cell B Tmp.		Conditio	on N/A		Status pass	
Sensor Compo	tine Loss		Conditio	on Not tested		Status pass	
Sensor Compo	nent System Memo)	Condition	on		Status pass	
Sensor Compo Sensor Compo	nent Line Loss nent System Memo)	Condition	on Not tested		Status pass	

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number	Tag Site	1	Technicia	an	Site Vis	it Date	Paramete	r	Owner ID
Vaisala	E3720077	NEC602		Martin Va	alvur	07/23/2	019	Temperatu	ure2meter	none
				Mfg Serial Tfer I	Number	Fluke 3275143 01229	3	Para Tfer	meter Tem Desc. RTD	perature
DAS 1: Abs Avg Err A	DA Abs Max Err Abs	S 2: s Avg Err Ab	s Max Err	Slope Cert I	Date		0.99989 1/23/2019	Interce CorrC	ept	-0.00649
0.09	0.16									
UseDescription	Test type	InputTmpRaw	InputTmpC	Corrected	OutputTm	pSignal	OutputSi	gnalEng	OSE Unit	Difference
primary	Temp Low Rang	0.21		0.22	,	0.000		0.38	С	0.16
primary	Temp Mid Range	24.73		24.74		0.000		24.80	С	0.06
primary	Temp High Rang	46.72		46.73		0.000		46.79	С	0.06
Sensor Compo	ment Properly Sited	d	Cond	ition Prop	perly sited			Status pa	ass	
Sensor Compo	nent Shield		Cond	ition Clea	an			Status Pa	ass	
Sensor Compo	nent Blower		Cond	ition N/A				Status Pa	ass	
Sensor Compo	nent Blower Status	s Switch	Cond	ition N/A				Status pa	ass	
Sensor Compo	nent System Mem	0	Cond	ition				Status pa	ass	

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	NEC602	Martin Valvur	07/23/2019	Shelter Temperate	ure none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter	Shelter Temperature
Abs Avg ErrAb0.88	1.06 Abs Avg	Err Abs Max Err	Serial Number	3275143	Tfer Desc.	RTD
			Tfer ID	01229		
			Slope	0.9998	9 Intercept	-0.00649
			Cert Date	1/23/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.89	26.90	0.000	27.5	С	0.64
primary	Temp Mid Range	27.05	27.06	0.000	28.1	С	1.06
primary	Temp Mid Range	26.60	26.61	0.000	27.5	С	0.93
Sensor Con	nponent System Memo	•	Condition		Status	pass	

Infrastructure Data For

Site ID	NEC602	Technician Martin	/alvur Site Visit Date 07/23/2019
Shelter I	Make	Shelter Model	Shelter Size
Shelter C	Dne	AR 263648	24 cuft
The second second			

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	NEC602	Martin Valvur	07/23/2019	Filter Depth	Omega	3842		

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 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.

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Site ID NEC602	Technician Martin Valvur	Site Visit Date 07/23	3/2019		
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	Present			
City, State Zip Code	Newcastle, WY 82701	Present			
City, State Zip Code Time Zone	Newcastle, WY 82701 Mountain	Present Fire Extinguisher First Aid Kit			
City, State Zip Code Time Zone Primary Operator	Newcastle, WY 82701 Mountain	PresentFire ExtinguisherFirst Aid KitSafety Glasses			
City, State Zip Code Time Zone Primary Operator Primary Op. Phone #	Newcastle, WY 82701 Mountain	PresentFire ExtinguisherFirst Aid KitSafety GlassesSafety Hard Hard			
City, State Zip Code Time Zone Primary Operator Primary Op. Phone # Primary Op. E-mail	Newcastle, WY 82701 Mountain	PresentFire ExtinguisherFirst Aid KitSafety GlassesSafety Hard HardClimbing Belt			
City, State Zip Code Time Zone Primary Operator Primary Op. Phone # Primary Op. E-mail Backup Operator	Newcastle, WY 82701 Mountain	Fire ExtinguisherExtensionFirst Aid KitISafety GlassesISafety Hard HardIClimbing BelaISecurity FenceI			
City, State Zip Code Time Zone Primary Operator Primary Op. Phone # Primary Op. E-mail Backup Operator Backup Op. Phone #	Newcastle, WY 82701 Mountain	Fire ExtinguisherImage: Second se			
City, State Zip Code Time Zone Primary Operator Primary Op. Phone # Primary Op. E-mail Backup Operator Backup Op. Phone #	Newcastle, WY 82701 Mountain	PresentFire ExtinguisherFirst Aid KitSafety GlassesGafety Hard HatCimbing BeltSecurity FenceSecure ShelterStable Extry State			
City, State Zip Code Time Zone Primary Operator Primary Op. Phone # Primary Op. E-mail Backup Operator Backup Op. Phone #	Newcastle, WY 82701 Mountain	Fire Extinguisher Image: Comparison of the second of t			
City, StateZip CodeZip CodeTime ZonePrimary OperatorPrimary Op. Phone #Primary Op. E-mailBackup OperatorBackup Op. Phone #Shelter Working RoomShelter Clean	Newcastle, WY 82701 Mountain	Fire Extinguisher □ Fires Extinguisher □ Fires Aid Kit □ Safety Glasses □ Safety Glasses □ Safety Hard Hat □ Climbing Belt □ Security Fence □ State Extry States ✓ AR 263648 ✓ DAS, and MFC only. ✓			
City, StateZip CodeTime ZonePrimary OperatorPrimary Op. Phone #Primary Op. E-mailBackup OperatorBackup Op. E-mailShelter Working RoomShelter CleanSite OK	Newcastle, WY 82701 Mountain	Fire Extinguisher Fires Aid Kit Gafety Glasses Gafety Hard Had Gafety Balt Garunity Fence Secure Shelter Stable Entry Steps Gat AR 263648			

NEC602

F-02058-1500-S2-rev002

Site ID

Technician Martin Valvur

Site Visit Date 07/23/2019

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

Siting Distances OK

Siting Criteria Comment

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.

Fi	eld Systems Data Form		F-02058-1500-S3-rev002					
Site	e ID NEC602 Technician Martin Valvur		Site Visit Date 07/23/2019					
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?		N/A					
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A					
3	Are the tower and sensors plumb?	✓	N/A					
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?							
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)							
6	Is the solar radiation sensor plumb?		N/A					
7	Is it sited to avoid shading, or any artificial or reflected light	? 🗸	N/A					
8	Is the rain gauge plumb?		N/A					
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	✓	N/A					
10	Is the surface wetness sensor sited with the grid surface facing north?	✓	N/A					
11	Is it inclined approximately 30 degrees?	✓	N/A					

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Site	e ID	NEC602	Technician	Martin Valvur		Site Visit Date 07/23/2019
1	Do all th condition	e meterological sensor 1, and well maintained	rs appear to be 1?	intact, in good	✓	Temperature only
2	Are all the reporting	ne meteorological sens g data?	ors operationa	l online, and	✓	Temperature only
3	Are the s	hields for the tempera	ature and RH s	ensors clean?	✓	
4	Are the a	spirated motors work	xing?			N/A
5	Is the sol scratches	ar radiation sensor's l s?	lens clean and f	ree of	✓	N/A
6	Is the su	rface wetness sensor g	rid clean and u	ndamaged?	✓	N/A
7	Are the s condition	ensor signal and pow , and well maintained	er cables intact l?	, in good		
8	Are the s from the	ensor signal and powe elements and well ma	er cable connec intained?	tions protected		

Field a	Systems Data Fo	orm		F-02058-1500-S5-rev002			
Site ID	NEC602	Technician	Martin Valvur	Site Visit Date	07/23/2019		
Sitin	g Criteria: Are the pollut	t <mark>ant analyzers a</mark>	and deposition equipm	nent sited in accor	dance with 40 CFR 58	8, Appendix E	
1 Do thunre	he sample inlets have at le stricted airflow?	east a 270 degre	ee arc of				

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?		Saturated with moisture
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

✓

✓

Fi	eld Sy	stems Data Fo	orm				F-02	058-15	00-S6-rev002
Site	e ID	NEC602	Technician	Martin Valvur		Site Visit Date	07/23/2019		
	<u>DAS, se</u>	nsor translators, and j	peripheral equi	pment operatio	ns ai	nd maintenance			
1	Do the l well ma	DAS instruments appe intained?	ar to be in good	l condition and					
2	Are all modem	the components of the , backup, etc)	DAS operation	al? (printers,	✓				
3	Do the a lightnin	analyzer and sensor sig g protection circuitry?	gnal leads pass (?	through		Not present			
4	Are the well ma	signal connections pro intained?	otected from the	e weather and	✓				
5	Are the	signal leads connected	l to the correct	DAS channel?	✓				
6	Are the ground	DAS, sensor translato ed?	rs, and shelter	properly	✓				
7	Does th	e instrument shelter h	ave a stable pov	ver source?	✓				
8	Is the ir	strument shelter temp	perature control	lled?					
9	Is the m	net tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	ample tower stable and	l grounded?						
11	Tower of	comments?						Ŀ	

Fie	ld Systems Data	Fo	rm				F-0 2	2058-	-1500-S7-rev002
Site	ID NEC602		Tech	nician Martin Val	/ur	Site Visit Dat	e 07/23/2019	9	
De	ocumentation								
D	oes the site have the requi	red in	strume	nt and equipment	t manuals:	2			
Wind Wind Temj Relat Solat Surfa Wind Temj Hum Solat Tipp Ozor Filte	d speed sensor d direction sensor perature sensor tive humidity sensor r radiation sensor ace wetness sensor d sensor translator perature translator idity sensor translator r radiation translator ing bucket rain gauge ne analyzer r nack flow controller	Yes		N/A □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	Data logg Data logg Strip chan Computer Modem Printer Zero air p Filter flow Surge pro UPS Lightning Shelter ai	er er rt recorder r pump v pump otector g protection device eater r conditioner	Yes		
Filter	r pack MFC nower supply	,			Shelter al	r conditioner			
Inte	Doog the gite have the regr	ined a	nd mo	st recent OC door	monto on	d nonant forma?			
1	Does the site have the requ	nreu a	<u>ina mo</u>	st recent QC doct	iments and	a report forms:	G		
Static SSRI Site O HAS Field Calif Ozor Prev	on Log F Ops Manual P I Ops Manual oration Reports ne z/s/p Control Charts entive maintenance schedu	Pres	sent ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	Not present 2013 2013 2013 Not present Not present Not present	• • • • • • •			ent	
1	Is the station log properly	comp	oleted d	luring every site v	visit? 🗸				
2	Are the Site Status Repor current?	t Forr	ns bein	g completed and					
3	Are the chain-of-custody sample transfer to and fro	torms om lat	propei o?	rly used to docum	ent 🔽				
4	Are ozone z/s/p control ch current?	arts p	oroperly	y completed and		Control charts not	used		
D	• • • • • • •			1 1 / 1 / 0					

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

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

NEC602 Technician Martin Valvur Site Visit Date 07/23/2019 Site ID Site operation procedures Trained by previous operator Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5

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

the required site activities? (including documentation)

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	\checkmark	Semiannually	\checkmark
Visual Inspections	\checkmark	Weekly	\checkmark
Translator Zero/Span Tests (climatronics)		N/A	\checkmark
Manual Rain Gauge Test		Not performed	
Confirm Reasonableness of Current Values	\checkmark	Weekly	\checkmark
Test Surface Wetness Response		N/A	\checkmark

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

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

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

		8
3	Are the automatic and	manual z/s/p checks monitored and
	reported? If yes, how?	•

	Unknown	
✓		
	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 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.

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Site	ID	NEC602	Techni	cian	Martin Valvur		Site Visit Date	07/23/2019	
	<u>Site oper</u>	ation procedures							
1	Is the filt	ter pack being changed	every T	uesda	y as scheduled?		Filter changed variou	us times	
2	Are the S correctly	Site Status Report Forr ?	ns being	comp	oleted and filed	✓			
3	Are data schedule	downloads and backu d?	ps being	perfo	ormed as		No longer required		
4	Are gene	eral observations being	made an	d rec	corded? How?	✓	SSRF		
5	Are site s fashion?	supplies on-hand and r	eplenish	ed in	a timely	✓			
6	Are sam	ple flow rates recorded	? How?				SSRF		
7	Are sam fashion?	ples sent to the lab on a	ı regular	sche	dule in a timely	✓			
8	Are filter and ship	rs protected from conta ping? How?	aminatio	n <mark>du</mark> r	ing handling	✓			
9	Are the s operation	site conditions reported ns manager or staff?	l regular	ly to 1	the field				
QC	Check Pe	rformed		Free	luency			Compliant	
Μ	[ulti-poin	t MFC Calibrations	\checkmark	Sem	iannually				
FJ	low Syste	m Leak Checks	\checkmark	Wee	kly				
Fi	ilter Pack	Inspection							
FJ	low Rate	Setting Checks	\checkmark	Wee	kly				
Vi	isual Che	ck of Flow Rate Roton	neter 🗆	Not	oresent				
In	-line Filt	er Inspection/Replacen	nent 🗹	Sem	iannually			\checkmark	
Sa	ample Lii	ne Check for Dirt/Wate	er 🗸	Wee	kly				

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

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

NEC602

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|--|

Techni

Technician Martin Valvur

Site Visit Date 07/23/2019

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	324333-1	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	Vaisala	HMP45AC	E3720077	none
Zero air pump	Thomas	107CAB18	079600005244	none

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number			
WNC	NC429-Martin Valvur-07/24/2019								
1	7/24/2019	Computer	Hewlett Packard	none	6560 b	5CB1520H5J			
2	7/24/2019	DAS	Environmental Sys Corp	None	8832	A4868			
3	7/24/2019	Elevation	Elevation	None	1	None			
4	7/24/2019	Filter pack flow pump	Thomas	none	107CAB18	0688001767			
5	7/24/2019	flow rate	Tylan	03379	FC280AV	AW9403023			
6	7/24/2019	Infrastructure	Infrastructure	none	none	none			
7	7/24/2019	Met tower	unknown	none	unknown	none			
8	7/24/2019	MFC power supply	Tylan	03684	RO-32	FP9404003			
9	7/24/2019	Ozone	ThermoElectron Inc	0352631	49i A3NAA	1313057856			
10	7/24/2019	Ozone Standard	ThermoElectron Inc	none	49i PSA2AB	0807328333			
11	7/24/2019	Sample Tower	Aluma Tower	none	В	none			
12	7/24/2019	Shelter Temperature	ARS	none	none	none			
13	7/24/2019	Shield (2 meter)	RM Young	none	43532	none			
14	7/24/2019	Siting Criteria	Siting Criteria	None	1	None			
15	7/24/2019	Temperature2meter	RM Young	none	41342	14264			
16	7/24/2019	Zero air pump	Teledyne	none	701	1304			

DAS Data Form

DAS Time Max Error: 1.67

Mfg	Serial Nun	nber Site	Т	echnician	Site Visit Date	Parameter	Use Desc.
Environmental S	Sys A4868	WNC	429 I	Martin Valvur	07/24/2019	DAS	Primary
Das Date:	7 /24/2019	Audit Date	7 /24/2019	Mfg	Fluke	Parameter	DAS
Das Time: Das Day:	205	Audit Time Audit Day	205	Serial Number	95740243	Tfer Desc.	DVM
Low Channel:		High Channel:	:	Tfer ID	01312		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0002	0.0003	0.0002	0.0003	Cert Date	1/25/201	9 CorrCoff	1.00000
				Mfg	HY	Parameter	DAS
				Serial Number	12010039329	Tfer Desc.	Source generator (D
				Tfer ID	01322		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	6/15/201	4 CorrCoff	1.00000
Channel	Input DV	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
1	0.0000	-0.0005	-0.0004	V	V	0.0001	
1	0.1000	0.0994	0.0994	. V	V	0.0000	
1	0.3000	0.2993	0.2996	5 V	V	0.0003	
1	0.5000	0.4999	0.4996	ō V	V	-0.0003	
1	0.7000	0.6995	0.6993	8 V	V	-0.0002	
1	0.9000	0.8996	0.8995	5 V	V	-0.0001	
1	1.0000	1.0002	1.0000) V	V	-0.0002	

Flow Data Form

Mfg	Serial Nun	nber Tag S	ite	Tec	chnician	Site Visit D	ate Para	meter	Owner ID
Tylan	AW940302	23	WNC429	Ma	artin Valvur	07/24/2019) flow r	ate	03379
Mfg	Tylan				Mfg	BIOS		Parameter F	low Rate
SN/Owner ID	FP9404003	03684			Serial Number	148613		Tfer Desc. B	IOS 220-H
Parameter:	MFC power sup	oply			Tfer ID	01421	01421		
					Slope	1.	00000 In	tercept	0.00000
					Cert Date	3/4	4/2019 C	orrCoff	1.00000
DAS 1:		DAS 2:		_	Cal Factor Z	ero	0.	205	
A Avg % Diff:	A Max % Dif	A Avg %I	Diff A Max	% Dif	Cal Factor F	ull Scale	6.	008	
3.12%	3.34%				Rotometer R	eading:		3.5	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSigna	all PctDifference
primary	pump off	0.000	0.000	-0.39	0.000	-0.17	l/m	l/m	
primary	leak check	0.000	0.000	-0.40	0.000	-0.17	l/m	l/m	
primary	test pt 1	2.990	2.990	2.65	0.000	3.08	l/m	l/m	3.01%
primary	test pt 2	2.990	2.990	2.65	0.000	3.08	l/m	l/m	3.01%
primary	test pt 3	2.990	2.990	2.65	0.000	3.09	l/m	l/m	3.34%
Sensor Comp	onent Leak Tes	t		Conditio	on		Stat	us pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Stat	us pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Poor		Stat	us Fail	
Sensor Comp	onent Rotomete	er Condition		Conditio	n Clean and dry		Stat	us pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	resent	Stat	us pass	
Sensor Comp	onent Filter Dis	tance		Conditio	n 5.5 cm		Stat	us pass	
Sensor Comp	onent Filter Dep	oth		Conditio	n -1.0 cm		Stat	us pass	
Sensor Comp	onent Filter Azi	muth		Conditio	n 100 deg		Stat	us pass	
Sensor Comp	onent System N	lemo		Conditio	n See comments	3	Stat	us pass	

Ozone Data Form

Mfg		Serial Number	Tag Site	1	Tech	nician	Site Visit Date	Parameter	Owner ID
ThermoElectro	n Inc	1313057856	WNC42	9	Mart	in Valvur	07/24/2019	Ozone	0352631
Slope: Intercept CorrCoff: DAS 1: A Avg % Diff 0.0%	*: A N	0.97856 Slope 1.03205 Inter 1.00000 Corr DA 1ax % Dif A 4 0.0%	:: () cept () Coff: () S 2: Avg %Diff A	0.00000 0.00000 0.00000 Max % Dif	M So T SI C	Ifg erial Number 'fer ID lope 'ert Date	ThermoElectron 49CPS-70008-3 01110 1.0015 10/30/207	Inc Paramet 64 Tfer Des 51 Intercept 18 CorrCoff	er ozone c. Ozone primary stan 0.00666 1.00000
UseDescripti primary primary primary primary primary	ion	ConcGroup 1 2 3 4 5	Tfer Raw 0.20 14.80 36.90 65.51 114.30	Tfer Cor 0.19 14.77 36.83 65.40 114.12	r	Site 1.34 15.50 36.93 64.94 112.80	Site Unit ppb ppb ppb ppb ppb	RelPerDif 0.27 -0.71 -1.16	AbsDif 1.15 0.73
Sensor Com Sensor Com Sensor Com	1pone 1pone 1pone	nt Sample Train nt 22.5 degree nt Inlet Filter Co	rule pndition	Cond	lition lition lition	Good		StatuspassStatuspassStatuspass	
Sensor Com	ıpone	nt Battery Back	up	Cond	lition	N/A		Status pass	
Sensor Com	ıpone	nt Offset		Cond	lition	-0.0021		Status pass	
Sensor Com	ipone	<mark>nt</mark> Span		Cond	lition	1.003		Status pass	
Sensor Com	ipone	nt Zero Voltage		Cond	lition	0.00036		Status pass	
Sensor Com	ipone	nt Fullscale Vol	tage	Cond	lition	10.0059		Status pass	
Sensor Com	ipone	nt Cell A Freq.		Cond	lition	65.1 kHz		Status pass	
Sensor Com	ipone	nt Cell A Noise		Cond	lition	0.6 ppb		Status pass	
Sensor Com	ıpone	nt Cell A Flow		Cond	lition	0.63 lpm		Status pass	
Sensor Com	ipone	nt Cell A Press	ure	Cond	lition	639.0 mmHg		Status pass	
Sensor Com	ipone	nt Cell A Tmp.		Cond	lition	34.7 C		Status pass	
Sensor Com	ipone	nt Cell B Freq.		Cond	lition	53.2 kHz		Status Fail	
Sensor Com	ipone	nt Cell B Noise		Cond	lition	0.9 ppb		Status pass	
Sensor Com	ipone	nt Cell B Flow		Cond	lition	0.66 lpm		Status pass	
Sensor Com	ipone	nt Cell B Press	ure	Cond	lition	638.7 mmHg		Status pass	
Sensor Com	ipone	nt Cell B Tmp.		Cond	lition	N/A		Status pass	
Sensor Com	ipone	nt Line Loss		Cond	lition	Not tested		Status pass	
Sensor Com	ipone	nt System Mem	0	Cond	lition	See comments	;	Status pass	

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number	r Ta Site	7	Technicia	n	Site Vis	sit Date	Paramete	r	Owner ID
RM Young	14264	WNC429)	Martin Va	lvur	07/24/2	2019	Temperati	ure2meter	none
				Mfg		Fluke		Para	meter Tem	perature
				Serial	Number	3275143	3	Tfer	Desc. RTD	
				Tfer I	D	01229				
DAS 1:	DA	AS 2:		Slope			0.99989	Interce	ept	-0.00649
Abs Avg Err A	Abs Max Err Ab	os Avg Err Ab	os Max Err	Cert I	Date		1/23/2019	CorrC	off	1.00000
0.11	0.19									
UseDescription	Test type	InputTmpRaw	InputTmpC	orrected	OutputTm	pSignal	OutputSi	gnalEng	OSE Unit	Difference
primary	Temp Low Rang	0.21		0.22		0.0000		0.41	С	0.19
primary	Temp Mid Rang	24.64		24.65		0.0000		24.77	С	0.12
primary	Temp High Rang	48.06		48.07		0.0000		48.09	С	0.02
Sensor Compo	nent Properly Site	d	Condi	ition Prop	perly sited			Status pa	ass	
Sensor Compo	nent Shield		Condi	ition Clea	an			Status pa	ass	
Sensor Compo	nent Blower		Condi	i <mark>tion</mark> Fun	ctioning			Status Pa	ass	
Sensor Compo	nent Blower Statu	s Switch	Condi	ition N/A				Status pa	ass	
Sensor Compo	nent System Merr	10	Condi	ition				Status Pa	ass	

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	WNC429	Martin Valvur	07/24/2019	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter She	Iter Temperature
Abs Avg ErrAb0.82	s Max Err Abs Avg 1.13	Err Abs Max Err	Serial Number 3275	3275143	Tfer Desc. RTD)
			Tfer ID	01229		
			Slope	0.9998	9 Intercept	-0.00649
			Cert Date	1/23/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.48	25.49	0.000	26.6	С	1.13
primary	Temp Mid Range	25.32	25.33	0.000	26.3	С	0.99
primary	Temp Mid Range	26.68	26.69	0.000	27.0	С	0.35
Sensor Component System Memo Condition Status pass							

Infrastructure Data For

Site ID	WNC429	Technician Martin Va	alvur Site Visit Date 07/24/2019
Shelter	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 3034-1)	640 cuft
100.000000000			

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	WNC429	Martin Valvur	07/24/2019	Filter Position	Tylan	1345		
The filter attachment plat orientation.	e is mounted too	low in the enclosur	re resulting in th	e filter being expos	sed to wind-driven	rain and in the s	standard geo	ometric
Ozone	WNC429	Martin Valvur	07/24/2019	Cell B Freq.	ThermoElectron	4486		
This analyzer diagnostic	check is outside	the manufacturer's i	recommended va	alue.				
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: DocumentationCo

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

3 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.

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.

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Site ID	WNC429		Technician Martin Valv	ur	Site Visit D	Date 07/24	4/2019
Site Sponsor ((agency)	NPS		USC	SS Map		Wind Cave
Operating Gr	oup	NPS and	state of SD	Maj	Map Scale		
AQS #		46-033-0132		Maj	o Date		
Meteorologica	al Type	R.M. You	ng				
Air Pollutant	Analyzer	Ozone, N	IOx, PM2.5, PM10, IMPRO	VE QA	PP Latitude		43.5578
Deposition Mo	easurement	dry, wet		QA	PP Longitude		-103.4839
Land Use		prairie - v	voodland - evergreen	QA	PP Elevation N	Meters	1292
Terrain		rolling		QA	PP Declinatior	1	
Conforms to M	MLM	Marginall	у	QA	PP Declination	n Date	
Site Telephon	e			Auc	it Latitude		43.557639
Site Address 1	L	Visitor Ce	enter	Aud	it Longitude		-103.483856
Site Address 2	2	Route 38	5 Wind Cave National Park	Auc	it Elevation		1288
County		Custer	Custer		it Declination		8.1
City, State		Hot Sprin	gs, SD		P	Present	
Zip Code		57747		Fire	Extinguisher		
Time Zone		Mountain		Firs	t Aid Kit		
Primary Oper	rator			Safe	ety Glasses		
Primary Op.	Phone #			Safe	ety Hard Hat		
Primary Op. 1	E-mail			Clir	nbing Belt		
Backup Opera	ator			Sec	irity Fence		
Backup Op. I	Phone #			Sec	ire Shelter	\checkmark	
Backup Op. I	E-mail			Stal	ole Entry Step	s V	
Shelter Work	ing Room 🗹	Make	Ekto	Model	8810 (s/n 3034	l-1)	Shelter Size 640 cuft
Shelter Clean		Notes	One shelter houses the oz houses the flow system an	one monit	or and is in goo /E. It is older ar	d conditio	n and clean. The second shelter nate controlled.
Site OK	\checkmark	Notes					
Driving Direc	tions From The s the op	Hot Spring ite operato posite sid	as proceed north on 385 int or's office is in the visitors of e of the parking lot from the	o Wind Ca enter. The visitor ce	ve National Pa site is up the g nter.	rk. Turn lo gravel acco	eft onto the visitor center loop road. ess road to the park water supply on

WNC429

F-02058-1500-S2-rev002

Site ID

Technician Martin Valvur

Site Visit Date 07/24/2019

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

Siting Distances OK

Siting Criteria Comment

Fie	eld Sy	stems Data Fo	orm		F-02058-1500-S3-rev002				
Site	e ID	WNC429	Technician	Martin Valvur		Site Visit Date 07/24/2019			
1	Are win being in	d speed and direction fluenced by obstructio	sensors sited so ons?	as to avoid	✓	N/A			
2	Are win (i.e. win horizont tower in	d sensors mounted so d sensors should be m tally extended boom > to the prevailing wind	as to minimize ounted atop the 2x the max dian 1)	tower effects? e tower or on a neter of the		N/A			
3	Are the	tower and sensors plu	ımb?		✓	N/A			
4	Are the avoid ra	temperature shields p diated heat sources su	oointed north or 1ch as buildings	positioned to , walls, etc?	✓				
5	Are tem conditio surface standing	perature and RH sens ns? (i.e. ground below and not steeply sloped g water should be avoi	sors sited to avo v sensors should l. Ridges, hollov ided)	id unnatural be natural vs, and areas of					
6	Is the so	lar radiation sensor p	lumb?		✓	N/A			
7	Is it site	d to avoid shading, or	any artificial o	r reflected light?	✓	N/A			
8	Is the ra	in gauge plumb?			✓	N/A			
9	Is it site towers,	d to avoid sheltering e etc?	effects from buil	dings, trees,	✓	N/A			
10	Is the su facing n	urface wetness sensor : orth?	sited with the g	rid surface	✓	N/A			
11	Is it inc	lined approximately 3	0 degrees?		✓	N/A			

F-02058-1500-S4-rev002

Sit	e ID	WNC429	Technician	Martin Valvur		Site Visit Date	07/24/2019	
1	Do all th condition	e meterological senso n, and well maintaine	rs appear to be d?	intact, in good	✓			
2	Are all t reportin	he meteorological sen g data?	sors operationa	l online, and				
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 su	rface wetness sensor §	grid clean and u	ndamaged?	✓	N/A		
7	Are the s	sensor signal and pow n, and well maintaine	er cables intact d?	, in good	\checkmark	Signs of wear		
8	Are the s from the	sensor signal and pow elements and well ma	er cable connec aintained?	tions protected				

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

The temperature sensor signal cable insulation is cracked and showing signs of extreme wear.

Fie	eld Sy	stems Data Fo	orm		F-02058-1500-85-rev002					
Site	e ID	WNC429	Technician	Martin Valvur		Site Visit Date	07/24/2019			
	Siting C	riteria: Are the pollut	ant analyzers an	d deposition equ	uipn	nent sited in accord	dance with 40 Cl	TR 58, Appendix E		
1	Do the sa unrestrie	ample inlets have at le cted airflow?	east a 270 degree	arc of						
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?									
	Pollutan	t analyzers and depos	ition equipment	operations and	mai	<u>ntenance</u>				
1	Do the a condition	nalyzers and equipme n and well maintained	ent appear to be i l?	in good	✓					
2	Are the a reportin	analyzers and monitor g data?	rs operational, or	n-line, and	✓					
3	Describe	e ozone sample tube.				1/4 inch teflon, 4 me	eters above groun	d		
4	Describe	e dry dep sample tube				3/8 teflon by 12 met	ters			
5	Are in-li indicate	ne filters used in the o location)	ozone sample line	e? (if yes		At inlet only				
6	Are sam obstruct	ple lines clean, free of ions?	kinks, moisture,	, and	✓					
7	Is the ze	ro air supply desiccan	t unsaturated?							
8	Are ther	re moisture traps in th	e sample lines?							
9	Is there a clean?	a rotometer in the dry	v deposition filter	line, and is it	✓	Clean and dry				

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

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

Fi	eld Sy	stems Data Fo	orm			F-02	058-15	00-S6-rev002
Site	e ID	WNC429	Technician Ma	rtin Valvur	Site Visit I	Date 07/24/2019		
	<u>DAS, se</u>	ensor translators, and	peripheral equipme	ent operations	and maintenance	2		
1	Do the l well ma	DAS instruments appe intained?	ear to be in good co	ndition and 🔽]			
2	Are all modem	the components of the , backup, etc)	DAS operational?	(printers,				
3	B 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	5 Are the signal leads connected to the correct DAS channel?							
6	Are the ground	DAS, sensor translate ed?	ors, and shelter proj	perly 🗸]			
7	Does the	e instrument shelter h	ave a stable power a	source?]			
8	Is the in	nstrument shelter temp	perature controlled	?	Both on			
9	Is the m	net tower stable and gr	ounded?		Stable	[Grounded	
10	Is the sa	ample tower stable and	l grounded?					
11	Tower o	comments?						

Field Systems Data Form						F-02058-1500-S7-rev002				
Site ID	WNC429		Fechn	ician	Martin Valvur		Site Visit Date)7/24/2019	9	
Documenta	<u>tion</u>									
Does the sit	<u>e have the required</u>	insti	umen	t and e	equipment ma	anuals?				
Wind speed se Wind direction Temperature s Relative humid Solar radiation Surface wetnes Wind sensor th Temperature t Humidity sens Solar radiation Tipping bucke Ozone analyze Filter pack flo	Ye nsor n sensor sensor dity sensor dity sensor n sensor ss sensor ss sensor ranslator or translator n translator or translator or translator or translator or translator st rain gauge or St controller FC power supply				Da Da Str Co Mc Pri Zer Fil Su UP Lig Sho Sho	ta logger ta logger ip chart i mputer odem inter ro air pun ter flow p rge prote S ghtning p elter heat elter air o	recorder mp pump ctor rotection device ter conditioner	Yes	 N● N●	N/A V V V V V V V V V V V V V V V V V V
Does the s	<u>ite nave the require</u>	rosor	a mosi	<u>t recen</u>	t QC docume	ents and r	<u>eport forms :</u>	Curr	ont	
Station Log SSRF Site Ops Man HASP Field Ops Mar Calibration Re Ozone z/s/p Co Preventive ma	al nual eports ontrol Charts intenance schedule		J	ataview	3					
1 Is the stat	tion log properly co	mple	ted du	iring e	very site visit	? 🖌 Da	taview			
2 Are the S current?	ite Status Report Fo	orms	being	compl	eted and	✓				
3 Are the cl sample tr	hain-of-custody for ansfer to and from	ms pi lab?	roperl	y used	to document					
4 Are ozono current?	e z/s/p control chart	ts pro	perly	compl	eted and	Co	ntrol charts not us	ed		
Provide any ac natural or man	lditional explanatio n-made, that may a	on (pl ffect	notogr the m	aph or onitori	sketch if nec ng parameter	essary) r rs:	egarding conditio	ons listed	above, o	or any other features,

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

reported? If yes, how?

Site	ID	WNC429	Technician	Martin Valvur		Site Visit Date	07/24/2019		
1	Site oper Has the course?	ration procedures site operator attended If yes, when and who	d a formal CAS instructed?	TNET training	✓	Trained during site ir	nstallation		
2	Has the training	backup operator atte course? If yes, when	nded a formal (and who instru	CASTNET cted?		Trained by site opera	ator		
3	Is the site schedule	e visited regularly on ?	the required T	uesday	✓				
4	Are the s flollowed	tandard CASTNET o by the site operator?	perational pro	cedures being	✓				
5	Is the site the requi	e operator(s) knowled red site activities? (in	geable of, and a	able to perform entation)	✓				

F-02058-1500-S8-rev002

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

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

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

QC Check Performed	Frequency	y	Compliant
Multi-point Calibrations	 Quarterly 		
Automatic Zero/Span Tests			
Manual Zero/Span Tests	 Every 2 we 	eeks	
Automatic Precision Level Tests			
Manual Precision Level Test	Every 2 we	eeks	
Analyzer Diagnostics Tests			
In-line Filter Replacement (at inlet)			
In-line Filter Replacement (at analyze			
Sample Line Check for Dirt/Water			
Zero Air Desiccant Check			
 Do multi-point calibration gases go throug sample train including all filters? Do automatic and manual z/s/p gasses go the complete sample train including all filters 	gh the complete through the ?		
3 Are the automatic and manual z/s/n check	s monitored and	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 WNC429 Technician Martin Valvur Site Visit Date 07/24/2019 Site ID Site operation procedures Is the filter pack being changed every Tuesday as scheduled? 1 Are the Site Status Report Forms being completed and filed 2 correctly? no longer required 3 Are data downloads and backups being performed as scheduled? Are general observations being made and recorded? How? 4 ✓ Are site supplies on-hand and replenished in a timely 5 fashion? SSRF Are sample flow rates recorded? How? 6 \checkmark Are samples sent to the lab on a regular schedule in a timely 7 fashion? Gloves not used Are filters protected from contamination during handling 8 and shipping? How? Are the site conditions reported regularly to the field 9 operations manager or staff? **QC Check Performed** Compliant Frequency \checkmark Semiannually **Multi-point MFC Calibrations** ✓ ✓ Weekly **Flow System Leak Checks Filter Pack Inspection** \checkmark ✓ Weekly **Flow Rate Setting Checks** \checkmark ✓ Weekly Visual Check of Flow Rate Rotometer ✓ As needed \checkmark **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:

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.

WNC429

F-02058-1500-S10-rev002

Site ID

Techi

Technician Martin Valvur

Site Visit Date 07/24/2019

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	Tylan	FC280AV	AW9403023	03379
Infrastructure	Infrastructure	none	none	none
Met tower	unknown	unknown	none	none
MFC power supply	Tylan	RO-32	FP9404003	03684
Ozone	ThermoElectron Inc	49i A3NAA	1313057856	0352631
Ozone Standard	ThermoElectron Inc	49i PSA2AB	0807328333	none
Sample Tower	Aluma Tower	В	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
PED	108-Sandy	Grenville-07/26/2019				
1	7/26/2019	Computer	Dell	07051	Inspiron 15	Unknown
2	7/26/2019	DAS	Campbell	000406	CR3000	2511
3	7/26/2019	Elevation	Elevation	None	1	None
4	7/26/2019	Filter pack flow pump	Thomas	00564	107CA18	1088003022
5	7/26/2019	Flow Rate	Арех	000835	AXMC105LPMDPCV	108252
6	7/26/2019	Infrastructure	Infrastructure	none	none	none
7	7/26/2019	Modem	Raven	06587	V4221-V	0844353122
8	7/26/2019	Ozone	ThermoElectron Inc	000732	49i A1NAA	1105347319
9	7/26/2019	Ozone Standard	ThermoElectron Inc	000214	49i A3NAA	0622717855
10	7/26/2019	Sample Tower	Aluma Tower	000788	В	unknown
11	7/26/2019	Shelter Temperature	Campbell	none	107-L	none
12	7/26/2019	Siting Criteria	Siting Criteria	None	1	None
13	7/26/2019	Temperature	RM Young	06408	41342	14041
14	7/26/2019	Zero air pump	Werther International	06883	C 70/4	000815257

DAS Data Form

DAS Time Max Error:

0

Mfg	Serial	Number Site	Τ	echnician	Site Visit Date	Parameter	Use Desc.
Campbell	2511	PED	D108 S	andy Grenville	07/26/2019	DAS	Primary
Das Date: Das Time: Das Day:	7 /26/2019 14:54:15 207	Audit Date Audit Time Audit Day	7 /26/2019 14:54:15 207	Mfg Serial Number	Fluke 95740135	Parameter Tfer Desc.	DAS DVM
Low Channe Avg Diff:	el: Max Diff:	High Channel Avg Diff:	l: Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.000	0.0	0.0003	0.0003	Cert Date	1/25/201	9 CorrCoff	1.00000
				Mfg	Datel	Parameter	DAS
				Serial Number	15510194	Tfer Desc.	Source generator (D
				Tfer ID	01320		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	2/13/201	2 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	V	V	0.0000	
7	0.1000	0.0999	0.0999	V	V	0.0000	
7	0.3000	0.2997	0.2997	V	V	0.0000	
7	0.5000	0.4996	0.4995	V	V	-0.0001	
7	0.7000	0.6995	0.6994	V	V	-0.0001	
7	0.9000	0.8994	0.8992	V	V	-0.0002	
7	1.0000	0.9993	0.9990	V	V	-0.0003	

Flow Data Form

Mfg	Serial Nun	nber Tag	Site	Тес	chnician	Site Visit Date	e Param	eter	Owner ID
Арех	108252		PED108	Sa	indy Grenville	07/26/2019	Flow R	ate	000835
					Mfg	BIOS	P	arameter Flo	w Rate
					Serial Number	148613	Т	fer Desc. BIC)S 220-Н
					Tfer ID	01421			
					Slope	1.000	000 Inte	ercept	0.00000
					Cert Date	3/4/2)19 Cor	rCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero	-0.(01	
A Avg % Diff:	A Max % Dif	A Avg %	Diff A Max	% Dif	Cal Factor F	ull Scale	1.()2	
2.04%	2.04%				Rotometer R	eading:	1.3	35	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E In	putUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.03	0.000	0.02	l/m	1/m	
primary	leak check	0.000	0.000	0.01	0.000	0.00	l/m	1/m	
primary	test pt 1	1.470	1.470	1.47	0.000	1.50	l/m	l/m	2.04%
primary	test pt 2	1.472	1.470	1.47	0.000	1.50	l/m	l/m	2.04%
primary	test pt 3	1.473	1.470	1.47	0.000	1.50	l/m	l/m	2.04%
Sensor Comp	onent Leak Tes	st		Conditio	n		Status	pass	
Sensor Comp	onent Tubing C	ondition		Conditio	Good		Status	pass	
Sensor Comp	onent Filter Pos	sition		Conditio	on Good		Status	pass	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	See comments	3	Status	pass	
Sensor Comp	onent Filter Dis	tance		Conditio	n 4.5 cm		Status	pass	
Sensor Comp	onent Filter Dep	oth		Conditio	n 1.5 cm		Status	pass	
Sensor Comp	onent Filter Azi	muth		Conditio	n 180 deg		Status	pass	
Sensor Comp	onent System M	Nemo		Conditio	n See comments	3	Status	pass	

Ozone Data Form

Mfg		Serial Numb	oer Tag	Site		Tech	hnician	Site Visit Date	Parameter	Owner ID
ThermoElec	tron Inc	1105347319		PED108	;	San	ndy Grenville	07/26/2019	Ozone	000732
Slope: Intercept CorrCoff:	-	0.99796 Slo 0.29137 Int 0.999999 Co	pe: ercept rrCoff:).00000).00000).00000	I S	Mfg Serial Number Ifer ID	ThermoElectron 1180030022 01114	Inc Paramet	sc. Ozone primary stan
DAS 1: A Avg % D	Diff: A N 0%	I Aax % Dif A 0.0%	DAS 2: A Avg %	Diff A	Max % Dif		Slope Cert Date	0.9984	0 Intercept 9 CorrCoff	0.27090
UseDescri primar primar primar primar primar	iption ry	ConcGroup 1 2 3 4 5	Tfe 0 1: 34 6' 11	r Raw 0.31 5.10 4.74 7.20 1.20	Tfer Co 0.03 14.85 34.52 67.03 111.10	rr)	Site -0.41 14.87 33.94 66.61 110.60	Site Unit ppb ppb ppb ppb ppb	RelPerDif -1.69 -0.63 -0.45	AbsDif -0.44 0.02
Sensor C Sensor C Sensor C	ompone ompone ompone	ent Sample Transition 22.5 degree ent Inlet Filter	ain e rule Conditio	n	Cone Cone Cone	dition dition dition	n Good n Clean		StatuspassStatuspassStatuspass	
Sensor C	ompone	ant Battery Ba	ckup		Con	ditio	n N/A		Status pass	
Sensor C	ompone	ont Offset			Con	ditio	n -0.10		Status pass	
Sensor C	ompone	ent Span			Con	ditio	n 0.996		Status pass	
Sensor C	ompone	ent Zero Volta	ge		Con	ditio	n N/A		Status pass	
Sensor C	ompone	ent Fullscale V	/oltage		Con	ditio	n N/A		Status pass	
Sensor C	ompone	ent Cell A Free	4.		Con	ditio	n 83.5 kHz		Status pass	
Sensor C	ompone	ent Cell A Nois	se		Con	ditio	n 1.3 ppb		Status pass	
Sensor C	ompone	ent Cell A Flow	v		Con	ditio	n 0.62 lpm		Status pass	
Sensor C	ompone	ent Cell A Pres	ssure		Con	ditio	n 713.2 mmHg		Status pass	
Sensor C	ompone	ent Cell A Tmp).		Con	ditio	n 35.5 C		Status pass	
Sensor C	ompone	ent Cell B Free	q.		Con	ditio	n 99.1 kHz		Status pass	
Sensor C	ompone	ent Cell B Nois	se		Con	ditio	n 0.9 ppb		Status pass	
Sensor C	ompone	ent Cell B Flow	v		Con	ditio	n 0.56 lpm		Status pass	
Sensor C	ompone	ent Cell B Pres	ssure		Con	ditio	n 713.9 mmHg		Status pass	
Sensor C	ompone	ent Cell B Tmp).		Con	ditio	n N/A		Status pass	
Sensor C	ompone	ent Line Loss			Con	ditio	n Not tested		Status pass	
Sensor C	ompone	ent System Me	emo		Con	ditio	n		Status pass	

Temperature Data Form

Mfg	Serial Number	Tag Site	1	ſechni	ician	Site V	isit Date	Paramo	eter	Owner ID	
RM Young	14041	PED108	,	Sandy	Grenville	07/26	/2019	Temper	ature	06408	
				Mf	g	Extech	1	Pa	rameter Te	mperature	
				Ser	ial Number	H2327	34	Tf	er Desc. R	ſD	
				Tfe	er ID	01227					
DAS 1:	DAS	S 2:		Slo	ре		1.0073	3 Inte	rcept	0.14497	
Abs Avg Err Abs Max Err Abs Avg Err Abs Max E			Max Err	Cei	rt Date		2/12/201	9 Corr	rCoff	1.00000	
0.13	3 0.17										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary	Temp Low Range	0.24	0.09		0.000		0.0)	С	-0.09	
primary	Temp Mid Range	25.39	25.06	5	0.000		24.	9	С	-0.12	
primary	Temp High Range	49.33	48.83	3	0.000		48.	7	С	-0.17	
Sensor Con	ponent Shield		Condi	tion N	Ioderately clea	an		Status	pass		
Sensor Con	nponent Blower		Condi	ondition N/A				Status	s pass		
Sensor Con	ponent Blower Status	Switch	Condi	ondition N/A				Status	IS pass		
Sensor Con	ponent System Memo)	Condi	tion				Status	pass		

Shelter Temperature Data For

Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
none	PED108	Sandy Grenville	07/26/2019	Shelter Temperatu	ire none
DAS 2:		Mfg	Extech	Parameter S	Shelter Temperature
Max Err Abs Avg 1.47	Err Abs Max Err	Serial Number	H232734	Tfer Desc.	RTD
		Tfer ID	01227		
		Slope	1.0073	3 Intercept	0.14497
		Cert Date	2/12/201	9 CorrCoff	1.00000
	Serial Number Tag none DAS 2: Max Err 1.47	Serial Number Tag Site none PED108 DAS 2: Max Err Max Err Abs Avg Err Abs Max Err 1.47	Serial Number Tag Site Technician none PED108 DAS 2: Mfg Max Err Abs Avg Err 1.47 Image: Constraint of the second secon	Serial Number Tag Site Technician Site Visit Date none PED108 Sandy Grenville 07/26/2019 DAS 2: Mfg Extech Max Err Abs Avg Err Abs Max Err 1.47 1.47 1.47 01227 Slope 1.0073 Cert Date 2/12/201	Serial Number Tag Site Technician Site Visit Date Parameter none PED108 Sandy Grenville 07/26/2019 Shelter Temperatu DAS 2: Mfg Extech Parameter Max Err Abs Avg Err Abs Max Err Serial Number H232734 Tfer Desc. F 1.47 Tfer ID 01227 Tfer Desc. F Slope 1.00733 Intercept Cert Date 2/12/2019 CorrCoff

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	30.30	29.94	0.000	29.4	С	-0.57
primary	Temp Mid Range	25.27	24.94	0.000	26.4	С	1.47
primary	Temp Mid Range	27.05	26.71	0.000	27.5	С	0.75
Sensor Component System Memo Condition Status pass							

Infrastructure Data For

Site ID	PED108	Technician Sandy Gr	enville Site Visit Date 07/26/2019
Shelter 1	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2116-13)	640 cuft

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem		
Flow Rate	PED108	Sandy Grenville	07/26/2019	Moisture Present	Apex	4280				
here is moisture present in the dry deposition sample train inside the shelter.										

Field Systems Comments

1 Parameter: SitingCriteriaCom

The site is in a clearing in an evergreen plantation in the Prince Edward-Gallion State Forest. Trees were cut within the last 11 years to increase the size of the clearing. The tree line is encroaching again and is between 25 and 35 meters from the site.

2 Parameter: ShelterCleanNotes

The shelter is in fair condition, clean, neat, and well organized. The floor is rotting beneath the heater.

Field Sy	vstems	Data	Form	

F-02058-1500-S1-rev002

Site ID PED108	Technician Sandy Grenville	Site Visit Date 07/2	6/2019
Site Sponsor (agency)	EPA	USGS Map	Green Bay
Operating Group	Private	Map Scale	
AQS #	51-147-9991	Map Date	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	QAPP Latitude	37.1653
Deposition Measurement	dry, wet	QAPP Longitude	-78.3070
Land Use	woodland - mixed	QAPP Elevation Meters	150
Terrain	rolling	QAPP Declination	-9.1
Conforms to MLM	Yes	QAPP Declination Date	2/22/2006
Site Telephone		Audit Latitude	37.165222
Site Address 1	SR 629	Audit Longitude	-78.307067
Site Address 2	Prince Edward-Gallion State Forest	Audit Elevation	149
County	Prince Edward	Audit Declination	-9.4
City, State	Burkesville, VA	Present	
Zip Code	23922	Fire Extinguisher 🗹	No inspection date
Time Zone	Eastern	First Aid Kit	
Primary Operator		Safety Glasses	
Primary Op. Phone #		Safety Hard Hat 🗹	
Primary Op. E-mail		Climbing Belt	
Backup Operator		Security Fence	
Backup Op. Phone #		Secure Shelter	
Backup Op. E-mail		Stable Entry Steps ✓	
Shelter Working Room	Make Ekto M	odel 8810 (s/n 2116-13)	Shelter Size 640 cuft
Shelter Clean	Notes The shelter is in fair condition, heater	clean, neat, and well organized	d. The floor is rotting beneath the
Site OK	Notes		
Driving Directions From Park. churcl	Farmville travel east on 460 approximatel Continue approximately 8.5 miles on 696 h) into the state forest. Turn left onto rout	y 1 mile. Turn right (south) on δ (do not turn at the next sign fo e 629 and continue approxima	to route 696 toward Twin Lakes State or Twin Lakes State Park near the tely 1.3 miles. The site is not visible
from t	he road, and is through a gate on a grave	I road to the right.	

PED108

F-02058-1500-S2-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 07/26/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		✓
Major industrial complex	10 to 20 km		
City > 50,000 population	40 km		
City 10,000 to 50,000 population	10 km		
City 1,000 to 10,000 population	5 km		
Major highway, airport or rail yard	2 km		
Secondary road, heavily traveled	500 m		
Secondary road, lightly traveled	200 m		
Feedlot operations	500 m		\checkmark
Intensive agricultural ops (including aerial spraying)	500 m		
Limited agricultural operations	200 m		\checkmark
Large parking lot	200 m		\checkmark
Small parking lot	100 m		\checkmark
Tree line	50 m	25 - 35 m	
Obstacles to wind	10 times obstacle height		

Siting Distances OK

Siting Criteria Comment

The site is in a clearing in an evergreen plantation in the Prince Edward-Gallion State Forest. Trees were cut within the last 11 years to increase the size of the clearing. The tree line is encroaching again and is between 25 and 35 meters from the site.

Fie	eld Sy	stems Data Fo	orm				F-020	58-15	500-83	-rev002
Site	e ID	PED108	Technician	Sandy Grenville		Site Visit Date	07/26/2019]	
1 2	Are wind being in Are wind (i.e. wind horizont tower in	d speed and direction fluenced by obstruction d sensors mounted so d sensors should be mo ally extended boom > to the prevailing wind	sensors sited so ons? as to minimize ounted atop the 2x the max dian	as to avoid tower effects? tower or on a meter of the	✓	N/A N/A				
3	Are the	tower and sensors plu	mb?		✓	N/A				
4	Are the avoid ra	temperature shields p diated heat sources su	ointed north or Ich as buildings	positioned to , walls, etc?	✓					
5	Are tem conditio surface a standing	perature and RH sens ns? (i.e. ground below and not steeply sloped ; water should be avoi	ors sited to avo sensors should . Ridges, hollow ded)	id unnatural be natural vs, and areas of						
6	Is the so	lar radiation sensor p	lumb?			N/A				
7	Is it site	l to avoid shading, or	any artificial o	r reflected light?		N/A				
8	Is the ra	in gauge plumb?			✓	N/A				
9	Is it site towers, o	l to avoid sheltering e etc?	ffects from bui	ldings, trees,		N/A				
10	Is the su facing n	rface wetness sensor s orth?	sited with the g	rid surface	✓	N/A				
11	Is it inc	lined approximately 3	0 degrees?			N/A				

Site ID

1

2

3

·				
ID	PED108	Technician Sandy Grenvill	e	Site Visit Date 07/26/2019
Do all th conditio	ne meterological sensor n, and well maintained	's appear to be intact, in good !?		
Are all t reportin	he meteorological sens g data?	ors operational online, and		
Are the	shields for the tempera	ature and RH sensors clean?	\checkmark	Moderately clean

4	Are the aspirated motors working?	✓
5	Is the solar radiation sensor's lens clean and free of scratches?	
6	Is the surface wetness sensor grid clean and undamaged?	✓
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	

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

Moderately clean N/A N/A N/A

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

F-02058-1500-S4-rev002

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-85-rev002
Site	e ID	PED108	Technician	Sandy Grenville		Site Visit Date 07/26/2019
	Siting C	riteria: Are the pollut	ant analyzers a	nd deposition equ	<u>ıipn</u>	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the s unrestri	ample inlets have at le cted airflow?	east a 270 degree	e arc of	✓	
2	Are the	sample inlets 3 - 15 m	eters above the	ground?	✓	
3	Are the and 20 r	sample inlets > 1 mete neters from trees?	er from any maj	or obstruction,	✓	
	<u>Pollutan</u>	nt analyzers and depos	ition equipment	t operations and	mai	ntenance
1	Do the a conditio	nalyzers and equipme n and well maintained	ent appear to be	in good	✓	
2	Are the reportin	analyzers and moniton g data?	rs operational, o	on-line, and	✓	
3	Describe	e ozone sample tube.				1/4 teflon by 18 meters
4	Describe	e dry dep sample tube.				3/8 teflon by 18 meters
5	Are in-li indicate	ine filters used in the o location)	ozone sample lin	e? (if yes	✓	At inlet only
6	Are sam obstruct	ple lines clean, free of tions?	[°] kinks, moisture	e, and	✓	
7	Is the ze	ro air supply desiccan	t unsaturated?		✓	
8	Are the	re moisture traps in th	e sample lines?			Flow line only
9	Is there clean?	a rotometer in the dry	v deposition filte	er line, and is it		Clean and dry

4 = 0 0

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Field Systems Data Form				F-02058-1500-S6-rev002				
Site	e ID	PED108	Technician Sandy Grenville		Site Visit Da	te 07/26/2019)	
	DAS, se	nsor translators, and j	peripheral equipment operation	<u>ns a</u>	nd maintenance			
1	Do the I well mai	DAS instruments appe intained?	ar to be in good condition and	✓				
2	Are all t modem,	he components of the backup, etc)	DAS operational? (printers,					
3	Do the a lightning	nalyzer and sensor sig g protection circuitry?	nal leads pass through	✓	Met sensors only			
4	Are the well mai	signal connections pro intained?	tected from the weather and	✓				
5	Are the	signal leads connected	to the correct DAS channel?	✓				
6	Are the grounde	DAS, sensor translato ed?	rs, and shelter properly	✓				
7	Does the	e instrument shelter ha	ave a stable power source?	✓				
8	Is the in	strument shelter temp	erature controlled?					
9	Is the m	et tower stable and gr	ounded?		Stable		Grounded	
10	Is the sa	mple tower stable and	grounded?					
11	Tower c	omments?			Met tower remov	ed	<u> </u>	

Field S	ystems Data F	orm				F-02	058-1	1500-S7-rev002
Site ID	PED108	Te	chnician	Sandy Grenville	Site Visit Date 07	7/26/2019		
Docume	ntation							
Does the	site have the required	instru	ment and	d equipment manuals:	<u>?</u>			
Wind speed Wind direc Temperatu Relative hu Solar radia Surface wet Wind senso Temperatu Humidity s Solar radia Tipping bu Ozone anal Filter pack	Ye I sensor tion sensor re sensor umidity sensor tion sensor tion sensor tion sensor tre translator re translator tion translator cket rain gauge yzer flow controller	s N 1 [] 1 [] 1 [] 1 [] 1 [] 1 [] 1 [] 1 [] 1 [] 1 [] 1 [] 1 [] 1 [] 1 [] 1 [] 1 []		/A Data logg Data logg Data logg Strip char Computer Modem Printer Printer Filter flow Surge pro UPS Lightning Shelter ho	ger ger rt recorder r pump w pump otector g protection device eater r conditioner	Yes □ □ ✓ □ □ □ □ □ □ □ □ □ □ □	No	N/A V
Filter pack	MFC power supply							
Does th	ne site have the required	<u>d and r</u> resent	most reco	ent OC documents and	d report forms?	Curren	ıt	
Station Log SSRF	ş							
Site Ops M	anual	\checkmark	Oct 20	01				
HASP		\checkmark	Feb 20)14		\checkmark		
Field Ops M	Ianual	\checkmark	July 19	999				
Calibration	Reports	\checkmark				\checkmark		
Ozone z/s/p	Control Charts							
Preventive	maintenance schedule							

Pr	eve	ntive	e mai	nten	ance	sche	dule	

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

Site	ID	PED108	Technician	Sandy Grenville		Site Visit Date	07/26/2019]
1	Site oper Has the course?	<u>ration procedures</u> site operator attende If yes, when and who	d a formal CAS instructed?	TNET training		Trained in FL in 198	7 and refresher course	e in July 2006
2	Has the training	backup operator atte course? If yes, when	nded a formal (and who instru	CASTNET cted?				
3	Is the site schedule	e visited regularly on ?	the required T u	uesday	✓			
4	Are the s flollowed	tandard CASTNET of by the site operator?	perational pro	cedures being	✓			
5	Is the site the requi	e operator(s) knowled ired site activities? (in	geable of, and a	able to perform entation)	✓			
	Are regu	lar operational QA/Q	C checks perfo	ormed on meteor	olog	gical instruments?		

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

✓

N/A

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

OC	Chook	Dorformod
	UTECK	I el loi meu

Test Surface Wetness Response

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

rrequency	
Semiannually	
Daily	
As needed	
Daily	
As needed	
Weekly	
Every 2 weeks	
N/A	
Weekly	

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

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

	Unknown
✓	
✓	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:

Compliant

✓

F-02058-1500-S8-rev002

Fi	eld Sy	stems Data Fo	rm				500-S9-rev00	
Site	e ID	PED108	Technician	Sandy Grenville	!	Site Visit Date	07/26/2019]
	<u>Site oper</u>	ration procedures						
1	Is the file	ter pack being changed	l every Tuesda	y as scheduled?		Flter changed morir	ings	
2	Are the s correctly	Site Status Report For y?	ms being comp	leted and filed	✓			
3	Are data schedule	downloads and backu d?	ips being perfo	rmed as		No longer required		
4	Are gene	eral observations being	made and reco	orded? How?	\checkmark	SSRF		

✓

2

6	Are sample flow rates recorded? How	v?		✓	SSRF, call-in	
7	Are samples sent to the lab on a regu fashion?	lar	schedule in a timely	✓		
8	Are filters protected from contamina and shipping? How?	tioı	n during handling		Clean gloves on and	off
9	Are the site conditions reported regu operations manager or staff?	larl	y to the field			
QC	Check Performed		Frequency			Compliant
I	Multi-point MFC Calibrations	✓	Semiannually			\checkmark
I	Flow System Leak Checks	✓	Weekly			\checkmark
I	Filter Pack Inspection					
I	Flow Rate Setting Checks	✓	Weekly			\checkmark
	Visual Check of Flow Rate Rotometer	✓	Weekly			\checkmark
]	n-line Filter Inspection/Replacement		Unknown			

✓ Weekly

Are site supplies on-hand and replenished in a timely

5

fashion?

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:

✓

PED108

F-02058-1500-S10-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 07/26/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07051
DAS	Campbell	CR3000	2511	000406
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	1088003022	00564
Flow Rate	Apex	AXMC105LPMDPC	108252	000835
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0844353122	06587
Ozone	ThermoElectron Inc	49i A1NAA	1105347319	000732
Ozone Standard	ThermoElectron Inc	49i A3NAA	0622717855	000214
Sample Tower	Aluma Tower	В	unknown	000788
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14041	06408
Zero air pump	Werther International	C 70/4	000815257	06883

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
<i>ZI04</i>	433-Martin	Valvur-08/03/2019				
1	8/3/2019	DAS	Environmental Sys Corp	none	8816	4296
2	8/3/2019	Ozone	ThermoElectron Inc	90568	49C	49C-59348-322
3	8/3/2019	Ozone Standard	ThermoElectron Inc	90728	49C	49C-70528-366
4	8/3/2019	Precipitation	Climatronics	91002	100508-2	illegible
5	8/3/2019	Shelter Temperature	ARS	none	unknown	none
6	8/3/2019	Solar Radiation	Licor	none	LI-200	64345
7	8/3/2019	Temperature2meter	RM Young	none	41432VC	15103
8	8/3/2019	Wind Direction	RM Young	90859	AQ05305	59339wdr
9	8/3/2019	Wind Speed	RM Young	90859	AQ05305	59339wsp
10	8/3/2019	Zero air pump	Werther International	none	PC70/4	531392

DAS Data Form

DAS Time Max Error: 0.75

Mfg	Serial Nu	mber Site	Т	echnician	Site Visit Date	Parameter	Use Desc.
Environmental S	Sys 4296	ZIO	433	Martin Valvur	08/03/2019	DAS	Primary
Das Date:	8 /13/2019	Audit Date	8 /13/2019	Mfg	Fluke	Parameter	DAS
Das Time:	Time: 08:39:00 Audit Time 08:39:45 D 215 Aulit D 215		Serial Number	95740243	Tfer Desc.	DVM	
Low Channel:	215	High Channel		Tfer ID	01312		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0002	0.0003	0.0002	0.0003	Cert Date	1/25/201	9 CorrCoff	1.00000
				Μfσ	НҮ	Parameter	DAS
				Social Number	12010030320		Source generator (D
				Serial Number	12010039329	Tier Desc.	Source generator (D
				Tfer ID	01322		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	6/15/201	4 CorrCoff	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
4	0.0000	-0.0001	-0.0003	V	V	-0.0002	
4	0.1000	0.0998	0.0997	V	V	-0.0001	
4	0.3000	0.2997	0.2997	V	V	0.0000	
4	0.5000	0.5004	0.5003	V	V	-0.0001	
4	0.7000	0.6999	0.6997	V	V	-0.0002	
4	0.9000	0.8999	0.8996	V	V	-0.0003	
4	1.0000	1.0005	1.0002	V	V	-0.0003	

Ozone Data Form

Mfg	Serial Number	Fag Site	Те	chnician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-59348-322	ZIO433	Ma	artin Valvur	08/03/2019	Ozone	90568
Slope: Intercept CorrCoff: DAS 1: A Avg % Diff: A N 0.0%	0.98129 Slope: 0.02606 Interce 1.00000 CorrC DAS Max % Dif A Av 0.0%	ept () off: () 2: vg %Diff A	0.00000 0.00000 0.00000 Max % Dif	Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 49CPS-70008-3 01110 1.0015 10/30/20	Inc Paramete 64 Tfer Dese 51 Intercept 18 CorrCoff	c. Ozone primary stan 0.00666 1.00000
UseDescription primary primary	ConcGroup 1 2	Tfer Raw 0.23 16.23	Tfer Corr 0.22 16.19	Site 0.33 15.68	Site Unit ppb ppb	RelPerDif	AbsDif 0.11 -0.51
primary primary primary	3 4 5	38.79 68.19 112.06	38.72 68.08 111.88	37.95 66.85 109.75	ppb ppb ppb	-2.01 -1.82 -1.92	
Sensor Compone	ent Sample Train		Conditi	on Good		Status pass	
Sensor Compone	ent 22.5 degree ru	le	Conditi	on		Status pass	
Sensor Compone	ent Inlet Filter Con	dition	Conditi	on Clean		Status pass	
Sensor Compone	ent Battery Backup)	Conditi	on N/A		Status pass	
Sensor Compone	ent Offset		Conditi	on 0.20		Status pass	
Sensor Compone	ent Span		Conditi	on 1.003		Status pass	
Sensor Compone	ent Zero Voltage		Condition 0.000			Status pass	
Sensor Compone	ent Fullscale Volta	ge	Conditi	on 1.0002		Status pass	
Sensor Compone	ent Cell A Freq.		Conditi	on 86.2 kHz		Status pass	
Sensor Compone	ent Cell A Noise		Conditi	on 0.6 ppb		Status pass	
Sensor Compone	ent Cell A Flow		Conditi	on 0.73 lpm		Status pass	
Sensor Compone	ent Cell A Pressur	e	Conditi	on 650.2 mmHg		Status pass	
Sensor Compone	ent Cell A Tmp.		Conditi	on 37.0 C		Status pass	
Sensor Compone	ent Cell B Freq.		Conditi	on 95.7 kHz		Status pass	
Sensor Compone	ent Cell B Noise		Conditi	on 0.5 ppb		Status pass	
Sensor Compone	ent Cell B Flow		Conditi	on 0.73 lpm		Status pass	
Sensor Compone	ent Cell B Pressur	e	Conditi	on 650.2 mmHg		Status pass	
Sensor Compone	ent Cell B Tmp.		Conditi	on N/A		Status pass	
Sensor Compone	ent Line Loss		Conditi	on Not tested		Status pass	
Sensor Compone	ent System Memo		Conditi	on		Status pass	
La contra de							

Wind Direction Data Form

Sensor Component Torque

Sensor Component Vane Condition

Sensor Component System Memo

Mfg	Serial Numbe	er Tag Site		Technician	Site V	isit Date	Paramo	eter	Owner ID	
RM Young	59339wdr	ZIO433		Martin Valvur	08/03	/2019	Wind Di	rection	90859	
				Mfg Serial Num Tfer ID	RM Yo ber01266	bung	Pa	er Desc. win	d direction d direction whee	
Vane SN: \overline{N}	J/A	C. A. Align, de	g. true:	Slope		1.0000	0 Inte	rcept	0.00000	
VaneTorque	15 to 1	5	2	Cert Date		1/1/200	6 Cori	rCoff	1.00000	
								· · · ·		_
				Mfg	USNIKa	ata	Pa	rameter win	d direction	
				Serial Num	ber 19003	7	Tf	er Desc. trai	nsit	
				Tfer ID	01265					
				Slope		1.0000	0 Inte	rcept	0.00000	
				Cert Date		1/23/201	9 Corr	rCoff	1.00000	
Abs Avg Err Abs Max Err	DAS 1: Orientation Lin 9.5 12	DA nearity: Or 1.4 4	S 2: ientation	Linearity:]					
UseDescriptio	on TferID	Input Raw	Linearity	Output V	Output Deg	g. Differ	rence	Change	Error	
primary	01266	0		0.000	350	-	10	45.3	3 ###########	
primary	01266	45	✓	0.000	38		7	47.9):###########	
primary	01266	90	\checkmark	0.000	84		6	46.2	2 1.2	
primary	01266	135	\checkmark	0.000	130		5	46	5 1	
primary	01266	180	\checkmark	0.000	175		5	45	5 0	
primary	01266	225	\checkmark	0.000	216		9	41	l -4	
primary	01266	270		0.000	260		10	43.9)############	
primary	01266	315		0.000	305		10	44.7	7:############	
primary	01265	2		0.000	350		12		12	
primary	01265	92		0.000	83		9		9	
primary	01265	182		0.000	175		7		7	
primary	01265	272		0.000	262		10		10	
Sensor Comj	ponent Condition		Cond	lition Good			Status	pass		
Sensor Com	ponent Mast		Cond	Condition Good				pass		
Sensor Comj	ponent Sensor Heat	ter	Cond	Condition N/A				pass		
Sensor Com	ponent Sensor Plun	nb	Cond	lition Plumb			Status	pass		

Condition

Condition

Condition

Status pass

Status pass

Status pass

Wind Speed Data Form

Mfg	Serial Numb	oer Tag Site	J	Fechnician	Site Visit Date	e Parameter	Owner II)
RM Young	59339wsp	ZIO433	3	Martin Valvur	08/03/2019	Wind Speed	90859	
				Mfg Serial Number	RM Young CA4353	Parame Tfer De	ter wind speed sc. wind speed mo	tor (h
				Tfer ID	01457			
Prop or Cups S	SN 59835			Slope	1.000	000 Intercept	0.000	000
Prop or Cups	Torque	0.3 to	0.3	Cert Date	4/19/20	018 CorrCoff	1.00(000
Prop Correctio	on Facto 0.0512			Cert Date		concon		
•	DAS 1:	I	DAS 2:					
	Low Range H	igh Range: I	ow Range	High Range:				
Abs Avg Err	0.05	0.00%						
Abs Max Err	0.20	0.00%						
UseDescription	n: Input Device	Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.20	0.0	0.0		-0.20	
primary	01457	200	1.02	0.0	1.0		0.00	
primary	01457	400	2.05	0.0	2.1		0.00	
primary	01457	800	4.10	0.0	4.1		0.00	
primary	01457	1200	6.14	0.0	6.1	0.00%		
primary	01457	2400	12.29	0.0	12.3	0.00%		
primary	01457	4000	20.48	0.0	20.5	0.00%		
primary	01457	9400	48.13	0.0	48.1	0.00%		
Sensor Comj	ponent Condition		Condi	ition Good		Status pass]
Sensor Comj	ponent Prop or Cu	ps Condition	Condi	ition Good		Status pass		
Sensor Comj	ponent Sensor He	ater	Condi	ition N/A		Status pass		
Sensor Comj	ponent Torque		Condi	ition		Status pass		
Sensor Comj	ponent Sensor Plu	imb	Condi	ition Plumb		Status pass		
Sensor Comj	ponent System Me	emo	Condi	ition		Status pass		

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number	r Tag Site]	Fechnicia	an	Site Vis	it Date	Paramete	er	Owner ID
RM Young	15103	ZIO433		Martin Va	alvur	08/03/2	019	Temperat	ure2meter	none
				Mfg Serial Tfer I	Number D	Fluke 3275143 01229	3	Para Tfer	meter Tem Desc. RTD	perature
DAS 1: Abs Avg Err A	DA bs Max Err Ab	AS 2: s Avg Err Ab	s Max Err	Slope Cert I	Date		0.99989 1/23/2019	Interco CorrC	ept	-0.00649 1.00000
0.3	0.4									
UseDescription	Test type	InputTmpRaw	InputTmpC	orrected	OutputTm	pSignal	OutputSi	gnalEng	OSE Unit	Difference
primary	Temp Low Rang	0.22		0.23		0.000		0.41	С	0.18
primary	Temp Mid Range	23.75		23.76		0.000		24.16	С	0.4
primary	Temp High Rang	47.95		47.96		0.000		48.29	С	0.33
Sensor Compo	nent Properly Site	d	Condi	ition Part	tially shade	d Status pass		ass		
Sensor Compo	nent Shield		Condi	Condition Clean				Status pa	ass	
Sensor Compo	nent Blower		Condi	Condition Functioning				Status Pa	ass	
Sensor Compo	nent Blower Statu	s Switch	Condi	Condition N/A			Status pass			
Sensor Compo	nent System Mem	10	Condi	ition				Status pa	ass	
Solar Radiation Data Form

Mfg	Serial Number	r Tag Site	Те	echnio	cian	Site Visit Date Parame		eter	Owner ID	
Licor	64345	ZIO433	Μ	lartin '	Valvur	08/03/2019	Solar R	adiation	none	
				Mfg	ç	Eppley	Pa	rameter solar	radiation	
				Seri	ial Number	23824	Tf	er Desc. SR tr	ansfer sensor	
				Tfei	r ID	01247				
DAS 1:	DA	AS 2:		Slop	pe	1.0000	0 Inte	rcept	0.00000	
% Diff of Avg	%Diff of Max %]	Diff of Avg: %D	iff of Max	Cer	t Date	1/22/201	9 Corr	rCoff	1.00000	
0.7%	0.3%	0.0%	0.0%							
UseDescription	Measure Date	MeasureTime	Tfer Rav	N	Tfer Corr	DAS w	/m2	PctDifferenc	e	
primary	8/3/2019	08:00	430		430	429		-0.	3%	
primary	8/3/2019	09:00	583		583	570		-2.1	3%	
primary	8/3/2019	10:00	791		791	794		0.	3%	
Sensor Compo	ment Sensor Clear	n	Conditi	ion Cl	lean		Status	pass		
Sensor Compo	ment Sensor Leve	1	Conditi	ion Le	evel		Status	pass		
Sensor Component Properly Sited			Conditi	Condition Properly sited			Status			
Sensor Component System Memo				Condition				Status pass		

Precipitation Data Form

Mfg	Serial 1	Number Tag	Site		Technician			Site	Visit Date	Parameter		Owner ID		
Climatronics	illegible	e	ZIO433		Ma	artin Valvur		08/0	03/2019	Precipit	ation		91002	
						Mfg		PMF)	Pa	aramete	r Prec	ipitation	
DAS 1:		DAS 2:			Serial Number Nor			Non	е	Tí	fer Desc	250ml graduate		
A Avg % Di	ff: A Max % I	Dif A Avg % 7%	Diff A N	/Iax % Dif		Tfer ID		0124	19					
						Slope			1.0000	00 Inte	rcept		0.000	00
						Cert Date			4/26/201	13 Cor	rCoff		1.000	00
UseDesc.	Test type	TferVolume	Iteration	TimePerT	ïp	Eq.Ht	DAS	s eng	Eq.HtUnit	OSE U	nit Tfer	Units I	PctDifferen	ce
primary	test 1	250	10 sec		7.50	7.	37	mm	mm	n	nl	-1.7	%	
primary	test 2	250	2	10 sec		7.50	7.	62	mm	mm	n	nl	1.6	%
Sensor Con	mponent Prop	erly Sited		Cond	litio	Properly s	sited			Status	pass			
Sensor Co	mponent Gaug	ge Drain Scree	n	Cond	litio	n Installed				Status	pass			
Sensor Co	mponent Funn	el Clean		Cond	litio	n Clean				Status	pass			
Sensor Co	mponent Conc	lition		Cond	litio	Good				Status	pass			
Sensor Co	mponent Gaug	ge Screen		Cond	litio	n Installed				Status	pass			
Sensor Co	mponent Gaug	ge Clean		Cond	litio	n Clean				Status	pass			
Sensor Con	mponent Leve	1		Cond	litio	n Level				Status	pass			
Sensor Cor	mponent Sens	or Heater		Cond	litio	N/A				Status	pass			
Sensor Con	mponent Syste	em Memo		Cond	litio	on				Status	pass			

Shelter Temperature Data For

Mfg	Serial Number Tag Site		Technician	Site Visit Date	Parameter	Owner ID
ARS	none	ZIO433	Martin Valvur	08/03/2019	Shelter Temperatu	renone
DAS 1:	DAS 2:		Mfg	Fluke	Parameter S	helter Temperature
Abs Avg Err Abs	Max Err Abs Avg 3.44	Err Abs Max Err	Serial Number	3275143	Tfer Desc.	TD
			Tfer ID	01229		
			Slope	0.9998	9 Intercept	-0.00649
			Cert Date	1/23/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.91	24.92	0.000	27.4	С	2.52
primary	Temp Mid Range	26.39	26.40	0.000	27.7	С	1.31
primary	Temp Mid Range	24.08	24.09	0.000	27.5	С	3.44
Sensor Con	nponent System Memo	•	Condition		Status	pass	

Site Inventory by Site Visit

Site \	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
СНС	432-Martii	n Valvur-08/05/2019				
1	8/5/2019	Computer	Hewlett Packard	none	ProBook	5CG5340VRK
2	8/5/2019	DAS	Environmental Sys Corp	none	8832	A4871K
3	8/5/2019	elevation	Elevation	none	none	none
4	8/5/2019	Infrastructure	Infrastructure	none	none	none
5	8/5/2019	Modem	CradlePoint	none	unknown	unknown
6	8/5/2019	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460049
7	8/5/2019	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1152780006
8	8/5/2019	Precipitation	Texas Electronics	none	TR-525i-HT	64172-315
9	8/5/2019	Relative Humidity	Vaisala	none	HMP45A	Z1730058
10	8/5/2019	Sample Tower	Aluma Tower	none	FOT-10	Unknown
11	8/5/2019	Shelter Temperature	ARS	none	unknown	none
12	8/5/2019	siting criteria	Siting Criteria	none	none	None
13	8/5/2019	Solar Radiation	Licor	none	Pyranometer	PY16747
14	8/5/2019	Wind Direction	RM Young	90856	AQ05103-5	43941wdr
15	8/5/2019	Wind Speed	RM Young	90856	AQ05103-5	43941wsp
16	8/5/2019	Zero air pump	Werther International	none	P 70/4	000756726

DAS Data Form

DAS Time Max Error: 0.95

Mfg	Serial Nu	nber Site	Т	echnician	Site Visit Date	Parameter	Use Desc.
Environmental	Sys A4871K	СНС	432	Martin Valvur	08/05/2019	DAS	Primary
Das Date:	8 /5 /2019	Audit Date	8 /5 /2019	Mfg	Fluke	Parameter	DAS
Das Time:	08:43:57	Audit Time	08:43:00 217	Serial Number	95740243	Tfer Desc.	DVM
Low Channel:		High Channels	:	Tfer ID	01312		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0003	0.0007	0.0003	0.0007	Cert Date	1/25/201	9 CorrCoff	1.00000
				Mfg	HY	Parameter	DAS
				Serial Number	12010039329	Tfer Desc.	Source generator (D
				Tfer ID	01322		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	6/15/201	4 CorrCoff	1.00000
Channel	Input D'	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
8	0.0000	-0.0006	-0.0008	V	V	-0.0002	
8	0.1000	0.0996	0.1000	V	V	0.0004	
8	0.3000	0.2992	0.2993	V	V	0.0001	
8	0.5000	0.4998	0.5005	V	V	0.0007	
8	0.7000	0.6997	0.6999	V	V	0.0002	
8	0.9000	0.8997	0.9001	V	V	0.0004	
8	1.0000	1.0006	1.0008	V	V	0.0002	

Ozone Data Form

Mfg		Serial Numb	ber Tag Site Techn		nician	Site Visit Date	Paramete	er Owner ID		
ThermoElect	ron Inc	CM08460049	Э	CHC432	2	Mart	in Valvur	08/05/2019	Ozone	none
Slope: [Intercept] CorrCoff: [DAS 1: A Avg % Di 0.0	() () () () () () () () () () () () () (0.99233 Sloj 0.12613 Inte 0.99999 Cor D Iax % Dif A 0.0%	pe: [ercept [rrCoff: [Avg %	(((Diff A	0.00000 0.00000 0.00000 Max % Dif	M So T SI C	Ifg erial Number 'fer ID lope Cert Date	ThermoElectron 49CPS-70008-36 01110 1.0015 10/30/201	Inc Para 64 Tfer 1 Interce 8 CorrC	ImeterozoneDesc.Ozone primary stanept0.00666off1.00000
UseDescrip primary primary primary primary primary	ption y y y y y	ConcGroup 1 2 3 4 5	Tfer 0. 14 36 64 11	Raw 00 .07 .66 .09 1.22	Tfer Corr 0.00 14.04 36.59 63.98 111.04		Site 0.38 13.74 36.57 63.46 110.40	Site Unit ppb ppb ppb ppb ppb	RelPerD	if AbsDif 0.38 -0.3 0.05 0.82 0.58
Sensor Co Sensor Co Sensor Co	ompone ompone ompone	nt Sample Tra nt 22.5 degree nt Inlet Filter (ain e rule Conditior)	Condi Condi Condi Condi	tion tion tion	Good Clean		Status Pa Status Pa Status Pa	ass ass ass
Sensor Co	ompone	nt Battery Bac	ckup		Condi	tion	N/A		Status Pa	ass
Sensor Co	ompone	nt Offset			Condi	tion	0.30		Status pa	ass
Sensor Co	ompone	nt Span			Condi	tion	0.995		Status Pa	ass
Sensor Co	ompone	nt Zero Voltag	ge		Condi	tion	N/A		Status Pa	ass
Sensor Co	ompone	nt Fullscale V	oltage		Condi	tion	N/A		Status Pa	ass
Sensor Co	ompone	nt Cell A Freq			Condi	tion	89.2 kHz		Status Pa	ass
Sensor Co	ompone	nt Cell A Nois	е		Condi	tion	0.8 ppb		Status Pa	ass
Sensor Co	ompone	nt Cell A Flow	1		Condi	tion	0.64 lpm		Status Pa	ass
Sensor Co	ompone	nt Cell A Pres	sure		Condi	tion	598.1 mmHg		Status Pa	ass
Sensor Co	ompone	nt Cell A Tmp	•		Condi	tion	32.3 C		Status Pa	ass
Sensor Co	mpone	nt Cell B Freq	.		Condi	tion	122.6 kHz		Status Pa	ass
Sensor Co	mpone	nt Cell B Nois	e		Condi	tion	0.9 ppb		Status pa	ass
Sensor Co	ompone	nt Cell B Flow	1		Condi	tion	0.64 lpm		Status Pa	ass
Sensor Co	ompone	nt Cell B Pres	sure		Condi	tion	597.8 mmHg		Status pa	ass
Sensor Co	ompone	nt Cell B Tmp	•		Condi	tion	N/A		Status Pa	ass
Sensor Co	ompone	nt Line Loss			Condi	tion	Not tested		Status Pa	ass
Sensor Co	ompone	nt System Me	mo		Condi	tion			Status Pa	ass

Wind Direction Data Form

Mfg	Serial Number Tag Site			Technician	Site Visit Date Parame			eter Owner ID			
RM Young	43941wdr	CHC432		Martin Valvur		08/05/20	19	Wind Di	rection	90856	
				Mfg		RM Youn	g	Pa	rameter	wind direction	
				Sorial Num	hor			т	or Dece	wind direction v	wheel
				Serial Nulli	lber			II	er Desc.		viicei
				Tfer ID		01266					
Vane SN: N/A		. A. Align. de	eg. true:	Slope			1.00000	Inte	rcept	0.00	000
VaneTorque	10 to 10		0	Cert Date			1/1/2006	Cori	rCoff	1.00	000
				Mfo		Ushikata		Pa	rameter	wind direction	
				Gardal Name	1	100027				tropoit	
				Serial Num	ber	190037		11	er Desc.	เกลกรแ	
				Tfer ID		01265					
				Slope			1.00000	Inte	rcept	0.00	000
				Cert Date		1.	/23/2019	Cori	rCoff	1.00	000
_			<i></i>								
D	AS 1:	DA t O	AS 2:	.							
	rientation Linea	rity: Or	ientation	Linearity:	7						
Abs Avg Err	1.3	1.7			_						
Abs Max Err	3	4									
UseDescription	TferID	Input Raw	Linearity	Output V	Out	put Deg.	Differ	ence	Change	Error	
primary	01266	0	\checkmark	0.000		0		0	46.4	############	
primary	01266	45	\checkmark	0.000		41		4	40.6	-4.4	
primary	01266	90	✓	0.000		88		2	46.9	1.9	
primary	01266	135	✓	0.000		132		3	44.6	############	
primary	01266	180		0.000		181		1	48.6	############	
primary	01266	225	✓	0.000		226		0	44.8	############	
primary	01266	270		0.000		269		1	43.7	############	
primary	01266	315	✓	0.000		314		1	44.4	############	
primary	01265	0		0.000		0		0		0	
primary	01265	90		0.000		87		3		3	
primary	01265	180		0.000		180		0		0	
primary	01265	270		0.000		268		2		2	
Sensor Compo	nent Condition		Cond	lition Good				Status	pass		
Sensor Compo	onent Mast		Cond	lition Good				Status	pass		
Sensor Compo	nent Sensor Heater		Cond	lition N/A				Status	pass		
Sensor Compo	nent Sensor Plumb		Cond	lition Plumb				Status	pass		
Sensor Compo	nent Torque		Cond	lition				Status	pass		
Sensor Compo	nent Vane Condition	I	Cond	lition Good				Status	pass]
Sensor Compo	ment System Memo		Cond	lition				Statue	pass		
Sensor Compo			Cont					Status			

Wind Speed Data Form

Mfg	Serial Number	er Tag Site	Т	echnician	Site Visit Dat	e Visit Date Parameter)
RM Young	43941wsp	CHC43	2	Martin Valvur	08/05/2019	Wind Speed	90856	
				Mfg Serial Number	RM Young CA4353	Parame Tfer Des	ter wind speed sc. wind speed mo	tor (h
				Tfer ID	01457			
Prop or Cups S	SN 76717			Slope	1.00	000 Intercept	0.00	000
Prop or Cups	Torque	0.3 to	0.3	Cert Date	4/19/2	018 CorrCoff	1.00	000
Prop Correction Facto 0.0512								
	DAS 1:	D	AS 2:					
	Low Range Hi	gh Range: L	ow Range	High Range:				
Abs Avg Err	0.05	0.09%						
Abs Max Err	0.20	0.16%						
UseDescription	n: Input Device	Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.20	0.0	0.0		-0.20	
primary	01457	200	1.02	0.0	1.0		0.01	
primary	01457	400	2.05	0.0	2.1		0.00	
primary	01457	800	4.10	0.0	4.1		0.00	
primary	01457	1200	6.14	0.0	6.2	0.16%		
primary	01457	2400	12.29	0.0	12.3	0.08%		
primary	01457	4000	20.48	0.0	20.5	0.05%		
primary	01457	9400	48.13	0.0	48.2	0.06%		
Sensor Comj	ponent Condition		Condit	tion Good		Status pass]
Sensor Comj	ponent Prop or Cup	os Condition	Condit	tion Good		Status pass		
Sensor Comj	ensor Component Sensor Heater		Condit	tion N/A		Status pass		
Sensor Comj	ponent Torque		Condit	tion		Status pass		
Sensor Comj	ponent Sensor Plur	nb	Condit	tion Plumb		Status pass		
Sensor Component System Memo			Condit	tion				

Humidity Data Form

Mfg	Serial Num	Serial Number Tag Site			Technician	Site Vis	it Date	Param	eter	Owner ID		
Vaisala	Z1730058		CHC432		Martin Valvur		08/05/2	019	Relativ	e Humidity	none	
					Mfg		Rotronic	:	P	arameter Rel	ative Humidity	
					Serial Nu	mber	124432		Т	fer Desc. Hyg	groclip	
					Tfer ID		01225					
					Slope			1.0000	D Inte	ercept	0.00000	
	DAS 1:		DAS 2:		Cert Date	e		8/5/201	9 Cor	rCoff	1.00000	
Abs Avg Err	Low Range: H	ligh Ran	ige: Low R	ange:	High Range							
Abs Max Err	2.7											
UseDesc.	Test type	Devie	ce Input	RH	GTL Raw	RH (Corr. DAS V		olts	DAS %RH	Difference	
primary	RH Low Range	Hygroo	clip 32.	3	33.9	33	5.9	0.000)	31.2	-2.7	
primary	RH Low Range	Hygroo	clip 52.)	46.7	46	5.7	0.000)	46.5	-0.2	
primary	RH High Range	Hygroo	clip 90.)	81.2	81	.2	0.000		78.6	-2.6	
Sensor Com	ponent RH Filter			Cond	ition Clean				Status	pass		
Sensor Com	ponent Shield	Cond	ition Clean				Status	pass				
Sensor Component Blower C					Condition Functioning				Status	pass		
Sensor Component Blower Status Switch Co				Cond	Condition N/A				Status pass			
Sensor Com	Sensor Component System Memo					Condition				Status pass		

Solar Radiation Data Form

Mfg	Serial Number	r Tag Site	Те	Technician		Site Visit Date	Param	eter	Owner ID
Licor	PY16747	CHC432	Μ	lartin V	/alvur	08/05/2019	Solar R	adiation	none
				Mfg		Eppley	Pa	rameter sola	ar radiation
				Seria	al Number	23824	Tf	er Desc. SR	transfer sensor
				Tfer	ID	01247			
DAS 1:	DAS 1: DAS 2:				e	1.0000	0 Inte	rcept	0.00000
% Diff of Avg	Avg %Diff of Max %Diff of Avg: %Diff of			Max Cert Date		1/22/2019 Corr		rCoff	1.00000
1.8%	3.4%	0.0%	0.0%						
UseDescription	Measure Date	MeasureTime	Tfer Raw	v	Tfer Corr	DAS w	/m2	PctDifferer	ice
primary	8/5/2019	10:00	747		747	755		1	.0%
primary	8/5/2019	11:00	904		904	886		-2	2.0%
primary	8/5/2019	12:00	983		983	963		-2	2.0%
primary	8/5/2019	13:00	991		991	957		-3	3.4%
Sensor Compo	onent Sensor Clear	n	Conditi	on Cle	ean		Status	pass	
Sensor Compo	Conditi	on Le	vel		Status	pass			
Sensor Component Properly Sited			Conditi	Condition Properly sited			Status	pass	
Sensor Component System Memo			Conditi	Condition			Status pass		

Precipitation Data Form

Mfg	Serial	Number Tag	Site		Technician			Site	Param	Parameter		Owner I	D	
Texas Electro	nics 64172	-315	CHC432		Mart	in Valvur		08/0	05/2019	Precipi	Precipitation		none	
					N	Mfg			PMP			Parameter Precipitation		
DAS 1:		DAS 2:			S	Serial Number None			e	Tfer Desc. 250ml graduate				е
A Avg % Dif	f: A Max %	Dif A Avg %	6Diff A N	Aax % Dif		fer ID		0124	19					
		J L			S.	lope			1.0000	00 Inte	erce	pt	0.00	0000
					C	Cert Date			4/26/201	13 Cor	rCo	off	1.00	0000
UseDesc.	Test type	TferVolume	Iteration	TimePerT	ìp	Eq.Ht	DAS	eng	Eq.HtUnit	OSE U	nit	TferUn	its PctDiffere	ence
primary	primary test 1 250 1					5.40	5.	50	mm	mm		ml	1.	9%
primary	test 2	250	2	10 sec		5.40	5.	20	mm	mm		ml	-3.	7%
Sensor Cor	nponent Prop	erly Sited		Cond	lition	Properly	sited			Status	, pa	SS		
Sensor Cor	nponent Gau	ge Drain Scree	en	Cond	lition	Installed				Status	, pa	SS		
Sensor Cor	nponent Funr	nel Clean		Cond	lition	Clean				Status	, pa	SS		
Sensor Cor	nponent Con	dition		Cond	lition	Good				Status	, pa	SS		
Sensor Cor	nponent Gau	ge Screen		Cond	lition	Installed				Status	, pa	SS		
Sensor Cor	nponent Gau	ge Clean		Cond	lition	Clean				Status	, pa	SS		
Sensor Cor	nponent Leve	1		Cond	lition	Level				Status	, pa	SS		
Sensor Cor	nponent Sens	sor Heater		Cond	lition	Functioni	ng			Status	, pa	SS		
Sensor Component System Memo				Cond	lition	ition				Status	, pa	SS		

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	CHC432	Martin Valvur	08/05/2019	Shelter Temperatu	renone
DAS 1:	DAS 2:		Mfg	Fluke	Parameter S	helter Temperature
Abs Avg Err Abs	2.88	Err Abs Max Err	Serial Number	3275143	Tfer Desc.	TD
			Tfer ID	01229		
			Slope	0.9998	9 Intercept	-0.00649
			Cert Date	1/23/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.28	23.29	0.000	26.2	С	2.88
primary	Temp Mid Range	24.17	24.18	0.000	27.0	С	2.79
primary	Temp Mid Range	26.64	26.65	0.000	27.9	С	1.29
Sensor Component System Memo Condition Status pass							

Infrastructure Data For

Site ID	CHC432	Technician Martin	Valvur Site Visit Date 08/05/2019
Shelter	Make	Shelter Model	Shelter Size
Ekto		8812	768 cuft

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

Field Systems Comments

1 Parameter: SiteOpsProcComm

Dry deposition samples are not collected at this CASTNET site.

F-02058-1500-S1-rev002

Site ID CHC432	Technician Martin Valvur	Site Visit Date 08/0	5/2019
Site Sponsor (agency)	NPS	USGS Map	
Operating Group	NPS	Map Scale	
408 #	35-045-0020	Map Date	
Meteorological Type	R M Young		
Meteorological Type			[]
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 Me	odel 8812	Shelter Size 768 cuft
Shelter Clean	Notes		
Site OK	Notes		
Driving Directions From park e rough	highway 550 take county road 7950 (dirt r ntrance look for a gate on the north side dirt road to the top of the mesa.	road) for 21 miles to the park er of the road. Proceed through the	ntrance. Less than one mile from the ne gate for approximately 3 miles on

CHC432

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Site ID

Technician Martin Valvur

Site Visit Date 08/05/2019

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

Siting Distances OK

Siting Criteria Comment

Fi	eld Systems Data Form	F-02058-1500-S3-rev002	
Site	Technician Martin Valvur		Site Visit Date 08/05/2019
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		
2	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

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Site	e ID	CHC432	Technician	Martin Valvur		Site Visit Date	08/05/2019	
1 2 3	Do all th condition Are all th reporting Are the s	e meterological sensor 1, and well maintained he meteorological sens g data? shields for the tempera	s appear to be ? ors operationa ature and RH s	intact, in good l online, and ensors clean?				
4	Are the a	aspirated motors work	ing?					
5	Is the sol scratches	ar radiation sensor's l s?	ens clean and f	ree of				
6	Is the su	rface wetness sensor g	rid clean and u	ndamaged?		I/A		
7 8	Are the s condition Are the s from the	sensor signal and powe n, and well maintained sensor signal and powe elements and well ma	er cables intact ? er cable connec intained?	, in good tions protected				
					L			

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Sit	e ID CHC432 Technician Martin Valvur		Site Visit Date 08/05/2019
	Siting Criteria: Are the pollutant analyzers and deposition en	quipr	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	✓	
2	Are the sample inlets 3 - 15 meters above the ground?	✓	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	✓	
	Pollutant analyzers and deposition equipment operations and	d ma	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓	
2	Are the analyzers and monitors operational, on-line, and reporting data?		
3	Describe ozone sample tube.		1/4 teflon by 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

Field Systems Data Form							F-0	2058-15	00-S6-rev002
Site ID CHC432 Technician Martin Valvur						Site Visit	Date 08/05/201	19	
	DAS, se	nsor translators, and	peripheral equi	pment operatio	ns and	<u>l maintenanc</u>	<u>ce</u>		
1	Do the I well ma	DAS instruments appe intained?	ear to be in good	l condition and					
2	Are all t modem,	he components of the backup, etc)	DAS operation	al? (printers,					
3	Do the a lightnin	nalyzer and sensor signalyzer and sensor signature and s	gnal leads pass † ?	through					
4	Are the signal connections protected from the weather and well maintained?								
5	Are the	signal leads connected	l to the correct	DAS channel?					
6	Are the grounde	DAS, sensor translato ed?	ors, and shelter	properly					
7	Does the	e instrument shelter h	ave a stable pov	ver source?					
8	Is the in	strument shelter temp	perature control	lled?					
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	l grounded?						
11	Tower o	comments?							

Field Systems Data I	For	m			F-02	2058	-1500-S7-rev002
Site ID CHC432		Tech	nician Martin Va	Ivur Site Visit Date	08/05/2019)	
Documentation							
Does the site have the require	d ins	trume	nt and equipmer	<u>nt manuals?</u>			
Y Wind speed sensor Wind direction sensor Temperature sensor Relative humidity sensor Solar radiation sensor Surface wetness sensor Wind sensor translator Temperature translator Humidity sensor translator				Data logger Data logger Strip chart recorder Computer Modem Printer Zero air pump Filter flow pump Surge protector	Yes □ □ □ □		
Solar radiation translator Tipping bucket rain gauge Ozone analyzer Filter pack flow controller Filter pack MFC power supply				UPS Lightning protection device Shelter heater Shelter air conditioner		> > > >	
Does the site have the requir	ed ar	nd mo	<u>st recent QC doo</u>	cuments and report forms?			
Station Log SSRF Site Ops Manual HASP Field Ops Manual Calibration Reports Ozone z/s/p Control Charts Preventive maintenance schedulo		ent 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Dataview N/A Electronic copy Electronic copy Electronic copy Electronic copy Electronic copy Electronic copy		Curre	nt	
1 Is the station log properly c	ompl	eted d	luring 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?

✓	N/A
	N/A

✓ Electronic copy

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

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

Site	ID	CHC432	Technician	Martin Valvur	 Site Visit Date	08/05/2019	
	Site ope	ration procedures					
1	Has the course?	site operator attended If yes, when and who	a formal CAS	TNET training	N/A		
2	Has the training	backup operator atter course? If yes, when a	nded a formal (and who instru	CASTNET cted?	N/A		
3	Is the sit	e visited regularly on t ?	he required Tu	iesday			
4	Are the s flollowed	standard CASTNET of I by the site operator?	perational pro	cedures being	N/A		
5	Is the sit the requi	e operator(s) knowleda ired site activities? (inc	geable of, and a cluding docum	able to perform entation)			

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

QC Check Performed
Multipoint Calibrations

Frequency

Multipoint Calibrations	\checkmark	Semiannually	\checkmark
Visual Inspections	\checkmark	Every 2 weeks	\checkmark
Translator Zero/Span Tests (climatronics)	\checkmark	N/A	\checkmark
Manual Rain Gauge Test	\checkmark	Monthly	\checkmark
Confirm Reasonableness of Current Values	\checkmark	Every 2 weeks	\checkmark
Test Surface Wetness Response	\checkmark	N/A	\checkmark

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

QC Check Performed

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

Frequency ✓ ✓ Semiannually \checkmark \checkmark Daily ✓ ✓ Every 2 weeks ✓ ✓ Daily \checkmark Not performed ✓ ✓ Alarm values only ✓ ✓ Every 2 weeks \checkmark \checkmark N/A \checkmark \checkmark Every 2 weeks ✓ ✓ Every 2 weeks

Unknown

Electronic copy

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

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

✓

✓

✓

Compliant

Compliant

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F-02058-1500-S9-rev002

Site	ID	CHC432	Technic	cian	Martin Valvur		Site Visit Date	08/05/2019			
	<u>Site ope</u>	ration procedures									
1	Is the fil	ter pack being change	ed every Tu	iesda	y as scheduled?		N/A				
2	Are the correctly	Site Status Report For y?	rms being (comp	leted and filed		N/A				
3	Are data schedule	a downloads and back ed?	ups being]	perfo	rmed as	✓	N/A				
4	Are gen	eral observations bein	g made an	d rec	orded? How?		N/A				
5	Are site fashion?	supplies on-hand and	replenishe	d in a	ı timely						
6	Are sample flow rates recorded? How?						N/A				
7	Are sam fashion?	ples sent to the lab on	a regular	sched	ule in a timely	✓	N/A				
8	Are filte and ship	rs protected from con pping? How?	taminatior	ı duri	ng handling		N/A				
9	Are the operation	site conditions reporte ons manager or staff?	ed regularl	y to t	he field						
QC	Check Po	erformed		Freq	uency			Compliant			
N	Iulti-poir	nt MFC Calibrations	\checkmark	N/A				\checkmark			
F	low Syste	em Leak Checks	\checkmark	N/A				\checkmark			
F	Filter Pack Inspection							\checkmark			
F	Flow Rate Setting Checks							\checkmark			
V	Visual Check of Flow Rate Rotometer							\checkmark			
Iı	n-line Fil	ter Inspection/Replace	ement 🗹	N/A				\checkmark			
S	ample Li	ne Check for Dirt/Wa	ter 🗹	N/A				\checkmark			
rov	ide anv a	dditional explanation	(photogra	oh or	sketch if neces	sarv) regarding condition	ons listed above, or a	v other features.		

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

Dry deposition samples are not collected at this CASTNET site.

CHC432

F-02058-1500-S10-rev002

Site ID

Tech

Technician Martin Valvur

Site Visit Date 08/05/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	ProBook	5CG5340VRK	none
DAS	Environmental Sys Cor	p 8832	A4871K	none
elevation	Elevation	none	none	none
Infrastructure	Infrastructure	none	none	none
Modem	CradlePoint	unknown	unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	CM08460049	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1152780006	none
Precipitation	Texas Electronics	TR-525i-HT	64172-315	none
Relative Humidity	Vaisala	HMP45A	Z1730058	none
Sample Tower	Aluma Tower	FOT-10	Unknown	none
Shelter Temperature	ARS	unknown	none	none
siting criteria	Siting Criteria	none	None	none
Solar Radiation	Licor	Pyranometer	PY16747	none
Wind Direction	RM Young	AQ05103-5	43941wdr	90856
Wind Speed	RM Young	AQ05103-5	43941wsp	90856
Zero air pump	Werther International	P 70/4	000756726	none

Site Inventory by Site Visit

Site Vi	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
GTH1	61-Martin	n Valvur-08/06/2019				
1	8/6/2019	Computer	Dell	07055	Inspiron 15	834MC12
2	8/6/2019	DAS	Campbell	000416	CR3000	2513
3	8/6/2019	Elevation	Elevation	None	1	None
4	8/6/2019	Filter pack flow pump	Thomas	00517	107CAB18	100300020817
5	8/6/2019	Flow Rate	Арех	000558	AXMC105LPMDPCV	50735
6	8/6/2019	Infrastructure	Infrastructure	none	none	none
7	8/6/2019	Modem	Raven	06604	H4222-C	0844355767
8	8/6/2019	Ozone	ThermoElectron Inc	000617	49i A1NAA	1009241780
9	8/6/2019	Ozone Standard	ThermoElectron Inc	000208	49i A3NAA	0611416461
10	8/6/2019	Sample Tower	Aluma Tower	03564	A	none
11	8/6/2019	Shelter Temperature	Campbell	none	107-L	none
12	8/6/2019	Siting Criteria	Siting Criteria	None	1	None
13	8/6/2019	Temperature	RM Young	06120	41342VC	11742
14	8/6/2019	Zero air pump	Werther International	06927	P 70/4	000836211

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Nu	mber Site	ſ	Fechnician	Site Visit Date	Parameter	Use Desc.
Campbell	2513	GTH	1161	Martin Valvur	08/06/2019	DAS	Primary
Das Date:	8 /6 /2019	Audit Date	8 /6 /2019	Mfg	Fluke	Parameter	DAS
Das Time: Das Day:	218	Audit Time	218	Serial Number	95740243	Tfer Desc.	DVM
Low Channel	:	High Channel	:	Tfer ID	01312		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0002	0.0010	0.0002	0.0010	Cert Date	1/25/201	9 CorrCoff	1.00000
				Mfg	HY	Parameter	DAS
				Serial Number	12010039329	Tfer Desc.	Source generator (D
				Tfer ID	01322		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	6/15/201	4 CorrCoff	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.0004	-0.0005	5 V	V	-0.0001	
7	0.1000	0.0996	0.0996	5 V	V	0.0000	
7	0.3000	0.2998	0.2998	8 V	V	0.0000	
7	0.5000	0.5001	0.5002	2 V	V	0.0001	
7	0.7000	0.6995	0.6994	4 V	V	-0.0001	
7	0.9000	0.9020	0.9018	8 V	V	-0.0002	
7	1.0000	1.0001	0.9991	V	V	-0.0010	

Flow Data Form

Mfg	Serial Nun	nber Tag	Site	Тес	chnician	Site Visit Date	Parar	neter	Owner ID
Арех	50735		GTH161	Ma	artin Valvur	08/06/2019	Flow F	Rate	000558
			Mfg	BIOS	I	Parameter Flow	v Rate		
					Serial Number	148613	1	Ffer Desc. BIO	S 220-H
					Tfer ID	01421			
					Slope	1.0000)0 Int	tercept	0.00000
					Cert Date	3/4/201	19 Co	orrCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero	-0	.04	
A Avg % Diff:	A Max % Dif	A Avg %	Diff A Max	: % Dif	Cal Factor F	ull Scale	0	.96	
1.10%	1.32%				Rotometer R	eading:	:	3.8	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E Inp	utUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.04	l/m	l/m	
primary	leak check	0.000	0.000	0.02	0.000	-0.02	l/m	l/m	
primary	test pt 1	3.040	3.040	3.04	0.000	3.01	l/m	l/m	-0.99%
primary	test pt 2	3.040	3.040	3.04	0.000	3.01	l/m	l/m	-0.99%
primary	test pt 3	3.040	3.040	3.04	0.000	3.00	l/m	l/m	-1.32%
Sensor Comp	onent Leak Tes	st		Conditio	on		Statu	ıs pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Statu	IS pass	
Sensor Comp	onent Filter Pos	sition		Conditio	Good		Statu	IS pass	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	Clean and dry		Statu	Is pass	
Sensor Comp	onent Moisture	Present		Conditio	No moisture pr	resent	Statu	Is pass	
Sensor Comp	onent Filter Dis	tance		Conditio	5.0 cm		Statu	<mark>is</mark> pass	
Sensor Comp	onent Filter Dep	oth		Conditio	1.0 cm		Statu	Is pass	
Sensor Comp	onent Filter Azi	muth		Conditio	n 360 deg		Statu	IS pass	
Sensor Comp	onent System N	/lemo		Conditio	n		Statu	is pass	

Ozone Data Form

Mfg		Serial Num	ber Tag	Site]	Fech	nnician	Site Visit Date	Paramet	ter	Owner ID
ThermoElec	tron Inc	1009241780)	GTH161		Mar	tin Valvur	08/06/2019	Ozone		000617
Slope: Intercept CorrCoff: DAS 1: A Avg % D	((Diff: A M	1.01969 Sld D.35367 Int D.99998 Co	ope: tercept orrCoff: DAS 2: A Avg %	Diff A	0.00000 0.00000 0.00000 Max % Dif	N S T S	Mfg Serial Number Ffer ID Slope Cert Date	ThermoElectron 49CPS-70008-36 01110 1.0015 10/30/201	Inc Par 64 Tfe 1 Interc	rameter o r Desc. O cept	zone primary stan 0.00666 1.00000
0.0	0%	0.0%									
UseDescri primar primar primar primar primar	iption ry ry ry ry ry ry	ConcGroup 1 2 3 4 5	Tfe 0 1: 3: 6: 11	r Raw 0.30 5.05 5.06 5.16 0.20	Tfer Com 0.29 15.02 35.00 65.05 110.02	r	Site 0.24 14.97 35.08 65.66 112.10	Site Unit ppb ppb ppb ppb ppb	RelPer	Dif 0.23 0.93 1.87	AbsDif -0.05 -0.05
Sensor C	ompone	nt Sample Tr	ain		Cond	itior	n Good		Status [pass	
Sensor C	ompone	nt 22.5 degre	e rule		Cond	itior	n		Status [pass	
Sensor C	ompone	nt Inlet Filter	Conditio	n	Cond	itior	n Clean		Status [pass	
Sensor C	ompone	nt Battery Ba	ickup		Cond	itior	n N/A		Status F	pass	
Sensor C	ompone	nt Offset			Cond	itior	n 0.000		Status F	pass	
Sensor C	ompone	nt Span			Cond	Condition 1.013			Status pass		
Sensor C	ompone	nt Zero Volta	ge		Cond	Condition N/A			Status F	pass	
Sensor C	ompone	nt Fullscale \	/oltage		Cond	Condition N/A			Status pass		
Sensor C	ompone	nt Cell A Fre	q.		Cond	Condition 86.5 kHz		Status pass		pass	
Sensor C	ompone	nt Cell A Noi	se		Conditio		0.6 ppb		Status [pass	
Sensor C	ompone	nt Cell A Flov	N		Conditi		n 0.32 lpm	Status F	pass		
Sensor C	ompone	nt Cell A Pre	ssure		Cond	itior	n 525.9 mmHa		Status F	pass	
Sensor C	ompone	nt Cell A Tm	p.		Cond	itior	35.0 C		Status 1	pass	
Sensor C	ompone	nt Cell B Fre	q.		Cond	itior	101.4 kHz		Status 1	oass	
Sensor C	ompone	nt Cell B Noi	se		Cond	itior	n 0.8 ppb		Status I	oass	
Sensor C	ompone	nt Cell B Flov	N		Cond	itior	n 0.46 lpm		Status I	oass	
Sensor C	ompone	nt Cell B Pre	ssure		Cond	itior	525.3 mmHq		Status r	pass	
Sensor C	omnone	nt Cell B Tm	D.		Cond	ition	n N/A		Status	Dass	
Sensor C	omnono	nt Line Loss	· ·		Cond	ition	Not tested		Status	Dass	
Sensor C	ompone	nt System M	emo		Cond	ition	n		Status	nass	
Sensor C	ompone	eyeten m	0.110			IUUI			Status		

Temperature Data Form

Mfg	Serial Number	Tag Site	1	Technician		Site V	isit Date	Param	eter	Owner ID	
RM Young	11742	GTH161		Martin Valvur		08/06	/2019	Temper	ature	06120	
				Mf	g	Fluke		Pa	rameter Te	mperature	
				Ser	rial Number	32751	43	Tf	er Desc. R	D	
				Tfe	er ID	01229					
DAS 1:	DAS	5 2:		Slo	pe		0.9998	9 Inte	rcept	-0.00649	
Abs Avg Err	Abs Max Err Abs	Avg Err Abs	Max Err	x Err Cert Date		1/23/2019 CorrCoff		1.00000			
0.09	0.20										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary	Temp Low Range	0.02	0.03		0.000	0.2		С	0.2		
primary	Temp Mid Range	23.61	23.62	2	0.000		23.	7	С	0.06	
primary	Temp High Range	45.73	45.74	ŀ	0.000		45.	8	С	0.02	
Sensor Con	ponent Shield		Condi	tion C	Clean			Status	pass		
Sensor Con	ponent Blower		Condi	tion N	J/A			Status	pass		
Sensor Component Blower Status Switch			Condi	Condition N/A				Status pass			
Sensor Component System Memo			Condi	Condition				Status	status pass		

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	GTH161	Martin Valvur	08/06/2019	Shelter Temperatu	Ire none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter	Shelter Temperature
Abs Avg ErrAbs Max ErrAbs Avg ErrAbs Max Err0.070.13		Serial Number	3275143	Tfer Desc.	RTD	
			Tfer ID	01229		
			Slope	0.9998	9 Intercept	-0.00649
			Cert Date	1/23/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.07	23.08	0.000	23.2	С	0.13
primary	Temp Mid Range	26.42	26.43	0.000	26.4	С	-0.05
primary	Temp Mid Range	28.12	28.13	0.000	28.2	С	0.04
Sensor Con	nponent System Memo	•	Condition		Status	pass	

Infrastructure Data For

Site ID	GTH161	Technician Martin Va	Ilvur Site Visit Date 08/06/2019
Shelter	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2149-12)	640 cuft

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

Field Systems Comments

1 Parameter: ShelterCleanNotes

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.

F-02058-1500-S1-rev002

Site ID GTH161	Technician Martin Valvur	Site Visit Date 08/0	6/2019			
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 Declination9.6				
City, State	Crested Butte, CO	Present				
Zip Code	81224	Fire Extinguisher 🗹	Inspected July 2016			
Time Zone	Mountain	First Aid Kit				
Primary Operator		Safety Glasses				
Primary Op. Phone #		Safety Hard Hat				
Primary Op. E-mail		Climbing Belt				
Backup Operator		Security Fence				
Backup Op. Phone #		Secure Shelter				
Backup Op. E-mail		Stable Entry Steps ✓				
Shelter Working Room ✓	Make Ekto M	odel 8810 (s/n 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.						

GTH161

F-02058-1500-S2-rev002

Site ID

Technician Martin Valvur

Site Visit Date 08/06/2019

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

Siting Distances OK

Siting Criteria Comment

Field Systems Data Form						F	F-02058-15	00-S3-rev002
Site	e ID	GTH161	Technician	Martin Valvur		Site Visit Date 08/06	6/2019	
1	Are wind being inf	d speed and direction fluenced by obstructio	sensors sited so ons?	as to avoid	✓	N/A		
2	Are wind (i.e. wind horizont tower in	d sensors mounted so d sensors should be m ally extended boom > to the prevailing wind	as to minimize ounted atop the 2x the max diar l)	tower effects? e tower or on a meter of the		N/A		
3	Are the	tower and sensors plu	mb?		✓	N/A		
4	Are the avoid ra	temperature shields p diated heat sources su	ointed north or Ich as buildings	positioned to , walls, etc?		South		
5	Are tem condition surface a standing	perature and RH sens ns? (i.e. ground below and not steeply sloped s water should be avoi	ors sited to avo sensors should . Ridges, hollow ded)	id unnatural be natural vs, and areas of		Over shelter		
6	Is the so	lar radiation sensor p	lumb?		✓	N/A		
7	Is it sited	d to avoid shading, or	any artificial o	r reflected light?		N/A		
8	Is the ra	in gauge plumb?			✓	N/A		
9	Is it sited towers, d	d to avoid sheltering e etc?	ffects from buil	ldings, trees,	✓	N/A		
10	Is the su facing n	rface wetness sensor s orth?	ited with the gr	rid surface	✓	N/A		
11	Is it inc	lined approximately 3	0 degrees?			N/A		

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

The temperature sensor has been 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.

F-02058-1500-S4-rev002

Site	e ID	GTH161	Technician	Martin Valvur		Site Visit Date 08/06/2019
1 2 3	Do all th condition Are all th reporting Are the s	e meterological sensor n, and well maintained ne meteorological sens g data? shields for the tempera	rs appear to be 1? sors operational ature and RH se	intact, in good l online, and ensors clean?	>	Temperature only Temperature only
4	Are the a	aspirated motors worl	king?			N/A
5	Is the sol scratches	ar radiation sensor's s?	lens clean and f	ree of		N/A
6	Is the su	rface wetness sensor g	rid clean and u	ndamaged?		N/A
7	Are the s condition	ensor signal and pow 1, and well maintained	er cables intact, 1?	, in good		
8	Are the s from the	ensor signal and pow elements and well ma	er cable connec aintained?	tions protected		
Fi	eld Systems Data Form		F-02058-1500-S5-rev002			
-----	--	-------------	---			
Sit	GTH161 Technician Martin Valvur		Site Visit Date 08/06/2019			
	Siting Criteria: Are the pollutant analyzers and deposition e	<u>quip</u>	ment sited in accordance with 40 CFR 58, Appendix E			
1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?					
2	Are the sample inlets 3 - 15 meters above the ground?	✓				
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?					
	Pollutant analyzers and deposition equipment operations and	d ma	<u>intenance</u>			
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓				
2	Are the analyzers and monitors operational, on-line, and reporting data?					
3	Describe ozone sample tube.		1/4 teflon by 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?	✓				
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry			

Fi	eld Sy	stems Data Fo	orm				F-0 2	2058-15	00-S6-rev002
Site	e ID	GTH161	Technician	Martin Valvur		Site Visit Date	08/06/2019	9	
	DAS, se	ensor translators, and	peripheral equi	pment operation	ns ai	nd maintenance			
1	Do the well ma	DAS instruments appe intained?	ar to be in good	l condition and					
2	Are all modem	the components of the , backup, etc)	DAS operation	al? (printers,					
3	Do the lightnir	analyzer and sensor signs of the sensor signal sensor signal sensor signal sensor signal sensor signal sensor s	gnal leads pass † ?	through		Met sensors only			
4	Are the well ma	signal connections pro intained?	otected from the	e weather and	✓				
5	Are the	signal leads connected	l to the correct	DAS channel?	✓				
6	Are the ground	DAS, sensor translato ed?	ors, and shelter	properly					
7	Does th	e instrument shelter h	ave a stable pov	ver source?	✓				
8	Is the in	nstrument shelter temp	perature control	lled?					
9	Is the n	net tower stable and gr	ounded?			Stable		Grounded	
10	Is the s	ample tower stable and	l grounded?						
11	Tower	comments?				Tower does not hav	ve ground ro	od but is bolt	ed to shelter.

Field S	Systems Data	a Foi	rm				F-02	.058-	1500-8	87-rev00
Site ID	GTH161		Techni	cian 🛛	Martin Valvur	Site Visit Date	08/06/2019			
Docume	entation									
Does the	<u>e site have the requ</u>	ired in	strument	and e	equipment manuals?					
Wind spee Wind direct Temperatu Relative hu Solar radia Surface we Wind sense Temperatu Humidity s	d sensor ction sensor ure sensor umidity sensor ation sensor etness sensor or translator ure translator sensor translator	Yes			Data logger Data logger Strip chart Computer Modem Printer Zero air pu Filter flow p Surge prote	recorder mp pump ector	Yes □ □ □ □ □	No		
Solar radia Tipping bu Ozone ana Filter pack Filter pack	ation translator icket rain gauge lyzer & flow controller & MFC power suppl	□ □ ✓ Iy			UPS Lightning p Shelter hea Shelter air	protection device ter conditioner				
<u>Does t</u>	<u>ne site nave the req</u>	uirea a	ina mosi	recen	I QC documents and	report forms:	~			
Station Lo SSRF Site Ops M HASP Field Ops 2	g Ianual Manual	Pres	sent ✓ ✓ Oo ↓	ct 2001 ly 1990	0			nt		
Calibratio	n Reports			-						
Ozone z/s/j	p Control Charts									
Preventive	maintenance sched	lule								
1 Is the 2 Are th	station log properl he Site Status Repo	y comp rt Forn	oleted du ns being	ring ev compl	very site visit? 🗸					
curre	nt?									
3 Are the same	he chain-of-custody le transfer to and fr	forms com lab	properly ?	used	to document					

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

Control charts not used

GTH161 Technician Martin Valvur Site Visit Date 08/06/2019 Site ID Site operation procedures Trained by previous operator Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

Translator Zero/Span Tests (climatronics)
Visual Inspections
Multipoint Calibrations
QC Check Performed

Confirm Reasonableness of Current Val

		Frequency	Compliant
	\checkmark	N/A	\checkmark
	\checkmark	N/A	\checkmark
s)	\checkmark	N/A	\checkmark
	\checkmark	N/A	\checkmark
ues	\checkmark	N/A	\checkmark
	\checkmark	N/A	\checkmark

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

00	Check	Performed
VU.	CHECK	I ci ioi meu

Manual Rain Gauge Test

Test Surface Wetness Response

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

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

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

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

	Unknown
✓	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:

F-02058-1500-S8-rev002

Field Systems Data Form F-02058-1500-S9-rev002 GTH161 Technician Martin Valvur Site Visit Date 08/06/2019 Site ID Site operation procedures Is the filter pack being changed every Tuesday as scheduled? Filter changed morinings 1 Are the Site Status Report Forms being completed and filed 2 correctly? No longer required Are data downloads and backups being performed as 3 scheduled? ✓ SSRF, logbook Are general observations being made and recorded? How? 4 ✓ Are site supplies on-hand and replenished in a timely 5 fashion? SSRF, call-in Are sample flow rates recorded? How? 6 \checkmark Are samples sent to the lab on a regular schedule in a timely 7

✓

✓

Clean gloves on and off

Compliant

- 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

fashion?

Frequency

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

GTH161

F-02058-1500-S10-rev002

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Techn

Technician Martin Valvur

Site Visit Date 08/06/2019

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	Raven	H4222-C	0844355767	06604
Ozone	ThermoElectron Inc	49i A1NAA	1009241780	000617
Ozone Standard	ThermoElectron Inc	49i A3NAA	0611416461	000208
Sample Tower	Aluma Tower	A	none	03564
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
BAS	601-Martin	Valvur-08/19/2019				
1	8/19/2019	DAS	Campbell	none	CR1000	41006
2	8/19/2019	elevation	Elevation	none	none	none
3	8/19/2019	Filter pack flow pump	Thomas	none	107CAB18	Illegible
4	8/19/2019	Flow Rate	Omega	none	FMA6518ST-RS232	318559-1
5	8/19/2019	Infrastructure	Infrastructure	none	none	none
6	8/19/2019	Met tower	unknown	none	unknown	none
7	8/19/2019	Ozone	ThermoElectron Inc	L0534684	49i A1NAA	1214552973
8	8/19/2019	Ozone Standard	ThermoElectron Inc	none	49i E3CAA	1214552971
9	8/19/2019	Shelter Temperature	unknown	none	unknown	none
10	8/19/2019	siting criteria	Siting Criteria	none	none	None
11	8/19/2019	Temperature2meter	Campbell	none	10755	124
12	8/19/2019	Zero air pump	Thomas	none	107CAB18	100800033636

Flow Data Form

Mfg Serial Number Tag Site				Тес	chnician	Site Visit Date Param		meter Owner ID		
Omega	318559-1		BAS601	Ma	artin Valvur	08/19/2019	Flow R	late	none	
					Mfg	BIOS	Parameter Flow Rate			
					Serial Number	122974	Tfer Desc. BIOS 220-H			
					Tfer ID	01416				
					Slope	1.001	78 Int	ercept	0.00161	
					Cert Date	7/13/20)18 <mark>Co</mark> l	rrCoff	1.00000	
DAS 1:		DAS 2:			Cal Factor Z	ero	0.2	49		
A Avg % Diff:	A Max % Dif	A Avg %	Diff A Max	% Dif	Cal Factor F	ull Scale	0.9	88		
1.43%	1.64%				Rotometer R	eading:		0		
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E In	putUnit	OutputSignalI	PctDifference	
primary	pump off	0.000	0.000	0.00	0.000	0.25	l/m	l/m		
primary	leak check	0.000	0.000	0.00	0.000	0.25	l/m	l/m		
primary	test pt 1	3.050	3.040	0.00	0.000	3.00	l/m	l/m	-1.32%	
primary	test pt 2	3.060	3.050	0.00	0.000	3.00	l/m	l/m	-1.64%	
primary	test pt 3	3.050	3.040	0.00	0.000	3.00	l/m	l/m	-1.32%	
Sensor Comp	onent Leak Tes	st		Conditio	Condition			Status pass		
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Statu	s pass		
Sensor Comp	onent Filter Pos	sition		Conditio	n Poor		Statu	s Fail		
Sensor Comp	onent Rotomete	er Conditio	า	Conditio	N/A		Statu	s pass		
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	resent	Statu	s pass		
Sensor Comp	onent Filter Dis	tance		Conditio	n 6.0 cm		Statu	s pass		
Sensor Comp	onent Filter Dep	oth		Conditio	n - 3.0 cm		Statu	s Fail		
Sensor Comp	onent Filter Azi	muth		Conditio	n 360 deg		Statu	s pass		
Sensor Comp	onent System M	/lemo		Conditio	n		Statu	s pass		

Ozone Data Form

Mfg	Serial Number	Tag Site	Te	chnician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1214552973	BAS601	Ma	artin Valvur	08/19/2019	Ozone	L0534684
Slope: Intercept CorrCoff: DAS 1: A Avg % Diff: A N 0.0%	0.99416 Slope: -0.21771 Interc 0.99981 Corr(DAS Max % Dif A A 0.0%	: (cept (Coff: S 2: .vg %Diff A	0.00000 0.00000 0.00000 Max % Dif	Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 49CPS-70008-3 01110 1.0015 10/30/207	Inc Paramete 64 Tfer Desc 51 Intercept 18 CorrCoff	C. Ozone primary stan 0.00666 1.00000
UseDescription primary primary primary primary primary	ConcGroup 1 2 3 4 5	Tfer Raw 0.11 16.27 36.77 65.16 115.17	Tfer Corr 0.10 16.23 36.70 65.05 114.98	Site 0.05 15.69 35.41 65.86 113.60	Site Unit ppb ppb ppb ppb ppb	RelPerDif -3.58 1.24 -1.21	AbsDif -0.05 -0.54
Sensor Compone Sensor Compone Sensor Compone	ent Sample Train 22.5 degree r ent Inlet Filter Co	ule	Condition	on Good on Clean		StatuspassStatuspassStatuspass	
Sensor Compone	ent Battery Backu	ıp	Conditi	on N/A		Status pass	
Sensor Compone	ent Offset		Conditio	on 0.1		Status pass	
Sensor Compone	ent Span		Condition	on 1.009		Status pass	
Sensor Compone	ent Zero Voltage		Condition	on N/A		Status pass	
Sensor Compone	ent Fullscale Volt	age	Condition	on N/A		Status pass	
Sensor Compone	ent Cell A Freq.		Condition	on 117.8 kHz		Status pass	
Sensor Compone	ent Cell A Noise		Condition	on 1.0 ppb		Status pass	
Sensor Compone	ent Cell A Flow		Conditio	on 0.66 lpm		Status pass	
Sensor Compone	ent Cell A Pressu	re	Conditie	on 645.9 mmHg		Status pass	
Sensor Compone	ent Cell A Tmp.		Conditie	on 32.6 C		Status pass	
Sensor Compone	ent Cell B Freq.		Conditio	on 79.0 kHz		Status pass	
Sensor Compone	ent Cell B Noise		Conditio	on 0.9 ppb		Status pass	
Sensor Compone	ent Cell B Flow		Conditio	on 0.68 lpm		Status pass	
Sensor Compone	ent Cell B Pressu	re	Conditi	on 645.7 mmHg		Status pass	
Sensor Compone	ent Cell B Tmp.		Conditi	on N/A		Status pass	
Sensor Compone	ent Line Loss		Conditio	on Not tested		Status pass	
Sensor Compone	ent System Memo	C	Conditio	on		Status pass	

2 Meter Temperature Data Form

Calc. Difference

Mfg	S	erial Number	r Tag Site	7	Technicia	n	Site Vis	it Date	Paramete	er	Owner ID
Campbel	l .	124	BAS601		Martin Va	alvur	08/19/2	019	Temperate	ure2meter	none
					Mfg		Fluke		Para	meter Tem	perature
					Serial	Number	3275143	3	Tfer	Desc. RTD	
					Tfer I	D	01229]		
DAS 1:		DA	S 2:		Slope			0.9998	9 Interce	ept	-0.00649
Abs Avg	Err Abs M	Max Err Ab	s Avg Err Ab	os Max Err	Cert I	Date		1/23/201	9 CorrC	off	1.00000
	0.12	0.21									
UseDes	cription	Test type	InputTmpRaw	InputTmpC	Corrected	OutputTm	pSignal	OutputS	ignalEng	OSE Unit	Difference
primary	Tem	p Low Rang	0.04		0.05		0.000		0.06	С	0.01
primary	Tem	np Mid Range	22.68		22.69		0.000		22.90	С	0.21
primary	Tem	np High Rang	48.19		48.20		0.000		48.33	С	0.13
Sensor	Component	Properly Site	d	Cond	ition Prop	perly sited			Status pa	ass	
Sensor	Component	Shield		Cond	ition Clea	an			Status pa	ass	
Sensor	Component	Blower		Cond	ition N/A				Status Pa	ass	
Sensor	Component	Blower Statu	s Switch	Cond	ition N/A				Status pa	ass	
Sensor	Component	System Mem	0	Cond	ition				Status pa	ass	

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
unknown	none	BAS601	Martin Valvur	08/19/2019	Shelter Temperatu	ire none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter S	Shelter Temperature
Abs Avg Err Abs 0.43	s Max Err Abs Avg 0.45	Err Abs Max Err	Serial Number	3275143	Tfer Desc.	RTD
			Tfer ID	01229		
			Slope	0.9998	39 Intercept	-0.00649
			Cert Date	1/23/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.79	22.80	0.000	23.3	С	0.45
primary	Temp Mid Range	24.25	24.26	0.000	24.7	С	0.45
primary	Temp Mid Range	27.11	27.12	0.000	27.5	С	0.38
Sensor Con	nponent System Memo)	Condition	status pass			

Infrastructure Data For

Si	te ID BAS601	Technician Martin	Yalvur Site Visit Date 08/19/2019	
	Shelter Make	Shelter Model	Shelter Size	
	Shelter One	AR 263648	24 cuft	
CHARME S	Shelter Make	Shelter Model	Shelter Size	
and the second				

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	BAS601	Martin Valvur	08/19/2019	Filter Position	Omega	3806		

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: SiteOpsProcedures

The ozone inlet filter is replaced each month.

2 Parameter: DocumentationCo

The filter pack chain-of-custody labels are not being used.

3 Parameter: ShelterCleanNotes

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

4 Parameter: MetSensorComme

Some objects violate the 45 degree rule for the tipping bucket rain gage. The Temperature shield is mounted on the south side of the tower tripod at 2 meters.

F-02058-1500-S1-rev002

Site ID	BAS601		Technician	Martin Valvur		Site Visit I	Date 08/19	9/2019		
						Mon				
Site Sponsor	(agency)	EPA			0565	wiap				
Operating G	roup	BLM			Map S	cale				
AQS #		56-003-00	002		Map I	Date				
Meteorologic	al Type									
Air Pollutant	t Analyzer				QAPP	Latitude				
Deposition M	leasurement				QAPP	Longitude				
Land Use					QAPP	Elevation	Meters			
Terrain					QAPP	Declinatio	n			
Conforms to	MLM				QAPP	Declinatio	n Date			
Site Telephor	ne				Audit	Latitude				44.279947
Site Address	1				Audit	Longitude				-108.04082
Site Address	2				Audit	Elevation				1241
County		Big Horn			Audit	Declination	1	10.3		
City, State		Basin, WY	1			1	Present			
Zip Code		82410			Fire E	xtinguisher				
Time Zone		Mountain			First A	Aid Kit				
Primary Ope	erator				Safety	Glasses				
Primary Op.	Phone #				Safety	Hard Hat				
Primary Op.	E-mail				Climb	ing Belt				
Backup Oper	rator				Securi	ty Fence				
Backup Op.	Phone #				Secure	e Shelter	\checkmark			
Backup Op.	E-mail				Stable	Entry Step	<mark>∕</mark>			
Shelter Work	king Room	Make	Shelter One	Ν	Iodel AF	R 263648		Shelter Size	24 cuft	
Shelter Clear	n 🗸	Notes	The enclosure I	houses the oz	one, DAS,	and MFC o	nly.			
Site OK		Notes								
Driving Diree	ctions									
Site ID	BAS601		Technician	Martin Valvur		Site Visit I	Date 08/19	9/2019		
Site Sponsor	(agency)	EPA			USGS	Мар				
Operating G	roup	BLM			Map S	cale				

BAS601

F-02058-1500-S2-rev002

Site ID

Technician Martin Valvur

Site Visit Date 08/19/2019

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

Siting Distances OK

Siting Criteria Comment

Site ID

BAS601

Fi	eld Sy	stems Data Fo	orm		F-02058-1500-S3-rev00						
Site	e ID	BAS601	Technician Martin Va	alvur	Site Visit Date	08/19/2019					
1	Are win being in	d speed and direction fluenced by obstructio	sensors sited so as to avons?	oid 🗸							
2	Are win (i.e. win horizon tower in	d sensors mounted so d sensors should be m tally extended boom > nto the prevailing wind	as to minimize tower eff ounted atop the tower of 2x the max diameter of t	fects? r on a the							
3	Are the	tower and sensors plu	mb?	\checkmark							
4	Are the avoid ra	temperature shields p adiated heat sources su	ointed north or position ich as buildings, walls, e	ed to 🛛 🗍 tc?	Pointing south						
5	Are tem conditio surface standing	perature and RH sens ons? (i.e. ground below and not steeply sloped g water should be avoi	ors sited to avoid unnat sensors should be natur . Ridges, hollows, and a ded)	ural 🔽 ral reas of							
6	Is the so	olar radiation sensor p	lumb?	\checkmark							
7	Is it site	d to avoid shading, or	any artificial or reflecte	ed light? 🔽							
8	Is the ra	ain gauge plumb?		\checkmark							
9	Is it site towers,	d to avoid sheltering e etc?	ffects from buildings, tr	ees,	45 degree rule viola	ation					
10	Is the su facing n	urface wetness sensor s orth?	ited with the grid surfac	ce 🗸	N/A						
11	Is it inc	lined approximately 3	0 degrees?	\checkmark	N/A						
Dre	wido onv	additional avalanation	n (nhatagranh ar skatah	if noosson	y) nogonding condi	tions listed above as	any other features				

Some objects violate the 45 degree rule for the tipping bucket rain gage. The Temperature shield is mounted on the south side of the tower tripod at 2 meters.

Site	BAS601 Technician Martin Valvur	Site Visit Date 08/19/2019
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)	

F-02058-1500-S4-rev002

Site	e ID	BAS601	Technician	Martin Valvur		Site Visit Date	08/19/2019	
1	Do all the condition	e meterological sensor 1, and well maintained	rs appear to be 1?	intact, in good				
2	Are all th reporting	he meteorological sens g data?	sors operationa	l online, and	✓			
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 sur	rface wetness sensor g	rid clean and u	ndamaged?	✓	N/A		
7	Are the s condition	ensor signal and powe	er cables intact 1?	, in good				
8	Are the s from the	ensor signal and powe elements and well ma	er cable connec iintained?	tions protected	✓			

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

Site ID

BAS601

Tec

Technician Martin Valvur

Site Visit Date 08/19/2019

Field Systems Data Form F-02058-1500-S5-rev002 Site ID BAS601 Technician Martin Valvur Site Visit Date 08/19/2019 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 nylon 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?		Not present
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Not present

Site	e ID BAS601 Technician Martin Valvur	Site Visit Date 08/19/2019
	Siting Criteria: Are the pollutant analyzers and deposition e	quipment 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?	, 🗆

Fi	eld Systems Data Form		F-02	058-15	00-S6-rev002	
Site	BAS601 Technician Martin Valvur		Site Visit Date	08/19/2019		
	DAS, sensor translators, and peripheral equipment operation	ns a	nd maintenance			
1	Do the DAS instruments appear to be in good condition and well maintained?	✓				
2	Are all the components of the DAS operational? (printers, modem, backup, etc)					
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?		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?					
9	Is the met tower stable and grounded?		Stable		Grounded	
10	Is the sample tower stable and grounded?					
11	Tower comments?				V	

Site ID	BAS601	Technician Martin Valvur	Site Visit Date 08/19/2019			
DAS, sensor translators, and peripheral equipment operations and maintenance						

Field Systems Data	Form				F-02 ()58-150	0-S7-rev002
Site ID BAS601	Тес	hnician Martin	n Valvur	Site Visit Date	08/19/2019		
Documentation	Documentation						
Does the site have the require	ed instrun	nent and equip	ment manuals?	-			
Wind speed sensor Wind direction sensor Temperature sensor Relative humidity sensor Solar radiation sensor Surface wetness sensor Wind sensor translator Temperature translator Humidity sensor translator Solar radiation translator			Data logg Data logg Strip chan Computer Modem Printer Zero air p Filter flow Surge pro UPS	er er et recorder e ump v pump tector	Yes	No N/A Image: State	
Tipping bucket rain gauge			Lightning	protection device			
Ozone analyzer			Shelter he	eater			
Filter pack MFC power supply			Sheller al	Conditioner			
Doos the site have the requi	rod and m	ost recent OC	documents on	I ronart forme?			
Does the site have the requi	Dregent		uocuments and		Cumon	4	
Station Log SSRF Site Ops Manual HASP Field Ops Manual Calibration Reports Ozone z/s/p Control Charts Preventive maintenance schedu		Not present in BLM office in BLM office in BLM office Not present				t	
1 Is the station log properly completed during every site visit? Not present 2 Are the Site Status Benert Forms being completed and Image: Complete Status St							
current?	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?							
Provide any additional 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 chain-of-custody la	The filter pack chain-of-custody labels are not being used.						
Site ID BAS601	Тес	hnician Martin	n Valvur	Site Visit Date	08/19/2019		

Documentation

F-02058-1500-S8-rev002

rield Systems Data Form								1 -020	50-1.	00-50-10002
Site	ID	BAS601	Technicia	n	Aartin Valvur		Site Visit Date	08/19/2019		
1	<u>Site op</u> Has th course	eration procedures e site operator attended ? If yes, when and who	l a formal C. instructed?	AST						
2	Has th trainin	e backup operator atten ig course? If yes, when a	nded a forma and who inst	l C ruc	ASTNET ted?					
3	Is the since the second	ite visited regularly on t e?	he required	Tu	esday					
4	Are the flollow	e standard CASTNET o ed by the site operator?	perational p	roc	edures being					
5	Is the state of the requirements of the requir	ite operator(s) knowled uired site activities? (in	geable of, an cluding docu	d al me	ble to perform ntation)					
	<u>Are reg</u>	gular operational QA/Q	<u>C checks per</u>	<u>for</u>	med on meteor	ologi	cal instruments?			
QC	Check]	Performed			Frequency			Con	npliant	
Mu	ltipoint	Calibrations		✓	Semiannuall	/		\checkmark		
Visi	ual Insp	ections		✓	Weekly			\checkmark		
Tra	nslator	Zero/Span Tests (clima	tronics)		N/A			\checkmark		
Ma	nual Ra	in Gauge Test		✓	Monthly			\checkmark		
Con	nfirm Re	easonableness of Currer	nt Values	✓	Weekly			\checkmark		
Tes	t Surfac	e Wetness Response			N/A			\checkmark		
	<u>Are reg</u>	ular operational QA/Q	<u>C checks per</u>	for	med on the ozo	one an	alyzer?			
QC	Check]	Performed			Frequency			Con	npliant	
Mu	lti-point	Calibrations		✓	Semiannuall	/				
Aut	omatic 2	Zero/Span Tests		✓	Daily					
Ma	nual Zei	ro/Span Tests								
Aut	omatic 1	Precision Level Tests		✓	Daily					
Ma	nual Pre	ecision Level Test								
Ana	alyzer D	iagnostics Tests		✓	Weekly					
In-l	ine Filte	er Replacement (at inlet)	✓	Monthly					
In-l	ine Filte	er Replacement (at anal	yze		N/A			\checkmark		
San	nple Lin	e Check for Dirt/Water						\checkmark		
Zer	o Air Do	esiccant Check		✓	Weekly			\checkmark		
1 2	Do mul sample Do auto	ti-point calibration gase train including all filter matic and manual z/s/r	es go throug rs? o gasses go fl	n th roi	e complete		Inknown			
3	complete sample train including all filters? 3 Are the automatic and manual z/s/p checks monitored and reported? If yes, how?									

The ozone inlet filter is replaced each month.						
Site ID	BAS601	Technician	Martin Valvur	Site Visit Date	08/19/2019	

Field Systems Data Form F-02058-1500-S9-rev002 BAS601 Technician Martin Valvur Site Visit Date 08/19/2019 Site ID Site operation procedures Is the filter pack being changed every Tuesday as scheduled? Filter changed mornings 90% of the time 1 Are the Site Status Report Forms being completed and filed 2 correctly? No longer required 3 Are data downloads and backups being performed as scheduled? ✓ Are general observations being made and recorded? How? 4 ✓ Are site supplies on-hand and replenished in a timely 5 fashion? SSRF Are sample flow rates recorded? How? 6 \checkmark Are samples sent to the lab on a regular schedule in a timely 7 fashion? ✓ One set of gloves only Are filters protected from contamination during handling 8 and shipping? How? Are the site conditions reported regularly to the field 9 operations manager or staff? **QC Check Performed** Compliant Frequency \checkmark Semiannually **Multi-point MFC Calibrations** ✓ Weekly ✓ **Flow System Leak Checks Filter Pack Inspection** \checkmark ✓ Weekly **Flow Rate Setting Checks** Not present **Visual Check of Flow Rate Rotometer** Semiannually \checkmark **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:

Site ID	BAS601	Technician	Martin Valvur	Site Visit Date	08/19/2019	
<u>Site ope</u>	ration procedures					

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

Site ID	BAS601

Technician Martin Valvur

Site Visit Date 08/19/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR1000	41006	none
elevation	Elevation	none	none	none
Filter pack flow pump	Thomas	107CAB18	Illegible	none
Flow Rate	Omega	FMA6518ST-RS232	318559-1	none
Infrastructure	Infrastructure	none	none	none
Met tower	unknown	unknown	none	none
Ozone	ThermoElectron Inc	49i A1NAA	1214552973	L0534684
Ozone Standard	ThermoElectron Inc	49i E3CAA	1214552971	none
Shelter Temperature	unknown	unknown	none	none
siting criteria	Siting Criteria	none	None	none
Temperature2meter	Campbell	10755	124	none
Zero air pump	Thomas	107CAB18	100800033636	none

Site ID

Technician Martin Valvur

Site Visit Date 08/19/2019

Site Visit Sensors

BAS601

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number	
BUF603-Martin Valvur-08/20/2019							
1	8/20/2019	DAS	Campbell	49917	CR1000	43073	
2	8/20/2019	elevation	Elevation	none	none	none	
3	8/20/2019	Filter pack flow pump	Thomas	none	107CAB18A	119900011286	
4	8/20/2019	Flow Rate	Omega	none	FMA6518ST-RS232	315688-1	
5	8/20/2019	Infrastructure	Infrastructure	none	none	none	
6	8/20/2019	MFC power supply	Sceptre	none	FMA65PWC	295106-12	
7	8/20/2019	Sample Tower	Unknown	none	Unknown	None	
8	8/20/2019	siting criteria	Siting Criteria	none	none	None	
9	8/20/2019	Temperature2meter	Campbell	none	10755	Missing	

Flow Data Form

Mfg	Serial Nun	nber Tag S	Site	Тес	chnician	Site Visit D	ate Para	meter	Owner ID	
Omega	315688-1		BUF603	Ma	artin Valvur	08/20/2019	I9 Flow Rate		none	
Mfg	Sceptre				Mfg	BIOS		Parameter Flo	rameter Flow Rate	
SN/Owner ID 295106-12 none			Serial Number	122974		Tfer Desc. Bl	OS 220-H			
Parameter:	MFC power sup	oply			Tfer ID	01416				
					Slope	1.	00178 <mark>In</mark>	tercept	0.00161	
					Cert Date	7/13	3/2018 C	orrCoff	1.00000	
DAS 1:		DAS 2:		_	Cal Factor Z	ero	0.4	401		
A Avg % Diff:	A Max % Dif	A Avg %I	Diff A Max	% Dif	Cal Factor F	ull Scale	0.9	985		
2.86%	3.09%				Rotometer Reading: 0			0		
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	E InputUnit OutputSignal		I PctDifference	
primary	pump off	0.000	0.000	0.00	0.000	0.40	l/m	l/m		
primary	leak check	0.000	0.000	0.00	0.000	0.40	l/m	l/m		
primary	test pt 1	2.920	2.910	0.00	0.000	3.00	l/m	l/m	3.09%	
primary	test pt 2	2.930	2.920	0.00	0.000	3.00	l/m	l/m	2.74%	
primary	test pt 3	2.930	2.920	0.00	0.000	3.00	l/m	l/m	2.74%	
Sensor Comp	onent Leak Tes	it		Conditio	on		Stat	us pass		
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Stat	us pass		
Sensor Comp	onent Filter Pos	sition		Conditio	n Good		Stat	us pass		
Sensor Comp	onent Rotomete	er Condition	I	Conditio	n N/A		Stat	us pass		
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	resent	Stat	us pass		
Sensor Comp	onent Filter Dis	tance		Conditio	2.5 cm		Stat	us pass		
Sensor Comp	onent Filter Dep	oth		Conditio	n 10 cm		Stat	us pass		
Sensor Comp	onent Filter Azi	muth		Conditio	n 180 deg		Stat	us pass		
Sensor Comp	onent System N	/lemo		Conditio	on		Stat	us pass		

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number	Tag Site	r	Technician		Site Vis	it Date 1	Paramete	r	Owner ID
Campbell	Missing	BUF603		Martin Va	llvur	08/20/2	019	Femperatu	ure2meter	none
				Mfg		Fluke		Para	meter Tem	perature
				Serial	Number	3275143	3	Tfer	Desc. RTD	
				Tfer I	D	01229				
DAS 1:	DA	S 2:		Slope			0.99989	Interce	ept	-0.00649
Abs Avg Err A	bs Max Err Abs	s Avg Err Abs	s Max Err	Cert I	Date		1/23/2019	CorrC	off	1.00000
0.06	0.14									
UseDescription	Test type	InputTmpRaw	InputTmpC	orrected	OutputTm	pSignal	OutputSi	gnalEng	OSE Unit	Difference
primary		0.17		0.18		0.000		0.20	С	0.02
primary		25.00		25.01		0.000		25.15	С	0.14
primary		47.27		47.28		0.000		47.26	С	-0.02
Sensor Compo	nent Properly Sited	b	Cond	ition Prop	perly sited	·		Status pa	ass	
Sensor Compo	nent Shield		Cond	ition Clea	an			Status pa	ass	
Sensor Component Blower			Cond	Condition N/A				Status pa	ass	
Sensor Component Blower Status Switch			Cond	Condition N/A				Status pa	ass	
Sensor Compo	nent System Memo	0	Cond	Condition				Status pa	ass	

Infrastructure Data For

Site ID BUF603	Technician Martin	valvur Site Visit Date 08/20/2019
Shelter Make	Shelter Model	Shelter Size

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

Field Systems Comments

1 Parameter: 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.

F-02058-1500-S1-rev002

Site ID BUF603	Technician Martin Valvur	Site Visit Date 08/20	0/2019
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
County City, State	Johnson Buffalo, WY	Audit Declination Present	9.3
County City, State Zip Code	Johnson Buffalo, WY 82834	Audit Declination Present Fire Extinguisher	9.3
County City, State Zip Code Time Zone	Johnson Buffalo, WY 82834 Mountain	Audit Declination Present Fire Extinguisher First Aid Kit	9.3
County City, State Zip Code Time Zone Primary Operator	Johnson Buffalo, WY 82834 Mountain	Audit Declination Present Fire Extinguisher First Aid Kit Safety Glasses	9.3
County City, State Zip Code Time Zone Primary Operator Primary Op. Phone #	Johnson Buffalo, WY 82834 Mountain	Audit DeclinationImage: state st	9.3
County City, State Zip Code Time Zone Primary Operator Primary Op. Phone # Primary Op. E-mail	Johnson Buffalo, WY 82834 Mountain	Audit DeclinationImage: state st	9.3
County City, State Zip Code Time Zone Primary Operator Primary Op. Phone # Primary Op. E-mail Backup Operator	Johnson Buffalo, WY 82834 Mountain	Audit DeclinationImage: state st	9.3
County City, State Zip Code Time Zone Primary Operator Primary Op. Phone # Primary Op. E-mail Backup Operator Backup Op. Phone #	Johnson Buffalo, WY 82834 Mountain	Audit DeclinationImage: state st	9.3
County City, State Zip Code Time Zone Primary Operator Primary Op. Phone # Primary Op. E-mail Backup Operator Backup Op. Phone #	Johnson Buffalo, WY 82834 Mountain	Audit Declination / Present / Fire Extinguisher	9.3
County City, State City, State Cip Code Cip Code Cip Code Cip Code Cip Code Cip Code Cip	Johnson Buffalo, WY 82834 Mountain	Audit Declination $\begin{tabular}{lllllllllllllllllllllllllllllllllll$	9.3
CountyCity, StateZip CodeTime ZonePrimary OperatorPrimary Op. Phone #Primary Op. E-mailBackup OperatorBackup Op. Phone #Shelter Working RoomShelter Clean	Johnson Buffalo, WY 82834 Mountain	Audit Declination Fire Extinguisher First Aid Kit Aidety Glasses Safety Glasses Aidety Hard Had Climbing Belt Secure Shelter Aidety Fence Aidety Fence	9.3
CountyCity, StateCity, StateZip CodeTime ZonePrimary OperatorPrimary Op. Phone #Primary Op. E-mailBackup OperatorBackup OperatorBackup OperatorShelter Working RoomShelter CleanSite OK	Johnson Buffalo, WY 82834 Mountain	Audit Declination Fire Extinguisher First Aid Kit Gafety Glasses Safety Hard Had Climbing Belt Security Fence Secure Shelter Stable Entry Steps Odel	9.3

BUF603

F-02058-1500-S2-rev002

Site ID

Technician Martin Valvur

Site Visit Date 08/20/2019

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

Siting Distances OK

Siting Criteria Comment

Fi	eld Systems Data Form	F-02058-1500-S3-1	ev002	
Site	BUF603 Technician Martin Valvur		Site Visit Date 08/20/2019	
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	

The temperature is measured at 2.5 meters above the ground.

F-02058-1500-S4-rev002

Site	e ID	BUF603	Technician	Martin Valvur		Site Visit Date	08/20/2019]
1	1 Do all the meterological sensors appear to be intact, in good condition, and well maintained?							
2	Are all t reportin	he meteorological sens g data?	ors operationa	l online, and				
3	3 Are the shields for the temperature and RH sensors clean?			✓				
4	Are the	aspirated motors work	king?			N/A		
5	Is the so scratche	lar radiation sensor's s?	lens clean and f	ree of				
6	Is the su	rface wetness sensor g	rid clean and u	ndamaged?		N/A		
7	Are the s	sensor signal and pow n, and well maintained	er cables intact l?	, in good	✓			
8	Are the s from the	sensor signal and powe e elements and well ma	er cable connec intained?	tions protected				

Fi	eld Systems Data F	orm		F-02058-1500-S5-rev002
Site	BUF603	Technician Martin Valvur		Site Visit Date 08/20/2019
	Siting Criteria: Are the pollu	tant analyzers and deposition ec	uip	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the sample inlets have at l unrestricted airflow?	east a 270 degree arc of		
2	Are the sample inlets 3 - 15 m	eters above the ground?		
3	3 Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?			
	Pollutant analyzers and depo	sition equipment operations and	l ma	intenance
1	Do the analyzers and equipm condition and well maintained	ent appear to be in good d?	✓	N/A
2	Are the analyzers and monitor reporting data?	ors operational, on-line, and	✓	N/A
3	Describe ozone sample tube.			N/A
4	Describe dry dep sample tube	2.		3/8 teflon by 10 meters
5	Are in-line filters used in the indicate location)	ozone sample line? (if yes		N/A
6	Are sample lines clean, free o obstructions?	f kinks, moisture, and		
7	Is the zero air supply desiccan	nt unsaturated?	✓	N/A
8	Are there moisture traps in the	ne sample lines?		Not present
9	Is there a rotometer in the dr	y deposition filter line, and is it		Not present

clean?

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.

Fi	eld Sy	stems Data Fo		F-02058-1500-S6-rev002				
Site	e ID	BUF603	Technician Martin Valvur		Site Visit	Date 08/20/201	9	
DAS, sensor translators, and peripheral equipment operatio		ns ai	nd maintenan	<u>ice</u>				
1	Do the DAS instruments appear to be in good condition and well maintained?			✓				
2	Are all t modem,	the components of the , backup, etc)	DAS operational? (printers,	✓				
3	Do the a lightnin	analyzer and sensor sing protection circuitry	gnal leads pass through		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 ground	DAS, sensor translate ed?	rs, and shelter properly	✓				
7	Does the	e instrument shelter h	ave a stable power source?	✓				
8	Is the in	nstrument shelter temj	erature controlled?	✓	Marginally			
9	Is the m	net tower stable and gr	ounded?		Stable		Grounded	
10	Is the sa	ample tower stable and	l grounded?					
11	Tower o	comments?						

The NEMA enclosure has a cooling fan.

Field Systems Data Form						F-02058-1500-S7-rev002		
Site ID BU	F603	Tec	hnician Martin Valv	rur Site Visit Date C	8/20/2019			
<u>Documentatio</u>	<u>n</u>							
Does the site h	ave the required in	nstrum	ent and equipment	manuals?				
	Yes	No	N/A		Yes	No	N/A	
Wind speed sense	or 🗌			Data logger		✓		
Wind direction s	ensor			Data logger			\checkmark	
Temperature sen	Isor	✓		Strip chart recorder			\checkmark	
Relative humidit	y sensor			Computer			\checkmark	
Solar radiation s	ensor			Modem			\checkmark	
Surface wetness s	sensor			Printer			\checkmark	
Wind sensor tran	nslator			Zero air pump			\checkmark	
Temperature tra	nslator			Filter flow pump				
Humidity sensor	translator			Surge protector			\checkmark	
Solar radiation to	ranslator			UPS			\checkmark	
Tipping bucket r	ain gauge 🛛 🗌			Lightning protection device			\checkmark	
Ozone analyzer]	Shelter heater			\checkmark	
Filter pack flow of	controller	\checkmark		Shelter air conditioner			\checkmark	
Filter pack MFC	power supply							
Does the site	have the required	and m	ost recent QC docu	ments and report forms?				
	Pre	esent			Curre	nt		
Station Log			Not present					
SSRF			· ·		\checkmark			
Site Ops Manual			2013		\checkmark			
HASP			2013		\checkmark			
Field Ops Manual			2013		\checkmark			
Calibration Reports			Not present					
Ozone z/s/p Control Charts			N/A		\checkmark			
Preventive maintenance schedule [Not present					
1 Is the station	n log properly com	pleted	during every site v	isit?				
2 Are the Site Status Report Forms being completed and current?								
3 Are the chair sample trans	3 Are the chain-of-custody forms properly used to docume sample transfer to and from lab?			ent 🔽				
4 Are ozone z/ current?	Are ozone z/s/p control charts properly completed and current?							

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.
BUF603 Technician Martin Valvur Site Visit Date 08/20/2019 Site ID Site operation procedures Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

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

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

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

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

✓	N/A
✓	N/A
✓	N/A

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

F-02058-1500-S8-rev002

Fie	eld Sy	stems Data	Form	F-02058-1500-S9-rev				
Site	ID	BUF603	Technician	Martin Valvur	Site Visit Date	08/20/2019]	
	Site ope	eration procedures						
1	Is the fi	ilter pack being cha	nged every Tuesda	y as scheduled? 🗹	Filter changed morr	nings		
2	Are the	Site Status Report	Forms being comp	leted and filed 🔽				

No longer required

2

correctly?

3	Are data downloads and backups bei scheduled?		No longer required	1		
4	4 Are general observations being made and recorded? How?			SSRF		
5	Are site supplies on-hand and replent fashion?	ished in a timely	✓			
6	Are sample flow rates recorded? How	v?	✓	SSRF		
7	Are samples sent to the lab on a regu fashion?	lar schedule in a timely				
8	3 Are filters protected from contamination during handling and shipping? How?			One set of gloves	only	
9	Are the site conditions reported regulation operations manager or staff?	larly to the field				
Q	C Check Performed	Frequency			Compliant	
	Multi-point MFC Calibrations	Semiannually				
	Flow System Leak Checks	✓ Weekly			\checkmark	
	Filter Pack Inspection					
	Flow Rate Setting Checks	✓ Weekly				
	Visual Check of Flow Rate Rotometer	Not present				
	In-line Filter Inspection/Replacement	Semiannually			\checkmark	
	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-02058-15 0	0-S10-rev002
Site ID	BUF603	Technician	Martin Valvur	Site Visit Date	08/20/2019	

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
MFC power supply	Sceptre	FMA65PWC	295106-12	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 V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
SHE6	604-Martin	Valvur-08/20/2019				
1	8/20/2019	DAS	Campbell	49923	CR1000	unknown2
2	8/20/2019	elevation	Elevation	none	none	none
3	8/20/2019	Flow Rate	Omega	none	FMA6518ST-RS232	318559-1
4	8/20/2019	Infrastructure	Infrastructure	none	none	none
5	8/20/2019	Sample Tower	Unknown	none	Unknown	None
6	8/20/2019	siting criteria	Siting Criteria	none	none	None
7	8/20/2019	Temperature2meter	Campbell	none	10755	Illegible

Flow Data Form

Mfg	Serial Nun	iber Tag S	Site	Тес	chnician	Site Visit Da	Site Visit Date Paran		Owner ID
Omega	318559-1		SHE604	Ma	artin Valvur	08/20/2019	08/20/2019 Flow Rate		none
					Mfg	BIOS	P	arameter Flo	w Rate
					Serial Number	122974	Т	fer Desc. BIC	DS 220-H
					Tfer ID	01416			
					Slope	1.0	0178 Inte	ercept	0.00161
					Cert Date	7/13	/2018 Co	rrCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero	0.3	93	
A Avg % Diff:	A Max % Dif	A Avg %I	Diff A Max	% Dif	Cal Factor F	ull Scale	0.9	33	
2.88%	4.01%				Rotometer R	eading:		0	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignal	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	3.000	2.990	0.00	0.000	3.11	l/m	l/m	4.01%
primary	test pt 2	3.020	3.010	0.00	0.000	3.12	l/m	l/m	3.65%
primary	test pt 3	3.090	3.080	0.00	0.000	3.11	l/m	l/m	0.97%
Sensor Comp	onent Leak Tes	t		Conditio	n		Status	s pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Good		Status	s pass	
Sensor Comp	onent Rotomete	er Condition	I	Conditio	n N/A		Status	s pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture p	resent	Status	s pass	
Sensor Comp	onent Filter Dist	tance		Conditio	n 3.5 cm		Status	s pass	
Sensor Comp	onent Filter Dep	oth		Conditio	n 2.0 cm		Status	s pass	
Sensor Component Filter Azimuth			Conditio	ndition 315 deg			s pass		
Sensor Comp	onent System M	lemo		Conditio	on		Status	s pass	

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number	Tag Site	1	Fechnicia	n	Site Vis	it Date	Paramete	r	Owner ID
Campbell	Illegible	SHE604		Martin Va	alvur	08/20/2	019	Temperatu	ure2meter	none
				Mfg		Fluke		Para	meter Tem	perature
				Serial	Number	3275143	3	Tfer	Desc. RTD	
				Tfer I	D	01229]		
DAS 1:	DA	S 2:		Slope			0.99989	Interce	ept	-0.00649
Abs Avg Err A	bs Max Err Abs	s Avg Err Ab	s Max Err	Cert I	Date		1/23/2019	CorrC	off	1.00000
0.07	0.09									
UseDescription	Test type	InputTmpRaw	InputTmpC	orrected	OutputTm	pSignal	OutputSi	ignalEng	OSE Unit	Difference
primary	Femp Low Rang	0.16		0.17		0.000		0.22	С	0.05
primary '	Гетр Mid Range	24.23		24.24		0.000		24.33	С	0.09
primary '	Гетр High Rang	47.49		47.50		0.000		47.56	С	0.06
Sensor Compor	ent Properly Sited	k	Condi	tion Prop	perly sited			Status pa	ass	
Sensor Compor	ent Shield		Condi	tion Clea	an			Status pa	ass	
Sensor Compor	ent Blower		Condi	tion N/A				Status pa	ass	
Sensor Compor	nent Blower Status	Switch	Condi	tion N/A				Status Pa	ass	
Sensor Compor	nent System Memo	0	Condi	tion				Status pa	ass	

Infrastructure Data For

Site ID	SHE604	Technician Martin	Valvur Site Visit Date 08/20/2019
Shelter M	lake	Shelter Model	Shelter Size

Sensor Component S	ample Tower Type	Condition	Other	Status	pass
Sensor Component	onduit	Condition	Good	Status	pass
Sensor Component	et Tower	Condition	Good	Status	pass
Sensor Component	oisture Trap	Condition	Installed	Status	pass
Sensor Component	ower Cables	Condition	Good	Status	pass
Sensor Component	helter Temp Control	Condition	N/A	Status	pass
Sensor Component	otometer	Condition	Not installed	Status	Fail
Sensor Component S	ample Tower	Condition	Good	Status	pass
Sensor Component	helter Condition	Condition	Good	Status	pass
Sensor Component	helter Door	Condition	Good	Status	pass
Sensor Component	helter Roof	Condition	Good	Status	pass
Sensor Component	helter Floor	Condition	Good	Status	pass
Sensor Component	ignal Cable	Condition	Good	Status	pass
Sensor Component	ubing Type	Condition	3/8 teflon	Status	pass
Sensor Component S	ample Train	Condition	Good	Status	pass

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SHE604	Technician Martin Valvur	Site Visit Date 08/2	0/2019
			· · · · · · · · · · · · · · · · · · ·
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	Duccont	
		Present	
Zip Code	82801	Fire Extinguisher	
Zip Code Time Zone	82801 Mountain	Fire Extinguisher	
Zip Code Time Zone Primary Operator	82801 Mountain	Fire Extinguisher First Aid Kit Safety Glasses	
Zip Code Time Zone Primary Operator Primary Op. Phone #	82801 Mountain	Fire Extinguisher Image: Constraint of the second seco	
Zip Code Time Zone Primary Operator Primary Op. Phone # Primary Op. E-mail	82801 Mountain	Fire ExtinguisherFirst Aid KitSafety GlassesSafety Hard HatClimbing Belt	
Zip Code Time Zone Primary Operator Primary Op. Phone # Primary Op. E-mail Backup Operator	82801 Mountain	Fire ExtinguisherFirst Aid KitSafety GlassesSafety Hard HatClimbing BeltSecurity Fence	
Zip Code Time Zone Primary Operator Primary Op. Phone # Primary Op. E-mail Backup Operator Backup Op. Phone #	82801 Mountain	Fire ExtinguisherFirst Aid KitSafety GlassesSafety Hard HatClimbing BeltSecurity FenceSecure Shelter	
Zip Code Time Zone Primary Operator Primary Op. Phone # Primary Op. E-mail Backup Operator Backup Op. Phone # Backup Op. E-mail	82801 Mountain	Fire ExtinguisherFirst Aid KitSafety GlassesSafety Hard HatClimbing BeltSecurity FenceSecure ShelterStable Entry Steps	
Zip Code Time Zone Primary Operator Primary Op. Phone # Primary Op. E-mail Backup Operator Backup Op. Phone # Backup Op. E-mail	82801 Mountain	Fire Extinguisher First Aid Kit Safety Glasses Safety Hard Hat Climbing Belt Security Fence Secure Shelter Stable Entry Steps	
Zip CodeTime ZonePrimary OperatorPrimary Op. Phone #Primary Op. E-mailBackup OperatorBackup Op. Ehone #Shelter Working RoomShelter Clean	82801 Mountain	Fire Extinguisher First Aid Kit Safety Glasses Safety Hard Hat Climbing Belt Security Fence Secure Shelter Stable Entry Steps	
Zip CodeTime ZonePrimary OperatorPrimary Op. Phone #Primary Op. E-mailBackup OperatorBackup OperatorShelter Working RoomShelter CleanSite OK	82801 Mountain Mountain Mountain Mountain Mountain Mountain Mountain Notes NEMA enclosure, solar power Notes	Fire Extinguisher First Aid Kit Safety Glasses Safety Hard Hat Climbing Belt Security Fence Secure Shelter Stable Entry Steps	

SHE604

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Site ID

Technician Martin Valvur

Site Visit Date 08/20/2019

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

Siting Distances OK

Siting Criteria Comment

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

Fi	eld Systems Data Form	F-02058-1500-S3-rev002	
Site	SHE604 Technician Martin Valvur		Site Visit Date 08/20/2019
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.

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Site	e ID	SHE604	Technician	Martin Valvur		Site Visit Date	08/20/2019	
1 2 3	Do all th condition Are all th reporting Are the s	e meterological sensor 1, and well maintained 1e meteorological sens g data? shields for the tempera	rs appear to be 1? sors operational ature and RH se	intact, in good l online, and ensors clean?	<!--</th--><th></th><th></th><th></th>			
4	4 Are the aspirated motors working?					N/A		
5	Is the sol scratches	ar radiation sensor's] s?	lens clean and f	ree of				
6	Is the su	rface wetness sensor g	rid clean and u	ndamaged?	✓	N/A		
7	Are the s condition	ensor signal and powe	er cables intact, 1?	, in good				
8	Are the s from the	ensor signal and powe elements and well ma	er cable connec intained?	tions protected				

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

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

Fi	eld Systems Data Form		F-02058-1500-S5-rev(
Site	e ID SHE604 Technician Martin Valvu	ır	Site Visit Date 08/20/2019				
	Siting Criteria: Are the pollutant analyzers and depositio	n equipn	ent sited in accordance with 40 CFI	<u>R 58, Appendix E</u>			
1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?						
2	Are the sample inlets 3 - 15 meters above the ground?	\checkmark					
3	Are the sample inlets > 1 meter from any major obstructi and 20 meters from trees?	ion, 🗹					
	Pollutant analyzers and deposition equipment operations	and mai	ntenance				
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 trans in the sample lines?		Not present				

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

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

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.

Fi	eld Systems Data	a Form	F-02058-1500-S6-rev002				
Site	e ID SHE604	Technician Martin Valvur		Site Visit Date	08/20/2019		
	DAS, sensor translators,	and peripheral equipment operatio	ns a	nd maintenance			
1	Do the DAS instruments well maintained?	appear to be in good condition and	✓				
2 Are all the components of the DAS operational? (printers, modem, backup, etc)							
3	Do the analyzer and sens lightning protection circu		Not present				
4	Are the signal connection well maintained?						
5	Are the signal leads conn	ected to the correct DAS channel?	✓				
6	Are the DAS, sensor tran grounded?	islators, and shelter properly					
7	Does the instrument shel	ter have a stable power source?					
8	Is the instrument shelter	temperature controlled?		Marginally			
9	Is the met tower stable a	nd grounded?		Stable		Grounded	
10	Is the sample tower stabl	e 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	l Systems Data	a For	·m			F-02	. 058 .	-1500-S7-rev002
Site ID	SHE604		Techni	<mark>cian</mark> Marti	n Valvur Site Visit Date	8/20/2019		
<u>Doci</u>	umentation							
Does	s the site have the requi	ired ins	trumen	t and equir	oment manuals?			
		Yes	No	N/A		Yes	No	N/A
Wind s	peed sensor			\checkmark	Data logger		\checkmark	
Wind d	lirection sensor			\checkmark	Data logger			
Tempe	rature sensor		\checkmark		Strip chart recorder			
Relativ	e humidity sensor			\checkmark	Computer			\checkmark
Solar r	adiation sensor			\checkmark	Modem			\checkmark
Surface	e wetness sensor			\checkmark	Printer			\checkmark
Wind s	ensor translator				Zero air pump			\checkmark
Tempe	rature translator			\checkmark	Filter flow pump		\checkmark	
Humid	ity sensor translator			\checkmark	Surge protector			
Solar ra	adiation translator			\checkmark	UPS			
Tipping	g bucket rain gauge			\checkmark	Lightning protection device			
Ozone	analyzer			\checkmark	Shelter heater			
Filter p	ack flow controller		\checkmark		Shelter air conditioner			
Filter p	ack MFC power suppl	y		\checkmark				
Do	es the site have the req	uired a	nd most	recent QC	<u>C documents and report forms?</u>			
		Pres	ent			Curre	nt	
Station	Log			ot present				
SSRF	0							
Site Op	os Manual		20)13				
HASP			2)13				
Field O	ps Manual		2)13				
Calibra	ation Reports			ot present				
Ozone :	z/s/p Control Charts	[
Preven	tive maintenance sched	lule [
		L						
1 Is	the station log properly	y comp	leted du	ring every	site visit?			
2 An	re the Site Status Repo rrent?	rt Form	ıs being	completed	and 🗹			
3 Ai sai	re the chain-of-custody mple transfer to and fr	forms om lab	properly ?	y used to d	ocument 🗹			

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 received a disc with the 2013 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.

SHE604 Technician Martin Valvur Site Visit Date 08/20/2019 Site ID Site operation procedures Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? \checkmark Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

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

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

\checkmark	N/A
✓	N/A
✓	N/A

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

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

F-02058-1500-S8-rev002

Field S	Systems Data Fo	orm	F-02058-1500-S9-rev002		
Site ID	SHE604	Technician Martin Valvur	Site Visit Date 08/20/2019		

Site ID

	Site operation procedures					
1	Is the filter pack being changed every	Tuesday as scheduled?		Filter changed mor	nings	
2	Are the Site Status Report Forms bei correctly?	ng completed and filed				
3	Are data downloads and backups bein scheduled?	ng performed as		No longer required		
4	Are general observations being made	and recorded? How?	✓	SSRF		
5	Are site supplies on-hand and repleni fashion?	shed in a timely				
6	Are sample flow rates recorded? How	v?	✓	SSRF		
7	Are samples sent to the lab on a regular schedule in a timely fashion?					
8	Are filters protected from contamina and shipping? How?	tion during handling	✓	One set of gloves o	nly	
9	Are the site conditions reported regul operations manager or staff?	arly to the field				
QC	C Check Performed	Frequency			Compliant	
	Multi-point MFC Calibrations	Semiannually				
	Flow System Leak Checks	✓ Weekly				
	Filter Pack Inspection					
	Flow Rate Setting ChecksImage: 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:

F-02058-1500-S10-rev002

Site ID	SHE604

Technician Martin Valvur

Site Visit Date 08/20/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR1000	unknown2	49923
elevation	Elevation	none	none	none
Flow Rate	Omega	FMA6518ST-RS23	2 318559-1	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 V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
PRKI	34-Eric H	ebert-08/27/2019				
1	8/27/2019	Computer	Dell	07021	Inspiron 15	2884848822
2	8/27/2019	DAS	Campbell	000411	CR3000	2509
3	8/27/2019	Elevation	Elevation	None	1	None
4	8/27/2019	Filter pack flow pump	Thomas	04918	107CAB18	060300019989
5	8/27/2019	Flow Rate	Арех	000656	AXMC105LPMDPCV	illegible
6	8/27/2019	Infrastructure	Infrastructure	none	none	none
7	8/27/2019	Modem	Digi	07198	LR54	unknown
8	8/27/2019	Ozone	ThermoElectron Inc	000693	49i A1NAA	1030244806
9	8/27/2019	Ozone Standard	ThermoElectron Inc	000440	49i A3NAA	CM08200016
10	8/27/2019	Sample Tower	Aluma Tower	000930	В	AT214072-Z-7-2
11	8/27/2019	Shelter Temperature	Campbell	none	107-L	unknown
12	8/27/2019	Siting Criteria	Siting Criteria	None	1	None
13	8/27/2019	Temperature	RM Young	06306	41342VC	12545
14	8/27/2019	Zero air pump	Werther International	06905	C 70/4	000821907

DAS Data Form

DAS Time Max Error: 0.03

Mfg	Serial Nun	nber Site	Т	echnician	Site Visit Date Parameter		Use Desc.
Campbell	2509	PRK	134 E	Eric Hebert	08/27/2019	DAS	Primary
Das Date:	8 /27/2019	Audit Date	8 /27/2019	Mfg	Fluke	Parameter	DAS
Das Time: Das Day:	239	Audit Time	239	Serial Number	95740135	Tfer Desc.	DVM
Low Channel:		High Channel	:	Tfer ID	01311		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0000	0.0001	0.0000	0.0001	Cert Date	1/25/201	9 CorrCoff	1.00000
				Mfg	Datel	Parameter	DAS
				Serial Number	15510194	Tfer Desc.	Source generator (D
				Tfer ID	01320		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	2/13/201	2 CorrCoff	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	V	V	0.0000	
7	0.1000	0.0999	0.0999	V	V	0.0000	
7	0.3000	0.2997	0.2997	V	V	0.0000	
7	0.5000	0.4996	0.4996	V	V	0.0000	
7	0.7000	0.6995	0.6995	V	V	0.0000	
7	0.9000	0.8994	0.8993	V	V	-0.0001	
7	1.0000	0.9993	0.9992	V	V	-0.0001	

Flow Data Form

Mfg	Serial Nun	nber Tag	Site	Те	chnician	Site Visit D	Date Param	eter	Owner ID	
Apex	illegible		PRK134	Er	ic Hebert	08/27/2019	Flow R	ate	000656	
					Mfg	BIOS	Pa	arameter Flo	ow Rate	
					Serial Number	148613	Т	fer Desc. Blo	OS 220-H	
					Tfer ID	01421				
					Slope	1.	00000 Inte	ercept	0.00000	
					Cert Date	3/4	4/2019 Cor	rCoff	1.00000	
DAS 1:		DAS 2:			Cal Factor Z	ero	0.0)1		
A Avg % Diff:	A Max % Dif	A Avg %	Diff A Max	% Dif	Cal Factor F	ull Scale	0.9	99		
0.90%	1.35%				Rotometer R	eading:	1	.5		
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignal	I PctDifference	
primary	pump off	0.000	0.000	0.01	0.000	0.02	l/m	l/m		
primary	leak check	0.000	0.000	0.05	0.000	0.06	l/m	l/m		
primary	test pt 1	1.484	1.480	1.51	0.000	1.50	l/m	l/m	1.35%	
primary	test pt 2	1.486	1.490	1.51	0.000	1.50	l/m	l/m	0.67%	
primary	test pt 3	1.492	1.490	1.51	0.000	1.50	l/m	l/m	0.67%	
Sensor Comp	onent Leak Tes	st		Conditio	Condition			Status pass		
Sensor Comp	onent Tubing C	ondition		Conditio	on Good		Status	pass		
Sensor Comp	onent Filter Pos	sition		Conditio	n Good		Status	pass		
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	Clean and dry		Status	pass		
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	esent	Status	pass		
Sensor Comp	onent Filter Dis	tance		Conditio	9n 4.5 cm		Status	pass		
Sensor Component Filter Depth			Conditio	ndition 2.0 cm			pass			
Sensor Component Filter Azimuth			Conditio	dition 30 deg			Status pass			
Sensor Comp	onent System N	Лето		Conditio	on		Status	pass		

Ozone Data Form

Mfg		Serial Number	Tag Site	ſ	Fechr	nician	Site Visit Date	Parameter	Owner ID
ThermoElectro	n Inc	1030244806	PRK134		Eric ⊦	Hebert	08/27/2019	Ozone	000693
Slope: Intercept CorrCoff: DAS 1: A Avg % Diff 0.0%	(((:: A M	0.96640 Slope 1.33743 Interd 0.99999 Corre DA Iax % Dif A A 0.0%	: (Copt (Coff: Coff: Cof	0.00000 0.00000 0.00000 Max % Dif	M Se Tf Sle Ce	fg erial Number Ger ID ope ert Date	ThermoElectron 1180030022 01114 0.9984 6/11/201	Inc Parameter Tfer Dese O Intercept	c. Ozone primary stan 0.27090 1.00000
UseDescripti primary primary primary primary primary	ion	ConcGroup 1 2 3 4 5	Tfer Raw 0.47 15.99 33.23 68.63 117.32	Tfer Corr 0.19 15.74 33.01 68.46 117.23		Site -1.18 13.66 30.72 65.06 111.80	Site Unit ppb ppb ppb ppb ppb	RelPerDif -7.19 -5.09 -4.74	AbsDif -1.37 -2.08
Sensor Com Sensor Com Sensor Com	ipone ipone ipone	nt Sample Train 22.5 degree r nt Inlet Filter Co	ule	Condi	ition ition ition	Good Moderately clea	an	StatuspassStatuspassStatuspass	
Sensor Com	- ipone	nt Battery Back	q	Condi	ition	N/A		Status pass	
Sensor Com	ipone	nt Offset		Condi	ition	0.000		Status pass	
Sensor Com	ipone	nt Span		Condi	Condition 1.008			Status pass	
Sensor Com	ipone	nt Zero Voltage		Condi	ition	ion N/A		Status pass	
Sensor Com	ipone	nt Fullscale Volt	age	Condi	ition	n N/A		Status pass	
Sensor Com	ipone	nt Cell A Freq.		Condi	ition	94.6 kHz		Status pass	
Sensor Com	ipone	nt Cell A Noise		Condi	ition	Not tested		Status pass	
Sensor Com	ipone	nt Cell A Flow		Condi	ition	0.71 lpm		Status pass	
Sensor Com	ipone	nt Cell A Pressu	ire	Condi	ition	695.7 mmHg		Status pass	
Sensor Com	ipone	nt Cell A Tmp.		Condi	ition	35.7 C		Status pass	
Sensor Com	ipone	nt Cell B Freq.		Condi	ition	95.8 kHz		Status pass	
Sensor Com	ipone	nt Cell B Noise		Condi	ition	Not tested		Status pass	
Sensor Com	ipone	nt Cell B Flow		Condi	ition	0.62 lpm		Status pass	
Sensor Com	ipone	nt Cell B Pressu	ire	Condi	ition	696.3 mmHg		Status pass	
Sensor Component Cell B Tmp.		Condi	ition	Dn N/A		Status pass			
Sensor Com	ipone	nt Line Loss		Condi	ition	Not tested		Status pass	
Sensor Com	ipone	nt System Mem	0	Condi	ition			Status pass	

Temperature Data Form

Mfg	Serial Number	Tag Site]	ſechni	ician	Site V	isit Date	Param	eter	Owner ID	
RM Young	12545	PRK134		Eric H	ebert	08/27	/2019	Temper	ature	06306	
				Mf	g	Extech	1	Ра	rameter Te	mperature	
				Ser	ial Number	H2327	'34	Tf	er Desc. R	D	
				Tfer ID		01227					
DAS 1:	DAS	Slope			1.00733 Intercept		0.14497				
Abs Avg Err	Abs Max Err Abs	Avg Err Abs	Max Err	x Err Cert Date			2/12/201	9 Cor	rCoff	1.00000	
0.07	0.11										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary	Temp Low Range	0.23	0.08		0.000		0.0)	С	-0.11	
primary	Temp Mid Range	24.01	23.69)	0.000		23.	6	С	-0.09	
primary	Temp High Range	45.90	45.42	2	0.000		45.	4	С	-0.01	
Sensor Con	ponent Shield		Condi	tion C	Clean			Status	pass		
Sensor Component Blower				Condition N/A				Status	s pass		
Sensor Component Blower Status Switch				Condition N/A				Status	1s pass		
Sensor Con	ponent System Memo)	Condi	Condition				Status	status pass		

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	unknown	PRK134	Eric Hebert	08/27/2019	Shelter Temperatur	renone
DAS 1:	DAS 2:		Mfg	Extech	Parameter S	helter Temperature
Abs Avg Err Abs	Max Err Abs Avg 0.40	Err Abs Max Err	Serial Number	H232734	Tfer Desc. R	TD
			Tfer ID	01227		
			Slope	1.0073	3 Intercept	0.14497
			Cert Date	2/12/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.81	26.47	0.000	26.2	С	-0.28
primary	Temp Mid Range	26.67	26.33	0.000	26.2	С	-0.11
primary	Temp Mid Range	27.29	26.95	0.000	26.6	С	-0.4
Sensor Con	nponent System Memo	•	Condition	Status pass			

Infrastructure Data For

Site ID	PRK134	Technician Eric Hebe	ert Site Visit Date 08/27/2019
Shelter	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2116-11)	640 cuft

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

Field Systems Comments

1 Parameter: SitingCriteriaCom

Clover and Barley have been planted for hay within 20m of the site starting in 2008.

2 Parameter: ShelterCleanNotes

The shelter is clean, neat, and well organized.

3 Parameter: PollAnalyzerCom

The ozone inlet filter housing is dirty, however the ozone accuracy was within acceptance limits.

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Site ID PRK134	PRK134 Technician Eric Hebert		7/2019				
Site Superson (a compan)	EDA	USGS Man	Perkinstown				
Site Sponsor (agency)		Man Saala					
Operating Group	Private	Map Scale					
AQS #	55-119-9991	Map Date					
Meteorological Type	R.M. Young						
Air Pollutant Analyzer	Ozone, PM2.5	QAPP Latitude	45.2066				
Deposition Measurement	dry, wet	QAPP Longitude	-90.5972				
Land Use	woodland - mixed	QAPP Elevation Meters	472				
Terrain	gently rolling	QAPP Declination	1.6				
Conforms to MLM	Yes	QAPP Declination Date	2/22/2006				
Site Telephone		Audit Latitude	45.206525				
Site Address 1	W 10776 CTH M	Audit Longitude	-90.597209				
Site Address 2		Audit Elevation	462				
County	Taylor	Audit Declination	-1.3				
City, State	Medford, WI	Present					
Zip Code	54451	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 Ekto Mo	odel 8810 (s/n 2116-11)	Shelter Size 640 cuft				
Shelter Clean	Notes The shelter is clean, neat, and	well organized.					
Site OK	Notes						
Driving Directions From Medford continue north on 13 approximately 4.5 miles and turn left (west) onto county route M. Continue approximately 13 miles. Before reaching Perkinstown, and just after crossing a small creek and two sharp curves, the site will be visible behind the landowners house on the right.							

Field	Systems	Data	Form
		2	

PRK134

F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 08/27/2019

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

Siting Distances OK

Siting Criteria Comment

Clover and Barley have been planted for hay within 20m of the site starting in 2008.

Fie	eld Sy	stems Data Fo	orm			F-02058-1500-S3-rev002			
Site	e ID	PRK134	Technician Er	ric Hebert		Site Visit Date 08/27/2019			
1	Are wind being inf	l speed and direction luenced by obstruction	sensors sited so as ons?	s to avoid	✓	N/A			
2 Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)						N/A			
3	Are the	tower and sensors plu	mb?		✓	N/A			
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?					Mounted to sample tower	-		
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)								
6	Is the so	ar radiation sensor p	lumb?	I	✓	N/A]		
7	Is it sited	l to avoid shading, or	any artificial or r	eflected light?	✓	N/A	-		
8	Is the ra	in gauge plumb?			✓	N/A	-		
9	Is it sited towers, e	l to avoid sheltering e etc?	ffects from buildi	ngs, trees,	✓	N/A	-		
10	10 Is the surface wetness sensor sited with the grid surface facing north?					N/A	-		
11	11 Is it inclined approximately 30 degrees?					N/A	-		
						L	-		

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

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Site	e ID	PRK134	Technician	Eric Hebert		Site Visit Date	08/27/2019	
 Do all the meterological sensors appear to be intact, in good condition, and well maintained? Are all the meteorological sensors operational online, and reporting data? 								
3	Are the s	hields for the tempera	ature and RH s	ensors clean?	\checkmark			
4	Are the aspirated motors working?					N/A		
5	5 Is the solar radiation sensor's lens clean and free of scratches?					N/A		
6	Is the sur	rface wetness sensor g	rid clean and u	ndamaged?	\checkmark	N/A		
7	Are the s conditior	ensor signal and powe	er cables intact 1?	, in good		N/A		
8	Are the s from the	ensor signal and powe elements and well ma	er cable connec iintained?	tions protected	✓	N/A		

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

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev002
Site	e ID	PRK134	Technician Eri	ic Hebert		Site Visit Date 08/27/2019
	Siting C	Criteria: Are the pollut	ant analyzers and	deposition equi	<u>ipm</u>	ent sited in accordance with 40 CFR 58, Appendix E
1	Do the s unrestri	cample inlets have at le	east a 270 degree a	rc of		
2	Are the	sample inlets 3 - 15 m	eters above the gro	ound?		
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?					
	<u>Pollutar</u>	nt analyzers and depos	sition equipment of	perations and n	nai	<u>atenance</u>
1	Do the a conditio	analyzers and equipme on and well maintained	ent appear to be in 1?	good		
2	Are the reportin	analyzers and monitor ng data?	rs operational, on-	line, and		
3	Describe	e ozone sample tube.			,	1/4 teflon by 15 meters
4	Describ	e dry dep sample tube				3/8 teflon by 15 meters
5	Are in-li indicate	ine filters used in the o location)	ozone sample line?	(if yes		At inlet only
6	Are sam obstruct	nple lines clean, free of tions?	f kinks, moisture,	and	✓	
7	Is the ze	ero air supply desiccan	nt unsaturated?		✓	
8	Are the	re moisture traps in th	e sample lines?			Flow line only
9	Is there clean?	a rotometer in the dry	y deposition filter l	ine, and is it		Clean and dry

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

The ozone inlet filter housing is dirty, however the ozone accuracy was within acceptance limits.

Fie	eld Sy	vstems Data Fo	orm				F-02	2058-15	00-S6-rev002
Site	e ID	PRK134	Technician	Eric Hebert		Site Visit Date	08/27/2019)	
	DAS, se	ensor translators, and j	peripheral equip	pment operation	<u>is ai</u>	nd maintenance			
1	Do the l well ma	DAS instruments appe intained?	ar to be in good	condition and					
2	Are all modem	the components of the , backup, etc)	DAS operation	al? (printers,	✓				
3	Do the a lightnin	analyzer and sensor signs of the sensor signs	gnal leads pass t ?	through		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 ground	DAS, sensor translato ed?	rs, and shelter j	properly					
7	Does th	e instrument shelter h	ave a stable pow	ver source?	✓				
8	Is the instrument shelter temperature controlled?								
9	Is the m	net tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	ample tower stable and	l grounded?						
11	Tower	comments?							

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

Field S	ystems Data	For	m				F-02	2058-	-1500-S7-ı	:ev002
Site ID	PRK134		Tech	nician	Eric Hebert	Site Visit Date	08/27/2019)		
Docume	<u>ntation</u>									
Does the	site have the requir	ed ins	<u>trume</u>	nt and	l equipment manuals?					
Wind speed Wind direc Temperatu Relative hu Solar radia Surface wet Wind senso Temperatu Humidity se Solar radia Tipping bu Ozone anal Filter pack	d sensor tion sensor re sensor unidity sensor tion sensor tness sensor or translator re translator ensor translator tion translator cket rain gauge yzer flow controller	Yes □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □		N/↓ Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	A Data logge Data logge Data logge Strip char Computer Modem Printer Printer Filter flow Surge prot UPS Lightning Shelter he	er er t recorder ump pump tector protection device ater conditioner	Yes □ □ ✓ □ □ □ □ □ □ □ □ □ □ □ □ □			
Does th	ne site have the requi	ired a	nd mo	st rece	ent QC documents and	report forms?				
		Pres	ent				Curre	ent		
Station Log	5						\checkmark			
SSRF							\checkmark			
Site Ops Ma	anual			Feb 200	01					
HASP				Fe b 20)14		\checkmark			

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

1

2

3

4

-	• •	
Preventive	maintenance	schedule

July 1990

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

✓

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

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Site	ID	PRK134	Technician	Eric Hebert		Site Visit Date 08/27/2019				
	Site ope	ration procedures								
1	Has the course?	site operator attended If yes, when and who	l a formal CAS instructed?	TNET training						
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?									
3	Is the sit schedule	e visited regularly on t ?	the required Tu	iesday	✓					
4	Are the s flollowed	standard CASTNET o I by the site operator?	perational proc	cedures being	✓	Channels up during ozone diagnostics				
5	Is the sit the requ	e operator(s) knowled ired site activities? (in	geable of, and a cluding docum	able to perform entation)	✓					
	Are regular operational QA/QC checks performed on meteorological instruments?									
QC	Check P	erformed		Frequency		Compliant				

\checkmark	N/A	\checkmark
\checkmark	N/A	\checkmark
	N/A	✓
\checkmark	N/A	\checkmark
\checkmark	N/A	\checkmark
\checkmark	N/A	\checkmark
	 > > > > > > 	✓ N/A ✓ N/A

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

QC Check Performed

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

Frequency	•
Semiannually	
Daily	
As needed	
Daily	
As needed	
Weekly	
Every 2 weeks	
N/A	
Weekly	
Weekly	

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

mpliant

ld Systems Data Form					F-02058-1500-S9-rev002			
D	PRK134	Technician	Eric Hebert		Site Visit Date 08/27/2019]		
<u>Site oper</u>	ation procedures							
Is the filt	ter pack being change	d every Tuesda	y as scheduled?	✓	Filter changed morinings			
Are the S correctly	Site Status Report For ?	ms being com	pleted and filed	✓				
Are data	downloads and backu	ips being perfo	ormed as		No longer required			

Fie

Site 1

1

2

3

scheduled?

Sample Line Check for Dirt/Water

Are data downloads and backups being performed as

4	Are general observations being made and recorded? How?				SSRF, logbook
5	Are site supplies on-hand and replen fashion?	ishe	d in a timely	✓	
6	Are sample flow rates recorded? How?				SSRF, logbook, call-in
7	Are samples sent to the lab on a regu fashion?	lar	schedule in a timely		
8	Are filters protected from contamination during handling and shipping? How?				Clean gloves on and off
9	Are the site conditions reported regu operations manager or staff?	larl	y to the field		
QC	Check Performed		Frequency		Compliant
]	Multi-point MFC Calibrations	✓	Semiannually		
]	Flow System Leak Checks	✓	Weekly		
]	Filter Pack Inspection				
]	Flow Rate Setting Checks	✓	Weekly		
1	Visual Check of Flow Rate Rotometer	✓	Weekly		
]	In-line Filter Inspection/Replacement	✓	Semiannually		

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

✓ Weekly

✓

rielu Systems Data rul II.	Field	Systems	Data	Form
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PRK134

F-02058-1500-S10-rev002

Technician Eric Hebert

Site Visit Date 08/27/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	2884848822	07021
DAS	Campbell	CR3000	2509	000411
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	060300019989	04918
Flow Rate	Apex	AXMC105LPMDPC	illegible	000656
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07198
Ozone	ThermoElectron Inc	49i A1NAA	1030244806	000693
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200016	000440
Sample Tower	Aluma Tower	В	AT214072-Z-7-2	000930
Shelter Temperature	Campbell	107-L	unknown	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	12545	06306
Zero air pump	Werther International	C 70/4	000821907	06905

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
VOY	413-Eric H	ebert-08/29/2019				
1	8/29/2019	DAS	Environmental Sys Corp	90632	8816	2505
2	8/29/2019	Elevation	Elevation	None	1	None
3	8/29/2019	Filter pack flow pump	Thomas	none	107CAB18	111500052144
4	8/29/2019	Flow Rate	Alicat	none	MC-10SLPM-D-PCV	Unknown
5	8/29/2019	Infrastructure	Infrastructure	none	none	none
6	8/29/2019	Ozone	ThermoElectron Inc	90714	49C	49C-66828-354
7	8/29/2019	Ozone Standard	ThermoElectron Inc	90569	49C	49C-59260-322
8	8/29/2019	Sample Tower	Aluma Tower	none	В	AT-51159-11-G
9	8/29/2019	Shelter Temperature	ARS	none	none	none
10	8/29/2019	Siting Criteria	Siting Criteria	None	1	None
11	8/29/2019	Temperature2meter	RM Young	none	41342VC	029199
12	8/29/2019	Zero air pump	Twin Tower Engineering	90719	TT70/E4	526294
DAS Data Form

DAS Time Max Error: 1.83

Mfg	Serial Nun	nber Site	1	Fechnician	Site Visit Date	Parameter	Use Desc.
Environmental S	bys 2505	VOY	413	Eric Hebert	08/29/2019	DAS	Primary
Das Date:	8 /29/2019	Audit Date	8 /29/2019	Mfg	Fluke	Parameter	DAS
Das Time:	11:28:00	Audit Time	11:26:10	Serial Number	95740135	Tfer Desc.	DVM
Low Channel	271	High Channel	271	Tfer ID	01311		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0000	0.0001	0.0000	0.0001	Cert Date	1/25/201	9 CorrCoff	1.00000
				Mfg	Datel	 Parameter	DAS
				Serial Number	15510194	Tfer Desc.	Source generator (D
				Tfer ID	01320]	
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	2/13/201	2 CorrCoff	1.00000
Channel	In mut DI		DAS Outrast	La martel La ite	OntractUnit	Difference	
Channel						Difference	
3	0.0000	0.0000	0.0000		V	0.0000	
3	0.1000	0.0999	0.1000	7 V	V	0.0001	
3	0.5000	0.2997	0.2997	v v	V	0.0000	
3	0.3000	0.4990	0.4990	S V	v V	0.000	
3	0.7000	0.0993	0.099.		v V	0.000	
3	1.0000	0.9992	0.9993	3 V	V	0.0001	

Flow Data Form

Mfg	Serial Nun	nber Tag	Site	Тес	chnician	Site Visit Date		eter	Owner ID
Alicat	Unknown		VOY413	Eri	ic Hebert	08/29/2019	08/29/2019 Flow R		none
					Mfg	BIOS	Pa	arameter Flo	w Rate
					Serial Number	148613	Т	fer Desc. BIC	DS 220-H
					Tfer ID	01421			
					Slope	1	.00000 Inte	ercept	0.00000
					Cert Date	3/	4/2019 Cor	rCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero	-0.02	21	
A Avg % Diff:	A Max % Dif	A Avg %	Diff A Max	% Dif	Cal Factor F	ull Scale	5.09	98	
0.22%	0.33%				Rotometer R	eading:	3.1	15	
Desc.	Test type	Input l/n	n Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignal	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.03	l/m	l/m	
primary	leak check	0.000	0.000	-0.01	0.000	0.03	l/m	l/m	
primary	test pt 1	2.988	2.990	2.96	0.000	3.00	l/m	l/m	0.33%
primary	test pt 2	2.993	2.990	2.96	0.000	3.00	l/m	l/m	0.33%
primary	test pt 3	3.000	3.000	2.96	0.000	3.00	l/m	l/m	0.00%
Sensor Comp	onent Leak Tes	st		Conditio	n		Status pass		
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Good		Status	pass	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	resent	Status	pass	
Sensor Comp	onent Filter Dis	tance		Conditio	n 5.5 cm		Status	pass	
Sensor Comp	onent Filter Dep	oth		Conditio	Condition 0.5 cm			pass	
Sensor Comp	onent Filter Azi	muth		Conditio	Condition 270 deg			pass	
Sensor Comp	onent System N	Лето		Conditio	Condition			pass	

Ozone Data Form

Mfg	Serial Nur	nber Tag Site	Т	echnician	Site Visit Date	Parameter	Owner ID
ThermoElectron	Inc 49C-6682	8-354 VOY	413 E	Fric Hebert	08/29/2019	Ozone	90714
Slope: Intercept CorrCoff: DAS 1: A Avg % Diff:	1.00464 S -0.49771 I 0.99999 (A Max % Dif	Slope:	0.00000 0.00000 0.00000 A Max % Dif	Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 1180030022 01114 0.9984 6/11/20	Inc Paramete Tfer Dese Intercept	er ozone c. Ozone primary stan 0.27090 1.00000
UseDescription	n ConcGrou	p Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary primary primary primary primary	1 2 3 4 5	0.46 16.11 33.58 68.68	0.18 15.86 33.36 68.51	-0.45 15.39 33.19 68.46	ppb ppb ppb ppb	-0.51 -0.07	-0.63 -0.47
Sensor Comp	onent Sample	Train	Condit	ion Good	ppo	Status pass	
Sensor Comp	onent 22.5 deg	ree rule	Condit	ion		Status pass	
Sensor Comp	onent Inlet Filte	er Condition	Condit	ion Clean		Status pass	
Sensor Comp	onent Battery E	Backup	Condit	ion N/A		Status pass	
Sensor Comp	onent Offset		Condit	ion 0.20		Status pass	
Sensor Comp	onent Span		Condit	ion 1.021		Status pass	
Sensor Comp	onent Zero Vol	tage	Condit	ion -0.0005		Status pass	
Sensor Comp	onent Fullscale	e Voltage	Condit	ion 1.0005		Status pass	
Sensor Comp	onent Cell A Fi	req.	Condit	ion 78.1 kHz		Status pass	
Sensor Comp	onent Cell A N	oise	Condit	ion 0.8 ppb		Status pass	
Sensor Comp	onent Cell A Fl	ow	Condit	ion 0.71 lpm		Status pass	
Sensor Comp	onent Cell A P	ressure	Condit	ion 706.8 mmHg		Status pass	
Sensor Comp	onent Cell A Tr	mp.	Condit	ion 33.3 C		Status pass	
Sensor Comp	onent Cell B Fi	req.	Condit	ion 71.4 kHz		Status pass	
Sensor Comp	onent Cell B N	oise	Condit	ion 0.9 ppb		Status pass	
Sensor Comp	onent Cell B FI	ow	Condit	ion 0.73 lpm		Status pass	
Sensor Comp	onent Cell B P	ressure	Condit	ion 706.1 mmHg		Status pass	
Sensor Comp	onent Cell B Tr	mp.	Condit	ion N/A		Status pass	
Sensor Comp	onent Line Los	S	Condit	ion Not tested		Status pass	
Sensor Comp	onent System	Memo	Condit	ion		Status pass	

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number	r Tag Site	Т	Fechnicia	an	Site Vis	it Date H	Paramete	r	Owner ID
RM Young	029199	VOY413		Eric Hebe	ərt	08/29/2	019 T	Temperati	ure2meter	none
				Mfg		Extech		Para	meter Tem	perature
				Serial	Number	H23273	4	Tfer	Desc. RTD	
				Tfer I	D	01227				
DAS 1:	DA	S 2:		Slope			1.00733	Interco	ept	0.14497
Abs Avg Err A	bs Max Err Ab	os Avg Err Ab	os Max Err	Cert I	Date		2/12/2019	CorrC	off	1.00000
0.37	0.46									
UseDescription	Test type	InputTmpRaw	InputTmpCo	orrected	OutputTm	pSignal	OutputSig	gnalEng	OSE Unit	Difference
primary	Temp Low Rang	0.33		0.18		0.000		-0.07	С	-0.25
primary	Temp Mid Range	23.51		23.20		0.000		22.81	С	-0.39
primary	Temp High Rang	44.56		44.09		0.000		43.63	С	-0.46
Sensor Compo	nent Properly Site	d	Condi	ition Prop	perly sited		:	Status pa	ass	
Sensor Compo	nent Shield		Condi	ition Clea	an		;	Status Pa	ass	
Sensor Compo	nent Blower		Condi	i <mark>tion</mark> Fun	ctioning		;	Status pa	ass	
Sensor Compo	nent Blower Statu	s Switch	Condi	ition N/A				Status pa	ass	
Sensor Compo	nent System Merr	10	Condi	ition				Status pa	ass	

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	VOY413	Eric Hebert	08/29/2019	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	elter Temperature
Abs Avg Err Abs	0.28	vg Err Abs Max Er	Serial Number	H232734	Tfer Desc. RTI)
			Tfer ID	01227		
			Slope	1.0073	3 Intercept	0.14497
			Cert Date	2/12/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	21.86	21.56	0.000	21.6	С	0.07
primary	Temp Mid Range	21.64	21.34	0.000	21.6	С	0.28
Sensor Con	nponent System Memo)	Condition		Status	pass	

Infrastructure Data For

Site ID	VOY413	Technician Eric Heb	ert Site Visit Date 08/29/2019
Shelter 1	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2880-2)	640 cuft

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

Field Systems Comments

1 Parameter: DasComments

The sample tower itself is not grounded, however it is bolted to the shelter which is grounded. The shelter has a leak above the instrument rack. The site operator has placed a gallon milk jug to catch the water which he reports can sometimes be full in one week.

2 Parameter: DocumentationCo

Correctly completing the general observations section of the SSRF on the day of filter installation was discussed with the operator.

3 Parameter: SitingCriteriaCom

The site is located at the top of a hill in a forest. There are trees surrounding the site which are below the tower height, but within 10 m of the inlet.

4 Parameter: ShelterCleanNotes

The shelter is neat and well organized. The shelter is in poor condition with a severe roof leak.

5 Parameter: PollAnalyzerCom

There are no trees violating the 22.5 degree cone above the ozone sample inlet. However, there is a communication tower which is above the 22.5 degree threshold.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID VOY413	Technician Eric Hebert	Site Visit Date 08/2	9/2019				
Site Sponsor (agency)	NPS	USGS Map	Ash River NE				
Operating Group	NPS	Map Scale					
AQS #	27-137-0034	Map Date					
Meteorological Type	Climatronics						
Air Pollutant Analyzer	Ozone, IMPROVE	QAPP Latitude	48.4128				
Deposition Measurement	dry, wet	QAPP Longitude	-92.8292				
Land Use	woodland - mixed	QAPP Elevation Meters	429				
Terrain	rolling	QAPP Declination					
Conforms to MLM	Marginally	QAPP Declination Date					
Site Telephone		Audit Latitude	48.412518				
Site Address 1	CR 129	Audit Longitude	-92.829225				
Site Address 2	Ash River Visitor Center Rd.	Audit Elevation	427				
County	St. Louis	Audit Declination	0.5				
City, State	Orr, MN	Present					
Zip Code	55771	Fire Extinguisher					
Time Zone	Central	First Aid Kit					
Primary Operator		Safety Glasses					
Primary Op. Phone #		Safety Hard Hat					
Primary Op. E-mail		Climbing Belt					
Backup Operator		Security Fence					
Backup Op. Phone #		Secure Shelter					
Backup Op. E-mail		Stable Entry Steps ✓					
Shelter Working Room	Make Ekto M	odel 8810 (s/n 2880-2)	Shelter Size 640 cuft				
Shelter Clean	Notes The shelter is neat and well or	ganized. The shelter is in poor	condition with a severe roof leak.				
Site OK	Notes						
Driving Directions From Duluth take route 53 north towards International Falls. Approximately 20 miles south of International Falls and just north of Orr, turn right (east) on County Road 129. Continue approximately 9.5 miles and turn left toward the Ash River Visitor Center. Continue approximately 1.5 miles and look for a closed gate on the right. The site is approximately 1 mile up the trail from the road.							

Field Systems Data Form

VOY413

F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 08/29/2019

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

Siting Distances OK

Siting Criteria Comment

The site is located at the top of a hill in a forest. There are trees surrounding the site which are below the tower height, but within 10 m of the inlet.

Fi	eld Sy	stems Data Fo	orm			F-02058 -	1500-S3-rev002
Site	e ID	VOY413	Technician	Eric Hebert		Site Visit Date 08/29/2019	
1	Are wind being inf	d speed and direction fluenced by obstructio	sensors sited so ons?	as to avoid		N/A	
2 Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)				tower effects? e tower or on a neter of the		N/A	
3	Are the tower and sensors plumb?					N/A	
4	Are the avoid ra	temperature shields p diated heat sources su	ointed north or Ich as buildings	positioned to , 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 so	lar radiation sensor p	lumb?		✓	N/A	
7	Is it site	d to avoid shading, or	any artificial o	r reflected light?		N/A	
8	Is the ra	in gauge plumb?			✓	N/A	
9	Is it sited towers, o	d to avoid sheltering e etc?	ffects from buil	dings, trees,	✓	N/A	
10	Is the su facing n	rface wetness sensor s orth?	sited with the gr	id surface	✓	N/A	
11	Is it inc	lined approximately 3	0 degrees?			N/A	
						L	

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site	e ID	VOY413	Technician	Eric Hebert		Site Visit Date 08/29/2019
1	1 Do all the meterological sensors appear to be intact, in good condition, and well maintained?					Temperature only
2	2 Are all the meteorological sensors operational online, and reporting data?					Temperature only
3	3 Are the shields for the temperature and RH sensors clean?				✓	
4	4 Are the aspirated motors working?					
5	5 Is the solar radiation sensor's lens clean and free of scratches?				✓	N/A
6	Is the su	rface wetness sensor g	rid clean and u	ndamaged?	✓	N/A
7	Are the s condition	ensor signal and powe	er cables intact, 1?	, in good	✓	
8	Are the s from the	ensor signal and powe elements and well ma	er cable connec hintained?	tions protected	✓	

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

Fi	field Systems Data Form				F-02058-1500-S5-				
Site	e ID	VOY413	Technician Eric Heber	t	Site Visit Date 08/29/2019				
	Siting C	criteria: Are the polluta	ant analyzers and depositi	ion equipn	nent sited in accordance with 40 CF	<u>R 58, Appendix E</u>			
1	Do the s unrestri	cample inlets have at le icted airflow?	ast a 270 degree arc of						
2	Are the	sample inlets 3 - 15 me	ters above the ground?						
3	Are the and 20 r	sample inlets > 1 meter meters from trees?	r from any major obstruc	ction,	Trees within 5 meters				
	<u>Pollutar</u>	nt analyzers and deposi	tion equipment operation	<u>ns and mai</u>	ntenance				
1	Do the a conditio	analyzers and equipme on and well maintained	nt appear to be in good ?						
2	Are the reportin	analyzers and monitor ng data?	s operational, on-line, and	d 🔽					
3	Describ	e ozone sample tube.			1/4 teflon by 12 meters				
4	Describ	e dry dep sample tube.			3/8 teflon by 9 meters				
5	Are in-li indicate	ine filters used in the o location)	zone sample line? (if yes		At inlet only				
6	Are sam obstruct	nple lines clean, free of tions?	kinks, moisture, and						
7	Is the ze	ero air supply desiccan	t unsaturated?						
8	Are the	re moisture traps in the	e sample lines?		<u></u>				
9	Is there clean?	a rotometer in the dry	deposition filter line, and	l is it 🗹	Clean and dry				

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

There are no trees violating the 22.5 degree cone above the ozone sample inlet. However, there is a communication tower which is above the 22.5 degree threshold.

Fi	eld Sy	stems Data Fo	orm				F-0 2	2058-15	00-S6-rev002
Site	e ID	VOY413	Technician	Eric Hebert		Site Visit I	Date 08/29/2019	9	
	DAS, se	ensor translators, and	peripheral equi	pment operation	<u>is ai</u>	nd maintenance	<u>e</u>		
1	Do the l well ma	DAS instruments appe intained?	ear to be in good	l condition and					
2	Are all modem	the components of the , backup, etc)	DAS operation	al? (printers,	✓				
3	Do the a lightnin	analyzer and sensor sign protection circuitry	gnal leads pass † ?	through	✓	Met sensors on	ly		
4	Are the well ma	signal connections pro intained?	otected from the	e weather and	✓				
5	Are the	signal leads connected	l to the correct	DAS channel?	✓				
6	Are the ground	DAS, sensor translato ed?	ors, and shelter	properly					
7	Does th	e instrument shelter h	ave a stable pov	ver source?	✓				
8	Is the ir	nstrument shelter temp	perature control	lled?					
9	Is the m	net tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	ample tower stable and	d 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 sample tower itself is not grounded, however it is bolted to the shelter which is grounded. The shelter has a leak above the instrument rack. The site operator has placed a gallon milk jug to catch the water which he reports can sometimes be full in one week.

Field Systems Data I	or	m				F-0 2	2058-	-1500-S7-rev002
Site ID VOY413		Tech	nician	Eric Hebert	Site Visit Date	08/29/2019	9	
Documentation								
Does the site have the required	l ins	trume	ent and	l equipment manuals?				
Y Wind speed sensor Wind direction sensor Temperature sensor Relative humidity sensor Solar radiation sensor Surface wetness sensor Surface wetness sensor Wind sensor translator Temperature translator Humidity sensor translator Solar radiation translator Solar radiation translator Tipping bucket rain gauge Ozone analyzer Filter pack flow controller Filter pack MFC power supply			N/2 V V V V V V V V V V V	A Data logge Data logge Data logge Strip char Computer Modem Printer Zero air p Filter flow Surge prot UPS Lightning Shelter her	er er t recorder ump pump tector protection devic ater conditioner	Yes ✓ □ □ □ □ □ □ □ □ □ □ □ □ □	No 	N/A
Does the site have the requir	ed a	nd mo	st recei	ent QC documents and	report forms?			
l Station Log SSRF Site Ops Manual HASP Field Ops Manual Calibration Reports Ozone z/s/p Control Charts Preventive maintenance schedule		ent	Datavie Jan 200	ew 06			ent	
1 Is the station log properly co	omp	leted c	luring o	every site visit? ✓	ataview			
2 Are the Site Status Report F current?	orm	ıs bein	g comp	pleted and 🔽 F	low section only			
3 Are the chain-of-custody for sample transfer to and from	ms j lab	prope ?	rly used	d to document 🔽				
4 Are ozone z/s/p control char current?	ts pi	roperl	y comp	pleted and 🔲 C	Control charts not u	used		
Provide any additional explanati natural or man-made, that may a	on (j offec	photog t the r	graph o nonitor	or sketch if necessary) ring parameters:	regarding condi	tions listed	above,	or any other features,

Correctly completing the general observations section of the SSRF on the day of filter installation was discussed with the operator.

Field Systems Data Form

F-02058-1500-S8-rev002

Site	e ID	VOY413	Technician	Eric Hebert		Site Visit Date 08/29/2019	
	Site ope	ration procedures					-
1	Has the course?	site operator attended If yes, when and who	d a formal CAS instructed?	TNET training		Trained by ARS	
2	Has the training	backup operator atte course? If yes, when	nded a formal (and who instru	CASTNET cted?			
3	Is the sit schedule	e visited regularly on ?	the required Tu	ıesday			
4	Are the s flollowed	standard CASTNET of by the site operator?	operational proc	cedures being			
5	Is the sit the requ	e operator(s) knowled ired site activities? (in	geable of, and a	able to perform entation)			
	Are regu	llar operational QA/Q	C checks perfo	rmed on meteor	ologi	ical instruments?	

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

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

OC	Check	Performed
$\mathbf{v}\mathbf{v}$	Chiech	I CITOT MICA

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

Frequency	(
Semiannually	
Daily	
Weekly	
Daily	
Weekly	
Alarm values only	
Every 3 weeks	
N/A	
Weekly	
Weekly	

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

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

	Unknown
✓	
✓	Dataview

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

Compliant

Field Systems Data Form F-02058-1500-S9-rev002 VOY413 Technician Eric Hebert Site Visit Date 08/29/2019 Site ID Site operation procedures Is the filter pack being changed every Tuesday as scheduled? Filter changed various times 1 Are the Site Status Report Forms being completed and filed 2 correctly? No longer required 3 Are data downloads and backups being performed as scheduled? SSRF Are general observations being made and recorded? How? 4 ✓ Are site supplies on-hand and replenished in a timely 5 fashion? SSRF Are sample flow rates recorded? How? 6 \checkmark Are samples sent to the lab on a regular schedule in a timely 7 fashion? ✓ One set of gloves only Are filters protected from contamination during handling 8 and shipping? How? Are the site conditions reported regularly to the field 9 operations manager or staff? **QC Check Performed** Compliant Frequency \checkmark Semiannually **Multi-point MFC Calibrations** ✓ Weekly ✓ **Flow System Leak Checks Filter Pack Inspection** \checkmark ✓ Weekly **Flow Rate Setting Checks** ✓ Weekly \checkmark Visual Check of Flow Rate Rotometer ✓ As needed \checkmark **In-line Filter Inspection/Replacement** \checkmark ✓ Weekly 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-	l

F-02058-1500-S10-rev002

Site	Vicit	Sancore
Site	Visit	Sensors

Site ID

VOY413

Technician Eric Hebert

Site Visit Date 08/29/2019

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Environmental Sys Corp	8816	2505	90632
Elevation	Elevation]1	None	None
Filter pack flow pump	Thomas	107CAB18	111500052144	none
Flow Rate	Alicat	MC-10SLPM-D-PCV	Unknown	none
Infrastructure	Infrastructure	none	none	none
Ozone	ThermoElectron Inc	49C	49C-66828-354	90714
Ozone Standard	ThermoElectron Inc	49C	49C-59260-322	90569
Sample Tower	Aluma Tower	B	AT-51159-11-G	none
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342VC	029199	none
Zero air pump	Twin Tower Engineering	TT70/F4	526294	90719

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ACA	416-Korey	Devins-09/18/2019				
1	9/18/2019	Computer	Hewlett Packard	none	8460p	CNU20941M6
2	9/18/2019	DAS	Environmental Sys Corp	none	8832	A3506K
3	9/18/2019	Elevation	Elevation	None	1	None
4	9/18/2019	F460 translator	Climatronics	none	100163	683
5	9/18/2019	Flow Rate	Alicat	none	MC-10SLPM-D-PCV	Illgeible
6	9/18/2019	Infrastructure	Infrastructure	none	none	none
7	9/18/2019	Mainframe	Climatronics	01342	100081	1288
8	9/18/2019	Met tower	Climatronics	none	unknown	illegible
9	9/18/2019	Ozone	ThermoElectron Inc	90744	49C	49C-74536-376
10	9/18/2019	Ozone Standard	T-API	none	T-703V	71
11	9/18/2019	Precipitation	Climatronics	01322	100508-2	illegible
12	9/18/2019	Relative Humidity	Rotronic	none	MP 601A	67857
13	9/18/2019	Sample Tower	Aluma Tower	none	В	AT-71103-7I-3
14	9/18/2019	Shelter Temperature	Agilaire	none	Unknown	None
15	9/18/2019	Shield (2 meter)	Climatronics	none	100325	illegible
16	9/18/2019	Siting Criteria	Siting Criteria	None	1	None
17	9/18/2019	Solar Radiation	Licor	none	LI-200	PY16746
18	9/18/2019	Temperature Translator	Climatronics	03630	100088-2	401
19	9/18/2019	Temperature2meter	Climatronics	none	100093	missing
20	9/18/2019	Wind Direction	Climatronics	none	100076	illegible
21	9/18/2019	Wind Speed	Climatronics	none	100075	illegible
22	9/18/2019	Zero air pump	ThermoElectron Inc	none	111	111-30215-237

DAS Data Form

DAS Time Max Error: 0.17

Mfg	Serial Nur	nber Site	Т	echnician	Site Visit Date	Parameter	Use Desc.
Environmental S	ys A3506K	ACA	416	Korey Devins	09/18/2019	DAS	Primary
Das Date:	9 /18/2019	Audit Date	9 /18/2019	Mfg	Fluke	Parameter	DAS
Das Time:	14:36:10	Audit Time	14:36:20	Serial Number	95740135	Tfer Desc.	DVM
Das Day:	201	Audit Day	201	Tfer ID	01311		
Low Channel: Avg Diff:	Max Diff:	Avg Diff:	: Max Diff:	Slope	1.0000	0 Intercent	0.00000
0.0006	0.0019	0.0006	0.0019	Cort Data	1/25/201	9 CorrCoff	1 00000
				Cert Date	1720/201		
				Mfg	Datel	Parameter	DAS
				Serial Number	15510194	Tfer Desc.	Source generator (D
				Tfer ID	01320		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	2/13/201	2 CorrCoff	1.00000
Channel	Input D'	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
9	0.0000	0.0000	0.0000	V	V	0.0000	
9	0.1000	0.1001	0.0997	V V	V	-0.0004	
9	0.3000	0.3004	0.2997	V V	V	-0.0007	
9	0.5000	0.5008	0.5004	V	V	-0.0004	
9	0.7000	0.7011	0.7002	V	V	-0.0009	
9	0.9000	0.9020	0.9019			-0.0001	
9	1.0000	1.0049	1.0030) V	V	-0.0019	

Flow Data Form

Mfg Serial Number Tag Site			Те	chnician	Site Visit Date Parame		eter	Owner ID	
Alicat	Illgeible		ACA416	Ko	orey Devins	09/18/2019	Flow R	ate	none
					Mfg	BIOS	P	arameter Flow	v Rate
					Serial Number	fer Desc. BIO	S 220-H		
					Tfer ID	01421			
					Slope	1.	00000 Inte	ercept	0.00000
					Cert Date	3/-	4/2019 Cor	rCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero		0	
A Avg % Diff: A Max % Dif A Avg % Diff A Max			% Dif	Cal Factor F	ull Scale		0		
0.43% 0.65%				Rotometer R	eading:	1	.5		
Desc.	Test type	Input l/m	n Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.01	0.0000	0.04	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.0000	0.03	l/m	l/m	
primary	test pt 1	1.529	1.530	1.50	0.0000	1.52	l/m	l/m	-0.65%
primary	test pt 2	1.525	1.520	1.50	0.0000	1.52	l/m	l/m	0.00%
primary	test pt 3	1.531	1.530	1.50	0.0000	1.52	l/m	l/m	-0.65%
Sensor Comp	onent Leak Tes	st		Conditio	n		Status	pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Good		Status	pass	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	No moisture pr	esent	Status	pass	
Sensor Component Filter Distance		Conditio	n 3.0 cm		Status	pass			
Sensor Component Filter Depth		Conditio	1.0 cm		Status	pass			
Sensor Component Filter Azimuth			Conditio	ndition 140 deg			pass		
Sensor Comp	onent System M	<i>l</i> lemo		Conditio	on		Status	pass	

Ozone Data Form

Mfg		Serial Number	r Tag Site	Т	echnician	Site Visit Date	Parameter	Owner ID
ThermoElectro	on Inc	49C-74536-37	6 ACA416	i I	Korey Devins	09/18/2019	Ozone	90744
Slope: Intercept CorrCoff: DAS 1: A Avg % Diff 0.0%	Slope: 1 Intercept -1 CorrCoff: C DAS 1: A Avg % Diff: A M 0.0% UseDescription		1.06837 Slope: 0.00000 1.25419 Intercept 0.00000 0.99999 CorrCoff: 0.00000 DAS 2: Intercept 0.00000 0.0% Image: CorrCoff: 0.00000		Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 1180930075 01115 1.0080 3/26/20	Inc Paramete Tfer Dese 0 Intercept 19 CorrCoff	er ozone c. Ozone primary stan -0.40210 1.00000
UseDescription primary primary primary primary primary Sensor Component		ConcGroup 1 2 3 4 5	Tfer Raw -0.02 14.74 34.95 68.14 113.60	Tfer Corr 0.37 15.02 35.07 67.99 113.09	Site -0.71 14.79 36.23 70.99 119.80	Site Unit ppb ppb ppb ppb ppb	RelPerDif 3.25 4.32 5.76	AbsDif -1.08 -0.23
Sensor Component Sample Train Sensor Component 22.5 degree Sensor Component Inlet Filter Component		n rule	Condi	tion Good tion tion Clean	Good			
Sensor Con	npone	nt Battery Back	up	Condi	tion N/A		Status pass	
Sensor Con	npone	nt Offset		Condi	tion 1.20		Status pass	
Sensor Con	npone	nt Span		Condi	tion 1.105		Status pass	
Sensor Con	npone	nt Zero Voltage	;	Condi	tion -0.0004		Status pass	
Sensor Con	npone	nt Fullscale Vol	Itage	Condi	tion 10.0000		Status pass	
Sensor Con	npone	ent Cell A Freq.		Condi	tion 88.5 kHz		Status pass	
Sensor Con	npone	ent Cell A Noise		Condi	tion 0.6 ppb		Status pass	
Sensor Con	npone	nt Cell A Flow		Condi	tion 0.72 lpm		Status pass	
Sensor Con	npone	nt Cell A Press	ure	Condi	tion 734.1 mmHg		Status pass	
Sensor Con	npone	ent Cell A Tmp.		Condi	tion 33.2 C		Status pass	
Sensor Con	npone	nt Cell B Freq.		Condi	tion 81.8 kHz		Status pass	
Sensor Con	npone	nt Cell B Noise		Condi	tion 0.3 ppb		Status pass	
Sensor Con	npone	nt Cell B Flow		Condi	tion 0.65 lpm		Status pass	
Sensor Con	npone	nt Cell B Press	ure	Condi	tion 734.6 mmHg		Status pass	
Sensor Con	npone	nt Cell B Tmp.		Condi	tion N/A		Status pass	
Sensor Con	npone	nt Line Loss		Condi	tion Not tested		Status pass	
Sensor Con	npone	nt System Men	סו	Condi	tion		Status pass	

Wind Direction Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID	
Climatronics	illegible	ACA416	Korey Devins	09/18/2019	Wind Direction	none	
Mfg	Climatronics		Mfg	Ushikata	Parameter	wind direction	
SN/Owner ID	683 none		Serial Number	191832	Tfer Desc. t	ransit	
Parameter:	F460 translator		Tfer ID	01272]		
Vane SN: 14	91 C. A	. Align. deg. true:	Slope	1.0000	0 Intercept	0.00000	
VaneTorque	5 to 18	360	Cert Date	1/23/201	9 CorrCoff	1.00000	
			Mfg	RM Young	Parameter	wind direction	
			Serial Number	None	Tfer Desc.	wind direction wheel	
			Tfer ID	01252			
			Slope	1.0000	0 Intercept	0.00000	
			Cert Date	4/26/201	3 CorrCoff	1.00000	
T	DAS 1.	DAS 2.	<u> </u>				

	DAD I.		DAG 2.	
	Orientation	Linearity:	Orientation	Linearity:
Abs Avg Err	3.8	1.8		
Abs Max Err	5	3		

UseDescription TferID Input Raw		Linearity	Output V	Output Deg.	Difference	Change	Error		
primary	01252	0	\checkmark	0.0000	358	2	47.5	2.5	
primary	01252	45	\checkmark	0.0000	41	4	42.54	-2.4	
primary 01252 90		90	\checkmark	0.0000	86	4	45.51	0.5	
primary	01252	135	\checkmark	0.0000	128	7	41.85	-3.1	
primary	01252	180	\checkmark	0.0000	176	4	47.3	2.2	
primary	01252	225	\checkmark	0.0000	221	4	45.7	0.7	
primary	01252	270	\checkmark	0.0000	265	5	43.5	-1.5	
primary	01252	315	\checkmark	0.0000	311	4	46.1	1	
primary	01272	90		0.0000	86	4		4	
primary	01272	180		0.0000	176	4		4	
primary	01272	270		0.0000	265	5		5	
primary	01272	360		0.0000	358	2		2	
Sensor Compon	ent Condition		Cond	Condition Good			s pass		
Sensor Compon	ent Mast		Cond	Condition Good			s pass]
Sensor Compon	ent Sensor Heate	r	Cond	Condition Functioning			s pass		
Sensor Compon	ent Sensor Plumb)	Cond	ition Plumb		Statu	s pass]
Sensor Component Torque		Cond	ition		Statu	s pass			
Sensor Compon	ent Vane Conditio	n	Cond	ition Good		Statu	s pass]
Sensor Component System Memo		Cond	Condition			s pass			

Wind Speed Data Form

Mfg	Serial Numb	er Tag Site		Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	ACA	416	Korey Devins	09/18/2019	Wind Speed	none
Mfg	Climatronics			Mfg	RM Young	Parameter wir	id speed
SN/Owner ID	683	none		Serial Number	CA04013	Tfer Desc. wir	id speed motor (I
Parameter:	F460 translator			Tfer ID	01254		
rop or Cups SN 2033 rop or Cups Torque 0.4 to				Slope	1.0000	0 Intercept	0.00000
brop or Cups Torque 0.4 to brop Correction Facto N/A		0.5	Cert Date	4/16/201	9 CorrCoff	1.00000	
				Mfg	RM Young	Parameter wir	id speed
				Serial Number	CA4353	Tfer Desc. wir	d speed motor (h
				Tfer ID	01457		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	4/16/201	9 CorrCoff	1.00000
D	OAS 1:		DAS 2:				
L	ow Range Hi	igh Range:	Low Range	High Range:			

	Low Range	High Range:	Low Range Hig	h Range:				
Abs Avg Err	0.13	7.27%						
Abs Max Err	0.21	25.69%						
UseDescription	n: Input Devie	ce Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.20	0.0	0.3		0.10	
primary	01254	50	1.40	0.0	1.2		-0.19	
primary	01254	100	2.57	0.0	2.6		-0.01	
primary	01254	170	4.22	0.0	4.0		-0.21	
primary	01254	250	6.10	0.0	5.9	-2.79%		
primary	01457	500	11.97	0.0	12.0	0.50%		
primary	01457	800	19.02	0.0	19.0	0.11%		
primary	01457	2000	47.22	0.0	35.1	-25.69%		
Sensor Com	ponent Conditio	n	Condition	Good		Status pass		
Sensor Com	ponent Prop or	Cups Condition	Condition	Condition Good		Status pass		
Sensor Com	ponent Sensor I	Heater	Condition	Functioning		Status pass		
Sensor Com	ponent Torque		Condition			Status pass		
Sensor Com	ponent Sensor I	Plumb	Condition	Plumb		Status pass		
Sensor Com	ponent System	Memo	Condition	See comments	S	Status pass		

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number	r Tag Site		Technicia	in	Site Vis	it Date	Paramete	r	Owner ID
Climatronics	missing	ACA416		Korey De	vins	09/18/2	019	Temperati	ure2meter	none
Mfg	Climatronics			Mfg		Extech		Para	meter Tem	perature
SN/Owner ID	401 ()3630		Serial	Number	H23273	4	Tfer	Desc. RTD	
Parameter:	Temperature Translator			Tfer I	D	01227]		
DAS 1:	DAS 2:			Slope		1.00733 Intercept			ept	0.14497
Abs Avg Err	bs Avg Err Abs Max Err Abs Avg Err Abs Ma		os Max Err	Cert I	Date		2/12/2019	CorrC	off	1.00000
0.12	0.28]						
UseDescription	Test type	InputTmpRaw	InputTmp	Corrected	OutputTm	pSignal	OutputS	ignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.52		0.37		0.0000		0.65	С	0.28
primary	Temp Mid Range	28.28		27.93		0.0000		27.91	С	-0.02
primary	Temp High Rang	47.22		46.73		0.0000		46.78	С	0.05
Sensor Compo	onent Properly Site	d	Cond	lition Prop	perly sited			Status pa	ass	
Sensor Compo	onent Shield		Cond	lition Mod	lerately clea	an		Status pa	ass	
Sensor Compo	Sensor Component Blower		Cond	lition Fun	ctioning			Status Pa	ass	
Sensor Component Blower Status Switch		Cond	Condition N/A			Status pass				
Sensor Component System Memo		Cond	Condition			Status pass				

Solar Radiation Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID			
Licor	PY16746	ACA416	Korey Devins	09/18/2019	Solar Radiation	none			
			Mfg Serial Number Tfer ID	Eppley 10765 01246	Parameter Tfer Desc.	solar radiation SR transfer translato			
DAS 1: % Diff of Avg %	DAS 2: 6Diff of Max %Diff of	Avg: %Diff of Ma	Slope x Cert Date	1.0000	000Intercept0.000019CorrCoff1.000				
			Mfg	Eppley	Parameter	solar radiation			
			Serial Number	34341F3	Tfer Desc.	SR transfer sensor			
			Tfer ID	01245					
			Slope	1.0000	00 Intercept	0.00000			
			Cert Date	1/22/201	19 CorrCoff	1.00000			
0.0%	0.0%	0.0%	6						
Sensor Compo	nent Sensor Clean	Con	dition Clean		Status pass				
Sensor Compo	nent Sensor Level	Con	dition Level		Status pass				
Sensor Compo	nent Properly Sited	Con	dition Properly sited		Status pass				
Sensor Component System Memo		Con	dition See comments	6	Status pass				

Humidity Data Form

Mfg	Serial Nun	nber Tag Site		Technician		Site Visit Date	Para	meter	Owner ID
Rotronic	67857	ACA	416	Korey Devins	3	09/18/2019	Relat	ive Humidity	none
				Mfg		AZ Instruments		Parameter Rel	ative Humidity
				Serial Nu	mber	10325189		Tfer Desc. Psy	chrometer
				Tfer ID		01223			
				Slope		1.015	40 In	tercept	-1.34560
	DAS 1:		DAS 2:	Cert Date	e	2/6/20	19 C	orrCoff	0.99994
	Low Range:	High Range:	Low Range	: High Range	e:				
Abs Avg Err	1.4								
Abs Max Err	2.2								
UseDesc.	Test type	Device	Input RH	GTL Raw	RH (Corr. DAS V	/olts	DAS %RH	Difference
primary	RH Low Range	Psychrometer	52.9	42.1	42	2.8 0.00	00	43.4	0.6
primary	RH Low Range	Psychrometer	75.3	78.5	78	8.6 0.00	00	76.4	-2.2
Sensor Com	ponent RH Filter		Co	ndition Clean			Stat	us pass	
Sensor Component Shield		Co	ndition Clean			Stat	us pass		
Sensor Component Blower		Co	ndition Functio	ning		Status pass			
Sensor Com	Sensor Component Blower Status Switch		Co	Condition N/A			Status pass		
Sensor Com	Sensor Component System Memo			Condition			Status pass		

Precipitation Data Form

Mfg	Serial	Number Tag	Site		Technicia	n	Site Visit	Date	Parameter		Owner ID
Climatronics	illegibl	e	ACA416		Korey Dev	vins	09/18/2019		Precipitation		01322
					Mfg		PMP		Para	meter P	recipitation
DAS 1:		DAS 2:			Serial	Number	EW-06134	1-50	Tfer	Desc. 2	50ml graduate
A Avg % Dif	ff: A Max % I	Dif A Avg %	6Diff A I	Max % Dif	Tfer II)	01250				
					Slope			1.0000	0 Interce	ept	0.00000
					Cert D	ate	g)/5/200	5 CorrC	off	1.00000
UseDesc.	Test type	TferVolume	Iteration	TimePerT	ip Eq.H	It DAS	Seng Eq.H	ltUnit	OSE Unit	TferUn	its PctDifference
primary	test 1	231.5	1	10 sec	5.00) 4.	90 m	ım	mm	ml	-2.0%
primary	test 2	231.5	2	10 sec	5.00) 4.	90 m	ım	mm	ml	-2.0%
Sensor Con	mponent Prop	erly Sited		Cond	l <mark>ition</mark> 45 de	egree rule			Status pa	ass	
Sensor Cor	mponent Gau	je Drain Scree	en	Cond	ndition Not installed				Status pa	ass	
Sensor Co	mponent Funr	el Clean		Cond	l <mark>ition</mark> Mode	erately cle	an		Status pa	ass	
Sensor Cor	mponent Conc	lition		Cond	i <mark>tion</mark> Fair				Status pa	ass	
Sensor Cor	mponent Gaug	je Screen		Cond	l <mark>ition</mark> Insta	lled			Status pa	ass	
Sensor Cor	mponent Gaug	je Clean		Cond	l <mark>ition</mark> Mode	erately cle	an		Status pa	ass	
Sensor Cor	mponent Leve			Cond	l <mark>ition</mark> Leve	I			Status pa	ass	
Sensor Con	mponent Sens	or Heater		Cond	lition Not f	unctioning	J		Status Fa	ail	
Sensor Cor	mponent Syste	em Memo		Cond	lition				Status pa	ass	

Shelter Temperature Data For

Mfg	Serial Number Tag Site		Technician	Site Visit Date	Parameter	Owner ID	
Agilaire	None	ACA416	Korey Devins	09/18/2019	Shelter Temperatu	ire none	
DAS 1:	DAS 2:		Mfg	Extech	Parameter S	Shelter Temperature	
Abs Avg Err Abs	S Max Err Abs Avg 2.09	Err Abs Max Err	Serial Number	H232734	Tfer Desc.	Desc. RTD	
			Tfer ID	01227			
			Slope	1.0073	33 Intercept	0.14497	
			Cert Date	2/12/201	9 CorrCoff	1.00000	

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.80	24.48	0.000	25.9	С	1.42
primary	Temp Mid Range	24.20	23.88	0.000	25.9	С	1.99
primary	Temp Mid Range	24.02	23.70	0.000	25.8	С	2.09
Sensor Component System Memo Condition Status pass							

Infrastructure Data For

Site ID	ACA416	Technician Ko	brey Devins Site Visit Date 09/18/2019
Shelter	Make	Shelter Model	Shelter Size
Custom		Unknown	Unknown

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard Problem	
Solar Radiation Additional details can be	ACA416 e found in the h	Korey Devins ardcopy of the site a	09/18/2019 udit report.	System Memo	Licor	4019		
Wind Speed Additional details can be	ACA416 e found in the h	Korey Devins ardcopy of the site a	09/18/2019 udit report.	Accuracy High R	Climatronics	4393		

Field Systems Comments

1 Parameter: SiteOpsProcComm

This site is operated by both the NPS and the State of Maine DEP. It is not visited by ARS for semiannual calibration and maintenance visits. The site operator does not perform many of the routine checks conducted at other CASTNET sites, such as tip checks, wetness sensor tests, and visual checks of the blowers. The state of Maine personnel maintain the meteorological systems and the ozone monitor.

2 Parameter: SiteOpsProcedures

The meteorological and ozone instrument checks and maintenance are performed by the State of Maine DEP.

3 Parameter: ShelterCleanNotes

The shelter is new, clean and well organized. Equipment is still being moved from the old shelter.

4 Parameter: MetSensorComme

The wind speed sensor response at the high speed test was much lower than expected. This condition has been observed and reported during previous audits.

5 Parameter: MetOpMaintCom

The surface wetness sensor is no longer operated. Although the solar radiation system was audited with the EEMS standard, the data were not recorded due to the flag set incorrectly on the DAS. Visual comparisons of the data were observed to be approximately 8% different throughout the day.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID ACA416	Technician Korey Devins	Site Visit Date 09/18	8/2019					
Site Sponsor (agency)	NPS/EPA	USGS Map	Salsbury Cove					
Operating Group	NPS/MEDEP	Map Scale						
AQS #	23-009-0103	Map Date						
Meteorological Type	Climatronics							
Air Pollutant Analyzer	Ozone, SO2, NOx, NOy, PM, VOC	QAPP Latitude	44.3770					
Deposition Measurement	dry, wet, Hg	QAPP Longitude	-68.2610					
Land Use	Costal, woodland - mixed	QAPP Elevation Meters	158					
Terrain	rolling	QAPP Declination						
Conforms to MLM	No	QAPP Declination Date						
Site Telephone	(432) 288-9322	Audit Latitude	44.377086					
Site Address 1	Route 233	Audit Longitude	-68.2608					
Site Address 2		Audit Elevation	153					
County	Hancock	Audit Declination	-16.4					
City, State	Bar Harbor, ME	Present						
Zip Code	04609	Fire Extinguisher 🗹	Inspected Aug 2017					
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 Custom M	odel Unknown	Shelter Size Unknown					
Shelter Clean	Notes The shelter is new, clean and	well organized. Equipment is st	till being moved from the old shelter.					
Site OK	Notes							
Driving Directions From take E road,	Driving Directions From Bangor go east on 1A to Ellsworth. From Ellsworth take route 3 east to Bar Harbor. At the west edge of town, take Eagle Lake Rd (route 233) west toward Acadia National Park. The site is through a gate, at the end of a gravel road, across from the Park Headquarters.							

Field Systems Data Form

ACA416

F-02058-1500-S2-rev002

Site ID

Technician Korey Devins

Site Visit Date 09/18/2019

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

Siting Distances OK

Siting Criteria Comment

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S3-rev002					
Site	e ID	ACA416	Technician K	orey Devins		Site Visit Date	09/18/2019				
1	Are wind being inf	d speed and direction fluenced by obstruction	s to avoid								
2	2 Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)										
3	Are the tower and sensors plumb?										
4	Are the avoid ra	temperature shields p diated heat sources su	ointed north or p ich as buildings, v	ositioned to walls, etc?							
5	Are temp condition surface a standing	perature and RH sens ns? (i.e. ground below and not steeply sloped swater should be avoid	ors sited to avoid sensors should b . Ridges, hollows ded)	l unnatural e natural , and areas of							
6	Is the so	lar radiation sensor p	lumb?								
7	Is it sited	l to avoid shading, or	any artificial or 1	reflected light?							
8	Is the ra	in gauge plumb?									
9	Is it sited towers, e	l to avoid sheltering e etc?	ffects from build	ings, trees,		15 degree rule viola	ation				
10	Is the su facing no	rface wetness sensor s orth?	sited with the grid	l surface							
11	Is it incl	lined approximately 3	0 degrees?								

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

The wind speed sensor response at the high speed test was much lower than expected. This condition has been observed and reported during previous audits.

Field Systems Data Form

F-02058-1500-S4-rev002

Site	e ID	ACA416	Technician	Korey Devins		Site Visit Date	09/18/2019	
1	Do all th condition	e meterological sensor n, and well maintained	rs appear to be l?	intact, in good				
2	2 Are all the meteorological sensors operational online, and reporting data?							
3	3 Are the shields for the temperature and RH sensors clean?							
4	4 Are the aspirated motors working?							
5	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 s	sensor signal and pow n, and well maintained	er cables intact l?	, in good				
8	Are the s from the	sensor signal and powers elements and well ma	er cable connec intained?	ctions protected				

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

The surface wetness sensor is no longer operated. Although the solar radiation system was audited with the EEMS standard, the data were not recorded due to the flag set incorrectly on the DAS. Visual comparisons of the data were observed to be approximately 8% different throughout the day.

Fi	eld Sy	stems Data Fo	orm		F-02058-1500-S5-rev002					
Site	e ID	ACA416	Technician	Korey Devins		Site Visit Date	09/18/2019			
	Siting C	riteria: Are the pollut	ant analyzers ai	<u>nd deposition eq</u>	<u>uipn</u>	nent sited in accore	dance with 40	<u>CFR 58</u>	3. Appendix E	
1	Do the s unrestri	ample inlets have at le cted airflow?	east a 270 degree	e arc of						
2	2 Are the sample inlets 3 - 15 meters above the ground?									
3	3 Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?				✓					
	Pollutar	nt analyzers and depos	ition equipment	t operations and	mai	<u>ntenance</u>				
1	Do the a conditio	nalyzers and equipme on and well maintained	ent appear to be ?	in good	✓					
2	Are the reportin	analyzers and moniton ng data?	rs operational, o	on-line, and	✓					
3	Describ	e ozone sample tube.				3/8 teflon by 12 me	ters			
4	Describ	e dry dep sample tube				3/8 teflon by 12 met	ters			
5	Are in-li indicate	ine filters used in the o location)	ozone sample lin	e? (if yes		At inlet only				
6	Are sam obstruct	ple lines clean, free of tions?	' kinks, moisture	e, and	✓					
7	Is the ze	ero air supply desiccan	t unsaturated?		✓					
8	Are the	re moisture traps in th	e sample lines?							
9	Is there clean?	a rotometer in the dry	deposition filte	er line, and is it		Clean and dry				

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:
Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S6-rev002			
Site	Site ID ACA416		Technician	cian Korey Devins		Site Visi	t Date 09/18/	2019]
	DAS, se	nsor translators, and	peripheral equi	pment operation	ns and	maintena	<u>nce</u>		
1	Do the l well ma	DAS instruments appe intained?	ar to be in good	l condition and					
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?			properly					
7	Does th	e instrument shelter h	ave a stable pov	ver source?					
8	Is the instrument shelter temperature controlled?								
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	ample tower stable and	l grounded?						
11	Tower o	comments?							

Field S	Systems Data I	For	m				F-0	2058-	1500-S7-rev002
Site ID	ACA416		Techn	ician	Korey Devins	Site Visit Da	te 09/18/201	9	
Docum	<u>ientation</u>								
Does th	ne site have the require	<u>d ins</u>	trumer	it and	equipment manua	als?			
Wind spec Wind dire Temperat Relative h Solar radi Surface w Wind sens Temperat Humidity Solar radi Tipping b Ozone ans Filter pac	Y ed sensor ection sensor ture sensor numidity sensor iation sensor vetness sensor sor translator ture translator sensor translator iation translator oucket rain gauge alyzer k flow controller k MFC power supply				A Data lo Data lo Strip c Compu Moden Printer Zero a Filter f Surge j UPS Lightn Shelter Shelter	ogger ogger hart recorder iter n r ir pump flow pump protector ing protection devi r heater r air conditioner	Yes ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	No 	N/A □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □
Does	<u>the site have the requir</u>	ed ar	nd mos	t rece	nt QC documents	and report forms?			
]	Prese	ent				Curi	rent	
Station Lo SSRF Site Ops M HASP Field Ops Calibratio Ozone z/s/ Preventive	og Manual 5 Manual on Reports /p Control Charts e maintenance schedule			atavie une 20	w)00				
1 Is the	e station log properly c	ompl	leted di	iring	every site visit? 🔽	Dataview			
2 Are t curre	2 Are the Site Status Report Forms being completed and current?								
3 Are t samp	the chain-of-custody for ple transfer to and from	rms j 1 lab	proper ?	y used	l to document				
4 Are o curro	ozone z/s/p control char ent?	rts pr	roperly	comp	leted and	Control charts no	t used		
Provide a natural or	ny additional explanati r man-made, that may a	on (p affec	photog t the m	caph o onitor	r sketch if necessa ing parameters:	nry) regarding cond	ditions listed	l above, o	or any other features,

Site	ID	ACA416	Technician	Korey Devins		Site Visit Date 09/18/2019			
1	Site ope Has the course?	<u>ration procedures</u> site operator attended If yes, when and who	d a formal CAS instructed?	TNET training					
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?				✓	Trained on-site by ARS during site installation			
3	Is the site schedule	e visited regularly on ?	the required Tu	ıesday	✓				
4	Are the s flollowed	standard CASTNET of by the site operator?	perational pro	cedures being	✓	Operator procedures are very good for filter replacement			
5	Is the site the requi	e operator(s) knowled ired site activities? (in	geable of, and a	able to perform entation)	✓				

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

Frequency

Frequency

Multipoint Calibrations	\checkmark	Semiannually by MEDEP	✓
Visual Inspections	\checkmark	Weekly	\checkmark
Translator Zero/Span Tests (climatronics)	\checkmark	Semiannually	\checkmark
Manual Rain Gauge Test	\checkmark	Monthly	✓
Confirm Reasonableness of Current Values	\checkmark	Weekly	✓
Test Surface Wetness Response		Not performed	

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

00	01	D (
QC	Check	Peri	tormed

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

- requests	0.01
Monthly	
Weekly	\checkmark
Monthly	\checkmark
N/A	\checkmark
Weekly	\checkmark
Weekly	\checkmark

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

\checkmark	Results are recorded weekly on a checklist

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

✓

✓

The meteorological and ozone instrument checks and maintenance are performed by the State of Maine DEP.

Compliant

Compliant

F-02058-1500-S8-rev002

F-02058-1500-59-rev002

Sit	e ID	ACA416	Technicia	n Korey Devins		Site Visit Date	09/18/2019			
	Site operation procedures									
1	Is the fil	ter pack being changed	l every Tue	sday as scheduled?		Filter changed morinings, 90%				
2	2 Are the Site Status Report Forms being completed and filed correctly?					Flow and general 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	5 Are site supplies on-hand and replenished in a timely fashion?									
6	Are sample flow rates recorded? How?				✓	SSRF				
7	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 Pe	rformed	F	requency			Compliant			
I	Aulti-poin	t MFC Calibrations	✓ s	emiannually						
I	Flow Syste	m Leak Checks	✓ M	eekly			\checkmark			
I	Filter Pack Inspection									
I	Flow Rate Setting Checks Veekly									
	isual Che	eck of Flow Rate Roton	neter 🗹 🕅	eekly						
Ι	n-line Filt	er Inspection/Replacer	nent 🗹 A	s needed						
5	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:

This site is operated by both the NPS and the State of Maine DEP. It is not visited by ARS for semiannual calibration and maintenance visits. The site operator does not perform many of the routine checks conducted at other CASTNET sites, such as tip checks, wetness sensor tests, and visual checks of the blowers. The state of Maine personnel maintain the meteorological systems and the ozone monitor.

ACA416

F-02058-1500-S10-rev002

Site ID

Tech

Technician Korey Devins

Site Visit Date 09/18/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	8460p	CNU20941M6	none
DAS	Environmental Sys Corp	8832	A3506K	none
Elevation	Elevation	1	None	None
F460 translator	Climatronics	100163	683	none
Flow Rate	Alicat	MC-10SLPM-D-PCV	Illgeible	none
Infrastructure	Infrastructure	none	none	none
Mainframe	Climatronics	100081	1288	01342
Met tower	Climatronics	unknown	illegible	none
Ozone	ThermoElectron Inc	49C	49C-74536-376	90744
Ozone Standard	T-API	T-703V	71	none
Precipitation	Climatronics	100508-2	illegible	01322
Relative Humidity	Rotronic	MP 601A	67857	none
Sample Tower	Aluma Tower	В	AT-71103-7I-3	none
Shelter Temperature	Agilaire	Unknown	None	none
Shield (2 meter)	Climatronics	100325	illegible	none
Siting Criteria	Siting Criteria	1	None	None
Solar Radiation	Licor	LI-200	PY16746	none
Temperature Translator	Climatronics	100088-2	401	03630
Temperature2meter	Climatronics	100093	missing	none
Wind Direction	Climatronics	100076	illegible	none
Wind Speed	Climatronics	100075	illegible	none
Zero air pump	ThermoElectron Inc	111	111-30215-237	none

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
VPII	20-Sandy (Grenville-09/24/2019				
1	9/24/2019	Computer	Dell	07032	Inspiron 15	Unknown
2	9/24/2019	DAS	Campbell	000402	CR3000	2514
3	9/24/2019	Elevation	Elevation	None	1	None
4	9/24/2019	Filter pack flow pump	Thomas	02751	107CAB18	1192001884
5	9/24/2019	Flow Rate	Арех	000591	AXMC105LPMDPCV	illegible
6	9/24/2019	Infrastructure	Infrastructure	none	none	none
7	9/24/2019	Modem	Digi	07203	LR54	unknown
8	9/24/2019	Ozone	ThermoElectron Inc	000690	49i A1NAA	1030244800
9	9/24/2019	Ozone Standard	ThermoElectron Inc	000328	49i A3NAA	0622717850
10	9/24/2019	Sample Tower	Aluma Tower	none	В	unknown
11	9/24/2019	Shelter Temperature	Campbell	none	107-L	none
12	9/24/2019	Siting Criteria	Siting Criteria	None	1	None
13	9/24/2019	Temperature	RM Young	04318	41342	4037
14	9/24/2019	Zero air pump	Werther International	06910	C 70/4	000829160

DAS Data Form

DAS Time Max Error:

0

Mfg	Serial	Number Site	T	echnician	Site Visit Date	Parameter	Use Desc.
Campbell	2514	VPI	120 S	Sandy Grenville	09/24/2019 DAS		Primary
Das Date:	9 /24/2019	Audit Date	9 /24/2019	Mfg	Fluke Parameter		DAS
Das Time: Das Day:	12:53:00	Audit Time Audit Day	267	Serial Number	95740135	Tfer Desc.	DVM
Low Channe	el:	High Channe	l:	Tfer ID	01311		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.000	0.0		0.0001	Cert Date	1/25/201	9 CorrCoff	1.00000
				Mfg	Datel	Parameter	DAS
				Serial Number	15510194 Tfer Desc		Source generator (D
				Tfer ID	01320		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	2/13/201	2 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	V	V	0.0000	
7	0.1000	0.0998	0.0999	V	V	0.0001	
7	0.3000	0.2997	0.2997	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	0.9992	0.9992	V	V	0.0000	

Flow Data Form

Mfg	Serial Nun	nber Tag 🖇	Site	Тес	chnician	Site Visit Date	Site Visit Date Parame		Owner ID	
Арех	illegible		VPI120	Sa	ndy Grenville	09/24/2019	Flow R	ate	000591	
					Mfg	BIOS	Parameter FI		w Rate	
					Serial Number	al Number 148613		fer Desc. BIC	S 220-H	
					Tfer ID	01421				
					Slope	1.000	000 Inte	ercept	0.00000	
					Cert Date	3/4/20)19 <mark>Co</mark> l	rrCoff	1.00000	
DAS 1:		DAS 2:			Cal Factor Z	ero		0		
A Avg % Diff:	A Max % Dif	A Avg %	Diff A Max	% Dif	Cal Factor F	ull Scale	0.9	99		
0.00%	0.00%				Rotometer R	tometer Reading:		65		
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E In	putUnit	OutputSignalI	PctDifference	
primary	pump off	0.000	0.000	0.00	0.000	0.00	l/m	l/m		
primary	leak check	0.000	0.000	0.00	0.000	0.01	l/m	l/m		
primary	test pt 1	1.505	1.500	1.51	0.000	1.50	l/m	l/m	0.00%	
primary	test pt 2	1.504	1.500	1.51	0.000	1.50	l/m	l/m	0.00%	
primary	test pt 3	1.505	1.500	1.51	0.000	1.50	l/m	l/m	0.00%	
Sensor Comp	onent Leak Tes	st		Conditio	on		Status pass			
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Status	s pass		
Sensor Comp	onent Filter Pos	sition		Conditio	n Good		Status	s pass		
Sensor Comp	onent Rotomete	er Conditior	١	Conditio	Clean and dry		Status	s pass		
Sensor Comp	onent Moisture	Present		Conditio	No moisture pr	esent	Status	s pass		
Sensor Component Filter Distance			Conditio	ndition Not tested			s pass			
Sensor Comp	onent Filter Dep	oth		Conditio	Not tested		Status	s pass		
Sensor Comp	onent Filter Azi	muth		Conditio	200 deg		Status	s pass		
Sensor Comp	onent System M	/lemo		Conditio	n		Status	s pass		

Ozone Data Form

Mfg	Serial Number T	ag Site	Те	chnician	Site Visit Date	Parameter	Owner ID	
ThermoElectron Inc	1030244800	VPI120	Sa	andy Grenville	09/24/2019	Ozone	000690	
Slope: Intercept CorrCoff: DAS 1: A Avg % Diff: A M 0.0%	0.96526 Slope: -0.04806 Interce 0.99996 CorrCo DAS Max % Dif A Av 0.0%		0.00000 0.00000 0.00000 Max % Dif	Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 1180030022 01114 0.9984 6/11/20	Inc Paramete Tfer Desc Intercept O CorrCoff	ozoneC. Ozone primary stan0.270901.00000	
UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif	
primary	1	0.28	0.00	0.41	ppb		0.41	
primary	3	35.40	35.18	33.47	ppo ppb	-4.98	-0.0	
primary	4	67.52	67.35	64.69	ppb	-4.03		
primary	5	114.20	114.11	110.40	ppb	-3.3		
Sensor Compone	ent Sample Train		Conditi	on Good		Status pass		
Sensor Compone	ent 22.5 degree rul	9	Conditi	on		Status pass		
Sensor Compone	ent Inlet Filter Cond	lition	Conditi	on Clean		Status pass		
Sensor Compone	ent Battery Backup		Conditi	on N/A		Status pass		
Sensor Compone	ent Offset		Conditi	on 0.000		Status pass		
Sensor Compone	ent Span		Conditi	on 0.998		Status pass		
Sensor Compone	ent Zero Voltage		Conditi	ion N/A		Status pass		
Sensor Compone	ent Fullscale Voltag	je	Conditi	ition N/A		Status pass		
Sensor Compone	ent Cell A Freq.		Conditi	on 104.5 kHz		Status pass		
Sensor Compone	ent Cell A Noise		Conditi	on 0.7 ppb		Status pass		
Sensor Compone	ent Cell A Flow		Conditi	on 0.66 lpm		Status pass		
Sensor Compone	ent Cell A Pressure	•	Conditi	on 655.4 mmHg		Status pass		
Sensor Compone	ent Cell A Tmp.		Conditi	on 37.3 C		Status pass		
Sensor Compone	ent Cell B Freq.		Conditi	on 89.9 kHz		Status pass		
Sensor Compone	ent Cell B Noise		Conditi	on 0.6 ppb		Status pass		
Sensor Compone	ent Cell B Flow		Conditi	on 0.66 lpm		Status pass		
Sensor Compone	ent Cell B Pressure		Conditi	on 655.1 mmHg		Status pass		
Sensor Compone	ent Cell B Tmp.		Conditi	on N/A		Status pass		
Sensor Compone	ent Line Loss		Conditi	on Not tested		Status pass		
Sensor Compone	ent System Memo		Conditi	on		Status pass		

Temperature Data Form

Mfg	Serial Number	Tag Site	Т	echni	ician	Site V	isit Date	Param	eter	Owner ID	
RM Young	4037	VPI120		Sandy	Grenville	09/24	/2019	Temper	ature	04318	
				Mf	g	Extect	1	Pa	rameter Te	mperature	
				Ser	ial Number	H2327	'34	Tf	er Desc. R	ſD	
				Tfer ID		01227					
DAS 1:	DAS		Slo	ре		1.0073	33 Intercept 0.14497				
Abs Avg Err Abs Max Err Abs Avg Err Abs Ma			Max Err	x Err Cert Date			2/12/201	9 Cor	rCoff	1.00000	
0.03	3 0.05										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary	Temp Low Range	0.25	0.10		0.000		0.1	L	С	0.03	
primary	Temp Mid Range	25.76	25.43		0.000		25.	4	С	0	
primary	Temp High Range	47.87	47.38		0.000		47.	3	С	-0.05	
Sensor Con	nponent Shield		Condi	tion C	Clean			Status	pass		
Sensor Component Blower			Condi	tion N	J/A			Status	pass		
Sensor Component Blower Status Switch				Condition N/A				Status	s pass		
Sensor Con	nponent System Memo)	Condi	Condition				Status	s pass		

Shelter Temperature Data For

Serial Number Tag Site		Technician	Site Visit Date	Parameter	Owner ID
none VPI120		Sandy Grenville	09/24/2019	Shelter Temperatu	none
DAS 2:		Mfg	Extech	Parameter S	helter Temperature
Max Err Abs Avg 0.87	Err Abs Max Err	Serial Number	H232734	Tfer Desc.	TD
		Tfer ID	01227		
		Slope	1.0073	33 Intercept	0.14497
		Cert Date	2/12/201	9 CorrCoff	1.00000
	Serial Number Tag none DAS 2: Max Err Abs Avg 0.87	Serial Number Tag Site none VPI120 DAS 2: Max Err Abs Avg Err Abs Max Err 0.87	Serial Number Tag Site Technician none VPI120 DAS 2: Mfg Max Err Abs Avg Err 0.87 Environment Tfer ID Slope Cert Date	Serial Number Tag Site Technician Site Visit Date none VPI120 Sandy Grenville 09/24/2019 DAS 2: Mfg Extech Max Err Abs Avg Err Abs Max Err 0.87 0.87 Extech 1000 1000 1000 Slope 1.0073 Cert Date 2/12/207	Serial Number Tag Site Technician Site Visit Date Parameter none VPI120 Sandy Grenville 09/24/2019 Shelter Temperature DAS 2: Mfg Extech Parameter Parameter Max Err Abs Avg Err Abs Max Err Serial Number H232734 Tfer Desc. F 0.87 Tfer ID 01227 Slope 1.00733 Intercept Cert Date 2/12/2019 CorrCoff

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.10	24.77	0.000	25.3	С	0.55
primary	Temp Mid Range	24.24	23.92	0.000	24.8	С	0.87
primary	Temp Mid Range	26.04	25.71	0.000	26.5	С	0.75
Sensor Component System Memo Condition Status pass							

Infrastructure Data For

Site ID VPI120	Technician Sandy G	renville Site Visit Date 09/24/2019
Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2107-3)	640 cuft

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

Field Systems Comments

1 Parameter: SitingCriteriaCom

The site is on a wooded hillside. The temperature sensor and sample inlet are at the tree tops of the downhill trees. The uphill tree line is 20 meters away.

2 Parameter: ShelterCleanNotes

The shelter is clean, neat, and well organized. Floor tiles are loose and the paneling is deteriorating.

3 Parameter: MetSensorComme

The temperature sensor is 10 meters from small pond.

F-02058-1500-S1-rev002

Site ID VPI120	Technician Sandy Grenville	Site Visit Date 09/24	4/2019				
		USCS Map	Eagleston				
Site Sponsor (agency)	EPA	USUS Map					
Operating Group	VA Tech	Map Scale					
AQS #	51-071-9991	Map Date					
Meteorological Type	Climatronics						
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	No	QAPP Declination Date	1/31/2007				
Site Telephone		Audit Latitude	37.329832				
Site Address 1	Mountain Lake Rd.	Audit Longitude	-80.55751				
Site Address 2	Jefferson National Forest	Audit Elevation	920				
County	Giles	Audit Declination	-7.8				
City, State	Newport, VA	Present					
Zip Code	24128	Fire Extinguisher 🔽	New in 2015				
Time Zone	Eastern	First Aid Kit					
Primary Operator		Safety Glasses					
Primary Op. Phone #		Safety Hard Hat 🗹					
Primary Op. E-mail		Climbing Belt					
Backup Operator		Security Fence					
Backup Op. Phone #		Secure Shelter					
Backup Op. E-mail		Stable Entry Steps ✓					
Shelter Working Room	Make Ekto Me	odel 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						
Driving Directions From toward mount	Driving Directions From Blacksburg go west on route 460 approximately 10 miles. Turn right (north) onto route 700, Mountain Lake Rd., toward Mountain Lake Resort. There is a sign for Virginia Tech and Horton Station. Continue on 700 up the mountain. Turn right at the sign for Horton Station on the gravel drive into the research center.						

VPI120

F-02058-1500-S2-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 09/24/2019

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

Siting Distances OK

Siting Criteria Comment

The site is on a wooded hillside. The temperature sensor and sample inlet are at the tree tops of the downhill trees. The uphill tree line is 20 meters away.

Fi	eld Sys	stems Data Fo	orm		F-02058-1500-S3-rev002					
Site	e ID	VPI120	Technician S	andy Grenville		Site Visit Date 09/24/2019				
1	Are wind being inf	d speed and direction fluenced by obstructio	sensors sited so a ons?	ns to avoid		N/A				
2	Are wind (i.e. wind horizont tower in	d sensors mounted so d sensors should be mo ally extended boom > to the prevailing wind	as to minimize to ounted atop the t 2x the max diamo	ower effects? ower or on a eter of the		N/A				
3	Are the t	tower and sensors plu	mb?		✓	N/A				
4	Are the t avoid ra	temperature shields p diated heat sources su	ointed north or p och as buildings,	oositioned to walls, etc?		South				
5	Are temp condition surface a standing	perature and RH sens ns? (i.e. ground below and not steeply sloped swater should be avoid	ors sited to avoid sensors should b . Ridges, hollows ded)	l unnatural oe natural , and areas of		10 meters from pond				
6	Is the so	lar radiation sensor p	lumb?		✓	N/A				
7	Is it sited	l to avoid shading, or	any artificial or 1	reflected light?	✓	N/A				
8	Is the rai	in gauge plumb?			✓	N/A				
9	Is it sited towers, e	d to avoid sheltering e etc?	ffects from build	ings, trees,	✓	N/A				
10	Is the sur facing no	rface wetness sensor s orth?	ited with the grid	l surface		N/A				
11	Is it incl	lined approximately 3	0 degrees?			N/A				

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

The temperature sensor is 10 meters from small pond.

Site ID

1

2

	•				
ID	VPI120	Technician Sandy Grenv	rille	Site Visit Date 09/24/2019	
Do al condi	the meterological senso tion, and well maintained	rs appear to be intact, in go d?	od 🗸		
Are a	ll the meteorological sen	sors operational online, and	\checkmark		

	reporting data?
3	Are the shields for the temperature and RH sensors clean?
4	Are the aspirated motors working?
5	Is the solar radiation sensor's lens clean and free of

- scratches?6 Is the surface wetness sensor grid clean and undamaged?
- 7 Are the sensor signal and power cables intact, in good condition, and well maintained?
- 8 Are the sensor signal and power cable connections protected from the elements and well maintained?

✓	
✓	
✓	Moderately clean
✓	N/A
✓	N/A
✓	N/A
✓	
✓	

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

F-02058-1500-S4-rev002

Field Systems Data Form				F-02058-1500-S5-rev002		
Site	e ID	VPI120	Technician	Sandy Grenville		Site Visit Date 09/24/2019
	Siting C	riteria: Are the pollut	ant analyzers a	nd deposition eq	uipn	<u>ent sited in accordance with 40 CFR 58, Appendix E</u>
1	Do the s unrestri	ample inlets have at le cted airflow?	east a 270 degre	e arc of	✓	
2	Are the	sample inlets 3 - 15 m	eters above the	ground?	✓	
3	Are the and 20 r	sample inlets > 1 mete neters from trees?	er from any maj	or obstruction,		
	<u>Pollutar</u>	nt analyzers and depos	ition equipmen	t operations and	mai	ntenance
1	Do the a conditio	nalyzers and equipme n and well maintained	ent appear to be l?	in good	✓	
2	Are the reportin	analyzers and moniton ng data?	rs operational, o	on-line, and	✓	
3	Describe	e ozone sample tube.				1/4 teflon by 18 meters
4	Describ	e dry dep sample tube.				3/8 teflon by 18 meters
5	Are in-li indicate	ine filters used in the o location)	ozone sample lin	ne? (if yes		At inlet only
6	Are sam obstruct	ple lines clean, free of tions?	kinks, moistur	e, and	✓	
7	Is the ze	ero air supply desiccan	t unsaturated?		✓	
8	Are the	re moisture traps in th	e sample lines?			Flow line only
9	Is there clean?	a rotometer in the dry	v deposition filte	er line, and is it		Clean and dry

Fi	eld Sy	stems Data Fo	orm			F-0 2	2058-15	00-S6-rev002
Site	e ID	VPI120	Technician Sandy Grenville		Site Visit Dat	<mark>e</mark> 09/24/2019	9	
	DAS, se	nsor translators, and j	peripheral equipment operation	<u>15 a</u>	<u>nd maintenance</u>			
1	Do the I well mai	DAS instruments appe intained?	ar to be in good condition and	✓				
2	Are all t modem,	he components of the backup, etc)	DAS operational? (printers,	✓				
3	Do the a lightning	nalyzer and sensor sig g protection circuitry?	nal leads pass through	✓	Met sensors only			
4	Are the well mai	signal connections pro intained?	tected from the weather and					
5	Are the	signal leads connected	to the correct DAS channel?					
6	Are the grounde	DAS, sensor translato ed?	rs, and shelter properly	✓				
7	Does the	e instrument shelter ha	ave a stable power source?	✓				
8	Is the in	strument shelter temp	erature controlled?	✓				
9	Is the m	et tower stable and gr	ounded?		Stable		Grounded	
10	Is the sa	mple tower stable and	grounded?					
11	Tower c	omments?			Met tower remove	d		

Field Systems Data FormF-02058-1500-S7						1500-S7-rev002	
Site ID VPI120		Tech	nician	Sandy Grenville Site Visit	Date 09/24/2019		
Documentation							
Does the site have the requi	ed in	strum	ent and	<u>equipment manuals?</u>			
	Yes	No	N/ /	X	Yes	No	N/A
Wind speed sensor			\checkmark	Data logger		✓	
Wind direction sensor			✓	Data logger			\checkmark
Temperature sensor		✓		Strip chart recorder			\checkmark
Relative humidity sensor			\checkmark	Computer	\checkmark		
Solar radiation sensor			\checkmark	Modem		\checkmark	
Surface wetness sensor			\checkmark	Printer			\checkmark
Wind sensor translator			\checkmark	Zero air pump		\checkmark	
Temperature translator			\checkmark	Filter flow pump		\checkmark	
Humidity sensor translator			\checkmark	Surge protector			
Solar radiation translator			\checkmark	UPS		\checkmark	
Tipping bucket rain gauge			\checkmark	Lightning protection of	device		\checkmark
Ozone analyzer		\checkmark		Shelter heater		\checkmark	
Filter pack flow controller	\checkmark			Shelter air conditione	r 🗸		
Filter pack MFC power supply			\checkmark				
Does the site have the requ	ired a	and mo	ost recei	nt QC documents and report form	<u>ns?</u>		
	Pres	sent			Curre	nt	
Station Log		✓					

Station Log	\checkmark		\checkmark
SSRF			\checkmark
Site Ops Manual		Oct 2001	
HASP		Feb 2014	\checkmark
Field Ops Manual		July 1990	
Calibration Reports			\checkmark
Ozone z/s/p Control Charts			
Preventive maintenance schedule			

1

2

3

4

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

Site	ID	VPI120	Technician	Sandy Grenville	Site Visit Date	09/24/2019]
1	Site ope Has the course?	ration procedures site operator attended If yes, when and who	l a formal CAS instructed?	TNET training			
2	Has the training	backup operator atte course? If yes, when	nded a formal (and who instru	CASTNET cted?			
3	Is the site schedule	e visited regularly on a ?	the required T ı	ıesday			
4	Are the s flollowed	tandard CASTNET o by the site operator?	perational pro	cedures being			
5	Is the site the requi	e operator(s) knowled ired site activities? (in	geable of, and a cluding docum	able to perform entation)			

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

QC Ch	eck Per	formed
-------	---------	--------

Frequency

Frequency

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

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

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

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

requency	
Semiannually	
Daily	
As needed	
Daily	
As needed	
Weekly	
Every 2 weeks	
N/A	
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?

	1 1	8	
3	Are the automatic and m	anual z/s/p checks monitored and	
	reported? If yes, how?		

	Unknown
✓	logbook, call-in

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

Compliant

Compliant

F-02058-1500-S8-rev002

ield Sy	stems Data Fo	orm		F-02058-1500-S9-rev0(
ite ID	VPI120	Technician	Sandy Grenville	Site Visit Date	09/24/2019]		
<u>Site oper</u>	ration procedures							
Is the file	ter pack being change	ed every Tuesda	ay as scheduled? 🗹	Filter changed mori	nings			

 \checkmark

 \checkmark

✓

✓

No longer required

SSRF, logbook, call-in

Clean gloves on and off

SSRF, logbook

- Are the Site Status Report Forms being completed and filed 2 correctly?
- 3 Are data downloads and backups being performed as scheduled?
- Are general observations being made and recorded? How? 4
- Are site supplies on-hand and replenished in a timely 5 fashion?

Are sample flow rates recorded? How?

- Are samples sent to the lab on a regular schedule in a timely 7
- Are filters protected from contamination during handling 8 and shipping? How?
- Are the site conditions reported regularly to the field 9 operations manager or staff?

QC Check Performed

fashion?

S

1

6

Frequency

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

VPI120

F-02058-1500-S10-rev002

Site	ID	
Ditt	\mathbf{n}	

Tech

Technician Sandy Grenville

Site Visit Date 09/24/2019

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	07203
Ozone	ThermoElectron Inc	49i A1NAA	1030244800	000690
Ozone Standard	ThermoElectron Inc	49i A3NAA	0622717850	000328
Sample Tower	Aluma Tower	В	unknown	none
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	000829160	06910

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
PAR	107-Sandy	Grenville-09/25/2019				
1	9/25/2019	Computer	Dell	07072	Inspiron 15	Unknown
2	9/25/2019	DAS	Campbell	000333	CR3000	2112
3	9/25/2019	Elevation	Elevation	None	1	None
4	9/25/2019	Filter pack flow pump	Thomas	00859	107CA18	missing
5	9/25/2019	Flow Rate	Арех	000803	AXMC105LPMDPCV	50752
6	9/25/2019	Infrastructure	Infrastructure	none	none	none
7	9/25/2019	Modem	Digi	07160	LR54	unknown
8	9/25/2019	Ozone	ThermoElectron Inc	000689	49i A1NAA	1030244802
9	9/25/2019	Ozone Standard	ThermoElectron Inc	000436	49i A3NAA	CM08200012
10	9/25/2019	Sample Tower	Aluma Tower	000838	В	unknown
11	9/25/2019	Shelter Temperature	Campbell	none	107-L	none
12	9/25/2019	Siting Criteria	Siting Criteria	None	1	None
13	9/25/2019	Temperature	RM Young	04316	41342VO	4013
14	9/25/2019	Zero air pump	Werther International	06907	C 70/4	000829179

DAS Data Form

DAS Time Max Error:

0

Mfg	Serial	Number Site	T	echnician	Site Visit Date	Parameter	Use Desc.
Campbell	2112	PAI	R107 S	Sandy Grenville	09/25/2019	DAS	Primary
Das Date:	9 /25/2019	Audit Date	9 /25/2019	Mfg	Fluke	Parameter	DAS
Das Time: Das Day:	13:30:00	Audit Time Audit Day	13:30:00 268	Serial Number	95740135	Tfer Desc.	DVM
Low Channe	el:	High Channe	l:	Tfer ID	01311		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.000	0.0	0.000	0.0001	Cert Date	1/25/201	9 CorrCoff	1.00000
				Mfg	Datel	Parameter	DAS
				Serial Number	15510194	Tfer Desc.	Source generator (D
				Tfer ID	01320		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	2/13/201	2 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	V	V	0.0000	
7	0.1000	0.0999	0.0999	V	V	0.0000	
7	0.3000	0.2997	0.2997	V	V	0.0000	
7	0.5000	0.4995	0.4995	V	V	0.0000	
7	0.7000	0.6995	0.6994	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 Nun	ıber Tag	Site	Тес	chnician	Site Visit	Date Para	meter	Owner ID
Арех	50752		PAR107	Sa	ndy Grenville	09/25/201	9 Flow	Rate	000803
					Mfg	BIOS		Parameter Flo	w Rate
					Serial Number	148613		Tfer Desc. BIC	DS 220-H
					Tfer ID	01421			
					Slope	1	1.00000 In	tercept	0.00000
					Cert Date	3	/4/2019 C	orrCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero	-(0.02	
A Avg % Diff:	A Max % Dif	A Avg %	Diff A Max	: % Dif	Cal Factor F	ull Scale	().97	
2.17%	2.60%				Rotometer R	eading:		1.5	
Desc.	Test type	Input l/n	n Input Corr_	MfcDisp.	OutputSignal	Output S E	E InputUnit	OutputSignal	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.02	l/m	l/m	
primary	test pt 1	1.537	1.540	1.54	0.000	1.50	l/m	l/m	-2.60%
primary	test pt 2	1.538	1.540	1.54	0.000	1.51	l/m	l/m	-1.95%
primary	test pt 3	1.540	1.540	1.54	0.000	1.51	l/m	l/m	-1.95%
Sensor Comp	onent Leak Tes	t		Conditio	on		Stat	us pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Stat	us pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Good		Stat	us pass	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	Clean and dry		Stat	us pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture p	resent	Stat	us pass	
Sensor Comp	onent Filter Dis	tance		Conditio	n 5.5 cm		Stat	us pass	
Sensor Comp	onent Filter Dep	oth		Conditio	3.0 cm		Stat	us pass	
Sensor Comp	onent Filter Azi	muth		Conditio	n 90 deg		Stat	us pass	
Sensor Comp	onent System N	/lemo		Conditio	on		Stat	us pass	

Ozone Data Form

Mfg	Serial Numb	er Ta Site	Тес	chnician	Site Visit Date	Parameter	Owner ID
ThermoElectron	Inc 1030244802	PAR10	7 Sa	ndy Grenville	09/25/2019	Ozone	000689
Slope: Intercept CorrCoff	0.98162 Slop -0.62791 Inte 0.99985 Cor	pe: 0 ercept 0 rCoff 0	0.00000 0.00000 0.00000	Mfg Serial Number Tfer ID	ThermoElectron 1180030022 01114	Inc Paramete	er ozone c. Ozone primary stan
DAS 1:	D	AS 2:		Slope	0.9984	0 Intercept	0.27090
A Avg % Diff: 0.0%	A Max % Di A 0.0%	Avg %Diff A	Max % Di	Cert Date	6/11/201	9 CorrCoff	1.00000
		TC	Tfor	0.1	0''. II.''		
DiseDescription	1 ConcGroup	0.36	0.08	-1.11	Site Unit	RelPerDif	-1.19
primary	2	15.20	14.95	13.78	ppb		-1.17
primary	3	33.83	33.61	33.70	ppb	0.27	
primary	4	68.18	68.01	65.77	ppb	-3.35	
Sensor Comp	nent Sample Tra	111.42	Conditio	Good	ppo	Statue Dass	
Sensor Comp	onent 22.5 degree			on		Status pass	
Sensor Comp	onent Inlet Filter (Condition	Conditio	n Clean		Status pass	
Sensor Comp	Dent Battery Bac	kup	Conditio	n N/A		Status pass	
Sensor Comp	onent Offset		Conditio	n 0.10		Status pass	
Sensor Comp	onent Span		Conditio	n 1.009		Status pass	
Sensor Comp	onent Zero Voltag	je	Conditio	n N/A		Status pass	
Sensor Comp	onent Fullscale V	oltage	Conditio	n N/A		Status pass	
Sensor Comp	onent Cell A Freq	•	Conditio	n 85.4 kHz		Status pass	
Sensor Comp	onent Cell A Nois	е	Conditio	0.7 ppb		Status pass	
Sensor Comp	onent Cell A Flow	,	Conditio	n 0.43 lpm		Status pass	
Sensor Comp	onent Cell A Pres	sure	Conditio	n 680.1 mmHg		Status pass	
Sensor Comp	onent Cell A Tmp		Conditio	n 35.8 C		Status pass	
Sensor Comp	onent Cell B Freq		Conditio	n 86.6 kHz		Status pass	
Sensor Comp	onent Cell B Nois	e	Conditio	n 0.4 ppb		Status pass	
Sensor Comp	onent Cell B Flow	,	Conditio	n 0.51 lpm		Status pass	
Sensor Comp	onent Cell B Pres	sure	Conditio	n 680.7 mmHg		Status pass	
Sensor Comp	onent Cell B Tmp		Conditio	n N/A		Status pass	
Sensor Comp	Denent Line Loss		Conditio	Not tested		Status pass	
Sensor Comp	onent System Me	mo	Conditio	on		Status pass	

Temperature Data Form

Mfg	Serial Number	Tag Site	Т	echni	ician	Site V	isit Date	Param	eter	Owner ID
RM Young	4013	PAR107		Sandy	Grenville	09/25	/2019	Temper	ature	04316
				Mf	g	Extech	1	Ра	rameter Te	emperature
				Ser	ial Number	H2327	34	Tf	er Desc. R	ГD
				Tfe	er ID	01227				
DAS 1:	DA	S 2:		Slo	ре		1.0073	3 Inte	rcept	0.14497
Abs Avg Err	Abs Max Err Abs	Avg Err Abs	Max Err	Cei	rt Date		2/12/201	9 Cor	rCoff	1.00000
0.22	2 0.50									
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference
primary	Temp Low Range	0.23	0.08		0.000		0.1	l	С	0.05
primary	Temp Mid Range	26.17	25.84		0.000		25.	7	С	-0.12
primary	Temp High Range	48.70	48.20)	0.000		47.	7	C	-0.5
Sensor Con	nponent Shield		Condi	tion N	Ioderately clea	an		Status	pass	
Sensor Con	nponent Blower		Condi	tion N	J/A			Status	pass	
Sensor Con	nponent Blower Status	Switch	Condi	tion N	J/A			Status	pass	
Sensor Con	nponent System Memo)	Condi	tion				Status	pass	

Infrastructure Data For

Site ID	PAR107	Technician	Sandy Grenville	Site Visit Date	09/25/2019
Shelter N	Make	Shelter Model	Shelt	er Size	
Ekto		8810	640 c ^r	uft	And the second

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

Field Systems Comments

1 Parameter: SitingCriteriaCom

The city of Parsons, estimated population 1500, is within 5 km of the site.

2 Parameter: ShelterCleanNotes

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	PAR107	Sandy Grenville	09/25/2019	Shelter Temperatur	renone
DAS 1:	DAS 2:		Mfg	Extech	Parameter S	helter Temperature
Abs Avg Err Abs	S Max Err Abs Avg 0.61	Err Abs Max Err	Serial Number	H232734	Tfer Desc. R	TD
			Tfer ID	01227		
			Slope	1.0073	33 Intercept	0.14497
			Cert Date	2/12/201	19 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	27.01	26.67	0.000	27.3	С	0.61
primary	Temp Mid Range	29.57	29.21	0.000	28.8	С	-0.41
primary	Temp Mid Range	25.66	25.33	0.000	25.6	С	0.31
Sensor Component System Memo			Condition	1 Status pass			

Site ID	PAR107		Technician S	andy Grenville	Site	Visit I	Date 09/28	5/2019		
Site Sponsor	(agency)	EPA/USF	3		USGS Maj	þ		Parsons		
Operating G	roup	USFS			Map Scale					
AQS #		54-093-99	91		Map Date					
Meteorologic	al Type	Climatronics								
Air Pollutan	t Analyzer	Ozone			QAPP Lat	itude				
Deposition M	leasurement	dry, wet			QAPP Lon	gitude				
Land Use		woodland	- mixed		QAPP Elev	vation I	Meters			
Terrain		complex			QAPP Dec	linatio	n			
Conforms to	MLM	No			QAPP Declination Date					
Site Telepho	ne				Audit Latitude			39.090434		
Site Address	1	USFS Timber & Watershed Lab			Audit Longitude			-79.661742		
Site Address	2	Rt. 219, N	ursery Bottom		Audit Elevation			510		
County		Parsons			Audit Decl	ination	l	-9		
City, State		Parsons, V	NV			I	Present			
Zip Code		26287			Fire Exting	guisher		Inspected Nov 2	015	
Time Zone		Eastern			First Aid F	Kit				
Primary Ope	erator				Safety Gla	sses				
Primary Op.	Phone #				Safety Har	d Hat				
Primary Op.	E-mail				Climbing I	Belt				
Backup Ope	rator				Security Fo	ence				
Backup Op.	Phone #				Secure She	elter	\checkmark			
Backup Op.	E-mail				Stable Ent	ry Step	s 🗸			
Shelter Worl	king Room 🗹	Make	Ekto	M	odel 8810			Shelter Size	640 cuft	
Shelter Clear	1 🗹	Notes	The shelter is in	good conditior	n, clean, neat,	, and we	ell organize	ed.		
Site OK	\checkmark	Notes								
Driving Dire	ctions Take	highway 33	W to Elkins WV.	Turn onto 19	N to Parsons	. Conti	nue throug	h town to the Nu	rsery Botto	m

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PAR107

F-02058-1500-S2-rev002

Site ID

Techr

Technician Sandy Grenville

Site Visit Date 09/25/2019

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		✓
Major industrial complex	10 to 20 km		
City > 50,000 population	40 km		\checkmark
City 10,000 to 50,000 population	10 km		\checkmark
City 1,000 to 10,000 population	5 km	2.5 km	
Major highway, airport or rail yard	2 km		\checkmark
Secondary road, heavily traveled	500 m		\checkmark
Secondary road, lightly traveled	200 m		\checkmark
Feedlot operations	500 m		\checkmark
Intensive agricultural ops (including aerial spraying)	500 m		\checkmark
Limited agricultural operations	200 m		\checkmark
Large parking lot	200 m		\checkmark
Small parking lot	100 m		\checkmark
Tree line	50 m		\checkmark
Obstacles to wind	10 times obstacle height		

Siting Distances OK

Siting Criteria Comment

The city of Parsons, estimated population 1500, is within 5 km of the site.

Fie	eld Sy	stems Data Fo	orm				F-020	58-15	00-S3-	rev002
Site	e ID	PAR107	Technician	Sandy Grenville		Site Visit Date	09/25/2019			
1	Are win being in	d speed and direction fluenced by obstructio	sensors sited so ons?	as to avoid	✓	N/A				
2	Are win (i.e. wind horizont tower in	d sensors mounted so d sensors should be m ally extended boom > to the prevailing wind	as to minimize ounted atop the 2x the max dian l)	tower effects? e tower or on a meter of the		N/A				
3	Are the	tower and sensors plu	mb?		✓	N/A				
4	Are the avoid ra	temperature shields p diated heat sources su	ointed north or Ich as buildings	positioned to , walls, etc?	✓					
5	Are tem conditio surface a standing	perature and RH sens ns? (i.e. ground below and not steeply sloped s water should be avoi	ors sited to avo sensors should . Ridges, hollow ded)	id unnatural be natural vs, and areas of						
6	Is the so	lar radiation sensor p	lumb?		✓	N/A				
7	Is it site	d to avoid shading, or	any artificial o	r reflected light?		N/A				
8	Is the ra	in gauge plumb?			✓	N/A				
9	Is it site towers,	d to avoid sheltering e etc?	ffects from bui	ldings, trees,		N/A				
10	Is the su facing n	rface wetness sensor s orth?	sited with the g	rid surface	✓	N/A				
11	Is it inc	lined approximately 3	0 degrees?		✓	N/A				
8 9 10 11	Is the rational structure of the second structure of t	in gauge plumb? d to avoid sheltering e etc? rface wetness sensor s orth? lined approximately 3	ffects from buil sited with the gr 0 degrees?	ldings, trees, rid surface	> > >	N/A N/A N/A				

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Site	e ID	PAR107	Technician	Sandy Grenville		Site Visit Date	09/25/2019	
1	Do all the condition	e meterological sensor 1, and well maintained	rs appear to be 1?	intact, in good				
2	Are all th reporting	ne meteorological sens g data?	ors operationa	l online, and				
3	Are the s	hields for the tempera	ature and RH s	ensors clean?	✓			
4	4 Are the aspirated motors working?					N/A		
5	Is the sol scratches	ar radiation sensor's l	lens clean and f	ree of		N/A		
6	Is the sur	face wetness sensor g	rid clean and u	ndamaged?		N/A		
7	Are the s condition	ensor signal and pow a, and well maintained	er cables intact 1?	, in good				
8	Are the s from the	ensor signal and powe elements and well ma	er cable connec iintained?	tions protected				

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev002
Site	e ID	PAR107	Technician	Sandy Grenville		Site Visit Date 09/25/2019
	Siting C	Criteria: Are the pollut	ant analyzers a	nd deposition eq	uipn	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the s unrestri	cample inlets have at le	east a 270 degre	e arc of		
2	Are the	sample inlets 3 - 15 m	eters above the	ground?	✓	
3	Are the sample inlets > 1 meter from any major obstruction and 20 meters from trees?					
	<u>Pollutar</u>	nt analyzers and depos	ition equipmen	t operations and	mai	ntenance
1	Do the a conditio	analyzers and equipme on and well maintained	ent appear to be ?	e in good		
2	Are the reportin	analyzers and moniton ng data?	rs operational,	on-line, and	✓	
3	Describ	e ozone sample tube.				1/4 teflon by 12 meters
4	Describ	e dry dep sample tube				3/8 teflon by 12 meters
5	Are in-li indicate	ine filters used in the o location)	ozone sample lin	ne? (if yes		At inlet only
6	Are sam obstruct	nple lines clean, free of tions?	kinks, moistur	e, and		
7	Is the ze	ero air supply desiccan	t unsaturated?		✓	
8	Are the	re moisture traps in th	e sample lines?		✓	Flow line only
9	Is there clean?	a rotometer in the dry	v deposition filte	er line, and is it		Clean and dry

4 = 0 0

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Fi	eld Systems Data Form	F-02058-1500-S6-rev002				
Site	e ID PAR107 Technician Sandy Grenville	,	Site Visit Date	09/25/2019)	
	DAS, sensor translators, and peripheral equipment operatio	<u>ns a</u>	<u>nd maintenance</u>			
1	Do the DAS instruments appear to be in good condition and well maintained?					
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	✓				
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?		Met sensors only			
4	Are the signal connections protected from the weather and well maintained?	✓				
5	Are the signal leads connected to the correct DAS channel?	✓				
6	Are the DAS, sensor translators, and shelter properly grounded?	✓				
7	Does the instrument shelter have a stable power source?	✓				
8	Is the instrument shelter temperature controlled?					
9	Is the met tower stable and grounded?		Stable		Grounded	
10	Is the sample tower stable and grounded?					
11	Tower comments?		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 S	ystems Data	Fo	rm				F-02	2058	-1500-S7-rev002
Site ID	PAR107		Techn	ician	Sandy Grenville	Site Visit Date)9/25/2019	9	
Docume	ntation								
Does the	site have the requi	red in	strumer	nt and	equipment manuals?				
		Yes	No	N/A	A		Yes	No	N/A
Wind speed	l sensor			\checkmark	Data logge	er			
Wind direc	tion sensor			\checkmark	Data logge	er			
Temperatu	re sensor		✓		Strip char	t recorder			
Relative hu	midity sensor			✓	Computer			\checkmark	
Solar radia	tion sensor			✓	Modem			\checkmark	
Surface wet	tness sensor			✓	Printer				
Wind senso	or translator			\checkmark	Zero air p	ump			
Temperatu	re translator			\checkmark	Filter flow	y pump			
Humidity se	ensor translator			\checkmark	Surge prot	tector			
Solar radia	tion translator			\checkmark	UPS				
Tipping bu	cket rain gauge				Lightning	protection device			
Ozone anal	yzer		✓		Shelter he	ater		\checkmark	
Filter pack	flow controller	✓			Shelter air	conditioner	\checkmark		
Filter pack	MFC power supply	/		\checkmark					
Does th	ie site have the requ	iired a	and mos	t recei	nt QC documents and	<u>report forms?</u>			
		Pres	sent				Curre	ent	
Station Log	5		✓				\checkmark		
SSRF			✓				\checkmark		
Site Ops Ma	anual		✓ J	uly 199	90				
HASP			✓ F	eb 201	4		\checkmark		
Field Ops M	Ianual								
Calibration	Reports		✓				\checkmark		
Ozone z/s/p	Control Charts								
Preventive	maintenance sched	ule							
1 Is the s	station log properly	comp	oleted d	uring e	every site visit? 🔽 🛛	Iinimal information			
2 Are th	e Site Status Repor	t Forn	ns being	g comp	oleted and				

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

Control charts not used

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

Field Systems Data Form

Site	ID	PAR107	Technician	Sandy Grenville	Site Visit Date	09/25/2019	
1	<u>Site oper</u> Has the course?	<u>ration procedures</u> site operator attended If yes, when and who i	a formal CAS instructed?	TNET training			
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?						
3	Is the site schedule?	e visited regularly on t ?	he required Tu	ıesday			
4	Are the s flollowed	tandard CASTNET of by the site operator?	perational pro	cedures being			
5	Is the site the requi	e operator(s) knowledg red site activities? (inc	geable of, and a cluding docum	able to perform entation)			

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

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

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

OC	Chook	Dorformod
VU	CHECK	I el loi meu

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

Frequency	
Semiannually	
Daily	
As needed	
Daily	
As needed	
Weekly	
Every 2 weeks	
N/A	
Weekly	
Weekly	

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

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Fi	eld Sys	stems Data Form	F-02058-1500-S9-rev(
Site	e ID	PAR107 Technician Sandy Grenville		Site Visit Date 09/25/2019				
	Site oper	ration procedures						
1	Is the filt	ter pack being changed every Tuesday as scheduled?		Filter changed various times				
2	Are the s correctly	Site Status Report Forms being completed and filed 7?						
3	Are data schedule	downloads and backups being performed as d?		No longer required				
4	Are gene	eral observations being made and recorded? How?	✓	SSRF				
5	Are site fashion?	supplies on-hand and replenished in a timely						
6	Are sam	ple flow rates recorded? How?	✓	SSRF, call-in				

✓

Compliant

- 7 Are samples sent to the lab on a regular schedule in a timely
 ✓
 8 Are filters protected from contamination during handling
 ✓
 Clean gloves on and off
- 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

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	\checkmark
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

PAR107

F-02058-1500-S10-rev002

Site ID

Techi

Technician Sandy Grenville

Site Visit Date 09/25/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07072
DAS	Campbell	CR3000	2112	000333
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	missing	00859
Flow Rate	Apex	AXMC105LPMDPC	50752	000803
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07160
Ozone	ThermoElectron Inc	49i A1NAA	1030244802	000689
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200012	000436
Sample Tower	Aluma Tower	В	unknown	000838
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VO	4013	04316
Zero air pump	Werther International	C 70/4	000829179	06907

Site Inventory by Site Visit

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number				
LRL1	RL117-Sandy Grenville-09/26/2019									
1	9/26/2019	Computer	Dell	07010	D520	unknown				
2	9/26/2019	DAS	Campbell	000344	CR300	2123				
3	9/26/2019	Elevation	Elevation	None	1	None				
4	9/26/2019	Filter pack flow pump	Thomas	01133	107CA18	1088003123				
5	9/26/2019	Flow Rate	Арех	000460	AXMC105LPMDPCV	42229				
6	9/26/2019	Infrastructure	Infrastructure	none	none	none				
7	9/26/2019	Ozone	ThermoElectron Inc	000701	49i A1NAA	1030244808				
8	9/26/2019	Ozone Standard	ThermoElectron Inc	000444	49i A3NAA	CM08200020				
9	9/26/2019	Sample Tower	Aluma Tower	000783	В	none				
10	9/26/2019	Shelter Temperature	Campbell	none	107-L	none				
11	9/26/2019	Siting Criteria	Siting Criteria	None	1	None				
12	9/26/2019	Temperature	RM Young	06245	41342VC	12792				
13	9/26/2019	Zero air pump	Werther International	06904	C 70/4	000821901				

DAS Data Form

DAS Time Max Error:

0

Mfg	Seria	Number Sit	e T	echnician	Site Visit Date	Parameter	Use Desc.
Campbell	2123	LF	RL117 S	Sandy Grenville	09/26/2019	DAS	Primary
Das Date:	9 /26/2019	Audit Date	9 /26/2019	Mfg	Datel	Parameter	DAS
Das Time: Das Day:	269	Audit Time Audit Day	269	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Channe	el:	High Chann	el:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	00 Intercept	0.00000
0.000	0.0	0.000	0.0001	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	00 Intercept	0.00000
				Cert Date	1/25/201	9 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0001	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	0.4996	0.4996	V	V	0.0000	
7	0.7000	0.6995	0.6995	V	V	0.0000	
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 Nun	nber Tag	Site	Тес	chnician	Site Visit Date	Parar	neter	Owner ID
Арех	42229		LRL117	Sa	ndy Grenville	09/26/2019	019 Flow Rate		000460
					Mfg	BIOS	BIOS		v Rate
					Serial Number	148613	1	Ffer Desc. BIO	S 220-H
					Tfer ID	01421			
					Slope	1.0000)0 Int	tercept	0.00000
					Cert Date	3/4/201	19 <mark>Co</mark>	orrCoff	1.00000
DAS 1:		DAS 2:		_	Cal Factor Z	ero	-0	.03	
A Avg % Diff:	A Max % Dif	A Avg %	Diff A Max	: % Dif	Cal Factor F	ull Scale	0	.97	
0.45%	0.67%				Rotometer R	eading:		1.7	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E Inp	utUnit	OutputSignalI	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	-0.02	l/m	l/m	
primary	test pt 1	1.494	1.490	1.53	0.000	1.49	l/m	l/m	0.00%
primary	test pt 2	1.496	1.500	1.53	0.000	1.49	l/m	l/m	-0.67%
primary	test pt 3	1.497	1.500	1.53	0.000	1.49	l/m	l/m	-0.67%
Sensor Comp	onent Leak Tes	it		Conditio	on		Statu	IS pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Statu	IS pass	
Sensor Comp	onent Filter Pos	sition		Conditio	Good		Statu	IS pass	
Sensor Comp	onent Rotomete	er Conditior	ו	Conditio	Clean and dry		Statu	IS pass	
Sensor Comp	onent Moisture	Present		Conditio	No moisture pr	esent	Statu	IS pass	
Sensor Comp	onent Filter Dis	tance		Conditio	1 4.0 cm		Statu	IS pass	
Sensor Comp	onent Filter Dep	oth		Conditio	1.0 cm		Statu	IS pass	
Sensor Comp	onent Filter Azi	muth		Conditio	n 160 deg		Statu	IS pass	
Sensor Comp	onent System N	/lemo		Conditio	n		Statu	Is pass	

Ozone Data Form

Mfg	;	Serial Num	ber Tag	Site	ſ	Гесh	nician	Site Visit Date	Parameter	Owner ID	
ThermoElectr	ron Inc	1030244808	8	LRL117		Sand	dy Grenville	09/26/2019	Ozone	000701	
Slope: Intercept CorrCoff:	0 -0 0	.98045 Sld .50137 In .99994 Cd	ope: tercept orrCoff:).00000).00000).00000	N S T	Afg Serial Number Efer ID	ThermoElectron 1180030022 01114	Inc Param	eter ozone	
DAS 1: A Avg % Di 0.09	ff: A M %	ax % Dif	DAS 2: A Avg %	Diff A	Max % Dif	S C	Slope Cert Date	0.9984 6/11/201	0 Intercep 9 CorrCof	t 0.27090 ff 1.00000	
UseDescrip primary primary primary primary primary	otion 7 7 7 7 7 7 7 7 7 7 7 7 7 7	ConcGroup 1 2 3 4 5	Tfe 00 11 33 60 11	r Raw 0.43 5.11 7.40 8.12 2.84	Tfer Corr 0.15 14.86 37.18 67.95 112.74	· · · · · · · · · · · · · · · · · · ·	Site -0.44 13.87 35.85 66.94 109.60	Site Unit ppb ppb ppb ppb ppb ppb	RelPerDif -3.(-1 -2.(AbsDif -0.59 -0.99 64 .5 82	
Sensor Co Sensor Co Sensor Co	mponer mponer mponer	t Sample T 22.5 degra t Inlet Filter	rain ee rule Conditio	n	Condi	ition ition ition	Good Clean		Status pas Status pas Status pas	s s	
Sensor Co	mponer	t Battery Ba	ackup		Condi	ition	N/A		Status pas	S	
Sensor Co	mponer	t Offset			Condi	ition	-0.10		Status pas	S	
Sensor Co	mponer	t Zero Volta	ade		Condi	ition ition	1.011		Status pas	s	
Sensor Co	mponer	t Fullscale	Voltage		Condi	ition	N/A		Status pas	s	
Sensor Co	mponer	t Cell A Fre	q.		Condi	ition	129.0 kHz		Status pass		
Sensor Co	mponer	t Cell A Noi	se		Condi	ition	0.90 ppb		Status pas	S	
Sensor Co	mponer	t Cell A Flo	w		Condi	ition	0.65 lpm		Status pas	S	
Sensor Co	mponer	t Cell A Pre	essure		Condi	ition	691.3 mmHg		Status pas	S	
Sensor Co	mponer	t Cell A Tm	р.		Condi	ition	35.5 C		Status pas	S	
Sensor Co	mponer	t Cell B Fre	q.		Condi	ition	90.8 kHz		Status pas	S	
Sensor Co	mponer	Cell B Noi	se		Condi	ition 	0.67 lpm		Status pas	s	
Sensor Co	mponer		w		Condi	ition	690.7 mmHg		Status pas	\$	
Sensor Co	mponer	t Cell B Tm	p.		Condi	ition	N/A		Status pas	s	
Sensor Co	mponer	t Line Loss	•		Condi	ition	Not tested		Status pas	S	
Sensor Co	mponer	t System M	emo		Condi	ition	n		Status pas	S	

Temperature Data Form

Mfg	Serial Number	Tag Site	Technician		Site V	isit Date	Param	eter	Owner ID	
RM Young	12792	LRL117	Sa	Sandy Grenville		09/26	/2019	Temper	ature	06245
				Mf	g	Extecl	า	Pa	rameter Te	emperature
				Ser	ial Number	H2327	734	Tf	er Desc. R	ſD
				Tfe	er ID	01227				
DAS 1:	DAS	S 2:		Slo	ре		1.0073	3 Inte	rcept	0.14497
Abs Avg Err	Abs Max Err Abs	Avg Err Abs	Max Err	ax Err Cert Date			2/12/2019 CorrCoff		1.00000	
0.22	2 0.34									
UseDesc.	Test type	InputTmpRaw	InputTmpC	npCorr. OutputTmpS		Signal OutputSig		gnalEng	OSE Unit	Difference
primary	Temp Low Range	0.21	0.06		0.000	0.3		С	0.26	
primary	Temp Mid Range	24.83	24.51		0.000		24.	5	С	-0.05
primary	Temp High Range	48.92	48.42		0.000		48.	1	С	-0.34
Sensor Con	nponent Shield		Conditi	on N	Ioderately cle	an		Status	pass	
Sensor Con	nponent Blower		Condition	on N	J/A			Status	pass	
Sensor Component Blower Status Switch			Condition	Condition N/A				Status	pass	
Sensor Con	nponent System Memo)	Condition	on				Status	pass	

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	LRL117	Sandy Grenville	09/26/2019	Shelter Temperatur	re none
DAS 1:	DAS 2:		Mfg	Extech	Parameter S	helter Temperature
Abs Avg Err Abs 0.56	Abs Max Err Abs Avg Err Abs Max Err 0.56 0.94 Image: Comparison of the second		Serial Number	H232734	Tfer Desc. R	TD
			Tfer ID	01227		
			Slope	1.0073	3 Intercept	0.14497
			Cert Date	2/12/201	9 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	29.80	29.44	0.000	28.5	С	-0.94
primary	Temp Mid Range	28.20	27.85	0.000	27.8	С	-0.01
primary	Temp Mid Range	25.50	25.17	0.000	25.9	С	0.72
Sensor Con	nponent System Memo	•	Condition		Status	pass	

Infrastructure Data For

Site ID	LRL117	Technician Sand	y Grenville Site Visit Date 09/26/2019
Shelter M	lake	Shelter Model	Shelter Size
Ekto		8810	640 cuft

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

Field Systems Comments

1 Parameter: SiteOpsProcedures

Ozone sample line leak checks conducted every other week following the inlet filter replacements.

2 Parameter: ShelterCleanNotes

The shelter is in good condition. A new peaked roof has been installed.

3 Parameter: MetOpMaintCom

The temperature sensor shield has moss growing on it and should be cleaned.

Field Systems Data Form	

F-02058-1500-S1-rev002

Site ID LRL117	Technician Sandy Grenville	Site Visit Date 09/2	6/2019	
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	Present		
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 ✓		
Shelter Working Room	Make Ekto Me	odel 8810	Shelter Size 640 cuft	
Shelter Clean	Notes The shelter is in good condition	n. A new peaked roof has beer	n installed.	
Site OK	Notes			
Driving Directions From S	Somerset take 30 west			

Field Systems Data Form

LRL117

F-02058-1500-S2-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 09/26/2019

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

Siting Distances OK

Siting Criteria Comment

Fie	eld Sys	stems Data Fo	orm			F-02058-1	500-S3-rev002
Site	e ID	LRL117	Technician	Sandy Grenville		Site Visit Date 09/26/2019]
1	Are wind being inf	l speed and direction luenced by obstructio	sensors sited so ons?	as to avoid	✓	N/A	
2	Are wind (i.e. wind horizont tower in	l sensors mounted so l sensors should be m ally extended boom > to the prevailing wind	as to minimize ounted atop the 2x the max dian	tower effects? e tower or on a meter of the		N/A	
3	Are the t	ower and sensors plu	mb?		✓	N/A	
4	Are the t avoid rac	emperature shields p diated heat sources su	ointed north or Ich as buildings	positioned to , walls, etc?	✓		
5	Are temp condition surface a standing	perature and RH sens ns? (i.e. ground below and not steeply sloped water should be avoi	ors sited to avo sensors should . Ridges, hollow ded)	id unnatural be natural vs, and areas of			
6	Is the sol	ar radiation sensor p	lumb?		✓	N/A	
7	Is it sited	l to avoid shading, or	any artificial o	r reflected light?		N/A	
8	Is the rai	in gauge plumb?			✓	N/A	
9	Is it sited towers, e	l to avoid sheltering e .tc?	ffects from buil	ldings, trees,	✓	N/A	
10	Is the sur facing no	rface wetness sensor s orth?	ited with the g	rid surface	✓	N/A	
11	Is it incl	ined approximately 3	0 degrees?			N/A	
						l	

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

Field Systems Data Form

Site	e ID	LRL117	Technician Sandy Grenville		Site Visit Date 09/26/2019
1	Do all th condition	e meterological sensor n, and well maintained	s appear to be intact, in good ?		
2	Are all the reporting	he meteorological sens g data?	ors operational online, and	✓	
3	Are the s	shields for the tempera	ture and RH sensors clean?	✓	Moderately clean
4	Are the a	aspirated motors work	ing?	✓	N/A
5	Is the sol scratches	lar radiation sensor's l s?	ens clean and free of	✓	N/A
6	Is the su	rface wetness sensor g	rid clean and undamaged?	\checkmark	N/A

✓

- Is the surface wetness sensor grid clean and undamaged? 6
- 7 Are the sensor signal and power cables intact, in good condition, and well maintained?
- ✓ Are the sensor signal and power cable connections protected 8 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 shield has moss growing on it and should be cleaned.

F-02058-1500-S4-rev002

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev002
Site	e ID	LRL117	Technician	Sandy Grenville		Site Visit Date 09/26/2019
	Siting C	Criteria: Are the pollut	ant analyzers a	nd deposition eq	<u>uipn</u>	ment sited in accordance with 40 CFR 58, Appendix E
1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?					
2	Are the	sample inlets 3 - 15 me	eters above the	ground?	✓	
3	Are the sample inlets > 1 meter from any major obstruction and 20 meters from trees?				✓	
	<u>Pollutar</u>	nt analyzers and depos	ition equipmen	t operations and	mai	<u>intenance</u>
1	Do the a conditio	analyzers and equipme on and well maintained	ent appear to be	e in good	✓	
2	Are the reportin	analyzers and monitor 1g data?	rs operational,	on-line, and	✓	
3	Describ	e ozone sample tube.				1/4 teflon by 12 meters
4	Describ	e dry dep sample tube.				3/8 teflon by 12 meters
5	Are in-l indicate	ine filters used in the o location)	ozone sample lii	ne? (if yes	✓	At inlet only
6	Are sam obstruct	nple lines clean, free of tions?	kinks, moistur	e, and	✓	
7	Is the ze	ero air supply desiccan	t unsaturated?			
8	Are the	re moisture traps in th	e sample lines?		✓	Flow line only
9	Is there clean?	a rotometer in the dry	deposition filt	er line, and is it	✓	Clean and dry

~ -

Provide any additional 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-0 2	2058-15	00-S6-rev002
Site	e ID	LRL117	Technician	Sandy Grenville		Site Visit Date	09/26/2019	9	
	DAS, sei	nsor translators, and	peripheral equi	pment operation	ns ai	<u>nd maintenance</u>			
1	Do the I well mai	DAS instruments appe intained?	ear to be in good	l condition and					
2	Are all t modem,	he components of the backup, etc)	al? (printers,						
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?					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	e instrument shelter h	ave a stable pov	ver source?	✓				
8	Is the in	strument shelter temp	perature control	lled?					
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	l grounded?						
11	Tower c	omments?						.	

Provide any additional 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 H	orr	n			F-0 2	2058-	1500-S7-rev002
Site ID LRL117]]	Fechn	i <mark>ician</mark> Sandy	Grenville Site Visit Date 0	9/26/2019	9	
Documentation							
Does the site have the required	l instr	rumei	<u>nt and equipn</u>	<u>nent manuals?</u>			
Y Wind speed sensor Wind direction sensor Temperature sensor Relative humidity sensor Solar radiation sensor Surface wetness sensor Wind sensor translator Temperature translator Humidity sensor translator Humidity sensor translator Solar radiation translator Tipping bucket rain gauge Ozone analyzer Filter pack flow controller				Data logger Data logger Strip chart recorder Computer Modem Printer Zero air pump Filter flow pump Surge protector UPS Lightning protection device Shelter heater	Yes	No V V V V V V V V V	N/A V
Deep the gite how the require				January and non-ant farmer?			
<u>Does the site have the require</u> 1	<u>ed and</u> Preser	<u>d mos</u> 1t	<u>st recent QC (</u>	locuments and report forms?	Curre	ent	
Station Log SSRF Site Ops Manual HASP Field Ops Manual Calibration Reports Ozone z/s/p Control Charts Preventive maintenance schedule			lot present lot present				

- **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?

ed
ed

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

✓

Field Systems Data Form

Site	ID LRL117 Technician Sandy Grenville	Site Visit Date	09/26/2019	
1	Site operation procedures Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?			
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?			
3	Is the site visited regularly on the required Tuesday schedule?			
4	Are the standard CASTNET operational procedures being flollowed by the site operator?			
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)			

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

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

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

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

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

F-02058-1500-S8-rev002

Compliant

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Field Systems Data Form							F-02058	-1500-S9-rev002		
Sit	e ID	LRL117 T	echnician	Sandy Grenville		Site Visit Da	te 09/26/2019			
	Site ope	ration procedures								
1	Is the fil	ter pack being changed ev	ery Tuesda	y as scheduled?		Filter changed aft	ernoons			
2	Are the correctly	Site Status Report Forms y?	being comp	oleted and filed						
3	Are data schedule	a downloads and backups l ed?	being perfo	ormed as		No longer required				
4	Are gen	eral observations being ma	ade and rec	corded? How?	✓	SSRF, logbook				
5	Are site fashion?	supplies on-hand and repl	enished in	a timely						
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 Po	erformed	Freq	luency			Compliant			
I	Multi-poir	nt MFC Calibrations	✓ Sem	iannually						
]	Flow Syste	em Leak Checks	✓ Wee	kly			\checkmark			
]	Filter Pac	k Inspection								
]	Flow Rate	Setting Checks	✓ Wee	kly			\checkmark			
١	Visual Ch	eck of Flow Rate Rotomete	er 🗹 Wee	kly						
]	In-line Fil	ter Inspection/Replacemen	t 🗹 Sem	iannually			\checkmark			
5	Sample Li	ne Check for Dirt/Water	✓ Wee	kly			\checkmark			

Provide any additional 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

LRL117

F-02058-1500-S10-rev002

Sile ID

Tech

Technician Sandy Grenville

Site Visit Date 09/26/2019

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	07010
DAS	Campbell	CR300	2123	000344
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	1088003123	01133
Flow Rate	Apex	AXMC105LPMDPC	42229	000460
Infrastructure	Infrastructure	none	none	none
Ozone	ThermoElectron Inc	49i A1NAA	1030244808	000701
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200020	000444
Sample Tower	Aluma Tower	В	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

Data Compiled: 1/28/2020 19:44:32

SiteVisitDateSiteTechnician09/25/2019ABT147Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99630	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.32338	ppb	Р
3	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.3	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	-0.32	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.39	ppb	Р

Data Compiled:

1/28/2020 19:21:17

SiteVisitDate Site Technician

09/18/2019 ACA416 Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.12	c	Р
2	Temperature2meter max error	Р	5	0.5	3	0.28	c	Р
3	Wind Speed average error below 5m/s in m/s	Р	3	0.5	12	0.13	m/s	Р
4	Wind Speed max error below 5m/s in m/s	Р	3	0.5	12	0.21	m/s	Р
5	Wind Speed average % difference above 5 m/s	Р	3	5	12	7.3	%	Fail
6	Wind Speed max % difference above 5 m/s	Р	3	5	12	25.7	%	Fail
7	Wind Speed Torque average error	Р	3	0.5	1	0.45	g-cm	Р
8	Wind Speed Torque max error	Р	3	0.5	1	0.5	g-cm	Fail
9	Wind Direction Input Deg True average error (de	Р	2	5	12	3.8	degrees	Р
10	Wind Direction Input Deg True max error (deg)	Р	2	5	12	5	degrees	Р
11	Wind Direction Linearity average error (deg)	Р	2	5	24	1.7	degrees	Р
12	Wind Direction Linearity max error (deg)	Р	2	5	24	3	degrees	Р
13	Wind Direction Torque average error	Р	2	30	1	12	g-cm	Р
14	Wind Direction Torque max error	Р	2	30	1	18	g-cm	Р
15	Relative Humidity average below 85%	Р	6	10	6	1.4	%	Р
16	Relative Humidity max below 85%	Р	6	10	6	2.2	%	Р
17	Precipitation average % difference	Р	1	10	2	2.0	%	Р
18	Precipitation max % difference	Р	1	10	2	2.0	%	Р
19	Ozone Slope	Р	0	1.1	4	1.06837	unitless	Р
20	Ozone Intercept	Р	0	5	4	-1.25419	ppb	Р
21	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
22	Ozone % difference avg	Р	7	10	4	3.8	%	Р
23	Ozone Absolute Difference g1	Р	7	3	1	-1.08	ppb	Р
24	Ozone Absolute Difference g2	Р	7	1.5	1	-0.23	ppb	Р
25	Flow Rate average % difference	Р	10	5	2	0.44	%	Р
26	Flow Rate max % difference	Р	10	5	2	0.65	%	Р
27	DAS Voltage average error	Р	9	0.003	14	0.0006	V	Р
28	Shelter Temperature average error	Р	5	2	9	1.83	с	Р
29	Shelter Temperature max error	Р	5	2	9	2.09	с	Fail

09/18/2019 ACA416

Technician

Korey Devins

Field Performance Comments

1	Parameter:	Solar Radiation	SensorComponent:	System Memo	CommentCode: 174
	Additional det	ails can be found in the h	ardcopy of the site audit r	eport.	
2	Parameter:	Wind Speed	SensorComponent:	Accuracy High Ran	CommentCode: 174

Additional details can be found in the hardcopy of the site audit report.

Field Systems Comments

1 Parameter: SiteOpsProcComm

This site is operated by both the NPS and the State of Maine DEP. It is not visited by ARS for semiannual calibration and maintenance visits. The site operator does not perform many of the routine checks conducted at other CASTNET sites, such as tip checks, wetness sensor tests, and visual checks of the blowers. The state of Maine personnel maintain the meteorological systems and the ozone monitor.

2 Parameter: SiteOpsProcedures

The meteorological and ozone instrument checks and maintenance are performed by the State of Maine DEP.

3 Parameter: ShelterCleanNotes

The shelter is new, clean and well organized. Equipment is still being moved from the old shelter.

4 Parameter: MetSensorComme

The wind speed sensor response at the high speed test was much lower than expected. This condition has been observed and reported during previous audits.

5 Parameter: MetOpMaintCom

The surface wetness sensor is no longer operated. Although the solar radiation system was audited with the EEMS standard, the data were not recorded due to the flag set incorrectly on the DAS. Visual comparisons of the data were observed to be approximately 8% different throughout the day.

Data Compiled: 1/26/2020 20:47:52

SiteVisitDateSiteTechnician08/22/2019ANA115Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.00901	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.33313	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.8	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	-0.42	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.26	ppb	Р

Data Compiled: 1/26/2020 14:53:43

SiteVisitDateSiteTechnician07/24/2019ARE128Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97944	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.31014	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	3.1	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	-0.37	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.78	ppb	Р

Data Compiled: 1/28/2020 19:34:14

SiteVisitDateSiteTechnician09/19/2019ASH135Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99454	unitless	Р
2	Ozone Intercept	Р	0	5	4	-2.50547	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99993	unitless	Р
4	Ozone % difference avg	Р	7	10	4	7.4	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	-3.14	ppb	Fail
6	Ozone Absolute Difference g2	Р	7	1.5	1	-2.51	ppb	Fail

Data Compiled: 10/27/2019 17:32:04

SiteVisitDate Site Technician

08/19/2019 BAS601 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.12	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.21	с	Р
3	Ozone Slope	Р	0	1.1	4	0.99416	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.21771	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99981	unitless	Р
6	Ozone % difference avg	Р	7	10	4	2.3	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	-0.05	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-0.54	ppb	Р
9	Flow Rate average % difference	Р	10	5	6	1.42	%	Р
10	Flow Rate max % difference	Р	10	5	6	1.64	%	Р
11	Shelter Temperature average error	Р	5	2	12	0.43	с	Р
12	Shelter Temperature max error	Р	5	2	12	0.45	с	Р

08/19/2019 BAS601

Technician

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: SiteOpsProcedures

The ozone inlet filter is replaced each month.

2 Parameter: DocumentationCo

The filter pack chain-of-custody labels are not being used.

3 Parameter: ShelterCleanNotes

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

4 Parameter: MetSensorComme

Some objects violate the 45 degree rule for the tipping bucket rain gage. The Temperature shield is mounted on the south side of the tower tripod at 2 meters.

Data Compiled: 10/27/2019 19:21:54

SiteVisitDate	Site	Technician
08/20/2019	BUF603	Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.06	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.14	с	Р
3	Flow Rate average % difference	Р	10	5	6	2.86	%	Р
4	Flow Rate max % difference	Р	10	5	6	3.09	%	Р

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.

Data Compiled: 1/26/2020 20:20:31

SiteVisitDateSiteTechnician08/07/2019CAN407Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97119	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.339	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99995	unitless	Р
4	Ozone % difference avg	Р	7	10	4	4.5	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	0.27	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-1.00	ppb	Р

Data Compiled: 1/26/2020 19:36:33

SiteVisitDate Site Technician 08/05/2019

CHC432 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	Р	3	0.5	8	0.05	m/s	Р
2	Wind Speed max error below 5m/s in m/s	Р	3	0.5	8	0.20	m/s	Р
3	Wind Speed average % difference above 5 m/s	Р	3	5	8	0.1	%	Р
4	Wind Speed max % difference above 5 m/s	Р	3	5	8	0.2	%	Р
5	Wind Speed Torque average error	Р	3	0.5	1	0.30	g-cm	Р
6	Wind Speed Torque max error	Р	3	0.5	1	0.3	g-cm	Р
7	Wind Direction Input Deg True average error (de	Р	2	5	8	1.2	degrees	Р
8	Wind Direction Input Deg True max error (deg)	Р	2	5	8	3	degrees	Р
9	Wind Direction Linearity average error (deg)	Р	2	5	16	1.7	degrees	Р
10	Wind Direction Linearity max error (deg)	Р	2	5	16	4	degrees	Р
11	Wind Direction Torque average error	Р	2	30	1	10	g-cm	Р
12	Wind Direction Torque max error	Р	2	30	1	10	g-cm	Р
13	Relative Humidity average below 85%	Р	6	10	3	1.8	%	Р
14	Relative Humidity max below 85%	Р	6	10	3	2.7	%	Р
15	Solar Radiation % diff of avg	Р	9	10	8	1.76	%	Р
16	Solar Radiation % diff of max STD value	Р	9	10	8	3.4	%	Р
17	Precipitation average % difference	Р	1	10	2	2.8	%	Р
18	Precipitation max % difference	Р	1	10	2	3.7	%	Р
19	Ozone Slope	Р	0	1.1	4	0.99233	unitless	Р
20	Ozone Intercept	Р	0	5	4	0.12613	ppb	Р
21	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
22	Ozone % difference avg	Р	7	10	4	0.9	%	Р
23	Ozone Absolute Difference g2	Р	7	1.5	1	-0.3	ppb	Р
24	DAS Voltage average error	Р	8	0.003	21	0.0003	V	Р
25	Shelter Temperature average error	Р	5	2	9	2.32	с	Fail
26	Shelter Temperature max error	Р	5	2	9	2.88	с	Fail
08/05/2019 CHC432

Technician Martin Valvur

Field Systems Comments

1 Parameter: SiteOpsProcComm

Dry deposition samples are not collected at this CASTNET site.

Data Compiled: 1/26/2020 17:04:34

SiteVisitDateSiteTechnician07/31/2019CND125Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97601	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.12496	ppb	Р
3	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.9	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	0.12	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.1	ppb	Р

Data Compiled:

1/26/2020 12:02:38

SiteVisitDate Site Technician

07/16/2019 CNT169 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	9	0.07	с	Р
2	Temperature max error	Р	4	0.5	9	0.12	с	Р
3	Ozone Slope	Р	0	1.1	4	1.0317	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.05684	ppb	Р
5	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
6	Ozone % difference avg	Р	7	10	4	3.3	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	0.03	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	0.39	ppb	Р
9	Flow Rate average % difference	Р	10	5	8	0.77	%	Р
10	Flow Rate max % difference	Р	10	5	8	0.99	%	Р
11	DAS Voltage average error	Р	7	0.003	63	0.0001	V	Р
12	Shelter Temperature average error	Р	5	2	18	0.16	с	Р
13	Shelter Temperature max error	Р	5	2	18	0.41	с	Р

Field Systems Comments

1 Parameter: SiteOpsProcedures

The ozone inlet filter is changed once each month.

2 **Parameter:** ShelterCleanNotes

The shelter is dirty. Many floor tiles are old and broken, the floor is deteriorating.

Data Compiled: 1/26/2020 10:59:50

SiteVisitDateSiteTechnician07/15/2019CTH110Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.96273	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.36734	ppb	Р
3	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
4	Ozone % difference avg	Р	7	10	4	4.7	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	-0.42	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.83	ppb	Р

Data Compiled: 1/27/2020 14:37:56

SiteVisitDateSiteTechnician09/05/2019DEN417Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.03417	unitless	Р
2	Ozone Intercept	Р	0	5	4	1.35257	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99995	unitless	Р
4	Ozone % difference avg	Р	7	10	4	6.9	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	1.93	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	1.62	ppb	Fail

Data Compiled: 1/26/2020 20:28:47

SiteVisitDateSiteTechnician08/08/2019DIN431Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99070	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.52028	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	2.6	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	-0.22	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.75	ppb	Р

Data Compiled: 1/25/2020 19:46:08

SiteVisitDate Site Technician

07/03/2019 GLR468 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.23	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.31	с	Р
3	Ozone Slope	Р	0	1.1	4	1.038	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.521	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.9	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	-0.08	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-0.04	ppb	Р
9	Flow Rate average % difference	Р	10	5	4	0.33	%	Р
10	Flow Rate max % difference	Р	10	5	4	0.33	%	Р
11	DAS Voltage average error	Р	15	0.003	63	0.0002	V	Р
12	Shelter Temperature average error	Р	5	2	18	0.99	с	Р
13	Shelter Temperature max error	Р	5	2	18	1.09	с	Р

Field Systems Comments

1 Parameter: SitingCriteriaCom

The site is located in a small clearing within 100 meters of a horse stable. There is a plywood and aluminum processing plant within 20 km of the site.

2 Parameter: ShelterCleanNotes

The shelter is in fair condition. Evidence of repairs to roof leaks attempted. Some floor tiles are loose.

3 Parameter: MetSensorComme

The recorded temperature data at this site is measured at approximately 2 meters above the ground.

Data Compiled: 1/27/2020 15:21:31

SiteVisitDateSiteTechnician09/16/2019GRB411Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97911	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.40853	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99996	unitless	Р
4	Ozone % difference avg	Р	7	10	4	3.9	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	0.11	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.99	ppb	Р

Data Compiled:

1/26/2020 20:11:55

SiteVisitDate Site Technician

08/06/2019 GTH161 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	18	0.09	с	Р
2	Temperature max error	Р	4	0.5	18	0.20	с	Р
3	Ozone Slope	Р	0	1.1	4	1.01969	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.35367	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.8	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	-0.05	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-0.05	ppb	Р
9	Flow Rate average % difference	Р	10	5	4	1.1	%	Р
10	Flow Rate max % difference	Р	10	5	4	1.32	%	Р
11	DAS Voltage average error	Р	7	0.003	56	0.0002	V	Р
12	Shelter Temperature average error	Р	5	2	18	0.07	с	Р
13	Shelter Temperature max error	Р	5	2	18	0.13	с	Р

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.

Data Compiled: 1/26/2020 21:04:33

SiteVisitDate Site Technician 08/23/2019 HOX148 Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99012	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.37417	ppb	Р
3	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
4	Ozone % difference avg	Р	7	10	4	2.2	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	-0.26	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.55	ppb	Р

Data Compiled: 1/25/2020 19:56:31

SiteVisitDateSiteTechnician07/05/2019HWF187Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97682	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.2718	ppb	Р
3	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
4	Ozone % difference avg	Р	7	10	4	3.1	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	-0.35	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.66	ppb	Р

Data Compiled: 1/26/2020 15:01:46

SiteVisitDateSiteTechnician07/24/2019KEF112Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.00429	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.46454	ppb	Р
3	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.9	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	-0.44	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.28	ppb	Р

Data Compiled: 10/27/2019 16:47:22

SiteVisitDate Site Technician

09/26/2019 LRL117 Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	15	0.22	с	Р
2	Temperature max error	Р	4	0.5	15	0.34	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98045	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.50137	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99994	unitless	Р
6	Ozone % difference avg	Р	7	10	4	3.6	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	-0.59	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-0.99	ppb	Р
9	Flow Rate average % difference	Р	10	5	6	0.44	%	Р
10	Flow Rate max % difference	Р	10	5	6	0.67	%	Р
11	DAS Voltage average error	Р	7	0.003	63	0.0000	V	Р
12	Shelter Temperature average error	Р	5	2	18	0.56	с	Р
13	Shelter Temperature max error	Р	5	2	18	0.94	c	Р

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 good condition. A new peaked roof has been installed.

3 Parameter: MetOpMaintCom

The temperature sensor shield has moss growing on it and should be cleaned.

Data Compiled: 1/26/2020 15:55:48

SiteVisitDateSiteTechnician07/25/2019MKG113korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97286	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.68795	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	4.7	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	-0.71	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-1.02	ppb	Р

Data Compiled:

1/26/2020 14:42:00

SiteVisitDate Site Technician

07/23/2019 NEC602 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.09	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.16	с	Р
3	Ozone Slope	Р	0	1.1	4	0.97785	unitless	Р
4	Ozone Intercept	Р	0	5	4	-1.07778	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99981	unitless	Р
6	Ozone % difference avg	Р	7	10	4	6.7	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	0.01	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-1.81	ppb	Fail
9	Flow Rate average % difference	Р	10	5	6	3.64	%	Р
10	Flow Rate max % difference	Р	10	5	6	3.85	%	Р
11	Shelter Temperature average error	Р	5	2	12	0.88	с	Р
12	Shelter Temperature max error	Р	5	2	12	1.06	с	Р

07/23/2019 NEC602

Technician

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 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.

Data Compiled: 1/25/2020 22:30:59

SiteVisitDate	Site	Technician
07/10/2019	NIC001	Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	12	0.06	с	Р
2	Temperature max error	Р	4	0.5	12	0.09	с	Р
3	Flow Rate average % difference	Р	10	5	6	0.11	%	Р
4	Flow Rate max % difference	Р	10	5	6	0.33	%	Р

07/10/2019 NIC001

Technician

Korey Devins

Field Performance Comments

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

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

Field Systems Comments

1 Parameter: DasComments

Single tower with filter pack mounted at 10 meters and temperature mounted at 9 meters.

2 Parameter: DocumentationCo

There is no logbook onsite to record information regarding site status or filter information.

3 Parameter: ShelterCleanNotes

Small footprint site with no shelter. Equipment housed in enclosure on sample tower. The NY DEC operators a full monitoring shelter at the same location.

4 Parameter: PollAnalyzerCom

There is water accumulating in a low section of the filter pack tubing below the enclosure.

Data Compiled: 1/25/2020 20:05:26

SiteVisitDateSiteTechnician07/08/2019NPT006Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.00136	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.45783	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.2	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	-0.47	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.42	ppb	Р

Data Compiled:

1/27/2020 21:47:22

SiteVisitDate Site Technician

09/25/2019 PAR107 Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	18	0.22	с	Р
2	Temperature max error	Р	4	0.5	18	0.50	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98162	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.62791	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99985	unitless	Р
6	Ozone % difference avg	Р	7	10	4	3.5	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	-1.19	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-1.17	ppb	Р
9	Flow Rate average % difference	Р	10	5	6	2.16	%	Р
10	Flow Rate max % difference	Р	10	5	6	2.6	%	Р
11	DAS Voltage average error	Р	7	0.003	70	0.0000	V	Р
12	Shelter Temperature average error	Р	5	2	18	0.44	с	Р
13	Shelter Temperature max error	Р	5	2	18	0.61	с	Р

Technician

09/25/2019 PAR107

Sandy Grenville

Field Systems Comments

1 Parameter: SitingCriteriaCom

The city of Parsons, estimated population 1500, is within 5 km of the site.

2 Parameter: ShelterCleanNotes

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

Data Compiled:

1/27/2020 19:35:20

SiteVisitDate Site Technician

07/26/2019 PED108 Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	9	0.13	с	Р
2	Temperature max error	Р	4	0.5	9	0.17	с	Р
3	Ozone Slope	Р	0	1.1	4	0.99796	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.29137	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.7	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	-0.44	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	0.02	ppb	Р
9	Flow Rate average % difference	Р	10	5	3	2.04	%	Р
10	Flow Rate max % difference	Р	10	5	3	2.04	%	Р
11	DAS Voltage average error	Р	7	0.003	70	0.0001	V	Р
12	Shelter Temperature average error	Р	5	2	18	0.93	с	Р
13	Shelter Temperature max error	Р	5	2	18	1.47	с	Р

07/26/2019 PED108

Technician

Sandy Grenville

Field Performance Comments

1 Parameter: Flow Rate SensorComponent: Moisture Present

CommentCode: 204

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

Field Systems Comments

1 Parameter: SitingCriteriaCom

The site is in a clearing in an evergreen plantation in the Prince Edward-Gallion State Forest. Trees were cut within the last 11 years to increase the size of the clearing. The tree line is encroaching again and is between 25 and 35 meters from the site.

2 Parameter: ShelterCleanNotes

The shelter is in fair condition, clean, neat, and well organized. The floor is rotting beneath the heater.

Data Compiled:

d: 9/27/2019 11:08:32

SiteVisitDate Site Technician

07/01/2019 PND165 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	15	0.04	с	Р
2	Temperature max error	Р	4	0.5	15	0.07	с	Р
3	Ozone Slope	Р	0	1.1	4	0.95438	unitless	Р
4	Ozone Intercept	Р	0	5	4	-2.08948	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99964	unitless	Р
6	Ozone % difference avg	Р	7	10	4	10.5	%	Fail
7	Ozone Absolute Difference g1	Р	7	3	1	-1.31	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-2.25	ppb	Fail
9	Flow Rate average % difference	Р	10	5	6	1.21	%	Р
10	Flow Rate max % difference	Р	10	5	6	1.64	%	Р
11	DAS Voltage average error	Р	7	0.003	70	0.0002	V	Р
12	Shelter Temperature average error	Р	5	2	18	0.73	с	Р
13	Shelter Temperature max error	Р	5	2	18	1.14	с	Р

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.

3 Parameter: MetSensorComme

Met sensors audits are no longer included under the contract.

4 Parameter: MetOpMaintCom

Only the temperature sensor is included in the site assessment.

Data Compiled:

1/27/2020 19:42:49

SiteVisitDate Site Technician

08/27/2019 PRK134 Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	12	0.07	с	Р
2	Temperature max error	Р	4	0.5	12	0.11	с	Р
3	Ozone Slope	Р	0	1.1	4	0.96640	unitless	Р
4	Ozone Intercept	Р	0	5	4	-1.33743	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	7.4	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	-1.37	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-2.08	ppb	Fail
9	Flow Rate average % difference	Р	10	5	4	0.90	%	Р
10	Flow Rate max % difference	Р	10	5	4	1.35	%	Р
11	DAS Voltage average error	Р	7	0.003	70	0.0000	v	Р
12	Shelter Temperature average error	Р	5	2	18	0.26	с	Р
13	Shelter Temperature max error	Р	5	2	18	0.40	с	Р

Field Systems Comments

1 Parameter: SitingCriteriaCom

Clover and Barley have been planted for hay within 20m of the site starting in 2008.

2 Parameter: ShelterCleanNotes

The shelter is clean, neat, and well organized.

3 Parameter: PollAnalyzerCom

The ozone inlet filter housing is dirty, however the ozone accuracy was within acceptance limits.

Data Compiled: 1/26/2020 16:04:42

SiteVisitDateSiteTechnician07/25/2019PSU106Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.95555	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.12622	ppb	Р
3	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
4	Ozone % difference avg	Р	7	10	4	4.2	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	0.17	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.74	ppb	Р

Data Compiled: 10/27/2019 18:45:57

SiteVisitDate	Site	Technician					
08/20/2019	SHE604	Martin Valvur					
Records with valid pass/fail criteria							

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.07	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.09	с	Р
3	Flow Rate average % difference	Р	10	5	8	2.88	%	Р
4	Flow Rate max % difference	Р	10	5	8	4.01	%	Р

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 received a disc with the 2013 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.

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, 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.

Data Compiled: 1/

1/26/2020 13:30:57

SiteVisitDate Site Technician

07/22/2019 THR422 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.06	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.14	с	Р
3	Ozone Slope	Р	0	1.1	4	0.96757	unitless	Р
4	Ozone Intercept	Р	0	5	4	-1.34024	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
6	Ozone % difference avg	Р	7	10	4	6.9	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	-1.18	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-1.7	ppb	Fail
9	Flow Rate average % difference	Р	10	5	4	0.77	%	Р
10	Flow Rate max % difference	Р	10	5	4	1.31	%	Р
11	DAS Voltage average error	Р	15	0.003	63	0.0002	V	Р
12	Shelter Temperature average error	Р	5	2	21	1.7	с	Р
13	Shelter Temperature max error	Р	5	2	21	2.14	с	Fail

07/22/2019 THR422

Technician Martin Valvur

Field Performance Comments

1	Parameter:	Ozone	SensorComponent:	Cell B Pressure	CommentCode: 99
	This analyzer of	diagnostic check is outsid	le the manufacturer's recor	nmended value.	
2	Parameter:	Ozone	SensorComponent:	Cell A Pressure	CommentCode: 99
	This analyzer of	diagnostic check is outsid	le the manufacturer's recor	nmended value.	
3	Parameter:	Ozone	SensorComponent:	Cell A Freq.	CommentCode: 99

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

Field Systems Comments

1 Parameter: SiteOpsProcComm

Gloves are not used to handle the filter pack. The filter bag is used as a glove.

2 Parameter: SiteOpsProcedures

The ozone sample train does not have a means to introduce test gas at the sample inlet. Results of routine zero, span, precision, and any multipoint calibration checks are maintained by the state personnel who perform the tests. The two inlet filters in the sample train are creating a large pressure drop.

3 Parameter: SitingCriteriaCom

The site is located 200 meters from an interstate rest area, and 300 meters from interstate 94. The rest area can have parked and idling vehicles for extended periods.

4 Parameter: ShelterCleanNotes

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

5 Parameter: PollAnalyzerCom

The ozone analyzer is operated by the state of North Dakota. The sample train contains a glass manifold. There is no means to introduce on-site generated test gas at the sample inlet. A through-the-probe audit was conducted using the EEMS system.
Data Compiled: 1/25/2020 22:12:24

SiteVisitDate	Site	Technician
07/09/2019	UND002	Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	6	0.19	с	Р
2	Temperature max error	Р	4	0.5	6	0.38	с	Р
3	Flow Rate average % difference	Р	10	5	6	1.21	%	Р
4	Flow Rate max % difference	Р	10	5	6	1.32	%	Р

07/09/2019 UND002

Technician Korey Devins

Field Performance Comments

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

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

Field Systems Comments

1 Parameter: DasComments

Single tower with filer pack mounted at 10 meters and temperature mounted at 9 meters.

2 Parameter: DocumentationCo

Although there is no CASTNET logbook present onsite, the site operator records CASTNET information in the VT Monitoring Coop logbook.

3 Parameter: ShelterCleanNotes

Small footprint site with no shelter. Equipment housed in enclosure on sample tower.

Data Compiled: 1/26/2020 20:55:46

SiteVisitDate Site Technician 08/22/2019 UVL124 Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.96589	unitless	Р
2	Ozone Intercept	Р	0	5	4	-3.15365	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99993	unitless	Р
4	Ozone % difference avg	Р	7	10	4	12.6	%	Fail
5	Ozone Absolute Difference g1	Р	7	3	1	-2.83	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-3.54	ppb	Fail

Data Compiled: 1/27/2020 19:48:56

SiteVisitDate Site Technician

08/29/2019 VOY413 Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.37	c	Р
2	Temperature2meter max error	Р	5	0.5	3	0.46	с	Р
3	Ozone Slope	Р	0	1.1	4	1.00464	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.49771	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.9	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	-0.63	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-0.47	ppb	Р
9	Flow Rate average % difference	Р	10	5	2	0.22	%	Р
10	Flow Rate max % difference	Р	10	5	2	0.33	%	Р
11	DAS Voltage average error	Р	3	0.003	63	0.0000	v	Р
12	Shelter Temperature average error	Р	5	2	14	0.18	с	Р
13	Shelter Temperature max error	Р	5	2	14	0.28	с	Р

Field Systems Comments

1 Parameter: DasComments

The sample tower itself is not grounded, however it is bolted to the shelter which is grounded. The shelter has a leak above the instrument rack. The site operator has placed a gallon milk jug to catch the water which he reports can sometimes be full in one week.

2 Parameter: DocumentationCo

Correctly completing the general observations section of the SSRF on the day of filter installation was discussed with the operator.

3 Parameter: SitingCriteriaCom

The site is located at the top of a hill in a forest. There are trees surrounding the site which are below the tower height, but within 10 m of the inlet.

4 Parameter: ShelterCleanNotes

The shelter is neat and well organized. The shelter is in poor condition with a severe roof leak.

5 Parameter: PollAnalyzerCom

There are no trees violating the 22.5 degree cone above the ozone sample inlet. However, there is a communication tower which is above the 22.5 degree threshold.

Data Compiled:

1/27/2020 22:08:47

SiteVisitDate Site Technician

09/24/2019 VPI120 Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	12	0.03	с	Р
2	Temperature max error	Р	4	0.5	12	0.05	c	Р
3	Ozone Slope	Р	0	1.1	4	0.96526	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.04806	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99996	unitless	Р
6	Ozone % difference avg	Р	7	10	4	4.1	%	Р
7	Ozone Absolute Difference g2	Р	7	1.5	1	-0.6	ppb	Р
8	Flow Rate average % difference	Р	10	5	6	0.00	%	Р
9	Flow Rate max % difference	Р	10	5	6	0.00	%	Р
10	DAS Voltage average error	Р	7	0.003	77	0.0000	V	Р
11	Shelter Temperature average error	Р	5	2	18	0.72	с	Р
12	Shelter Temperature max error	Р	5	2	18	0.87	с	Р

Field Systems Comments

1 Parameter: SitingCriteriaCom

The site is on a wooded hillside. The temperature sensor and sample inlet are at the tree tops of the downhill trees. The uphill tree line is 20 meters away.

2 Parameter: ShelterCleanNotes

The shelter is clean, neat, and well organized. Floor tiles are loose and the paneling is deteriorating.

3 Parameter: MetSensorComme

The temperature sensor is 10 meters from small pond.

Data Compiled: 1/25/2020 19:11:40

SiteVisitDate	Site	Technician
07/02/2019	WFM105	Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	15	0.12	с	Р
2	Temperature max error	Р	4	0.5	15	0.18	с	Р
3	Flow Rate average % difference	Р	10	5	4	1.47	%	Р
4	Flow Rate max % difference	Р	10	5	4	1.69	%	Р

Field Systems Comments

1 Parameter: DasComments

Single tower, with filter pack at 10 meters and temperature at 9 meters.

2 Parameter: SitingCriteriaCom

The site is located at the Atmospheric Science Research Center (ASRC) operated by the NY University (SUNY) system.

3 Parameter: ShelterCleanNotes

Small footprint site with no shelter. Equipment housed in enclosure on sample tower.

Data Compiled: 1/

1/26/2020 15:46:13

SiteVisitDate Site Technician

07/24/2019 WNC429 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.00	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.00	с	Р
3	Ozone Slope	Р	0	1.1	4	0.97856	unitless	Р
4	Ozone Intercept	Р	0	5	4	1.03205	ppb	Р
5	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.8	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	1.15	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	0.73	ppb	Р
9	Flow Rate average % difference	Р	10	5	10	3.12	%	Р
10	Flow Rate max % difference	Р	10	5	10	3.34	%	Р
11	DAS Voltage average error	Р	1	0.003	14	0.0002	V	Р
12	Shelter Temperature average error	Р	5	2	3	0.82	с	Р
13	Shelter Temperature max error	Р	5	2	3	1.13	с	Р

07/24/2019 WNC429

Technician

Martin Valvur

Field Performance Comments

1Parameter:Flow RateSensorComponent:Filter PositionCommentCode: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: Ozone SensorComponent: Cell B Freq.

CommentCode: 99

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

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: DocumentationCo

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

3 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.

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.

Data Compiled: 1/26/2020 20:39:56

SiteVisitDateSiteTechnician08/19/2019WST109Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.96271	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.07811	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	4.1	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	-0.05	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.81	ppb	Р

Data Compiled: 10/27/2019 20:17:45

SiteVisitDate Site Technician

07/02/2019 YEL408 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.29	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.41	с	Р
3	Ozone Slope	Р	0	1.1	4	1.00478	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.1015	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.7	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	0.10	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-0.31	ppb	Р
9	Flow Rate average % difference	Р	10	5	2	0.54	%	Р
10	Flow Rate max % difference	Р	10	5	2	0.64	%	Р
11	DAS Voltage average error	Р	8	0.003	14	0.0003	V	Р
12	Shelter Temperature average error	Р	5	2	21	0.86	с	Р
13	Shelter Temperature max error	Р	5	2	21	1.17	c	Р

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.

6 Parameter: MetOpMaintCom

The recorded temperature is now being measured at approximately 2 meters above the ground.

Data Compiled:

1/26/2020 18:39:33

SiteVisitDate Site Technician

08/03/2019 ZIO433 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.30	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.40	с	Р
3	Wind Speed average error below 5m/s in m/s	Р	3	0.5	8	0.05	m/s	Р
4	Wind Speed max error below 5m/s in m/s	Р	3	0.5	8	0.20	m/s	Р
5	Wind Speed average % difference above 5 m/s	Р	3	5	8	0.0	%	Р
6	Wind Speed max % difference above 5 m/s	Р	3	5	8	0.0	%	Р
7	Wind Speed Torque average error	Р	3	0.5	1	0.30	g-cm	Р
8	Wind Speed Torque max error	Р	3	0.5	1	0.3	g-cm	Р
9	Wind Direction Input Deg True average error (de	Р	2	5	8	9.5	degrees	Fail
10	Wind Direction Input Deg True max error (deg)	Р	2	5	8	12	degrees	Fail
11	Wind Direction Linearity average error (deg)	Р	2	5	16	1.4	degrees	Р
12	Wind Direction Linearity max error (deg)	Р	2	5	16	4	degrees	Р
13	Wind Direction Torque average error	Р	2	30	1	15	g-cm	Р
14	Wind Direction Torque max error	Р	2	30	1	15	g-cm	Р
15	Solar Radiation % diff of avg	Р	9	10	3	0.69	%	Р
16	Solar Radiation % diff of max STD value	Р	9	10	3	0.30	%	Р
17	Precipitation average % difference	Р	1	10	2	1.7	%	Р
18	Precipitation max % difference	Р	1	10	2	1.7	%	Р
19	Ozone Slope	Р	0	1.1	4	0.98129	unitless	Р
20	Ozone Intercept	Р	0	5	4	-0.02606	ppb	Р
21	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
22	Ozone % difference avg	Р	7	10	4	2.2	%	Р
23	Ozone Absolute Difference g1	Р	7	3	1	0.11	ppb	Р
24	Ozone Absolute Difference g2	Р	7	1.5	1	-0.51	ppb	Р
25	DAS Voltage average error	Р	4	0.003	7	0.0002	V	Р
26	Shelter Temperature average error	Р	5	2	3	2.42	с	Fail
27	Shelter Temperature max error	Р	5	2	3	3.44	с	Fail

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
HWF	187-Korey	Devins-07/05/2019				
1	7/5/2019	DAS	Campbell	000356	CR3000	2134
2	7/5/2019	Ozone	ThermoElectron Inc	000700	49i A1NAA	1030244793
3	7/5/2019	Ozone Standard	ThermoElectron Inc	000445	49i A3NAA	CM08200021
4	7/5/2019	Zero air pump	Teledyne	000772	701H	608

Mfg		Serial Numbe	r Tag Site	Т	echnician	Site Visit Date	Parameter	Owner ID
ThermoElecti	ron Inc	1030244793	HWF18	7	Korey Devins	07/05/2019	Ozone	000700
Slope: Intercept CorrCoff: DAS 1: A Avg % Di 0.0		0.97682 Slop 0.27180 Inter 1.00000 Corr DA Max % Dif A 0.0%	e: () ccept () Coff: () AS 2: Avg %Diff A	0.00000 0.00000 0.00000 Max % Dif	Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 1180030022 01114 0.9984 6/11/20	Inc Paramete Tfer Desc 10 Intercept 19 CorrCoff	ozoneOzone primary stan0.270901.00000
UseDescrip primary primary primary primary primary	y y y y y y y	ConcGroup 1 2 3 4 5	Tfer Raw 0.51 15.10 35.59 68.00 113.47	Tfer Corr 0.23 14.85 35.37 67.83 113.38	Site -0.12 14.19 34.39 66.07 110.40	Site Unit ppb ppb ppb ppb ppb	RelPerDif -2.81 -2.63 -2.66	AbsDif -0.35 -0.66
Sensor Co Sensor Co Sensor Co	mpone mpone mpone	ent Sample Trai 22.5 degree	n rule ondition	Condit	tion Good		Status pass Status pass Status pass	
Sensor Co	mpone	nt Battery Back		Condit	tion N/A		Status pass	
Sensor Co	mpone	ent Offset		Condit	tion 0.000		Status pass	
Sensor Co	mpone	ent Span		Condit	tion 0.993		Status pass	
Sensor Co	mpone	ent Zero Voltage	9	Condit	tion N/A		Status pass	
Sensor Co	mpone	nt Fullscale Vo	Itage	Condit	tion N/A		Status pass	
Sensor Co	mpone	ent Cell A Freq.		Condit	tion 94.4 kHz		Status pass	
Sensor Co	mpone	ent Cell A Noise		Condit	tion 0.3 ppb		Status pass	
Sensor Co	mpone	ent Cell A Flow		Condit	tion 0.61 lpm		Status pass	
Sensor Co	mpone	ent Cell A Press	ure	Condit	tion 704.5 mmHg		Status pass	
Sensor Co	mpone	ent Cell A Tmp.		Condit	tion 37.0 C		Status pass	
Sensor Co	mpone	ent Cell B Freq.		Condit	tion 94.1 kHz		Status pass	
Sensor Co	mpone	ent Cell B Noise		Condit	tion 0.6 ppb		Status pass	
Sensor Co	mpone	ent Cell B Flow		Condit	tion 0.65 lpm		Status pass	
Sensor Co	mpone	ent Cell B Press	ure	Condit	tion 705.0 mmHg		Status pass	
Sensor Co	mpone	ent Cell B Tmp.		Condit	tion N/A		Status pass	
Sensor Co	mpone	ent Line Loss		Condit	tion Not tested		Status pass	
Sensor Co	mpone	ent System Men	no	Condit	ion		Status pass	

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
NPT	006-Martin	v Valvur-07/08/2019				
1	7/8/2019	DAS	Campbell	000353	CR3000	2131
2	7/8/2019	Ozone	ThermoElectron Inc	000612	49i A1NAA	1009241779
3	7/8/2019	Ozone Standard	ThermoElectron Inc	000448	49i A3NAA	CM08200024
4	7/8/2019	Zero air pump	Werther International	000626	PC 70/4	000815300

Mfg		Serial Number	r Tag Site		Tech	nician	Site Visit Date	Parameter	Owner ID
ThermoElectr	on Inc	1009241779	NPT006	;	Mart	in Valvur	07/08/2019	Ozone	000612
Slope: Intercept CorrCoff: DAS 1: A Avg % Dif		1.00136 Slope 0.45783 Inter 0.99999 Corr DA 1ax % Dif A A 0.0%	e: () ccept () Coff: () As 2: Avg %Diff A	0.00000 0.00000 0.00000 Max % Dif	M S T S C	Ifg erial Number 'fer ID lope Cert Date	ThermoElectron 49CPS-70008-3 01110 1.0015 10/30/201	Inc Paramete 64 Tfer Dese 51 Intercept 18 CorrCoff	ozone C. Ozone primary stan 0.00666 1.00000
UseDescrip primary primary primary primary primary	otion Image: constraint of the second s	ConcGroup 1 2 3 4 5	Tfer Raw 0.18 15.78 35.87 65.98 109.72	Tfer Co 0.17 15.74 35.80 65.87 109.54	rr	Site -0.30 15.32 35.20 65.82 109.10	Site Unit ppb ppb ppb ppb ppb	RelPerDif -1.69 -0.08 -0.4	AbsDif -0.47 -0.42
Sensor Con Sensor Con Sensor Con	mpone mpone mpone	ant Sample Train ant 22.5 degree ant Inlet Filter Co	rule ondition		dition dition dition	Good Clean		StatuspassStatuspassStatuspass	
Sensor Cor	- mpone	nt Battery Back	up	Con	dition	N/A		Status pass	
Sensor Co	mpone	nt Offset		Con	dition	0.1		Status pass	
Sensor Co	mpone	nt Span		Con	dition	1.019		Status pass	
Sensor Co	mpone	nt Zero Voltage	•	Con	dition	N/A		Status pass	
Sensor Co	mpone	nt Fullscale Vol	tage	Con	dition	N/A		Status pass	
Sensor Co	mpone	nt Cell A Freq.		Con	dition	104.6 kHz		Status pass	
Sensor Co	mpone	nt Cell A Noise		Con	dition	0.9 ppb		Status pass	
Sensor Co	mpone	nt Cell A Flow		Con	dition	0.63 lpm		Status pass	
Sensor Co	mpone	nt Cell A Press	ure	Con	dition	651.8 mmHg		Status pass	
Sensor Co	mpone	nt Cell A Tmp.		Con	dition	36.1 C		Status pass	
Sensor Co	mpone	nt Cell B Freq.		Con	dition	89.3 kHz		Status pass	
Sensor Co	mpone	nt Cell B Noise		Con	dition	0.6 ppb		Status pass	
Sensor Co	mpone	nt Cell B Flow		Con	dition	0.63 lpm		Status pass	
Sensor Co	mpone	nt Cell B Press	ure	Con	dition	651.2 mmHg		Status pass	
Sensor Con	mpone	nt Cell B Tmp.		Con	dition	N/A		Status pass	
Sensor Con	mpone	nt Line Loss		Con	dition	Not tested		Status pass	
Sensor Cor	mpone	nt System Merr	10	Con	dition	L		Status pass	

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CTH	110-Korey	Devins-07/15/2019				
1	7/15/2019	DAS	Campbell	000415	CR3000	2510
2	7/15/2019	Ozone	ThermoElectron Inc	000735	49i A1NAA	1105347308
3	7/15/2019	Ozone Standard	ThermoElectron Inc	000447	49i A3NAA	CM08200023
4	7/15/2019	Zero air pump	Werther International	06864	PC70/4	000815261

Mfg	Serial Number	Fag Site	Те	chnician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347308	CTH110) Ko	prey Devins	07/15/2019	Ozone	000735
Slope: Intercept CorrCoff: DAS 1: A Avg % Diff: A 1 0.0%	0.96273 Slope: -0.36734 Interce 1.00000 CorrCo DAS Max % Dif A Av 0.0% []	ept () off: () 2: /g %Diff A	0.00000 0.00000 0.00000 Max % Dif	Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 1180030022 01114 0.9984 6/11/207	Inc Paramete Tfer Desc Intercept O Intercept	ozone Ozone primary stan 0.27090 1.00000
UseDescription primary primary primary primary	ConcGroup 1 2 3 4 5	Tfer Raw 0.38 14.42 36.83 68.15 113.65	Tfer Corr 0.10 14.17 36.61 67.98 113.56	Site -0.32 13.34 34.93 64.97 109.00	Site Unit ppb ppb ppb ppb	RelPerDif -4.7 -4.53 -4.1	AbsDif -0.42 -0.83
Sensor Compon	ent Sample Train	115.05	Conditi	on Good	ppo	Status pass	
Sensor Compon	ent 22.5 degree ru	le	 Conditi	on		Status pass	
Sensor Compon	ent Inlet Filter Con	dition	 Conditi	on Clean		Status pass	
Sensor Compon	ent Battery Backur)	Conditi	on N/A		Status Dass	
Sensor Compon	ent Offset		Conditi	on 0.2		Status pass	
Sensor Compon				01 0.2			
Sensor Compon			Conditi	on 1.000		Status pass	
Sensor Compon	ent Zero Voltage		Conditi	on N/A		Status pass	
Sensor Compon	ent Fullscale Volta	ge	Conditi	on N/A		Status pass	
Sensor Compon	ent Cell A Freq.		Conditi	on 96.2 kHz		Status pass	
Sensor Compon	ent Cell A Noise		Conditi	on 1.1 ppb		Status pass	
Sensor Compon	ent Cell A Flow		Conditi	on 0.58 lpm		Status pass	
Sensor Compon	ent Cell A Pressure	e	Conditi	on 684.8 mmHg		Status pass	
Sensor Compon	ent Cell A Tmp.		Conditi	on 35.9 C		Status pass	
Sensor Compon	ent Cell B Freq.		Conditi	on 95.7 kHz		Status pass	
Sensor Compon	ent Cell B Noise		Conditi	on 1.0 ppb		Status pass	
- Sensor Compon	ent Cell B Flow		 Conditi	on 0.71 lpm		Status pass	
Sensor Compon	ent Cell B Pressure	9	Conditi	on 685.7 mmHa		Status pass	
Sensor Compon	ent Cell B Tmp.		Conditi	on N/A		Status Dass	
Sensor Compon	ent Line Loss		Conditi	on Not tested		Status Dass	
Sensor Compon	ent System Memo		Conditi	on		Statue nass	
Sensor Compon						pass	

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
KEF	112-Korey	Devins-07/24/2019				
1	7/24/2019	DAS	Campbell	000414	CR3000	2537
2	7/24/2019	Ozone	ThermoElectron Inc	000728	49i A1NAA	1105347306
3	7/24/2019	Ozone Standard	ThermoElectron Inc	000432	49i A3NAA	CM08200008
4	7/24/2019	Zero air pump	Werther International	06932	C 70/4	000829174

Mfg	Serial Numbe	er Tag Site	Те	echnician	Site Visit Date	Parameter	Owner ID
ThermoElectron I	nc 1105347306	KEF112	κ.	orey Devins	07/24/2019	Ozone	000728
Slope: Intercept CorrCoff: DAS 1: A Avg % Diff: 4 0.0% [1.00429 Slop -0.46454 Inter 1.00000 Corr D A Max % Dif A 0.0%	e: () rcept () rCoff: () AS 2: Avg %Diff A	0.00000 0.00000 0.00000 Max % Dif	Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 1180030022 01114 0.9984 6/11/20	Inc Parameter Tfer Deservation 40 Intercept 19 CorrCoff	c. Ozone primary stan 0.27090 1.00000
UseDescriptior primary primary primary primary primary	ConcGroup 1 2 3 4 4 5	Tfer Raw 0.44 14.60 35.46 69.11 112.78	Tfer Corr 0.16 14.35 35.24 68.94 112.68	Site -0.28 14.07 34.81 68.64 112.80	Site Unit ppb ppb ppb ppb ppb	RelPerDif -1.23 -0.44 0.11	AbsDif -0.44 -0.28
Sensor Compo Sensor Compo Sensor Compo	onent Sample Trai	n rule ondition	Conditi	ion Good ion Clean		StatuspassStatuspassStatuspass	
Sensor Comp	ment Battery Back	kup	Condit	ion N/A		Status pass	
Sensor Comp	onent Offset		Condit	ion 0.000		Status pass	
Sensor Comp	ment Span		Condit	ion 1.011		Status pass	
Sensor Comp	nent Zero Voltage	Э	Condit	ion N/A		Status pass	
Sensor Comp	nent Fullscale Vo	ltage	Condit	ion N/A		Status pass	
Sensor Comp	ment Cell A Freq.		Condit	ion 94.1 kHz		Status pass	
Sensor Comp	nent Cell A Noise)	Condit	ion 0.9 ppb		Status pass	
Sensor Comp	nent Cell A Flow		Condit	ion 0.70 lpm		Status pass	
Sensor Comp	ment Cell A Press	sure	Condit	ion 669.4 mmHg		Status pass	
Sensor Comp	nent Cell A Tmp.		Condit	ion 38.1 C		Status pass	
Sensor Comp	onent Cell B Freq.		Condit	ion 87.6 kHz		Status pass	
Sensor Comp	nent Cell B Noise)	Condit	ion 0.8 ppb		Status pass	
Sensor Comp	onent Cell B Flow		Condit	ion 0.55 lpm		Status pass	
Sensor Comp	onent Cell B Press	sure	Condit	ion 670.3 mmHg		Status pass	
Sensor Comp	ment Cell B Tmp.		Condit	ion N/A		Status pass	
Sensor Comp	nent Line Loss		Condit	ion Not tested		Status pass	
Sensor Comp	onent System Mer	no	Conditi	ion		Status pass	

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ARE	128-Sandy	Grenville-07/24/2019				
1	7/24/2019	DAS	Campbell	000400	CR3000	2524
2	7/24/2019	Ozone	ThermoElectron Inc	000725	49i A1NAA	1105347326
3	7/24/2019	Ozone Standard	ThermoElectron Inc	000199	49i A3NAA	0607315737
4	7/24/2019	Zero air pump	Werther International	06866	PC70/4	000815262

Mfg		Serial Numb	er Tag S	Site	Те	chnician	Site Visit Date	Parameter	Owner ID
ThermoElec	tron Inc	1105347326		ARE128	Sa	andy Grenville	07/24/2019	Ozone	000725
Slope: Intercept CorrCoff:		0.97944 Sloj 0.31014 Inte 0.99998 Cor	pe:	0.000	00 00 00	Mfg Serial Number Tfer ID	ThermoElectron 1180930075 01115	Inc Paramete	er ozone c. Ozone primary stan
DAS 1: A Avg % D 0.0	Diff: A N 0%	D Max % Dif A 0.0%	AS 2: Avg %I	Diff A Max	3 % Dif	Slope Cert Date	1.0080	0 Intercept 9 CorrCoff	-0.40210 1.00000
UseDescri primar primar primar primar primar	iption ry ry ry ry ry ry	ConcGroup 1 2 3 4 5	Tfer -0. 15. 36. 67. 110	Raw T 01	Operation Operation <thoperation< th=""> <thoperation< th=""> <tho< td=""><td>Site 0.01 14.85 35.19 66.50 106.70</td><td>Site Unit ppb ppb ppb ppb ppb</td><td>RelPerDif -2.91 -1.88 -2.61</td><td>AbsDif -0.37 -0.78</td></tho<></thoperation<></thoperation<>	Site 0.01 14.85 35.19 66.50 106.70	Site Unit ppb ppb ppb ppb ppb	RelPerDif -2.91 -1.88 -2.61	AbsDif -0.37 -0.78
Sensor Co Sensor Co Sensor Co	ompone ompone ompone	ent Sample Tra ent 22.5 degree ent Inlet Filter (ain e rule Condition		Conditi Conditi Conditi	on Good on On Clean		StatuspassStatuspassStatuspass	
Sensor C	ompone	ent Battery Bac	ckup		Conditi	on N/A		Status pass	
Sensor C	ompone	ent Offset			Conditi	on 0.000		Status pass	
Sensor C	ompone	ent Span			Conditi	on 1.006		Status pass	
Sensor C	ompone	ent Zero Voltag	je		Conditi	on N/A		Status pass	
Sensor C	ompone	ent Fullscale V	oltage		Conditi	on N/A		Status pass	
Sensor C	ompone	ent Cell A Freq			Conditi	on 90.2 kHz		Status pass	
Sensor C	ompone	ent Cell A Nois	е		Conditi	on 0.7 ppb		Status pass	
Sensor C	ompone	ent Cell A Flow	'		Conditi	<mark>on</mark> 0.71 lpm		Status pass	
Sensor C	ompone	ent Cell A Pres	sure		Conditi	on 709.3 mmHg		Status pass	
Sensor C	ompone	ent Cell A Tmp			Conditi	on 30.7 C		Status pass	
Sensor C	ompone	ent Cell B Freq			Conditi	on 103.2 kHz		Status pass	
Sensor C	ompone	ent Cell B Nois	е		Conditi	on 1.1 ppb		Status pass	
Sensor C	ompone	ent Cell B Flow	1		Conditi	<mark>on</mark> 0.71 lpm		Status pass	
Sensor C	ompone	ent Cell B Pres	sure		Conditi	on 709.7 mmHg		Status pass	
Sensor C	ompone	ent Cell B Tmp			Conditi	on N/A		Status pass	
Sensor C	ompone	ent Line Loss			Conditi	on Not tested		Status pass	
Sensor C	ompone	ent System Me	mo		Conditi	on		Status pass	

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
PSU	106-Sandy	Grenville-07/25/2019				
1	7/25/2019	DAS	Campbell	000407	CR3000	2512
2	7/25/2019	Ozone	ThermoElectron Inc	000678	49i A1NAA	1030244791
3	7/25/2019	Ozone Standard	ThermoElectron Inc	000434	49i A3NAA	CM08200010
4	7/25/2019	Zero air pump	Werther International	06921	C 70/4	000836216

Mfg		Serial Nur	nber Tag	Site		Tech	nician	Site Visit Date	Parameter	Owner ID
ThermoElec	tron Inc	10302447	91	PSU106	;	San	dy Grenville	07/25/2019	Ozone	000678
Slope: Intercept CorrCoff:		0.95555 S 0.12622 I 1.00000 (llope: ntercept CorrCoff:).00000).00000).00000	N S T	Afg Serial Number Sfer ID	ThermoElectron 1180930075 01115	Inc Paramet	er ozone c. Ozone primary stan
DAS 1: A Avg % D 0.0	Diff: A N 0%	<mark>/lax % Dif</mark> 0.0%	DAS 2: A Avg %	Diff A	Max % Dif	S	Slope Cert Date	1.0080	0 Intercept 9 CorrCoff	-0.40210 1.00000
UseDescri primar primar primar primar primar	iption ry	ConcGrou 1 2 3 4 5	p Tfe -(10 33 67 10	r Raw).04 5.01 5.72 7.29 9.70	Tfer Cor 0.35 16.28 35.83 67.15 109.22	r	Site 0.52 15.54 34.48 64.25 104.50	Site Unit ppb ppb ppb ppb ppb	RelPerDif -3.84 -4.41 -4.42	AbsDif 0.17 -0.74
Sensor Co Sensor Co Sensor Co	ompone ompone ompone	ent Sample ent 22.5 deg ent Inlet Filte	Train ree rule er Conditio	n	Cond	lition lition lition	Good Clean		StatuspassStatuspassStatuspass	
Sensor C	ompone	ent Battery E	Backup		Cond	lition	N/A		Status pass	
Sensor C	ompone	ent Offset			Cond	lition	0.20		Status pass	
Sensor C	ompone	ent Span			Cond	lition	1.010		Status pass	
Sensor C	ompone	ent Zero Vol	tage		Cond	lition	N/A		Status pass	
Sensor C	ompone	nt Fullscale	e Voltage		Cond	lition	N/A		Status pass	
Sensor C	ompone	ent Cell A Fr	. eq.		Cond	lition	94.8 kHz		Status pass	
Sensor C	ompone	ent Cell A No	oise		Cond	lition	1.0 ppb		Status pass	
Sensor C	ompone	ent Cell A FI	OW		Cond	lition	1 0.68 lpm		Status pass	
Sensor C	ompone	ent Cell A Pr	ressure		Cond	lition	1 709.5 mmHg		Status pass	
Sensor C	ompone	ent Cell A Tr	mp.		Cond	lition	34.1 C		Status pass	
Sensor C	ompone	ent Cell B Fr	req.		Cond	lition	97.9 kHz		Status pass	
Sensor C	ompone	ent Cell B N	oise		Cond	lition	0.9 ppb		Status pass	
Sensor C	ompone	ent Cell B FI	ow		Cond	lition	0.66 lpm		Status pass	
Sensor C	ompone	ent Cell B Pr	ressure		Cond	lition	1 709.9 mmHg		Status pass	
Sensor C	ompone	ent Cell B Tr	mp.		Cond	lition	N/A		Status pass	
Sensor C	ompone	ent Line Los	S		Cond	lition	Not tested		Status pass	
Sensor C	ompone	ent System I	Memo		Cond	lition	1		Status pass	

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
MKG	G113-korey	Devins-07/25/2019				
1	7/25/2019	DAS	Campbell	000404	CR3000	2521
2	7/25/2019	Ozone	ThermoElectron Inc	000703	49i A1NAA	1030244805
3	7/25/2019	Ozone Standard	ThermoElectron Inc	000374	49i A3NAA	0726124694
4	7/25/2019	Zero air pump	Werther International	06937	C 70/4	000821896

Mfg		Serial Number	r Tag Site	Т	echnician	Site Visit Date	Parameter	Owner ID
ThermoElec	tron Inc	1030244805	MKG11	3 k	orey Devins	07/25/2019	Ozone	000703
Slope: Intercept CorrCoff: DAS 1: A Avg % D 0.0		0.97286 Slope 0.68795 Inter 0.99999 Corr DA Max % Dif A A 0.0%	e: () cept () Coff: () SS 2: Avg %Diff A	0.00000 0.00000 0.00000 Max % Dif	Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 1180030022 01114 0.9984 6/11/20	Inc Paramete Tfer Dese 10 Intercept 19 CorrCoff	c. Ozone primary stan 0.27090 1.00000
UseDescri primar primar primar primar primar	iption ry	ConcGroup 1 2 3 4 5	Tfer Raw 0.43 14.41 36.98 67.59 114.46	Tfer Corr 0.15 14.16 36.76 67.42 114.37	Site -0.56 13.14 35.21 64.61 110.70	Site Unit ppb ppb ppb ppb ppb	RelPerDif -4.31 -4.26 -3.26	AbsDif -0.71 -1.02
Sensor Co Sensor Co Sensor Co	ompone ompone ompone	ent Sample Train ent 22.5 degree ent Inlet Filter Co	rule	Condit	ion Good ion ion Clean		Status pass Status pass Status pass	
Sensor C	ompone	ent Battery Back	up	Condit	ion N/A		Status pass	
Sensor Co	- ompone	ent Offset		Condit	ion 0.1		Status pass	
Sensor Co	ompone	ent Span		Condit	ion 1.015		Status pass	
Sensor Co	ompone	ent Zero Voltage	9	Condit	ion N/A		Status pass	
Sensor Co	ompone	ent Fullscale Vol	tage	Condition N/A			Status pass	
Sensor Co	ompone	ent Cell A Freq.		Condit	ion 101.1 kHz		Status pass	
Sensor Co	ompone	ent Cell A Noise		Condit	ion 0.7 ppb		Status pass	
Sensor Co	ompone	ent Cell A Flow		Condit	ion 0.67 lpm		Status pass	
Sensor Co	ompone	ent Cell A Press	ure	Condit	ion 695.5 mmHg		Status pass	
Sensor Co	ompone	ent Cell A Tmp.		Condit	ion 34.2 C		Status pass	
Sensor Co	ompone	ent Cell B Freq.		Condit	ion 89.1 kHz		Status pass	
Sensor Co	ompone	ent Cell B Noise		Condit	ion 0.8 ppb		Status pass	
Sensor Component Cell B Flow			Condit	ion 0.61 lpm		Status pass		
Sensor Co	ompone	ent Cell B Press	ure	Condit	ion 694.9 mmHg		Status pass	
Sensor Component Cell B Tmp.			Condit	ion N/A		Status pass		
Sensor C	ompone	ent Line Loss		Condit	ion Not tested		Status pass	
Sensor Co	ompone	ent System Men	10	Condit	ion		Status pass	

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
CND.	125-Sandy	Grenville-07/31/2019				
1	7/31/2019	DAS	Campbell	000499	CR3000	3816
2	7/31/2019	Ozone	ThermoElectron Inc	000692	49i A1NAA	1030244803
3	7/31/2019	Ozone Standard	ThermoElectron Inc	000376	49i A3NAA	0726124693
4	7/31/2019	Zero air pump	Werther International	06868	C 70/4	000814284

Mfg		Serial Nun	ıber Tag	Site	J	Fech	nnician	Site Visit Date	Paramete	er	Owner ID
ThermoElec	tron Inc	103024480)3	CND125	;	San	dy Grenville	07/31/2019	Ozone		000692
Slope: Intercept CorrCoff:	(0.97601 SI 0.12496 Ir 1.00000 C	lope: ntercept orrCoff:	().00000).00000).00000	N S T	Mfg Serial Number Ffer ID	ThermoElectron 1180030022 01114	Inc Para	ameter ozono • Desc. Ozon	e primary stan
DAS 1: A Avg % D 0.0	Diff: A N 0%	lax % Dif 0.0%	DAS 2: A Avg %	Diff A	Max % Dif	s c	Slope Cert Date	6/11/201	0 Interce 9 CorrC	ept	0.27090
UseDescri primar primar primar primar primar	iption ry ry ry ry ry ry ry	ConcGroup 1 2 3 4 5	Tfe 0 11 31 67 11	r Raw 0.63 5.25 5.01 7.33 0.20	Tfer Corr 0.35 15.00 34.79 67.16 110.10	r	Site 0.47 14.90 34.01 65.49 107.70	Site Unit ppb ppb ppb ppb ppb	RelPerD -	2.27 -2.2	Dif 0.12 -0.1
Sensor Co Sensor Co Sensor Co	ompone ompone ompone	nt Sample T nt 22.5 degr nt Inlet Filte	Frain ree rule r Conditio	n	Condi	ition ition ition	a Good a a Clean		Status P Status P Status P	ass ass ass	
Sensor Construction	ompone	nt Battery B nt Offset	ackup		Condi	ition ition	1 N/A 1 -0.20		Status P	ass ass	
Sensor C	ompone	nt Span			Cond	ition	1.003		Status P	ass	
Sensor C	ompone	nt Zero Volt	age		Condi	ition	N/A		Status P	ass	
Sensor Consor Co	ompone: ompone:	nt Fullscale	eq.		Condi	ition ition	1 100.7 kHz		Status P	ass	
Sensor C	ompone	nt Cell A No	oise		Cond	ition	1 0.8 ppb		Status P	ass	
Sensor C	ompone	nt Cell A Flo	w		Cond	ition	0.72 lpm		Status P	ass	
Sensor C	ompone	nt Cell A Pr	essure		Cond	ition	710.7 mmHg		Status P	ass	
Sensor C	ompone	nt Cell A In	np. ea		Condi	ition ition	1 38.4 C		Status P		
Sensor C	ompone	nt Cell B No	oise		Condi	ition	1 0.6 ppb		Status P	ass	
Sensor C	ompone	nt Cell B Flo	ow		Cond	ition	1 0.71 lpm		Status P	ass	
Sensor C	ompone	nt Cell B Pr	essure		Cond	ition	711.6 mmHg		Status P	ass	
Sensor C	ompone	nt Cell B Tn	np.		Condi	ition	N/A		Status P	ass	
Sensor C	ompone	nt Line Loss	S A		Cond	ition	Not tested		Status P	ass	
Sensor C	ompone	nt System N	lemo		Cond	ition	1		Status P	ass	

Site Vi	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CAN4	07-Martin	n Valvur-08/07/2019				
1	8/7/2019	DAS	Environmental Sys Corp	90665	8816	2689
2	8/7/2019	Ozone	ThermoElectron Inc	none	49i A3NAA	1030745086
3	8/7/2019	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1030745084
4	8/7/2019	Zero air pump	Twin Tower Engineering	90721	TT70/E4	526297

Mfg		Serial Num	ıber Tag	Site	1	Tech	nician	Site Visit Date	Parameter	Owner ID
ThermoElec	tron Inc	103074508	36	CAN407	•	Mart	tin Valvur	08/07/2019	Ozone	none
Slope: Intercept CorrCoff:	(((0.97119 SI 0.33900 In 0.99995 C	lope: ntercept orrCoff:).00000).00000).00000	N S T	Afg Ferial Number Tfer ID	ThermoElectron 49CPS-70008-36 01110	Inc Paramo	eter ozone
DAS 1: A Avg % D 0.(Diff: A M 0%	lax % Dif 0.0%	DAS 2: A Avg %	Diff A	Max % Dif	s c	llope Cert Date	1.0015	1 Intercept 8 CorrCoff	0.00666
UseDescri primar primar primar primar primar	iption ry ry ry ry ry ry	ConcGroup 1 2 3 4 5	Tfe 0 10 3: 60 11	r Raw 0.07 6.55 5.85 6.51 4.51	Tfer Corr 0.06 16.51 35.78 66.40 114.33	r	Site 0.33 15.51 33.91 63.89 111.03	Site Unit ppb ppb ppb ppb ppb	RelPerDif -5.3 -3.8 -2.9	AbsDif 0.27 -1 7 5 3
Sensor C Sensor C Sensor C	omponer	nt Sample T nt 22.5 degr nt Inlet Filte	rain ree rule r Conditio	n	Cond	lition lition lition	Good Clean		Status pass Status pass Status pass	
Sensor C Sensor C	omponer	nt Battery B	ackup		Cond	lition lition	N/A -0.20		Status pass	5 5
Sensor C Sensor C	omponer	nt Span nt Zero Volt	age		Cond	lition lition	1.001 0.0004		Status pass	·
Sensor C Sensor C	omponer	nt Fullscale	Voltage eq.		Cond	lition	1.0003 84.5 kHz		Status pass	;
Sensor C	ompone	nt Cell A No	oise		Cond	lition	0.6 ppb		Status pass	
Sensor C	ompone	nt Cell A Flo	0W		Cond	ition	0.71 lpm		Status pass	
Sensor C	ompone	nt Cell A Pre	essure		Cond	lition	603.8 mmHg		Status pass	;
Sensor C	ompone	nt Cell A In	np.		Cond	lition	38.3 C		Status pass	
Sensor C	ompone	nt Cell B No	oise		Cond	lition	0.9 ppb		Status pass	
Sensor C	ompone	nt Cell B Flo	0W		Cond	lition	0.70 lpm		Status pass	;
Sensor C	ompone	nt Cell B Pre	essure		Cond	ition	603.5 mmHg		Status pass	;
Sensor C	ompone	nt Cell B Tr	np.		Cond	lition	N/A		Status pass	•
Sensor C	ompone	nt Line Loss) Aome		Cond	lition	Not tested		Status pass	
Sensor C	ompone				Cond	ution			status pass	

Site V	ïsit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
DIN43	31-Martin	Valvur-08/08/2019				
1	8/8/2019	DAS	Environmental Sys Corp	90652	8816	2565
2	8/8/2019	Ozone	ThermoElectron Inc	none	49i A3NAA	1211052490
3	8/8/2019	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460050
4	8/8/2019	Zero air pump	Werther International	none	PC70/4	531395

Mfg	Serial N	umber Tag	Site	Т	echnician	Site Visit Date	Parameter	Owner ID
ThermoElectror	Inc 121105	2490	DIN431	1	Martin Valvur	08/08/2019	Ozone	none
Slope: Intercept CorrCoff: DAS 1: A Avg % Diff: 0.0%	0.99070 -0.52028 0.99998 A Max % D 0.0	Slope: Intercept CorrCoff: DAS 2: if A Avg % %	bDiff A	0.00000 0.00000 0.00000 Max % Dif	Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 49CPS-70008-3 01110 1.0015 10/30/20	Inc Paramete 64 Tfer Dese 51 Intercept 18 CorrCoff	c. Ozone primary stan 0.00666 1.00000
UseDescription primary primary primary primary primary	on ConcGr 1 2 3 4 5	roup Tfe (1 3 6 1	er Raw 0.13 6.69 7.80 6.20 16.03	Tfer Corr 0.12 16.65 37.73 66.09 115.84	Site -0.10 15.90 36.74 64.59 114.50	Site Unit ppb ppb ppb ppb ppb	RelPerDif -2.66 -2.3 -1.16	AbsDif -0.22 -0.75
Sensor Com Sensor Com Sensor Com	ponent Samp ponent 22.5 c ponent Inlet F	le Train legree rule Filter Conditio	n	Condi	tion Good tion tion Clean		StatuspassStatuspassStatuspass	
Sensor Com	ponent Batter	y Backup		Condi	tion N/A		Status pass	
Sensor Com	ponent Offset	:		Condi	tion 0.000		Status pass	
Sensor Com	ponent Span			Condi	tion 1.004		Status pass	
Sensor Com	ponent Zero	/oltage		Condi	tion 0.0001		Status pass	
Sensor Com	ponent Fullsc	ale Voltage		Condi	tion 1.0001		Status pass	
Sensor Com	ponent Cell A	Freq.		Condi	tion 79.0 kHz		Status pass	
Sensor Com	ponent Cell A	Noise		Condi	tion 0.6 ppb		Status pass	
Sensor Com	ponent Cell A	Flow		Condi	tion 0.67 lpm		Status pass	
Sensor Com	ponent Cell A	Pressure		Condi	tion 623.0 mmHg		Status pass	
Sensor Com	ponent Cell A	Tmp.		Condi	tion 36.3 C		Status pass	
Sensor Com	ponent Cell B	Freq.		Condi	tion 74.9 kHz		Status pass	
Sensor Com	ponent Cell B	Noise		Condi	tion 0.6 ppb		Status pass	
Sensor Com	ponent Cell B	Flow		Condi	tion 0.64 lpm		Status pass	
Sensor Com	ponent Cell B	Pressure		Condi	tion 622.4 mmHg		Status pass	
Sensor Component Cell B Tmp.			Condi	tion N/A		Status pass		
Sensor Com	ponent Line L	.OSS		Condi	tion Not tested		Status pass	
Sensor Com	ponent Syste	m Memo		Condi	tion		Status pass	
Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number		
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WST.	109-Korey	Devins-08/19/2019						
1	8/19/2019	DAS	Campbell	000354	CR3000	2132		
2	8/19/2019	Ozone	ThermoElectron Inc	000611	49i A1NAA	1009241795		
3	8/19/2019	Ozone Standard	ThermoElectron Inc	000443	49i A3NAA	CM08200019		
4	8/19/2019	Zero air pump	Werther International	06934	P 70/4	000821881		

Mfg	Serial Number	Fag Site	Те	chnician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241795	WST109) Ko	prey Devins	08/19/2019	Ozone	000611
Slope: Intercept CorrCoff: DAS 1: A Avg % Diff: A N 0.0%	0.96271 Slope: -0.07811 Interce 0.999999 CorrC DAS Max % Dif A Av 0.0%	ept (Construction) off: Construction 2: vg %Diff A	0.00000 0.00000 0.00000 Max % Dif	Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 1180930075 01115 1.0080 3/26/20	Inc Paramete Tfer Dese 00 Intercept 19 CorrCoff	ozone Ozone primary stan -0.40210 1.00000
UseDescription primary primary primary primary primary	ConcGroup 1 2 3 4 5	Tfer Raw -0.09 15.33 36.74 67.78 109.89	Tfer Corr 0.30 15.60 36.84 67.64 109.41	Site 0.25 14.79 35.35 65.34 105.10	Site Unit ppb ppb ppb ppb ppb	RelPerDif -4.13 -3.46 -4.02	AbsDif -0.05 -0.81
Sensor Compone Sensor Compone Sensor Compone	ent Sample Train 22.5 degree ru ent Inlet Filter Con	le dition	Condition	on Good on Clean		StatuspassStatuspassStatuspass	
Sensor Compone	ent Battery Backup)	Conditi	on N/A		Status pass	
Sensor Compone	ent Offset		Conditi	on -0.20		Status pass	
Sensor Compone	ent Span		Conditi	on 0.992		Status pass	
Sensor Compone	ent Zero Voltage		Conditi	on N/A		Status pass	
Sensor Compone	ent Fullscale Volta	ge	Conditi	on N/A		Status pass	
Sensor Compone	ent Cell A Freq.		Conditi	on 98.0 kHz		Status pass	
Sensor Compone	ent Cell A Noise		Conditi	on 0.9 ppb		Status pass	
Sensor Compone	ent Cell A Flow		Conditi	on 0.67 lpm		Status pass	
Sensor Compone	ent Cell A Pressur	е	Conditi	on 708.1 mmHg		Status pass	
Sensor Compone	ent Cell A Tmp.		Conditi	on 37.6 C		Status pass	
Sensor Compone	ent Cell B Freq.		Conditi	on 99.6 kHz		Status pass	
Sensor Compone	ent Cell B Noise		Conditi	on 0.9 ppb		Status pass	
Sensor Compone	ent Cell B Flow		Conditi	on 0.69 lpm		Status pass	
Sensor Compone	ent Cell B Pressur	e	Conditi	on 708.7 mmHg		Status pass	
Sensor Compone	ent Cell B Tmp.		Conditi	on N/A		Status pass	
Sensor Compone	ent Line Loss		Conditi	on Not tested		Status pass	
Sensor Compone	ent System Memo		Condition	on		Status pass	

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number					
ANA	ANA115-Eric Hebert-08/22/2019										
1	8/22/2019	DAS	Campbell	000339	CR3000	2118					
2	8/22/2019	Ozone	ThermoElectron Inc	000699	49i A1NAA	1030244804					
3	8/22/2019	Ozone Standard	ThermoElectron Inc	000686	49i A3NAA	1030244818					
4	8/22/2019	Zero air pump	Werther International	06933	C 70/4	000836202					

Mfg		Serial Number	r Tag Site	1	Fechnic	ian	Site Visit Date	Parameter	Owner ID
ThermoElect	ron Inc	1030244804	ANA115	5	Eric Het	pert	08/22/2019	Ozone	000699
Slope: [Intercept] CorrCoff: [DAS 1: A Avg % Di 0.0		1.00901 Slope 0.33313 Inter 0.99999 Corr DA 1ax % Dif A 0.0%	e: cept Coff: AS 2: Avg %Diff A	0.00000 0.00000 0.00000 Max % Dif	Mfg Seria Tfer Slope Cert	al Number ID e Date	ThermoElectron 1180030022 01114 0.9984 6/11/207	Inc Paramete Tfer Dese Intercept IO CorrCoff	ozoneOzone primary stan0.270901.00000
UseDescrip primary primary primary primary primary	ption y y y y y	ConcGroup 1 2 3 4 5	Tfer Raw 0.48 14.67 35.82 68.47 116.35	Tfer Corr 0.20 14.42 35.60 68.30 116.26		Site -0.22 14.16 35.61 68.88 116.80	Site Unit ppb ppb ppb ppb ppb	RelPerDif 0.03 0.85 0.46	AbsDif -0.42 -0.26
Sensor Co Sensor Co Sensor Co	ompone ompone ompone	ant Sample Train ant 22.5 degree ant Inlet Filter Co	n rule ondition	Condi	ition Gc ition ition Cle	ean		StatuspassStatuspassStatuspass	
Sensor Co	mpone	nt Battery Back	up	Condi	ition N/	A		Status pass	
Sensor Co	ompone	nt Offset		Condi	ition 0.0	000		Status pass	
Sensor Co	ompone	nt Span		Condi	ition 1.0)43		Status pass	
Sensor Co	ompone	nt Zero Voltage)	Condi	ition N/	A		Status pass	
Sensor Co	ompone	nt Fullscale Vo	ltage	Condi	ition N/	A		Status pass	
Sensor Co	ompone	nt Cell A Freq.		Condi	ition 99	.8 kHz		Status pass	
Sensor Co	ompone	nt Cell A Noise		Condi	ition 1.3	3 ppb		Status pass	
Sensor Co	ompone	nt Cell A Flow		Condi	ition 0.7	73 lpm		Status pass	
Sensor Co	ompone	nt Cell A Press	ure	Condi	ition 69	9.9 mmHg		Status pass	
Sensor Co	ompone	nt Cell A Tmp.		Condi	ition 36	.9 C		Status pass	
Sensor Co	ompone	nt Cell B Freq.		Condi	ition 99	.6 kHz		Status pass	
Sensor Co	ompone	nt Cell B Noise		Condi	ition 0.9	9 ppb		Status pass	
Sensor Co	ompone	nt Cell B Flow		Condi	ition 0.7	70 lpm		Status pass	
Sensor Co	ompone	nt Cell B Press	ure	Condi	ition 70	0.5 mmHg		Status pass	
Sensor Co	ompone	nt Cell B Tmp.		Condi	ition N/	A		Status pass	
Sensor Co	ompone	nt Line Loss		Condi	ition No	ot tested		Status pass	
Sensor Co	ompone	nt System Men	10	Condi	ition			Status pass	

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
UVL	124-Eric H	lebert-08/22/2019				
1	8/22/2019	DAS	Campbell	000347	CR3000	2126
2	8/22/2019	Ozone	ThermoElectron Inc	000680	49i A1NAA	1030244792
3	8/22/2019	Ozone Standard	ThermoElectron Inc	000362	49i A3NAA	0726124686
4	8/22/2019	Zero air pump	Werther International	06936	C 70/4	000829169

Mfg		Serial Number	Tag Site	1	Fechnician	Site Visit I	Date Parameter	Owner ID
ThermoElecti	ron Inc	1030244792	UVL124		Eric Hebert	08/22/2019) Ozone	000680
Slope: Intercept CorrCoff: DAS 1: A Avg % Di	-: () ff: A M %	0.96589 Slope 3.15365 Inter 0.99993 Corr DA Iax % Dif A A	:: () cept () Coff: () S 2: Avg %Diff A	0.00000 0.00000 0.00000 Max % Dif	Mfg Serial Num Tfer ID Slope Cert Date	ThermoElec oer 118003002 01114 0. 6/1	ctron Inc Paramet 2 Tfer Des 99840 Intercept 1/2019 CorrCoff	c. Ozone primary stan 0.27090
UseDescrir	otion	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Uni	t RelPerDif	AbsDif
primary		1	0.36	0.08	-2.75	ppb		-2.83
primary	y	2	15.37	15.12	11.58	ppb		-3.54
primary	<i>y</i>	3	38.10	37.88	33.21	ppb	-13.14	
primary	y y	5	112.15	112.05	105.60	ppb	-9.49	
Sensor Co	mpone	nt Sample Trair	1	Condi	tion Good		Status pass	
Sensor Co	mpone	nt 22.5 degree	rule	Condi	tion		Status pass	
Sensor Co	mpone	nt Inlet Filter Co	ondition	Condi	tion Clean		Status pass	
Sensor Co	mpone	nt Battery Back	up	Condi	tion N/A		Status pass	
Sensor Co	mpone	nt Offset		Condi	tion 0.20		Status pass	
Sensor Co	mpone	nt Span		Condi	tion 1.009		Status pass	
Sensor Co	mpone	nt Zero Voltage		Condi	tion N/A		Status pass	
Sensor Co	mpone	nt Fullscale Vol	tage	Condi	tion N/A		Status pass	
Sensor Co	mpone	nt Cell A Freq.		Condi	tion 91.9 kHz		Status pass	
Sensor Co	mpone	nt Cell A Noise		Condi	tion Not tested		Status pass	
Sensor Co	mpone	nt Cell A Flow		Condi	tion 0.50 lpm		Status pass	
Sensor Co	mpone	nt Cell A Press	ure	Condi	tion 723.0 mm	Hg	Status pass	
Sensor Co	mpone	nt Cell A Tmp.		Condi	tion 37.1 C		Status pass	
Sensor Co	mpone	nt Cell B Freq.		Condi	tion 85.9 kHz		Status pass	
Sensor Co	mpone	nt Cell B Noise		Condi	tion Not tested		Status pass	
Sensor Co	mpone	nt Cell B Flow		Condi	tion 0.73 lpm		Status pass	
Sensor Co	mpone	nt Cell B Press	ure	Condi	tion 723.6 mm	Hg	Status pass	
Sensor Co	mpone	nt Cell B Tmp.		Condi	tion N/A		Status pass	
Sensor Co	mpone	nt Line Loss		Condi	tion < 1 %		Status pass	
Sensor Co	mpone	nt System Mem	0	Condi	tion		Status pass	

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
нох	148-Eric H	lebert-08/23/2019				
1	8/23/2019	DAS	Campbell	000426	CR3000	2533
2	8/23/2019	Ozone	ThermoElectron Inc	000614	49i A1NAA	1009241794
3	8/23/2019	Ozone Standard	ThermoElectron Inc	000438	49i A3NAA	CM08200014
4	8/23/2019	Zero air pump	Werther International	06938	C 70/4	000829164

Mfg		Serial Number	Tag Site	Те	chnician	Site Visit Date	Parameter	Owner ID
ThermoElect	tron Inc	1009241794	HOX148	B EI	ric Hebert	08/23/2019	Ozone	000614
Slope: [Intercept [CorrCoff: [DAS 1: A Avg % Di 0.0	(-(1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.99012 Slope 0.37417 Inter 0.00000 Corr DA (ax % Dif A A 0.0%	: (cept (Coff: (S 2: Avg %Diff A	0.00000 0.00000 0.00000 Max % Dif	Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 1180030022 01114 0.9984 6/11/20	Inc Paramete Tfer Desc Intercept O CorrCoff	ozone Ozone primary stan 0.27090 1.00000
UseDescri primar primar primar primar primar	ption y y y y y y	ConcGroup 1 1 2 3 4 5 5	Tfer Raw 0.36 15.79 33.16 67.88 115.49	Tfer Corr 0.08 15.54 32.94 67.71 115.40	Site -0.18 14.99 32.07 66.73 113.90	Site Unit ppb ppb ppb ppb ppb	RelPerDif -2.68 -1.46 -1.31	AbsDif -0.26 -0.55
Sensor Co Sensor Co Sensor Co	omponei omponei omponei	at Sample Train	rule	Conditi	on Good on on Clean		StatuspassStatuspassStatuspass	
Sensor Co	mpone	nt Battery Back	up	Conditi	on N/A		Status pass	
Sensor Co	mpone	nt Offset	-	 Conditi	on -0.50		Status pass	
Sensor Co	omponei	nt Span		 Conditi	on 1.028		Status pass	
Sensor Co	omponei	nt Zero Voltage		 Conditi	on N/A		Status pass	
Sensor Co	ompone	nt Fullscale Vol	tage	Conditi	on N/A		Status pass	
Sensor Co	mpone	nt Cell A Freq.		Conditi	on 100.6 kHz		Status pass	
Sensor Co	mpone	nt Cell A Noise		Conditi	on 0.6 ppb		Status pass	
Sensor Co	mpone	t Cell A Flow		Conditi	on 0.74 lpm		Status pass	
Sensor Co	omponei	nt Cell A Pressu	ure	 Conditi	on 706.4 mmHg		Status pass	
Sensor Co	ompone	nt Cell A Tmp.		Conditi	on 37.5 C		Status pass	
Sensor Co	ompone	nt Cell B Freq.		Conditi	on 95.3 kHz		Status pass	
Sensor Co	mpone	nt Cell B Noise		Conditi	on 0.8 ppb		Status pass	
Sensor Co	mpone	nt Cell B Flow		Conditi	on 0.74 lpm		Status pass	
Sensor Co	mpone	nt Cell B Pressu	ıre	Conditi	on 705.8 mmHg		Status pass	
Sensor Co	mpone	nt Cell B Tmp.		Conditi	on N/A		Status pass	
Sensor Co	mpone	nt Line Loss		Conditi	on Not tested		Status pass	
Sensor Co	ompone	nt System Mem	0	Conditi	on		Status pass	

Site Vi	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
DEN4	17-Martir	1 Valvur-09/05/2019				
1	9/5/2019	DAS	Environmental Sys Corp	90600	8816	2274
2	9/5/2019	Ozone	ThermoElectron Inc	none	49iQ-ABBN	1183030010
3	9/5/2019	Ozone Standard	ThermoElectron Inc	none	49C	49C-71310-368
4	9/5/2019	Zero air pump	Werther International	none	PC70/4	526281

Mfg		Serial Nu	mber Ta	Site	ן	Гech	nician	Site Visit Date	Parame	eter	Owner II)
ThermoElec	tron Inc	11830300	010	DEN417	•	Mart	tin Valvur	09/05/2019	Ozone		none	
Slope: Intercept CorrCoff		1.03417 1.35257 0.99995	Slope: Intercept CorrCoff	0 0 0	0.00000 0.00000 0.00000	M S T	Afg Ferial Number Tfer ID	ThermoElectron 49CPS-70008-36 01110	Inc Pa 64 Tf	ramete er Deso	er ozone	stan
DAS 1:			DAS 2:			S	lope	1.0015	1 Inter	rcept	0.006	366
A Avg % D		Max % Di	A Avg %	Diff A	Max % Di	C	Cert Date	10/30/201	8 Cori	Coff	1.000	000
0.0	J 70	0.0%										
UseDescri	iption	ConcGrou	up Tfe	r Raw	Tfer Corr	:	Site	Site Unit	RelPer	Dif	AbsDif	
primar	rv	2		4.77	-0.87		16.36	ppb ppb			1.93	
primar	ry	3	3	1.89	31.83		33.92	ppb		6.36		
primar	ry	4	6.	3.29	63.18		66.29	ppb		4.8		
primar	ry	5	10	6.60	106.43		111.80	ppb		4.92		
Sensor Co	ompone	ent Sample	Irain		Condi	ition	Good		Status	pass		
Sensor Co	ompone	ent 22.5 de	gree rule		Condi	ition			Status	pass		
Sensor Co	ompon	ent Inlet Filt	ter Conditio	n	Condi	ition	Clean		Status	pass]
Sensor Co	Sensor Component Battery Backup			Condi	ition	N/A		Status	pass]	
Sensor Co	ompon	ent Offset			Condi	ition	0.000		Status	pass]
Sensor Co	ompone	ent Span			Condi	ition	1.018		Status	pass]
Sensor Co	ompon	ent Zero Vo	oltage		Condi	ition	N/A		Status	pass		
Sensor Co	ompon	ent Fullscal	e Voltage		Condi	ition N/A			Status	pass		
Sensor Co	ompone	ent Cell A F	req.		Condi	ition	73.6 kHz		Status	pass		
Sensor Co	ompone	ent Cell A N	loise		Condi	ition	0.7 ppb		Status	pass		
Sensor Co	ompone	ent Cell A F	low		Condi	ition	1.45 lpm		Status	pass		
Sensor Co	ompone	ent Cell A F	Pressure		Condi	ition	699.13 mmHg		Status	pass		
Sensor Co	ompon	ent Cell A T	mp.		Condi	ition	30.28 C		Status	pass		
Sensor Co	ompone	ent Cell B F	req.		Condi	ition	70.6 kHz		Status	pass		
Sensor Co	ompone	ent Cell B N	loise		Condi	ition	0.60 ppb		Status	pass		
Sensor Co	ompone	ent Cell B F	low		Condi	ition	N/A		Status	pass		
Sensor Co	ompone	ent Cell B F	Pressure		Condi	ition	699.17 mmHg		Status	pass		
Sensor Component Cell B Tmp.			Condi	ition	N/A		Status	pass				
Sensor Co	Sensor Component Line Loss			Condi	ition	Not tested		Status	pass]	
Sensor Co	ompon	ent System	Memo		Condi	ition			Status	pass]

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
GRB-	411-Martin	n Valvur-09/16/2019				
1	9/16/2019	DAS	Environmental Sys Corp	90635	8816	2507
2	9/16/2019	Ozone	ThermoElectron Inc	none	49iQ-ABBN	1183030014
3	9/16/2019	Ozone Standard	ThermoElectron Inc	none	49C	0330302753
4	9/16/2019	Zero air pump	Werther International	90722	TT70/4E	507782

Mfg		Serial N	umber Ta	Site	,	Tech	nnician	Site Visit Date	Parame	eter	Owner II)
ThermoElec	tron Inc	1183030	0014	GRB41	1	Mar	tin Valvur	09/16/2019	Ozone		none	
Slope: Intercept CorrCoff		0.97911 0.40853 0.99996	Slope: Intercept CorrCoff		0.00000 0.00000 0.00000	N S T	Mfg Serial Number Ffer ID	ThermoElectron 49CPS-70008-30 01110	Inc Pa 64 Tf	ramete er Desc	ozone C. Ozone primary	stan
DAS 1:			DAS 2:			S	Slope	1.0015	1 Inter	rcept	0.006	666
A Avg % D	Diff: A I	Max % Di	i A Avg %	6Diff A	Max % Di	C	Cert Date	10/30/201	8 Cori	·Coff	1.000	000
0.0	J%	0.0%	<u>/o</u>									
UseDescri	iption	ConcGro	oup Tfe	er Raw	Tfer Cor	r	Site	Site Unit	RelPer	Dif	AbsDif	
prima	ry rv	2	1	0.14 5.86	0.13		0.24	ppb			-0.99	
prima	ry	3	3	7.01	36.94		35.50	ppb		-3.98	0.77	
prima	ry	4	6	9.19	69.07		66.90	ppb		-3.19		
prima	ry	5	1	15.50	115.31		112.80	ppb		-2.2		
Sensor Co	ompone	ent Sampl	e Train		Cond	ition	Good		Status	pass		
Sensor Co	ompone	ent 22.5 d	egree rule		Cond	ition	1		Status	pass]
Sensor Co	ompone	ent Inlet F	ilter Conditio	on	Cond	ition	Clean		Status	pass]
Sensor Component Battery Backup			Cond	ition	N/A		Status	pass]		
Sensor Co	ompon	ent Offset			Cond	ition	0.30		Status	pass		
Sensor Co	ompone	ent Span			Cond	ition	1.015		Status	pass		
Sensor Co	ompone	ent Zero V	/oltage		Cond	ition	N/A		Status	pass]
Sensor Co	ompone	ent Fullsca	ale Voltage		Cond	ition N/A			Status	pass		
Sensor Co	ompone	ent Cell A	Freq.		Cond	ition	73.4 kHz		Status	pass]
Sensor Co	ompone	ent Cell A	Noise		Cond	ition	0.85 ppb		Status	pass]
Sensor Co	ompone	ent Cell A	Flow		Cond	ition	1.21 lpm		Status	pass]
Sensor Co	ompon	ent Cell A	Pressure		Cond	ition	581.2 mmHg		Status	pass]
Sensor Co	ompone	ent Cell A	Tmp.		Cond	ition	31.01 C		Status	pass]
Sensor Co	ompone	ent Cell B	Freq.		Cond	ition	76.6 kHz		Status	pass]
Sensor Co	ompone	ent Cell B	Noise		Cond	ition	0.85 ppb		Status	pass]
Sensor C	ompon	ent Cell B	Flow		Cond	ition	N/A		Status	pass]
Sensor C	ompon	ent Cell B	Pressure		Cond	ition	581.3 mmHg		Status	pass		
Sensor Component Cell B Tmp.			Cond	ition	N/A		Status	pass				
Sensor C	ompon	ent Line Lo	OSS		Cond	ition	Not tested		Status	pass]
Sensor Co	ompon	ent Syster	n Memo		Cond	ition	1		Status	pass]

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ASH135-Korey Devins-09/19/2019						
1	9/19/2019	DAS	Campbell	000847	CR3000	11444
2	9/19/2019	Ozone	ThermoElectron Inc	000730	49i A1NAA	1105347325
3	9/19/2019	Ozone Standard	ThermoElectron Inc	000442	49i A3NAA	CM08200018
4	9/19/2019	Zero air pump	Werther International	06923	C 70/4	000836208

Mfg	Serial Numb	er Tag Site	Te	echnician	Site Visit Date	Parameter	Owner ID
ThermoElectron	Inc 1105347325	ASH13	5 K	orey Devins	09/19/2019	Ozone	000730
Slope: Intercept CorrCoff: DAS 1: A Avg % Diff: 0.0%	0.99454 Slop -2.50547 Inte 0.99993 Cor D A Max % Dif A 0.0%	ercept rCoff: AS 2: Avg %Diff A	0.00000 0.00000 0.00000 Max % Dif	Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 1180930075 01115 1.0080 3/26/207	Inc Paramete Tfer Desc D0 Intercept 19 CorrCoff	ozone c. Ozone primary stan -0.40210 1.00000
UseDescriptio primary primary primary primary primary	n ConcGroup 1 2 3 4 5	Tfer Raw 0.62 14.51 36.54 65.99 111.62	Tfer Corr 1.01 14.79 36.64 65.86 111.13	Site -2.13 12.28 34.55 63.35 107.60	Site Unit ppb ppb ppb ppb ppb	RelPerDif -5.87 -3.89 -3.23	AbsDif -3.14 -2.51
Sensor Comp Sensor Comp Sensor Comp	onent Sample Tra onent 22.5 degree onent Inlet Filter (in e rule	Conditi	ion Good ion Moderately cle	an	StatuspassStatuspassStatuspass	
Sensor Comp	onent Battery Bac	kup	Conditi	ion N/A		Status pass	
Sensor Comp	onent Offset		Conditi	ion 0.30		Status pass	
Sensor Comp	onent Span		Conditi	ion 1.010		Status pass	
Sensor Comp	onent Zero Voltag	Zero Voltage		dition N/A		Status pass	
Sensor Comp	onent Fullscale Ve	oltage	Conditi	ion N/A		Status pass	
Sensor Comp	onent Cell A Freq	•	Conditi	ion 98.0 kHz		Status pass	
Sensor Comp	onent Cell A Nois	e	Conditi	ion 0.7 ppb		Status pass	
Sensor Comp	onent Cell A Flow	,	Conditi	ion 0.71 lpm		Status pass	
Sensor Comp	onent Cell A Pres	sure	Conditi	ion 734.5 mmHg		Status pass	
Sensor Comp	onent Cell A Tmp		Conditi	ion 35.5 C		Status pass	
Sensor Comp	onent Cell B Freq	•	Conditi	ion 97.3 kHz		Status pass	
Sensor Comp	onent Cell B Nois	е	Conditi	ion 0.7 ppb		Status pass	
Sensor Comp	onent Cell B Flow	Cell B Flow		on 0.61 lpm		Status pass	
Sensor Comp	onent Cell B Pres	t Cell B Pressure		on 735.1 mmHg		Status pass	
Sensor Comp	onent Cell B Tmp	Cell B Tmp.		on N/A		Status pass	
Sensor Comp	onent Line Loss		Conditi	ion Not tested		Status pass	
Sensor Comp	onent System Me	mo	Conditi	ion		Status pass	

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ABT147-Korey Devins-09/25/2019						
1	9/25/2019	DAS	Campbell	000413	CR3000	2519
2	9/25/2019	Ozone	ThermoElectron Inc	000627	49i A1NAA	1009241772
3	9/25/2019	Ozone Standard	ThermoElectron Inc	000449	49i A3NAA	CM08200025
4	9/25/2019	Zero air pump	Werther International	06930	P 70/4	000829168

Mfg		Serial Number	Tag Site	Т	echnician	Site Visit Date	Parameter	Owner ID
ThermoElect	ron Inc	1009241772	ABT147	ŀ	Korey Devins	09/25/2019	Ozone	000627
Slope: [Intercept CorrCoff:] DAS 1: A Avg % Di 0.0		0.99630 Slope 0.32338 Inter 1.00000 Corre DA 1ax % Dif A A 0.0%	: (cept (Coff: (S 2: xvg %Diff A	0.00000 0.00000 0.00000 Max % Dif	Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 1180930075 01115 1.0080 3/26/201	Inc Paramete Tfer Dese 0 Intercept 19 CorrCoff	ozone c. Ozone primary stan -0.40210 1.00000
UseDescrip primary primary primary primary primary	ption y y y y y y	ConcGroup 1 2 3 4 5	Tfer Raw 0.24 16.05 36.56 67.39 110.13	Tfer Corr 0.63 16.32 36.66 67.25 109.65	Site 0.31 15.93 36.17 66.73 108.90	Site Unit ppb ppb ppb ppb ppb	RelPerDif -1.35 -0.78 -0.69	AbsDif -0.32 -0.39
Sensor Co Sensor Co Sensor Co	ompone ompone ompone	nt Sample Train nt 22.5 degree i nt Inlet Filter Co	rule	Condi Condi Condi Condi	tion Good tion tion Clean		StatuspassStatuspassStatuspass	
Sensor Co	ompone	nt Battery Back	qu	Condi	tion N/A		Status pass	
Sensor Co	ompone	nt Offset		Condi	tion 0.10		Status pass	
Sensor Component		<mark>nt</mark> Span	Span		ondition 1.008		Status pass	
Sensor Component		nt Zero Voltage	Zero Voltage		ndition N/A		Status pass	
Sensor Co	ompone	nt Fullscale Volt	age	Condi	tion N/A		Status pass	
Sensor Co	ompone	nt Cell A Freq.		Condi	<mark>tion</mark> 95.3 kHz		Status pass	
Sensor Co	ompone	nt Cell A Noise		Condi	tion 0.8 ppb		Status pass	
Sensor Co	ompone	nt Cell A Flow		Condi	tion 0.69 lpm		Status pass	
Sensor Co	ompone	nt Cell A Pressu	ıre	Condi	tion 713.8 mmHg		Status pass	
Sensor Co	ompone	nt Cell A Tmp.		Condi	tion 34.8 C		Status pass	
Sensor Co	ompone	nt Cell B Freq.		Condi	<mark>tion</mark> 95.8 kHz		Status pass	
Sensor Component		nt Cell B Noise	t Cell B Noise		ion 0.9 ppb		Status pass	
Sensor Component		nt Cell B Flow	t Cell B Flow		on 0.67 lpm		Status pass	
Sensor Component		nt Cell B Pressu	t Cell B Pressure		on 714.4 mmHg		Status pass	
Sensor Component		nt Cell B Tmp.	Cell B Tmp.		tion N/A		Status pass	
Sensor Co	ompone	nt Line Loss		Condi	tion Not tested		Status pass	
Sensor Component		nt System Mem	System Memo		tion		Status pass	