# 2015 – 4<sup>th</sup> Quarter Report Support for Conducting Systems & Performance Audits of CASTNET Sites and NADP Monitoring Stations

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**Prepared for:** 

**U. S. Environmental Protection Agency** 

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### List of Acronyms and Abbreviations

percent difference
analog to digital converter
Air Resource Specialist, Inc.
American Society for Testing and Materials
Clean Air Status and Trends Network
data acquisition system
direct current
degree
digital voltmeter
Environmental, Engineering & Measurement Services, Inc.
U.S. Environmental Protection Agency
Environmental Systems Corporation
Field Site Audit Database
geographical positioning system
liters per minute
Multilayer Model
meters per second
milivolt
National Institute of Standards and Technology
National Oceanic and Atmospheric Administration
National Park Service
Quality Assurance Project Plan
standard operating procedure
Thermo Environmental Instruments
United States Naval Observatory
volts
World Radiation Reference

## **1.0 CASTNET Quarterly Report**

### 1.1 Introduction

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

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

CASTNET pollutant flux estimates are calculated as the aggregate product of weekly measured chemical concentrations and model-estimated deposition velocities. Currently, the National Oceanic and Atmospheric Administration's multilayer inferential model (NOAA-MLM) described by Meyers et al. [1998] is used to derive deposition velocity estimates.

As of January 2016, the network is comprised of 94 active rural sampling sites across the Untied States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Environment Canada, Bureau of Land Management (BLM) and several independent partners. AMEC is responsible for operating the EPA and Environment Canada sponsored sites, and Air Resource Specialist, Inc. (ARS) is responsible for operating the NPS and BLM sponsored sites.

### **1.2 Project Objectives**

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

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

and PAL190. Five new sites sponsored by EPA and operated by the BLM in WY also operate meteorological sensors and are BAS601, NEC602, BUF603, FOR604, and SHE604.

Some or all of the additional monitored variables, NOy, CO, and SO<sub>2</sub> have been added to the EPA sponsored sites BVL130, HWF187, PND165, PNF126, ROM206, and BEL116. Those variables were audited at the PNF126, HWF187, and BEL116 stations during fourth quarter 2015. All of the SO<sub>2</sub> and NOy results for those audits were found to be within acceptance criteria. The preliminary reports of those results were delivered following the audits and are not included in this report.

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Precipitation	Response	10 manual tips	1 DAS count per tip
Precipitation	bitation Accuracy 2 introductions of known amounts of water		$\leq \pm 10.0\%$ of input amount
Relative HumidityAccuracyCompared to reference instrument or standard solution		≤±10.0% RH	
Solar Radiation	Accuracy	Compared to WRR traceable standard	$\leq \pm 10.0\%$ of daytime average
Surface Wetness	Response	Distilled water spray mist	Positive response
Surface Wetness	Sensitivity	1% decade resistance	N/A
Temperature	TemperatureAccuracyComparison to 3 NIST measured baths (~ 0° C, ambient, ~ full-scale)		≤± 0.5° C
Temperature Difference	Accuracy	Comparison to station temperature sensor	$\leq \pm 0.50^{\circ} \mathrm{C}$
Wind Direction	Wind DirectionOrientation AccuracyParallel 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	≤±5° mean absolute error
Wind Direction	Response Threshold	Starting torque tested with torque gauge	< 10 g-cm Climatronics; < 20 g-cm R.M. Young
Wind Speed	Wind SpeedAccuracyShaft rotational speed generated and measured with certified synchronous motor		$\leq \pm 0.5$ mps below 5.0 mps input; $\leq \pm 5.0\%$ of input at or above 5.0 mps
Wind Speed	Starting Threshold	Starting torque tested with torque gauge	< 0.5 g-cm
Mass Flow Controller	Flow Rate	Comparison with Primary Standard	$\leq \pm 5.0\%$ of designated rate

 Table 1. Performance Audit Challenge and Acceptance Criteria

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Ozone	Slope	Linear regression of multi-	$0.9000 \le m \le 1.1000$
Ozone	Intercept	point test gas concentration as	-5.0 ppb $\leq$ b $\leq$ 5.0 ppb
Ozone	Correlation Coefficient	transfer standard	$0.9950 \le r$
DAS Accuracy Comparison with certified standard		$\leq \pm 0.003 \text{ VDC}$	

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

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

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

### 1.3 CASTNET Sites Visited Fourth Quarter 2015

This report consists of the systems and performance and other audit results from the CASTNET sites visited during the fourth quarter (October through December) of 2015. The locations and dates of the site visits for complete audits are presented in Table 2.

<u>Side ID</u>	<u>Audit Type</u>	<u>Sponsor</u>	<u>Site Visit</u> <u>Date</u>	Station Name
WFM105	Flow Only	EPA	10/1/2015	Whiteface Mountain
NIC001	Flow Only	EPA	10/2/2015	Nicks Lake
UND002	Flow Only	EPA	10/5/2015	Underhill
GRS420	without met	NPS	10/26/2015	Great Smoky NP - Look Rock
LRL117	without met	EPA	11/1/2015	Laurel Hill
SHN418	without met	NPS	11/6/2015	Shenandoah NP - Big Meadows
WSP144	without met	EPA	11/9/2015	Washington Crossing State Park
VPI120	without met	EPA	11/19/2015	Horton Station
PAR107	without met	EPA	11/21/2015	Parsons
CDR119	without met	EPA	11/22/2015	Cedar Creek
BWR139	without met	EPA	11/24/2015	Blackwater NWR
CND125	without met	EPA	12/01/2015	Candor
PED108	without met	EPA	12/3/2015	Prince Edward
BFT142	without met	EPA	12/4/2015	Beaufort

 Table 2. Site Audit Visits

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

Side ID	<u>Audit Type</u>	<u>Sponsor</u>	Site Visit Date	Station Name
HWF187	NOy	EPA	10/3/2015	Huntington Wildlife Forest
HWF187	Ozone PE	EPA	10/3/2015	Huntington Wildlife Forest
HOW191	Ozone PE	EPA	10/6/2015	Howland Ameriflux
ASH135	Ozone PE	EPA	10/7/2015	Ashland
CTH110	Ozone PE	EPA	10/23/2015	Connecticut Hill
KEF112	Ozone PE	EPA	10/24/2015	Kane Experimental Forest
MKG113	Ozone PE	EPA	10/25/2015	M.K. Goddard State Park
PSU106	Ozone PE	EPA	10/27/2015	Penn State University
ABT147	Ozone PE	EPA	10/28/2015	Abington
WST109	Ozone PE	EPA	10/29/2015	Woodstock
ARE128	Ozone PE	EPA	11/2/2015	Arendtsville
PNF126	NOy	EPA	11/4/2015	Cranberry
PNF126	Ozone PE	EPA	11/4/2015	Cranberry
BEL116	SO <sub>2</sub>	EPA	11/19/2015	Beltsville
BEL116	Nitrotrain	EPA	11/25/2015	Beltsville
BEL116	Ozone PE	EPA	11/19/2015	Beltsville

 Table 3.
 TTP Pollutant PE Visits

### 1.4 Audit Results

The observations and results of the systems and performance audits are included in Appendix A, *Audit Report Forms* by site, arranged by audit date.

Photographs of site conditions are included within each systems report where necessary.

Copies of the spot reports that were sent immediately following the audit of each site are included as Appendix B, *Site Spot Report Forms*.

The Ozone PE results and observations are included in Appendix C, *Ozone Performance Evaluation Forms*.

## 2.0 NADP Quarterly Report

### 2.1 Introduction

The National Atmospheric Deposition Program (NADP) operates three precipitation chemistry networks and two atmospheric concentration networks. The National Trends Network (NTN) has been measuring acidic precipitation since 1978. The network currently has more than 250 sites. The Atmospheric Integrated Research Monitoring Network (AIRMoN) began operation in 1992 and currently measures event based precipitation events at 6 sites. The Mercury Deposition Network (MDN) measures total mercury in precipitation samples from more than 120 stations. The MDN began operation in 1996 and includes sites throughout the US and Canada. The Atmospheric Mercury Network (AMNet) and the Ammonia Monitoring Network (AMoN) measure ambient concentrations of mercury and ammonia, respectively.

The NADP and other long-term monitoring networks provide critical information to the EPA regarding evaluating the effectiveness of emission reduction control programs from the power industry.

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

### 2.2 **Project Objectives**

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

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

### 2.3 Sites Visited Fourth Quarter 2015

This report covers the results from the NADP sites surveyed during the fourth quarter (October through December) of 2015. The station names and dates of the audits are presented in Table 4.

<u>Side ID</u>	<u>Network</u>	<u>Visit Date</u>	Station Name		
ME02	MDN/NTN	10/15/2015	Bridgton		
ME08	NTN	10/16/2015	Gilead		
ME09	MDN/NTN	10/14/2015	Greenville Station		
ME96	MDN/NTN	10/13/2015	Casco Bay-Wolfe's Neck Farm		
NY22	NTN	10/19/2015	Akwesasne Mohawk-Fort Covington		
NY28	NTN	10/21/2015	Piseco Lake		
NY59	NTN	10/20/2015	Wanakena		
NY93	NTN	10/19/2015	Paul Smith's		
PA02	NTN	10/25/2015	Crooked Creek Lake		
PA18	MDN	10/27/2015	Young Woman's Creek		
PA21	MDN/NTN	10/25/2015	Goddard State Park		
PA52	MDN/NTN	10/30/2015	Little Pine State Park		
PA71	NTN	10/26/2015	Little Buffalo State Park		
PA72	MDN/NTN	10/29/2015	Milford		
PA98	NTN	10/30/2015	Frances Slocum State Park		
DE02	AIRMoN	11/23/2015	Lewes		
MD08	MDN/NTN/AMoN	11/23/2015	Piney Reservoir		
MD13	NTN	11/16/2015	UM WYE Center		
MD15	NTN	11/17/2015	Smith Island		
MD18	NTN	11/23/2015	Assateague Island National Seashore-Woodcock		
NJ00	NTN	11/12/2015	Edwin B. Forsythe National Wildlife Refuge		
NJ30	MDN	11/9/2015	New Brunswick		
NJ39	NTN	11/10/2015	Cattus Island County Park		

Table 4. Sites Surveyed – Fourth Quarter 2015

<u>Side ID</u>	<u>Network</u>	<u>Visit Date</u>	Station Name		
NJ99	NTN	11/18/2015	Washington Crossing		
PA00	AMoN	11/2/2015	Arendtsville		
PA37	MDN	11/20/2015	Waynesburg		
PA83	NTN	11/24/2015	Laurel Hill State Park		
TN11	MDN/NTN	11/3/2015	Great Smoky Mountains National Park-Elkmont		
VA13	AMoN	11/19/2015	Horton Station		
WV05	AMoN/NTN	11/22/2015	Cedar Creek State Park		
WV18	NTN	11/23/2015	Parsons		
NC17	MDN/NTN	12/1/2015	University Research Farm		
NC26	AMoN/MDN	12/1/2015	Candor		

### 2.4 Survey Results

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

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

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

## APPENDIX A

**CASTNET** Audit Report Forms

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number			
WFN	VFM105-Eric Hebert-10/01/2015								
1	10/1/2015	DAS	Campbell	none	CR850	23270			
2	10/1/2015	elevation	Elevation	none	none	none			
3	10/1/2015	Filter pack flow pump	Permotec	none	BL30EB	Illegible			
4	10/1/2015	Flow Rate	Apex	000668	AXMC105LPMDPCV	illegible			
5	10/1/2015	Infrastructure	Infrastructure	none	none	none			
6	10/1/2015	Modem	Sierra wireless	06983	unknown	unknown			
7	10/1/2015	Sample Tower	Aluma Tower	000748	В	AT-212125X75			
8	10/1/2015	siting criteria	Siting Criteria	none	none	None			
9	10/1/2015	Temperature	RM Young	04683	41342VC	6697			

## Flow Data Form

Mfg	Serial Nun	nber Ta	Site	Тес	chnician	Site Visit D	Date Paran	neter	<b>Owner ID</b>
Apex	illegible		WFM105	Eri	ic Hebert	10/01/2015	5 Flow R	late	000668
					Mfg	BIOS	P	arameter Flow	w Rate
					Serial Number	131818	Т	fer Desc. BIO	S 220-H
					Tfer ID	01417			
					Slope	1.0	00316 Int	ercept	-0.00540
					Cert Date	1/7	7/2015 <b>Co</b>	rrCoff	1.00000
DAS 1:		<b>DAS 2:</b>		_	Cal Factor Z	ero	-0.13	36	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	0.91	19	
0.44%	0.67%				Rotometer R	eading:		3	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.14	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	-0.13	l/m	l/m	
primary	test pt 1	3.018	3.010	3.00	0.000	3.02	l/m	l/m	0.33%
primary	test pt 2	3.031	3.030	3.00	0.000	3.02	l/m	l/m	-0.33%
primary	test pt 3	3.007	3.000	3.00	0.000	3.02	l/m	l/m	0.67%
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	Poor		Status	Fail	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	n 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	<b>n</b> 5.0 cm		Status	pass	
Sensor Comp	onent Filter Dep	oth		Conditio	<b>n</b> -1.0 cm		Status	Fail	
Sensor Comp	onent Filter Azi	muth		Conditio	n 270 deg		Status	pass	
Sensor Comp	onent System M	Nemo		Conditio	n See comments	3	Status	pass	

# Temperature Data Form

Mfg		Serial Numb	er Ta	Site		Technician		Site Visi	it Date	Param	eter	Owner II	D
RM Young		6697		WFM105		Eric Hebert		10/01/2	/01/2015 Temper		rature	04683	
						M So Ti	lfg erial Number fer ID	Extech H232679 01228	9	Pa Tí	arameter Te	emperature	
DAS 1: Abs Avg Err	Abs	D Max Er A	AS 2: bs Avg	Err Abs	Max Er	SI C	ope ert Date		1.00564 1/30/201	4 Inte	rcept rCoff	-0.219	981 000
0.35		0.44				]							
UseDesc.		Test type	Inp	utTmpRaw	InputTm	outTmpCorr. OutputTmpS		signal OutputSignalEng		OSE Unit	Difference		
primary	Temp	Mid Range		17.13	17.2	25	0.000		17.0	)	С	-0.26	
primary	Temp	High Range		39.70	39.7	70	0.000		39.3	3	C	-0.44	
Sensor Com	ponen	t Shield			Cond	lition	Clean			Status	pass		
Sensor Component Blower				Cond	Condition N/A				Status	pass			
Sensor Component Blower Status Switch					Cond	Condition N/A				Status	pass		
Sensor Com	ponen	t System Me	mo		Cond	Condition				Status	pass		

#### **Infrastructure Data For**

Site ID WFM105	Technician Eric He	ebert Site Visit Date 10/01/2015
Shelter Make	Shelter Model	Shelter Size

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	Not 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	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	N/A	Status	pass
Sensor Component	Shelter Door	Condition	N/A	Status	pass
Sensor Component	Shelter Roof	Condition	N/A	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 Bevline	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	WFM105	Eric Hebert	10/01/2015	Filter Position	Apex	4110		

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: DasComments

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

#### 2 Parameter: DocumentationCo

There is no logbook present to record the status of the site equipment or filter information.

#### 3 Parameter: SitingCriteriaCom

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

#### 4 Parameter: ShelterCleanNotes

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

# Field Systems Data Form

## F-02058-1500-S1-rev002

Site ID	WFM105	Technician Eric Hebert	Site Visit Date 10/01	/2015
Site Sponsor (	(agency)	EPA	USGS Map	
<b>Operating Gr</b>	oup	SUNY	Map Scale	
AQS #			Map Date	
Meteorologica	al Type			
Air Pollutant	Analyzer		QAPP Latitude	
Deposition M	easurement	dry, wet	QAPP Longitude	
Land Use		Woodland - mixed	QAPP Elevation Meters	
Terrain		Complex	QAPP Declination	
Conforms to 1	MLM	No	QAPP Declination Date	
Site Telephon	ie		Audit Latitude	44.39322
Site Address	1		Audit Longitude	-73.85874
Site Address 2	2		Audit Elevation	608
County			Audit Declination	
City, State		Wilmington, NY	Present	
Zip Code		12997	Fire Extinguisher	
Time Zone		Eastern	First Aid Kit	
Primary Open	rator		Safety Glasses	
Primary Op.	Phone #		Safety Hard Hat	
Primary Op.	E-mail		Climbing Belt	
Backup Oper	ator		Security Fence	
Backup Op. 1	Phone #		Secure Shelter	
Backup Op. 1	E-mail		Stable Entry Step	
Shelter Work	ing Room	Make M	odel	Shelter Size
Shelter Clean		Notes Small footprint site with no she	lter. Equipment housed in enclo	osure on sample tower.
Site OK	$\checkmark$	Notes		
<b>Driving Direc</b>	tions			

## **Field Systems Data Form**

WFM105

## F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 10/01/2015

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	75 m	
Tree line	50 m	25 m	
Obstacles to wind	10 times obstacle height		

Siting Distances OK

**Siting Criteria Comment** 

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

Fi	eld Sy	stems Data	a Form		<b>F-02058-1500-S3-rev</b>			
Site	e ID	WFM105	Technician Eric Hebert		Site Visit Date 10/01/2015			
1	Are win being in	d speed and direc fluenced by obstr	ction sensors sited so as to avoid ructions?		N/A			
2	Are win (i.e. win horizon tower in	d sensors mounte d sensors should tally extended bo to the prevailing	ed so as to minimize tower effects be mounted atop the tower or on om >2x the max diameter of the wind)	• ✓ a	N/A			
3	Are the	tower and sensor	s plumb?	$\checkmark$	N/A			
4	Are the avoid ra	temperature shie diated heat sourc	lds pointed north or positioned to ces such as buildings, walls, etc?	$\checkmark$				
5	Are tem conditio surface standing	perature and RH ns? (i.e. ground b and not steeply sl g water should be	(sensors sited to avoid unnatural pelow sensors should be natural oped. Ridges, hollows, and areas avoided)	✓				
6	Is the so	lar radiation sen	sor plumb?	$\checkmark$	N/A			
7	Is it site light?	d to avoid shadin	g, or any artificial or reflected		N/A			
8	Is the ra	in gauge plumb?		✓	N/A			
)	Is it site towers,	d to avoid shelter etc?	ing effects from buildings, trees,	$\checkmark$	N/A			
10	Is the su facing n	rface wetness ser orth?	nsor sited with the grid surface	✓	N/A			
11	Is it inc	lined approximat	tely 30 degrees?	✓	N/A			

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

## **Field Systems Data Form**

## F-02058-1500-S4-rev002

Site	ID	WFM105	Technician	Eric Hebert		Site Visit Date	10/01/2015	
1	Do all th condition	e meterological sensor 1, and well maintained	rs appear to be ii 1?	ntact, in good				
2	Are all the reporting	ne meteorological sens g data?	sors operational	online, and				
3	Are the s	hields for the tempera	ature and RH se	nsors clean?	✓			
4	Are the a	spirated motors work	king?			N/A		
5	Is the sol scratches	ar radiation sensor's	lens clean and fr	ree of	✓	N/A		
6	Is the su	rface wetness sensor g	grid clean and un	ndamaged?	✓	N/A		
7	Are the s condition	ensor signal and pow , 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 connect aintained?	ions protected				

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

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	WFM105 Technician Eric Hebert		Site Visit Date 10/01/2015
	Siting Criteria: Are the pollutant analyzers and deposition eq	uipi	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	✓	
2	Are the sample inlets 3 - 15 meters above the ground?	✓	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?		
	Pollutant analyzers and deposition equipment operations and	l ma	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓	
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓	
3	Describe ozone sample tube.		N/A
4	Describe dry dep sample tube.		3/8 Bevline by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)		N/A
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?	✓	N/A
8	Are there moisture traps in the sample lines?		Not present
9	Is there a rotometer in the dry deposition filter line, and is it clean?		

Provide any additional 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					<b>F-02</b>	058-15	00-S6-rev002
Site	e ID	WFM105	Technician	Eric Hebert		Site Visi	it Date	10/01/2015	;	
	<u>DAS, se</u>	nsor translators, and j	peripheral equi	pment operation	ns and	d maintena	<u>nce</u>			
1	Do the I well mai	DAS instruments appe intained?	ar to be in good	l condition and						
2	Are all t modem,	he components of the backup, etc)	al? (printers,							
3	Do the a lightnin	nalyzer and sensor sig g protection circuitry?	gnal leads pass	through						
4	Are the well mai	signal connections pro intained?	e weather and							
5	Are the	signal leads connected	to the correct	DAS channel?						
6	Are the grounde	DAS, sensor translato cd?	rs, and shelter	properly						
7	Does the	e instrument shelter h	ave a stable pov	ver source?						
8	Is the in	strument shelter temp	perature control	lled?	1	No				
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:

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

Field S	ystems Data	For	m				<b>F-0</b> 2	2058-	1500-8	57-rev00	2
Site ID	WFM105		Techni	cian	Eric Hebert	Site Visit Date	10/01/201	5			
Docume	entation										
Does the	e site have the require	ed inst	trumen	t and	equipment manuals?						
Wind speed Wind direct Temperatur Relative hu Solar radia Surface we Wind senso Temperatur Humidity s Solar radia Tipping bu Ozone anal Filter pack	d sensor ction sensor midity sensor ation sensor ation sensor ation sensor or translator are translator sensor translator ation translator ation translator acket rain gauge lyzer a flow controller a MFC power supply	Yes		N/#  >  >	A Data logge Data logge Strip char Computer Modem Printer Zero air p Filter flow Surge prot UPS Lightning Shelter hea Shelter air	er er t recorder ump pump tector protection device ater conditioner	Yes		N/A 9 9 9 9 9 9 9 9 9 9 9 9 9		
<u>Does tl</u>	<u>he site have the requi</u>	red ar	nd most	recei	nt QC documents and	<u>report forms?</u>	~				
Station Log SSRF Site Ops M HASP Field Ops I Calibration Ozone z/s/p Preventive	g Ianual Manual n Reports o Control Charts maintenance schedul		ent	o logb	book			ent			
1 Is the	station log properly o	compl	eted du	ring (	every site visit? 🗌 🛛	lo logbook					
2 Are th curren	ne Site Status Report nt?	Form	s being	comp	pleted and 🔽						
3 Are th sampl	ne chain-of-custody fo e transfer to and from	orms p n lab3	properly ?	y used	d to document						
4 Are oz	zone z/s/p control cha nt?	rts pr	operly	comp	oleted and V	I/A					
Provide an natural or	y additional explanat man-made, that may	tion (p affect	bhotogra t the mo	aph o onitor	or sketch if necessary) ring parameters:	regarding condit	ions listed	above,	or any oth	er features,	

There is no logbook present to record the status of the site equipment or filter information.

## **Field Systems Data Form**

#### Site ID WFM105 Technician Eric Hebert Site Visit Date 10/01/2015 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	
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	
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 through	the complete V N/A	

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

✓	N/A
✓	N/A
$\checkmark$	N/A

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

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S9-rev002				
Site	e ID	WFM105	Technician	Eric Hebert		Site Visit Date	10/01/2015			
	<u>Site ope</u>	ration procedures								
1	1 Is the filter pack being changed every Tuesday as scheduled?					Filter changed mornings				
2	2 Are the Site Status Report Forms being completed and filed correctly?									
3	Are dat schedul	a downloads and backu ed?	ips being perf	ormed as	✓	No longer required				
4	Are gen	eral observations being	g made and re	corded? How?	✓	SSRF				
5	5 Are site supplies on-hand and replenished in a timely fashion?				✓					
6	Are san	ple flow rates recorded	d? How?		✓	SSRF				
7	Are san fashion	nples sent to the lab on ?	a regular sche	edule in a timely	✓					
8	Are filte and shij	ers protected from cont pping? How?	amination du	ring handling	✓	Clean gloves on and	d off			
9	Are the operation	site conditions reported ons manager or staff?	d regularly to	the field						
QC	Check P	erformed	Fre	quency			Compliant			
N	<b>Aulti-poi</b>	nt MFC Calibrations	Sem Sem	niannually						
I	Flow System Leak Checks									
I	Filter Pack Inspection									
I	Flow Rate Setting Checks					$\checkmark$				
V	Visual Check of Flow Rate Rotometer Vekly					$\checkmark$				
Ι	n-line Fil	ter Inspection/Replace	ment 🗹 As r	needed						
8	Sample Li	ine Check for Dirt/Wat	er 🗹 Wee	ekly						

Provide any additional 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 Sys	stems Data Fo	rm		<b>F-02058-15</b> 0	0-S10-rev002	
Site ID	WFM105	Technician	Eric Hebert	Site Visit Date	10/01/2015	

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	000668
Infrastructure	Infrastructure	none	none	none
Modem	Sierra wireless	unknown	unknown	06983
Sample Tower	Aluma Tower	В	AT-212125X75	000748
siting criteria	Siting Criteria	none	None	none
Temperature	RM Young	41342VC	6697	04683

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
NIC	001-Eric He	ebert-10/02/2015				
1	10/2/2015	DAS	Campbell	000801	CR850	23268
2	10/2/2015	elevation	Elevation	none	none	none
3	10/2/2015	Filter pack flow pump	Permotec	none	BL30EB	Illegible
4	10/2/2015	Flow Rate	Арех	000594	AXMC105LPMDPCV	unknown
5	10/2/2015	Infrastructure	Infrastructure	none	none	none
6	10/2/2015	Sample Tower	Aluma Tower	000785	В	AT-212125X73
7	10/2/2015	siting criteria	Siting Criteria	none	none	None
8	10/2/2015	Temperature	RM Young	04943	41342	none

## Flow Data Form

Mfg	Serial Nun	nber Ta	Site	Тес	chnician	Site Visit Da	ate Paran	neter	<b>Owner ID</b>
Apex	unknown		NIC001	Eri	ic Hebert	10/02/2015	Flow R	Rate	000594
				[	Mfg	BIOS	P	arameter Flow	/ Rate
					Serial Number	131818	Г	fer Desc. BIO	S 220-H
					Tfer ID	01417			
					Slope	1.0	0316 <b>Int</b>	ercept	-0.00540
					Cert Date	1/7/	2015 Co	rrCoff	1.00000
DAS 1:		<b>DAS 2:</b>		L	Cal Factor Z	ero	-0.0	55	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	0.96	64	
0.99%	1.32%				Rotometer R	eading:	2.9	95	
Desc.	Test type	Input l/n	n Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall l	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	-0.06	l/m	l/m	
primary	test pt 1	3.039	3.040	3.00	0.000	3.00	l/m	l/m	-1.32%
primary	test pt 2	3.032	3.030	3.00	0.000	3.00	l/m	l/m	-0.99%
primary	test pt 3	3.021	3.020	3.00	0.000	3.00	l/m	l/m	-0.66%
Sensor Comp	onent Leak Tes	st		Conditio	n		Status	s pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Poor		Status	s Fail	
Sensor Comp	onent Rotomete	er Conditic	n	Conditio	n 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 3.5 cm		Status	pass	
Sensor Comp	onent Filter Dep	oth		Conditio	<b>n</b> -1.0 cm		Status	Fail	
Sensor Comp	onent Filter Azi	muth		Conditio	n 235 deg		Status	pass	
Sensor Comp	onent System N	/lemo		Conditio	n See comments	3	Status	pass	

# Temperature Data Form

Mfg	Serial Number 7	<b>Fa</b> Site		<b>Fechn</b> i	ician	Site V	isit Date	Param	eter	<b>Owner ID</b>
RM Young	none	NIC001		Eric H	ebert	10/02	2/2015	Temper	rature	04943
				Mf	g	Extec	h	Ра	arameter Te	emperature
				Ser	ial Number	H232	679	Tf	fer Desc. R	٢D
				Tfe	er ID	01228	3			
DAS 1.	DAS	2.		Slo	pe		1.0056	4 Inte	rcept	-0.21981
Abs Avg Err A	Abs Max Er Abs	Avg Err Abs	Max Er	Ce	rt Date		1/30/201	5 Cor	rCoff	1.00000
0.18	0.26									
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference
primary Te	mp Low Range	-0.09	0.13		0.000		0.1	l	С	-0.08
primary Te	mp Mid Range	22.01	22.1	1	0.000		21.	9	С	-0.26
primary Te	mp High Range	42.17	42.15	5	0.000		42.	0	С	-0.2
Sensor Compo	nent Shield		Condi	ition N	Noderately clea	an		Status	pass	
Sensor Compo	nent Blower		Condi	ition N	I/A			Status	pass	
Sensor Compo	nent Blower Status	Switch	Condi	ition N	I/A			Status	pass	
Sensor Compo	nent System Memo		Condi	ition				Status	pass	

#### **Infrastructure Data For**

Site ID NIC001	Technician Eric Hebert	Site Visit Date 10/02/2015
Shelter Make	Shelter Model	Shelter Size

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	Not 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	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	N/A	Status	pass
Sensor Component	Shelter Door	Condition	N/A	Status	pass
Sensor Component	Shelter Roof	Condition	N/A	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 Bevline	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	Eric Hebert	10/02/2015	Filter Position	Apex	3963		

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: 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.

# Field Systems Data Form

## F-02058-1500-S1-rev002

Site ID NIC001	Technician Eric Hebert	Site Visit Date 10/02	/2015
Site Sponsor (agency)	EPA	USGS Map	
<b>Operating Group</b>	NY DEC	Map Scale	
AQS #		Map Date	
Meteorological Type			
Air Pollutant Analyzer		QAPP Latitude	
<b>Deposition Measurement</b>	dry	QAPP Longitude	
Land Use	Woodland - mixed	QAPP Elevation Meters	
Terrain	Complex	QAPP 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	Old Forge, NY	Present	
Zip Code	13420	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 Step	
Shelter Working Room	Make Mo	odel	Shelter Size
Shelter Clean	Notes Small footprint site with no she	Iter. Equipment housed in encl	osure on sample tower.
Site OK	Notes		
Driving Directions			

## **Field Systems Data Form**

NIC001

## F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 10/02/2015

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

Siting Distances OK

Siting Criteria Comment
Fi	eld Systems Data Form		F-02058-1500-S3-rev002
Site	NIC001 Technician Eric Hebert		Site Visit Date 10/02/2015
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	✓	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A
3	Are the tower and sensors plumb?		N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	✓	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)		
6	Is the solar radiation sensor plumb?	✓	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	✓	N/A
8	Is the rain gauge plumb?	✓	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	✓	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	✓	N/A
11	Is it inclined approximately 30 degrees?	✓	N/A
Pro nat	wide any additional explanation (photograph or sketch if nece ural or man-made, that may affect the monitoring parameters	ssar s:	y) regarding conditions listed above, or any other features,

### F-02058-1500-S4-rev002

Site	e ID	NIC001	Technician Eric Hebert		Site Visit Date	10/02/2015	
1	Do all th condition	e meterological sensor n, and well maintained	s appear to be intact, in good ?	✓			
2	Are all t reportin	he meteorological sens g data?	ors operational online, and	✓			
3	Are the	shields for the tempera	ture and RH sensors clean?	✓			
4	Are the aspirated motors working?			✓	N/A		
5	Is the so scratche	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?	✓	N/A		
7	Are the s	sensor signal and powe n, and well maintained	er cables intact, in good ?	✓			
8	Are the s from the	sensor signal and powe e elements and well ma	er cable connections protected intained?				

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	NIC001     Technician     Eric Hebert		Site Visit Date 10/02/2015
	Siting Criteria: Are the pollutant analyzers and deposition e	quipi	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	<u>d ma</u>	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?		
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓	
3	Describe ozone sample tube.		N/A
4	Describe dry dep sample tube.		3/8 Bevline by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)		N/A
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?	✓	N/A
8	Are there moisture traps in the sample lines?		Not present
9	Is there a rotometer in the dry deposition filter line, and is it clean?		

Fie	eld Sy	stems Data Fo	orm			F-02058-1500-S6-rev002				
Site	Site ID         NIC001         Technician         Eric Hebert		Eric Hebert		Site Visi	t Date 1	0/02/2015			
	<u>DAS, se</u>	nsor translators, and p	peripheral equi	pment operation	ns an	<u>d maintena</u>	<u>nce</u>			
1	Do the I well mai	DAS instruments appearintained?	ar to be in good	l condition and						
2	Are all t modem,	the components of the backup, etc)	DAS operation	al? (printers,						
3	Do the a lightnin	nalyzer and sensor sig g protection circuitry?	gnal leads pass	through						
4	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 translatored?	rs, and shelter	properly						
7	Does the	e instrument shelter ha	ave a stable pov	ver source?						
8 Is the instrument shelter temperature controlled?						N/A				
9	Is the m	et tower stable and gro	ounded?			Stable			Grounded	
10	Is the sa	mple tower stable and	grounded?							
11 Tower comments?										

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

Fie	eld Systems Data	Form			<b>F-020</b> 5	58-1500-S7-rev002
Site	ID NIC001	Technician	Eric Hebert	Site Visit Date 10	/02/2015	
D	ocumentation	ad instrument and	aguinmant manuala?			
<u>D</u>	oes the site have the requir	ed instrument and	<u>equipment manuals:</u>		Vac	
Wind Wind Tem Rela Solar Surf Surf Tem Hum Solar Tipp Ozon Filte Filte	d speed sensor d direction sensor perature sensor tive humidity sensor r radiation sensor ace wetness sensor d sensor translator perature translator nidity sensor translator r radiation translator ing bucket rain gauge ne analyzer r pack flow controller r pack MFC power supply Does the site have the requi	Yes       No       N//         Image: I	A Data logge Data logge Strip chart Computer Modem Printer Zero air pu Filter flow Surge prot UPS Lightning Shelter hea Shelter air	r r recorder imp pump ector protection device iter conditioner report forms?		
		Present			Current	
Stati SSR Site HAS Field Calil Ozor Prev	on Log F Ops Manual P I Ops Manual bration Reports ne z/s/p Control Charts rentive maintenance schedu	□       No logb         ✓       □         □       □         □       □         □       □         □       □         □       □         □       □         □       □         □       □         □       □         □       □         □       □         □       □         □       □         □       □	pook			
1	Is the station log properly	completed during	every site visit? 🔲 🛛	o logbook		
2	Are the Site Status Report current?	Forms being comp	oleted and 🔽			
3	Are the chain-of-custody for sample transfer to and from	orms properly used m lab?	d to document			
4	Are ozone z/s/p control cha current?	arts properly comp	oleted and V	/A		
Prov natu	ide any additional explana ral or man-made, that may	tion (photograph o affect the monitor	or sketch if necessary) ring parameters:	regarding condition	is listed abo	we, or any other features,

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

#### Site ID NIC001 Technician Eric Hebert Site Visit Date 10/02/2015 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? ✓ 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	✓	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	$\checkmark$					
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						
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?

✓	N/A
✓	N/A
	N/A

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

F-02058-1500-S8-rev002

Fi	eld Sy	stems Data Fo	orm				<b>F-02058</b>	-02058-1500-S9-rev002		
Sit	Site ID NIC001 Tec		Technicia	Eric Hebert		Site Visit Date	10/02/2015			
	<u>Site ope</u>	eration procedures								
1	Is the filter pack being changed every Tuesday as scheduled?				?⊻	Filter changed mornings				
2	Are the correct	Site Status Report For ly?	rms being con	pleted and filed	✓					
3	Are dat schedul	a downloads and back ed?	ups being per	formed as	✓	No longer required	No longer required			
4	Are gen	neral observations being	g made and r	ecorded? How?	✓	SSRF				
5	Are site supplies on-hand and replenished in a timely fashion?			✓						
6	Are san	nple flow rates recorde	d? How?		✓	SSRF				
7	Are san fashion	nples sent to the lab on ?	a regular sch	edule in a timely						
8	Are filt and shi	ers protected from con pping? How?	tamination dı	ıring handling	✓	Clean gloves on and	d off			
9	Are the operation	site conditions reporte ons manager or staff?	ed regularly to	) the field	✓					
QC	Check P	erformed	Fr	equency			Compliant			
I	Multi-poi	nt MFC Calibrations	✓ Se	miannually						
I	Flow Syst	em Leak Checks	✓ We	ekly						
Filter Pack Inspection										
Flow Rate Setting Checks										
	Visual Ch	neck of Flow Rate Roto	meter 🗹 We	ekly						
I	n-line Fi	lter Inspection/Replace	ement 🗹 As	needed						
5	Sample L	ine Check for Dirt/Wa	ter 🗹 We	ekly						

Field Sys	stems Data Fo	rm	F-02058-1500-S10-rev0			
Site ID	NIC001	Technician	Eric Hebert	Site Visit Date	10/02/2015	

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	Арех	AXMC105LPMDPC	unknown	000594
Infrastructure	Infrastructure	none	none	none
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				
UNL	JND002-Eric Hebert-10/05/2015									
1	10/5/2015	DAS	Campbell	none	CR850	23269				
2	10/5/2015	elevation	Elevation	none	none	none				
3	10/5/2015	Filter pack flow pump	Permotec	none	BL30EB	Illegible				
4	10/5/2015	Flow Rate	Apex	000658	AXMC105LPMDPCV	unknown				
5	10/5/2015	Infrastructure	Infrastructure	none	none	none				
6	10/5/2015	Modem	Sierra wireless	06982	unknown	unknown				
7	10/5/2015	Sample Tower	Aluma Tower	000778	В	AT-212125X77				
8	10/5/2015	siting criteria	Siting Criteria	none	none	None				
9	10/5/2015	Temperature	RM Young	04688	41342	none				

## Flow Data Form

Mfg	Serial Nur	nber Ta	Site	Тес	chnician	Site Visit D	ate Paran	neter	<b>Owner ID</b>
Apex	unknown		UND002	Eri	ic Hebert	10/05/2015	Flow R	late	000658
				Mfg	BIOS	P	arameter Flow	v Rate	
					Serial Number	131010	I	Ier Desc. DIO	3 220-11
					Tfer ID	01417			
					Slope	1.0	00316 Inte	ercept	-0.00540
					Cert Date	1/7	/2015 Col	rrCoff	1.00000
DAS 1:		<b>DAS 2:</b>			Cal Factor Z	ero	-0.02	24	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale	0.99	91	
0.09%	0.23%				Rotometer R	eading:		3	
Desc.	Test type	Input l/m	n Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	-0.02	l/m	l/m	
primary	test pt 1	3.025	3.020	2.99	0.000	3.02	l/m	l/m	-0.03%
primary	test pt 2	3.024	3.020	3.00	0.000	3.02	l/m	l/m	0.00%
primary	test pt 3	3.017	3.010	3.00	0.000	3.02	l/m	l/m	0.23%
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 Rotomet	er Conditio	n	Conditio	n 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	<b>n</b> 4.0 cm		Status	pass	
Sensor Comp	onent Filter De	pth		Conditio	n 0.5 cm		Status	pass	
Sensor Comp	onent Filter Azi	muth		Conditio	n 180 deg		Status	pass	
Sensor Comp	onent System I	Nemo		Conditio	n		Status	pass	

## Temperature Data Form

Mfg	Serial Number Ta	a Site		Techni	chnician		isit Date/	Param	eter	<b>Owner ID</b>	
RM Young	none	UND002		Eric H	ebert	10/05	5/2015	Temper	ature	04688	
			Mfg		Extec	h	Pa	rameter Te	emperature		
				Serial Number		H232679		Tf	er Desc. R	٢D	
				Tfer ID		01228	3	]			
DAS 1. DAS 2.				Slo	pe	1.00564 Inte		ercept -0.21981		1	
Abs Avg Err Abs Max Er Abs Avg Err Abs Ma		Max Er	ax Er Cert Date		1/30/2015 Cor		rCoff 1.00000		0		
0.35	0.44										
UseDesc.	Test type I	nputTmpRaw	InputTm	ImpCorr. OutputTm		Signal OutputSig		gnalEng	OSE Unit	Difference	
primary Temp	b Low Range	-0.17	0.05	5 0.000		-0.3		C	-0.34		
primary Temp	o Mid Range	23.89	23.9	7	0.000		23.7		С	-0.27	
primary Temp	o High Range	43.70	43.6	7	0.000		43.	2	С	-0.44	
Sensor Compone	nt Shield		Cond	ition C	Clean			Status	pass		
Sensor Component Blower			Cond	Condition N/A				Status	pass		
Sensor Component Blower Status Switch				Condition N/A				Status pass			
Sensor Compone	nt System Memo		Cond	Condition				Status	pass		

#### **Infrastructure Data For**

Site ID UND	002 Technician Eri	ic Hebert Site Visit Date 10/05/2015
Shelter Make	Shelter Model	Shelter Size

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	Not 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	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	N/A	Status	pass
Sensor Component	Shelter Door	Condition	N/A	Status	pass
Sensor Component	Shelter Roof	Condition	N/A	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 Bevline	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

## **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.

### F-02058-1500-S1-rev002

Site ID UND002	Technician Eric Hebert	Site Visit Date 10/05	/2015	
Site Sponsor (agency)	EPA	USGS Map		
<b>Operating Group</b>	VT Monitoring Coop	Map Scale		
AQS #		Map Date		
Meteorological Type				
Air Pollutant Analyzer		QAPP Latitude		
<b>Deposition Measurement</b>	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 Step		
Shelter Working Room	Make Mo	odel	Shelter Size	
Shelter Clean	Notes Small footprint site with no she	Iter. Equipment housed in enclo	osure on sample tower.	
Site OK	Notes			
Driving Directions				

UND002

### F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 10/05/2015

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		
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		$\checkmark$

Siting Distances OK

Siting Criteria Comment

Fi	eld Systems Data Form		F-02058-1500-S3-rev002
Site	UND002 Technician Eric Hebert		Site Visit Date 10/05/2015
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?		N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A
3	Are the tower and sensors plumb?	✓	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?		
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)		
6	Is the solar radiation sensor plumb?	✓	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?		N/A
8	Is the rain gauge plumb?	✓	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	✓	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	✓	N/A
11	Is it inclined approximately 30 degrees?	✓	N/A
Pro nat	wide any additional explanation (photograph or sketch if nece ural or man-made, that may affect the monitoring parameters	ssar;	y) regarding conditions listed above, or any other features,

### F-02058-1500-S4-rev002

Site	e ID UND002 Teo	chnician Eric Hebert		Site Visit Date	0/05/2015	]
1	Do all the meterological sensors app condition, and well maintained?	ear to be intact, in good	✓			
2	Are all the meteorological sensors of reporting data?	perational 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 cl scratches?	lean and free of	✓	N/A		
6	Is the surface wetness sensor grid cle	ean and undamaged?	✓	N/A		
7	Are the sensor signal and power cab condition, and well maintained?	bles intact, in good	✓			
8	Are the sensor signal and power cab from the elements and well maintain	ole connections protected ned?				

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	UND002 Technician Eric Hebert		Site Visit Date 10/05/2015
	Siting Criteria: Are the pollutant analyzers and deposition ec	uipi	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	✓	
2	Are the sample inlets 3 - 15 meters above the ground?	✓	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?		
	Pollutant analyzers and deposition equipment operations and	l ma	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓	
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓	
3	Describe ozone sample tube.		N/A
4	Describe dry dep sample tube.		3/8 Bevline by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)		N/A
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?	✓	N/A
8	Are there moisture traps in the sample lines?		Not present
9	Is there a rotometer in the dry deposition filter line, and is it clean?		

Fi	eld Sy	stems Data Fo	orm				<b>F-0</b> 2	2058-15	00-S6-rev002
Site	e ID	UND002	Technician	Eric Hebert		Site Visit Date	10/05/2015	5	
	DAS, sei	nsor translators, and g	eripheral equi	pment operatio	ns an	<u>d maintenance</u>			
1 Do the DAS instruments appear to be in good condition and well maintained?									
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?	mal leads pass t	hrough					
4	4 Are the signal connections protected from the weather and well maintained?								
5	Are the	signal leads connected	to the correct l	DAS channel?					
6	Are the grounde	DAS, sensor translato d?	rs, and shelter J	properly					
7	Does the	instrument shelter ha	we a stable pow	ver source?					
8 Is the instrument shelter temperature controlled?				led?		N/A			
9	Is the m	et tower stable and gro	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	grounded?						
11	Tower c	omments?						•	

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

Fiel	d Systems Data	Foi	rm				<b>F-0</b> 2	2058-	1500-S7-rev002
Site I	D UND002		Technicia	n Eric Heber	t	Site Visit Date 1	0/05/201	5	
Do	<u>cumentation</u>								
Do	es the site have the requi	red in	strument ar	nd equipment	manuals	?			
		Yes	No I	N/A		-	Yes	No	N/A
Wind	speed sensor			<ul> <li>Image: A set of the set of the</li></ul>	Data logg	ger			
Wind	direction sensor			✓	Data logg	ger			$\checkmark$
Temp	erature sensor		<b>&gt;</b>		Strip cha	rt recorder			$\checkmark$
Relati	ive humidity sensor			✓	Compute	r			$\checkmark$
Solar	radiation sensor			✓	Modem			$\checkmark$	
Surfa	ce wetness sensor			✓	Printer				$\checkmark$
Wind	sensor translator			✓	Zero air p	pump			$\checkmark$
Temp	erature translator			✓	Filter flow	v pump		$\checkmark$	
Humi	dity sensor translator			✓	Surge pro	otector			$\checkmark$
Solar	radiation translator			✓	UPS				$\checkmark$
Tippi	ng bucket rain gauge			✓	Lightning	g protection device			$\checkmark$
Ozone	e analyzer			✓	Shelter he	eater			$\checkmark$
Filter	pack flow controller		✓		Shelter ai	r conditioner			$\checkmark$
Filter	pack MFC power supply	у 🗌		✓					
D	oes the site have the requ	uired a	nd most re	cent OC docu	iments and	d report forms?			
	-	Pres	ent				Curre	ent	
Statio	n Log	[	✓						
SSRF									
Site O	ps Manual	[							
HASP		[							
Field	Ops Manual	[							
Calib	ration Reports	[							
Ozone	e z/s/p Control Charts	[							
Preve	ntive maintenance sched	ul [							
1 I	s the station log properly	y comp	leted durin	g every site v	isit? 🔽				
2 A c	2 Are the Site Status Report Forms being completed and current?								
3 A s	Are the chain-of-custody ample transfer to and fr	forms om lab	properly us ?	sed to docum	ent 🗸				
4 A c	Are ozone z/s/p control cl current?	narts p	roperly cor	npleted and		N/A			
Provio natura	de any additional explan al or man-made, that ma	ation ( ly affeo	photograph et the monit	or sketch if oring param	necessary eters:	) regarding conditio	ns listed	above, o	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 Eric Hebert Site Visit Date 10/05/2015 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? ✓ 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	✓	Weekly	$\checkmark$
Translator Zero/Span Tests (climatronics)	✓	N/A	$\checkmark$
Manual Rain Gauge Test	$\checkmark$	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	
Manual Zero/Span Tests		N/A	
Automatic Precision Level Tests		N/A	
Manual Precision Level Test		N/A	$\checkmark$
Analyzer Diagnostics Tests		N/A	
In-line Filter Replacement (at inlet)		N/A	
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	<del>r</del> 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	

F-02058-1500-S8-rev002

Fi	eld Sy	stems Data Fo	rm					F-02058-15	500-S9-rev002
Sit	e ID	UND002	Technic	ian	Eric Hebert		Site Visit Date	10/05/2015	]
	<u>Site ope</u>	ration procedures							
1	Is the fi	ter pack being changed	l every Tu	esd	ay as scheduled?		Filter changed morr	nings	
2	Are the correctl	Site Status Report For y?	ms being o	om	pleted and filed	✓			
3	<ul> <li>Are data downloads and backups being performed as scheduled?</li> <li>Are general observations being made and recorded? He</li> <li>Are site supplies on-hand and replenished in a timely fashion?</li> <li>Are sample flow rates recorded? How?</li> </ul>				ormed as		No longer required		
4	Are gen	eral observations being	g made and	l re	corded? How?	✓	SSRF		
5	Are site fashion	supplies on-hand and r	replenishe	d in	a timely				
6	6 Are sample flow rates recorded? How?				✓	SSRF			
7	Are sam fashion	ples sent to the lab on a	a regular s	sche	dule in a timely				
8	Are filte and ship	ers protected from conta oping? How?	amination	du	ring handling	✓	One set of gloves o	nly	
9	Are the operation	site conditions reported ons manager or staff?	d regularly	y <b>to</b>	the field				
QC	Check P	erformed		Fre	quency			Compliant	
	Multi-poir	nt MFC Calibrations		Serr	niannually				
]	Flow Syste	em Leak Checks		Wee	ekly				
1	Filter Pac	k Inspection		Wee	ekly			$\checkmark$	
1	Flow Rate	Setting Checks		Wee	ekly				
	Visual Ch	eck of Flow Rate Roton	neter 🗹	Wee	ekly			$\checkmark$	
	In-line Fil	ter Inspection/Replacer	nent 🔽	As r	needed				
1	Sample Li	ne Check for Dirt/Wate	er 🗸	Wee	ekly			$\checkmark$	

Field Sy	stems Data Fo	rm	F-02058-1500-S10-rev002				
Site ID	UND002	Technician	Eric Hebert	Site Visit Date	10/05/2015		

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR850	23269	none
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	none	04688

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
GRS	420-Eric H	ebert-10/26/2015				
1	10/26/2015	Computer	Hewlett Packard	none	6730b	USH01700BY
2	10/26/2015	DAS	Environmental Sys Corp	none	8832	A4115K
3	10/26/2015	Elevation	Elevation	None	1	None
4	10/26/2015	Filter pack flow pump	Thomas	none	107CA18	0191007233
5	10/26/2015	flow rate	Tylan	none	FC280SAV	AW9706012
6	10/26/2015	Infrastructure	Infrastructure	none	none	none
7	10/26/2015	Met tower	Rohn	none	unknown	none
8	10/26/2015	MFC power supply	Tylan	03944	RO-32	FP9605010
9	10/26/2015	Modem	US Robotics	none	V.92	unknown
10	10/26/2015	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943903
11	10/26/2015	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450193
12	10/26/2015	Sample Tower	Aluma Tower	90945	В	none
13	10/26/2015	Shelter Temperature	ARS	none	none	none
14	10/26/2015	Siting Criteria	Siting Criteria	None	1	None
15	10/26/2015	Temperature	RM Young	none	41342	7297
16	10/26/2015	Zero air pump	Werther International	none	PC70/4	531385

### **DAS Data Form**

DAS Time Max Error: 0.05

Mfg	Serial Nu	umber Site	1	echnician	Site Visit Date	Parameter	Use Desc.
Environmenta	I Sys A4115K	GRS	6420	Eric Hebert	10/26/2015	DAS	Primary
Das Date:	10/26/2015	Audit Date	10/26/2015	Mfg	Datel	Parameter	DAS
Das Time:	299	Audit Thile	299	Serial Number	4000392	Tfer Desc.	Source generator (D
Low Channe	l:	High Channel	:	Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0000	0.000	0.0000	0.0001	Cert Date	1/22/201	5 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	86590148	Tfer Desc.	DVM
				Tfer ID	01310		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/22/201	5 CorrCoff	1.00000
Channel	Input I	OVM Output	DAS Output	InputUnit	OutputUnit	Difference	
2	0.0000	0.0000	0.0000	V	V	0.0000	
2	0.1000	0.1000	0.1000	V	V	0.0000	
2	0.3000	0.3000	0.3000	V	V	0.0000	
2	0.5000	0.5000	0.5000	V	V	0.0000	
2	0.7000	0.7000	0.7000	V	V	0.0000	
2	0.9000	0.9000	0.9001	V	V	0.0001	
2	1.0000	1.0000	1.0001	V	V	0.0001	

## Flow Data Form

Mfg	Serial Nun	nber Tag	Site	Te	chnician	Site Visit D	Date Param	eter	Owner ID
Tylan	AW970601	12	GRS420	Er	ic Hebert	10/26/2015	5 flow rat	e	none
Mfg	Tylan				Mfg	BIOS	P	arameter Flow	w Rate
SN/Owner ID	FP9605010	03944			Serial Number	131818	Т	fer Desc. BIC	S 220-H
Parameter	MFC power sup	oply			Tfer ID	01417			
					Slope	1.	00316 Inte	ercept	-0.00540
					Cert Date	1/7	7/2015 Cor	rCoff	1.00000
DAS 1:		<b>DAS 2:</b>			Cal Factor Z	ero	0.45	8	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale	5.38	1	
1.04%	1.48%				<b>Rotometer</b> R	eading:		3	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	-0.34	-0.3060	0.16	l/m	l/m	
primary	leak check	0.000	0.000	-0.34	-0.3060	0.16	l/m	l/m	
primary	test pt 1	3.054	3.050	2.58	2.5870	3.01	l/m	l/m	-1.48%
primary	test pt 2	3.039	3.030	2.58	2.5870	3.00	l/m	l/m	-0.86%
primary	test pt 3	3.032	3.030	2.58	2.5870	3.01	l/m	l/m	-0.79%
Sensor Comp	onent Leak Tes	st		Conditio	on		Status	pass	
Sensor Comp	onent Tubing C	ondition		Conditio	Good		Status	pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Fair		Status	pass	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	n See comments	3	Status	pass	
Sensor Comp	onent Filter Dis	tance		Conditio	5.0 cm		Status	pass	
Sensor Comp	onent Filter Dep	oth		Conditio	0.0 cm		Status	pass	
Sensor Comp	onent Filter Azi	muth		Conditio	n 90 deg		Status	pass	
Sensor Comp	onent System N	/lemo		Conditio	on		Status	pass	

## **Ozone Data Form**

Mfg S	erial Number Tag	Site	Те	chnician		Site Visit D	ate Paramo	eter Owner ID
ThermoElectron Inc	1023943903	GRS420	E	ric Hebert		10/26/2015	Ozone	none
Slope: 0. Intercept -0. CorrCoff 1.	97926Slope:35728Intercept00000CorrCoff	0.0000	0	Mfg Serial N Tfer ID	lumber	ThermoElec 49CPS-700 01110	tron Inc Pa 08-364 Tf	fer Desc. Ozone primary stan
DAS 1: A Avg % Diff: A Ma 2.8%	DAS 2: A Avg % 3.6%	6Dif A Max	% Di	Slope Cert Da	ıte	1.0 9/21	01130 Inter /2015 Corr	rcept -0.21263 rCoff 1.00000
UseDescription primary primary primary primary	ConcGroup           1           2           3           4	Tfer Raw 0.41 27.41 55.36 78.56	Tfer 0. 27 54	Corr 61 .31 .95	Si 0.2 26. 53. 75	te ppl 27 ppl 34 ppl 45 ppl 94 ppl	Site Unit	PctDifference
primary	5	104.57	103	.89 8.61	101	.10 ppl	)	-2.42%
Sensor Component Sensor Component Sensor Component	Sample Train Inlet Filter Conditio	n	Conditi Conditi Conditi	on Good on Clean on N/A			Status Status Status Status	pass pass pass
Sensor Component	Offset		Conditi	on 0.000			Status	pass
Sensor Component	Span		Conditi	<b>on</b> 1.000			Status	pass
Sensor Component	Zero Voltage		Conditi	on 0.000	1		Status	pass
Sensor Component	Fullscale Voltage		Conditi	on 1.000			Status	pass
Sensor Component	Cell A Freq.		Conditi	on 86.4 k	κHz		Status	pass
Sensor Component	Cell A Noise		Conditi	<mark>on</mark> 0.8 pp	b		Status	pass
Sensor Component	Cell A Flow		Conditi	on 0.69 l	pm		Status	pass
Sensor Component	Cell A Pressure		Conditi	on 689.1	mmHg		Status	pass
Sensor Component	Cell A Tmp.		Conditi	on 31.9 (	)		Status	pass
Sensor Component	Cell B Freq.		Conditi	on 85.7 k	Hz		Status	pass
Sensor Component	Cell B Noise		Conditi	<mark>on</mark> 0.8 pp	b		Status	pass
Sensor Component	Cell B Flow		Conditi	on 0.71 l	pm		Status	pass
Sensor Component	Cell B Pressure		Conditi	on 688.2	mmHg		Status	pass
Sensor Component	Cell B Tmp.		Conditi	on			Status	pass
Sensor Component	Line Loss		Conditi	on Not te	sted		Status	pass
Sensor Component	System Memo		Conditi	on			Status	pass

# **Temperature Data Form**

Mfg	Serial Number	Tag Site	r	<b>Fechn</b> i	ician	Site V	isit Date	Param	eter	Owner ID
RM Young	7297	GRS420		Eric H	ebert	10/26	6/2015	Temper	ature	none
				Mf	g	Fluke		Pa	rameter Te	emperature
				Ser	ial Number	20850	)85	Tf	fer Desc. R	ſD
				Tfe	er ID	01226	6			
DAS 1:	DAS	2:		Slo	ре		1.0010	5 Inte	rcept	-0.07989
Abs Avg Err	Abs Max Er Abs	Avg Err Abs	Max Er	Ce	rt Date		1/30/201	5 Cor	rCoff	1.00000
0.15	0.23									
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference
primary 7	Femp Low Range	0.04	0.12		0.0000		0.2	2	С	0.12
primary 7	Femp Mid Range	24.78	24.83	3	0.0000		24.	7	С	-0.09
primary 7	Гemp High Range	47.31	47.34	1	0.0000		47.	1	С	-0.23
Sensor Comp	onent Shield		Condi	tion N	loderately cle	an		Status	pass	
Sensor Comp	onent Blower		Condi	tion F	unctioning			Status	pass	
Sensor Comp	onent Blower Status	Switch	Condi	tion N	I/A			Status	pass	
Sensor Comp	onent System Memo		Condi	tion S	See comments	;		Status	pass	

# Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	GRS420	Eric Hebert	10/26/2015	Shelter Temperature	none
DAS 1:	DAS 2:	-	Mfg	Fluke	Parameter She	lter Temperatur
Abs Avg Err Abs	0.47 Abs Avg	Err Abs Max Er	Serial Number	2085085	Tfer Desc. RTD	)
			Tfer ID	01226		
			Slope	1.0010	5 Intercept	-0.07989
			Cert Date	1/30/201	5 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.71	22.77	0.000	22.3	С	-0.47
primary	Temp Mid Range	21.96	22.02	0.000	22.1	С	0.03

#### Infrastructure Data For

Site ID	GRS420	Technicia Eric Heb	ert Site Visit Date 10/26/2015
Shelter I	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2961-1)	640 cuft
17 Contractor (B. C. C. March			

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

## **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	GRS420	Eric Hebert	10/26/2015	Moisture Present	Tylan	648		
The filter sample tubing has drops of moisture in low sections outside the shelter.								

### F-02058-1500-S1-rev002

Site ID GRS420	Technician Eric Hebert	Site Visit Date 10/2	6/2015		
Site Sponsor (agency)	NPS	USGS Map	Blockhouse		
<b>Operating Group</b>	NPS	Map Scale			
AQS #	47-009-0101	Map Date			
Meteorological Type	R.M. Young				
Air Pollutant Analyzer	Ozone, Hg, SO2, NOx, PM2.5, PM10,	QAPP Latitude	35.6331		
<b>Deposition Measurement</b>	dry	QAPP Longitude	-83.9422		
Land Use	woodland - mixed	<b>QAPP Elevation Meters</b>	793		
Terrain	complex (ridge-top)	QAPP Declination			
Conforms to MLM	No	QAPP Declination Date			
Site Telephone		Audit Latitude	35.633482		
Site Address 1	Look Rock	Audit Longitude	-83.941606		
Site Address 2	Foothills Parkway	Audit Elevation	801		
County	Blount	Audit Declination	5.5		
City, State	Maryville, TN	Present			
Zip Code	37803	Fire Extinguisher 🗹	inspected Sept 2015		
Time Zone	Eastern	First Aid Kit			
Primary Operator		Safety Glasses			
Primary Op. Phone #		Safety Hard Hat 🔽			
Primary Op. E-mail		Climbing Belt			
Backup Operator		Security Fence			
Backup Op. Phone #		Secure Shelter			
Backup Op. E-mail		Stable Entry Step 🗹			
Shelter Working Room	Make Ekto M	Iodel         8810 (s/n 2961-1)         Shelter Size         640 cuft			
Shelter Clean	Notes The shelter is in good condition	n, clean, neat, and well organi	zed.		
Site OK	Notes				
Driving Directions From miles gate.	Driving Directions From Maryville proceed east on 321 and turn right (south) onto the Foothills Parkway. Continue approximately 11 miles. Just before reaching the Look Rock parking area and trail, turn right on a gravel road through a locked NPS gate. The site is approximately 200 meters up the trail on the right.				

**GRS420** 

### F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 10/26/2015

Potential Interferent	Minimum Distance From Measurement	Pass =	
	Apparatus		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	35 km	
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 located on a ridge top with the sampling height at the tops of the trees on the ridge. The site is within 40 km of Knoxville and other major sources.

Fi	eld Systems Data Form			F-02058-15	500-S3-rev002
Site	e ID GRS420 Technician Eric	Hebert	Site Visit Date	10/26/2015	]
1	Are wind speed and direction sensors sited so as to being influenced by obstructions?	o avoid 🗸	N/A		
2	Are wind sensors mounted so as to minimize towe (i.e. wind sensors should be mounted atop the tow horizontally extended boom >2x the max diameter tower into the prevailing wind)	r effects? er or on a r of the	N/A		
3	Are the tower and sensors plumb?		N/A		
4	Are the temperature shields pointed north or posi avoid radiated heat sources such as buildings, wal	tioned to Is, etc?			
5	Are temperature and RH sensors sited to avoid ur conditions? (i.e. ground below sensors should be n surface and not steeply sloped. Ridges, hollows, ar standing water should be avoided)	natural atural nd areas of			
6	Is the solar radiation sensor plumb?	$\checkmark$	N/A		
7	Is it sited to avoid shading, or any artificial or refl	ected light? ✓	N/A		
8	Is the rain gauge plumb?		N/A		
9	Is it sited to avoid sheltering effects from building towers, etc?	s, trees,	N/A		
10	Is the surface wetness sensor sited with the grid su facing north?	irface 🗹	N/A		
11	Is it inclined approximately 30 degrees?		N/A		

The temperature sensor has been relocated from 10 meters to approximately 3.9 meters above the ground. Previously recorded temperature data are not comparable to current data labeled as temperature.

### F-02058-1500-S4-rev002

Site	e ID	GRS420	Technician	Eric Hebert		Site Visit Date	10/26/2015	
1 2	<ol> <li>Do all the meterological sensors appear to be intact, in good condition, and well maintained?</li> <li>Are all the meteorological sensors operational online, and reporting data?</li> </ol>			<b>&gt;</b>				
3	Are the	shields for the temper	ature and RH s	ensors clean?	✓			
4	Are the	aspirated motors wor	king?		✓			
5	Is the sol scratche	lar radiation sensor's s?	lens clean and t	free of	✓	N/A		
6	Is the su	rface wetness sensor g	grid clean and u	indamaged?	✓	N/A		
7	Are the s	sensor signal and pow n, and well maintaine	er cables intact d?	, in good	✓			
8	Are the s from the	sensor signal and pow e elements and well ma	er cable connec aintained?	ctions protected	✓			

Field Systems Data Form			F-02058-1500-S5-rev002							
Site	ID GRS420 Technician Eric Hebert		Site Visit Date 10/26/2015							
	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	l ma	intenance							
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓								
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓								
3	Describe ozone sample tube.		1/4 teflon by 12 meters							
4	Describe dry dep sample tube.		3/8 teflon by 12 meters							
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	✓	At inlet only							
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓								
7	Is the zero air supply desiccant unsaturated?									
8	Are there moisture traps in the sample lines?									
9	Is there a rotometer in the dry deposition filter line, and is it clean?									
Fi	eld Sy	stems Data Fo	orm			<b>F-02</b>	058-15	500- <b>S6-rev</b> 002		
------	--	---	------------------	----------------	-------------	---------------	-----------	------------------------	--------------	------------------------
Site	e ID	GRS420	Technician	Eric Hebert		Site Visit	Date 10	/26/2015		
	DAS, sei	nsor translators, and p	peripheral equi	pment operatio	<u>ns a</u>	nd maintenand	<u>ce</u>			
1	Do the E well mai	DAS instruments appea intained?	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?	✓	Met sensors of	nly					
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 d?	rs, and shelter	properly	✓					
7	Does the	e instrument shelter ha	ave a stable pow	ver source?	✓					
8	Is the in	strument shelter temp	erature control	led?						
9	Is the m	et tower stable and gro	ounded?			Stable		•	Grounded	d
10	Is the sa	mple tower stable and	grounded?							
11	Tower c	omments?				Sample tower	grounde	d to shel	ter, and sli	lightly bent at hinge.

Field S	ystems Data Fo	orm					<b>F-02</b>	2058-	1500-S7-rev002
Site ID	GRS420	Tec	hnician	Eric Hebert		Site Visit Date 1	0/26/2015	5	
Docume	ntation								
<b>Does the</b>	site have the required i	instrun	nent and	equipment ma	nuals?				
Wind speed Wind direc Temperatu Relative hu Solar radia Surface wet Wind senso Temperatu Humidity so Solar radia Tipping bu Ozone anal Filter pack	site have the required         Yes         I sensor       Image: Sensor         re sensor       Image: Sensor         midity sensor       Image: Sensor         tion sensor       Image: Sensor         to sensor       Image: Sensor         r translator       Image: Sensor         re translator       Image: Sensor         tion translator       Image: Sensor		0     N/2       1     1	A Data Data Strij Con Moc Prin Zero Filto Surg UPS Ligh Shel Shel	a logger a logger p chart nputer lem nter o air pu er flow ge proto thining p lter hea lter air	r recorder imp pump ector protection device ter conditioner	Yes ✓ □ □ □ □ □ ✓ ✓ ✓ ✓ ✓	No	N/A
Filter pack	MFC power supply								
<b>Does th</b>	e site have the required	l and n	nost rece	nt QC documer	its and	<u>report forms?</u>			
	Pr	esent					Curre	nt	
Station Log		$\checkmark$	Datavie	w					
SSRF		$\checkmark$					$\checkmark$		
Site Ops M	anual	$\checkmark$					$\checkmark$		
HASP							$\checkmark$		
Field Ops M	Ianual	$\checkmark$					$\checkmark$		
Calibration	Reports	$\checkmark$	4/30/20	15			$\checkmark$		
Ozone z/s/p	<b>Control Charts</b>								
Preventive	maintenance schedule								
1 Is the	station log properly con	npleted	l during (	every site visit?	✓ Da	ataview			
2 Are th curren	e Site Status Report Fo t?	rms be	ing comp	oleted and	✓ Fl	ow & observation se	ections		
3 Are th sample	e chain-of-custody forn e transfer to and from l	ıs prop ab?	erly used	l to document					
4 Are oz curren	one z/s/p control charts t?	prope	rly comp	leted and		ontrol charts not use	ed		
Provide any natural or 1	v additional explanation nan-made, that may afi	ı (phot fect the	ograph o monitor	r sketch if nece ing parameters	ssary)	regarding conditio	ns listed	above, o	or any other features,

#### F-02058-1500-S8-rev002

Site	ID	GRS420	Technician	Eric Hebert	S	Site Visit Date	10/26/2015	
1	<u>Site ope</u> Has the course?	<u>ration procedures</u> site operator attende If yes, when and who	d a formal CAS instructed?					
2	Has the training	backup operator atte course? If yes, when	ended a formal ( and who instru	CASTNET cted?				
3	Is the sit schedule	e visited regularly on ?	the required T	uesday				
4	Are the s flollowed	standard CASTNET of by the site operator?	operational pro	cedures being				
5	Is the sit the requ	e operator(s) knowled ired site activities? (in	lgeable of, and a cluding docum	able to perform entation)				

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

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

Frequency

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

<b>OC</b>	Check	Performed	
Qυ	Check	I CI IOI IIICu	

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

requency	
Monthly and semiannually	
Daily	
Weekly	
Daily	
Alarm values only	
Weekly	
N/A	•
Weekly	
As needed	

- 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 sample train is leak-tested each week after the inlet filter is changed.

#### Compliant

#### F-02058-1500-S9-rev002

Site	ID	GRS420	Techni	cian	Eric Hebert		Site Visit Date	10/26/2015			
	Site ope	ration procedures									
1	Is the fil	ter pack being change	ed every T	uesda	y as scheduled?		Filter changed morinings in winter, changed in afternoon in summer				
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 gen	eral observations bein	ig made an	d rec	orded? How?		SSRF				
5	Are site fashion?	supplies on-hand and	replenishe	ed in	a timely	✓					
6	Are sample flow rates recorded? How?						SSRF				
7	Are sam fashion?	ples sent to the lab or	a regular	schee	dule in a timely	✓					
8	Are filte and ship	ers protected from com oping? How?	itaminatio	n dur	ing handling	✓	Clean gloves on and off				
9	Are the operation	site conditions report ons manager or staff?	ed regular	ly to t	he field						
QC	Check Po	erformed		Freq	uency			Compliant			
Ν	Iulti-poir	nt MFC Calibrations	$\checkmark$	Sem	iannually						
F	low Syste	em Leak Checks	$\checkmark$	Wee	kly						
F	Filter Pack Inspection										
F	Flow Rate Setting Checks       Image: Market Setting Checks										
V	Visual Check of Flow Rate Rotometer Weekly										
Ir	In-line Filter Inspection/Replacement 🗹 As needed										
S	ample Li	ne Check for Dirt/Wa	ter 🗸	Wee	kly						
Provi	ide anv a	dditional explanation	(photogra	ph or	· sketch if neces	sarv	) regarding condition	ons listed above, or a	v other features.		

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

Site operation and filter handling has improved since the previous audit visit.

GRS420

#### F-02058-1500-S10-rev002

Site ID

Technician Eric Hebert

Site Visit Date 10/26/2015

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6730b	USH01700BY	none
DAS	Environmental Sys Cor	8832	A4115K	none
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	0191007233	none
flow rate	Tylan	FC280SAV	AW9706012	none
Infrastructure	Infrastructure	none	none	
Met tower	Rohn	unknown	none	none
MFC power supply	Tylan	RO-32	FP9605010	03944
Modem	US Robotics	V.92	unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	1023943903	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1130450193	none
Sample Tower	Aluma Tower	В	none	90945
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	7297	none
Zero air pump	Werther International	PC70/4	531385	none

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
LRLI	17-Sandy	Grenville-11/01/2015				
1	11/1/2015	Computer	Dell	07010	D520	unknown
2	11/1/2015	DAS	Campbell	000344	CR300	2123
3	11/1/2015	Elevation	Elevation	None	1	None
4	11/1/2015	Filter pack flow pump	Thomas	01133	107CA18	1088003123
5	11/1/2015	Flow Rate	Арех	000460	AXMC105LPMDPCV	42229
6	11/1/2015	Infrastructure	Infrastructure	none	none	none
7	11/1/2015	Modem	Raven	06383	V4221-V	0802325832
8	11/1/2015	Ozone	ThermoElectron Inc	000701	49i A1NAA	1030244808
9	11/1/2015	Ozone Standard	ThermoElectron Inc	000444	49i A3NAA	CM08200020
10	11/1/2015	Sample Tower	Aluma Tower	03446	A	none
11	11/1/2015	Shelter Temperature	Campbell	none	107-L	none
12	11/1/2015	Siting Criteria	Siting Criteria	None	1	None
13	11/1/2015	Temperature	RM Young	06245	41342VC	12792
14	11/1/2015	Zero air pump	Werther International	06904	C 70/4	000821901

#### **DAS Data Form**

1.0000

7

0.9993

**DAS Time Max Error:** 

0.02

**Serial Number** Site Technician Site Visit Date Parameter Use Desc. Mfg Campbell 2123 LRL117 Sandy Grenville 11/01/2015 DAS Primary 11/1 /2015 11/1 /2015 Das Date: Audit Date Datel **Parameter** DAS Mfg 10:51:00 10:51:01 Das Time: Audit Time Tfer Desc. Source generator (D 15510194 Serial Number 305 305 Das Day: Audit Day 01320 Tfer ID Low Channel: **High Channel:** Avg Diff: Max Diff: Avg Diff: Max Diff: 0.0000 0.0000 0.0000 0.0000 Parameter DAS Fluke Mfg Tfer Desc. DVM Serial Number 95740135 01311 Tfer ID Slope 1.00000 Intercept 0.00000 1.00000 1/22/2015 **Cert Date** CorrCoff Channel Input DVM Output DAS Output InputUnit OutputUnit Difference 7 0.0000 V 0.0000 0.0000 0.0000 V 7 0.0999 0.0999 V V 0.0000 0.1000 7 V 0.3000 0.2997 0.2997 V 0.0000 V 0.5000 V 0.0000 7 0.4996 0.4996 7 0.7000 0.6995 0.6995 V V 0.0000 7 0.9000 0.8994 0.8994 V V 0.0000

0.9993

V

V

0.0000

# Flow Data Form

Apex         42229         LRL117         Sandy Grenville         11/01/2015         Flow Rate         000460           Mfg         BIOS         Parameter/Flow Rate         000460           Serial Number         103471         Tfer Desc. [n8xu6           Tfer ID         01420         Slope         0.99664           Cert Date         2/9/2016         CorrCoff         0.99996           Mfg         BIOS         Parameter/Flow Rate         0.03078           Scrial Number         103424         Tfer Desc. [BIOS cell         0.03078           Mfg         BIOS         Parameter/Flow Rate         0.03078           Scrial Number         103424         Tfer Desc. [BIOS cell         Tfer Desc. [BIOS cell           Tfer ID         01410	Mfg	Serial Number Tag Site Te			Тес	hnician	Site Visit D	ate Parameter		<b>Owner ID</b>	
Mfg       BIOS       Parameter/Flow Rate         Serial Number       103471       Tfer Desc. nexus         Tfer ID       01420       0.96664       Intercept       0.03078         Cert Date       2/5/2015       CorrCoff       0.99996         Mfg       BIOS       Parameter/Flow Rate       0.99996         Oxore Corr Date       2/5/2015       Corr Coff       0.99996         DAS 1:       DAS 2:       Cal Factor Full Scale       0.9058         0.05%       0.25%       Output Signal Output Signal Net/Difference       0.9998         Primary pump off       0.000       0.000       0.000       0.000       0.000         primary eak check       0.000       0.000       0.000       0.000       1/m       1/m         primary test pt 1       1.572       1.600       1.52       1.520       1.50       1/m       1/m </td <td>Apex</td> <td>42229</td> <td></td> <td>LRL117</td> <td>Sa</td> <td>ndy Grenville</td> <td>11/01/2015</td> <td>Flow</td> <td>Rate</td> <td>000460</td>	Apex	42229		LRL117	Sa	ndy Grenville	11/01/2015	Flow	Rate	000460	
Nrg       Instruction         Serial Number       103471         Tfer ID       01420         Slope       0.96664         Intercept       0.03078         Cert Date       2/5/2015         CorrCoff       0.99996         Mfg       BIOS         Parameter/Flow Rate         Scrial Number       103424         Tfer DD       01420         Mfg       BIOS         Parameter/Flow Rate         Scrial Number       103424         Tfer DD       01420         Tfer DD       01410         Stope       0.96664         Axg % Dif       A Max % Di         Cart Date       2/5/2015         CorrCoff       0.99996         DAS 1:       DAS 2:         Cart Date       2/5/2015         CorrCoff       0.99996         Axg % Dif A Max % Di       A Axg %Dif         A bag % Diff A Max % Di       A Arg % Dif         MidDisp.       OutputSignal Output S E         Desc.       Test type         Input Um       Input Orn         primary       test pi 1       1.574         Leak Test       Condition       1.520				Γ	Mfσ	BIOS	BIOS		w Rate		
Scrint Number         103471         Ther Desc, flexus           Tfer ID         01420            Slope         0.96664         Intercept         0.03078           Cert Date         2/5/2015         CorrCoff         0.99996           Mfg         BIOS         Parameter/Flow Rate           Serial Number         103424         Tfer Desc, BIOS cell           Tfer ID         01410             Sope         0.96664         Intercept         0.03078           Cert Date         2/5/2015         CorrCoff         0.99996           DAS 1:         DAS 2:         Cal Factor Zero         0           Cert Date         2/5/2015         CorrCoff         0.99996           DAS 6         6.05%         6.25%         0         0           Rotometer Reading:         1.5         0         0.000         0.000           Primary         pump off         0.000         0.000         0.000         0.000           primary         Lak check         0.000         0.000         0.000         1.52         1.520         1.50         1/m         1/m         -6.25%           primary         Lak check         0.000         0.000						·····5	400474				
Tfer ID       01420         Slope       0.96664       Intercept       0.03078         Cert Date       2/5/2015       CorrCoff       0.99996         Mfg       BIOS       Parameter Flow Rate         Serial Number       103424       Tfer Des. BIOS cell         Tfer ID       01410       103424       Tfer Des. BIOS cell         Sope       0.96664       Intercept       0.03078         Cert Date       2/5/2015       CorrCoff       0.99996         DAS 1:       DAS 2:       Cal Factor Zero       0         Cert Date       2/5/2015       CorrCoff       0.99996         6.05%       6.25%       Cal Factor Zero       0         Desc.       Test type       Input I/m Input Corr       MfcDisp.       OutputSignall Output S E InputUnit       OutputSignall PetDifference         primary       Lash check       0.000       0.000       0.000       0.000       I/m       Mim         primary       Lash check       0.000       0.000       0.000       I/m       Mim       6.25%         Sensor Component       Lash check       0.000       0.000       0.000       I/m       Mim       6.25%         Sensor Component       I/m						Serial Number	103471		Tfer Desc. ne	xus	
Siope       0.96664       Intercept       0.03078         Cert Date       2/5/2015       CorrCoff       0.99996         Mfg       BIOS       Parameter       Flow Rate         Serial Number       103424       Tfer Desc. BIOS cell       Tfer         Tfer ID       01410						Tfer ID	01420				
Cert Date       2/5/2015       Corr Coff       0.99996         Mfg       BIOS       Parameter       Flow Rate         Serial Number       103424       Tfer Dec.       BIOS         Tfer ID       01410						Slope	0.9	96664 In	tercept	0.03078	
Mfg       BIOS       Parameter Flow Rate         Serial Number       103424       Tfer Desc. BIOS cell         Tfer ID       01410         Slope       0.96664       Intercept       0.03078         Cert Date       2/5/2015       CorrCoff       0.99996         A Xg % Diff: A Max % Di       A Xg %Dif       A Max % Di       Cal Factor Full Scale       0.98         6.05%       6.25%       Cal Factor Scale       0.98       Rotometer Reading:       1.5         Desc:       Test type       Input I/m       Input Corr       MfcDisp.       OutputSignal       Output Signal PctDifference         primary       pump off       0.000       0.000       0.000       0.000       1/m       1/m       -6.25%         primary       test pt 1       1.574       1.600       1.52       1.520       1.50       1/m       1/m       -6.25%         primary       test pt 2       1.575       1.600       1.52       1.50       1/m       1/m       -5.66%         Sensor Component       Tubing Condition       Condition       Good       Status       pass         Sensor Component       Filter Position       Condition       Good       Status       pass						Cert Date	2/5	/2015 C	orrCoff	0.99996	
Serial Number         103424         Tfer Desc. BIOS cell           Tfer ID         01410         10410           Slope         0.96664         Intercept         0.03078           Cert Date         2/5/2015         CorrCoff         0.99996           DAS 1:         DAS 2:         Cal Factor Full Scale         0.98           6.05%         6.25%         Cal Factor Full Scale         0.98           6.05%         6.25%         Cal Factor Full Scale         0.98           Primary         Input //m Input Corr         MfcDisp.         OutputSignal         OutputSignal           Primary         Leak check         0.000         0.000         0.000         V/m         V/m           primary         Leak check         0.000         0.000         0.000         V/m         V/m         -6.25%           primary         Leak Check         0.000         0.000         0.000         V/m         V/m         -6.25%           primary         Leak Test         Condition         Good         Scano         V/m         V/m         -6.25%           sensor Component         Leak Test         Condition         Good         Status         pass         Scano           Sensor Component						Mfg	BIOS		Parameter Flo	w Rate	
Tfer ID       01410         Slope       0.96664       Intercept       0.03078         Cert Date       2/5/2015       CorrCoff       0.99996         DAS 1:       DAS 2:       Cal Factor Zero       0         A vg % Diff: A Max % Di       A Avg %Dif       A Max % Di       Cal Factor Full Scale       0.98         6.05%       6.25%       Cal Factor Full Scale       0.98         Pose:       Test type       Input I/m       Input Corr       MfcDisp.       Output Signal       Output Signal       PetDifference         primary       pump off       0.000       0.000       0.000       0.000       I/m       I/m         primary       test pt 1       1.574       1.600       1.52       1.520       1.50       I/m       I/m       -6.25%         primary       test pt 2       1.572       1.500       1.52       1.520       1.50       I/m       I/m       -6.25%         primary       test pt 3       1.572       1.500       1.52       1.520       1.50       I/m       I/m       -6.25%         Sensor Component       Fubir Condition       Good       Setaus       pass       Setaus       pass         Sensor Component       Fubir C						Serial Number	103424		Tfer Desc. Blo	DS cell	
Slope       0.96664       Intercept       0.03078         Cert Date       2/5/2015       CorrCoff       0.99996         DAS 1:       DAS 2:       Cal Factor Zero       0         A vg % Diff: A Max % Di       A Avg %Dif       A Max % Di       Cal Factor Full Scale       0.99         6.05%       6.25%       Cal Factor Full Scale       0.99       0.96         Desc.       Test type       Input I/m       Input Corr       MfcDisp.       Output Signal       Output S E       InputUnit       OutputSignal       OutputSignal       Primary         primary       pump off       0.000       0.000       0.000       0.000       I/m       I/m       I/m       Primary						Tfer ID	01410				
Cert Date       2/5/2015       CorrCoff       0.99996         DAS 1:       DAS 2:       Cal Factor Zero       0         A vg % Diff: A Max % Di       A Avg %Dif       A Max % Di       Cal Factor Full Scale       0.98         6.05%       6.25%       Rotometer Reading:       1.5         Desc.       Test type       Input I/m Input Corr       MfcDisp.       Output Signal Output S E       InputUnit       Output Signal PetDifference         primary       pump off       0.000       0.00       0.000       0.00       Vm       Vm         primary       test pt 1       1.574       1.600       1.52       1.50       Vm       Vm       -6.25%         primary       test pt 2       1.575       1.600       1.52       1.50       Vm       Vm       -6.25%         primary       test pt 2       1.575       1.600       1.52       1.50       Vm       Vm       -6.25%         sensor Component       Leak Test       Condition       Good       Status       pass       Sensor Component       Status       pass         Sensor Component       Rotometer Condition       Condition       Good       Status       pass         Sensor Component       Rotometer Condition						Slone	0.9	)6664 In	tercent	0.03078	
DAS 1:       DAS 2:       Cal Factor Zero       0         A vg % Diff: A Max % Di       A Avg %Dif       A Max % Di       Cal Factor Zero       0         6.05%       6.25%       Cal Factor Full Scale       0.98         6.05%       6.25%       Rotometer Reading:       1.5         Desc.       Test type       Input I/m       Input Corr       MfcDisp.       OutputSignal       Output S E       InputUnit       OutputSignal       Petropic         primary       pump off       0.000       0.000       0.000       0.000       I/m       I/m         primary       test pt 1       1.574       1.600       1.52       1.50       I/m       I/m       -6.25%         primary       test pt 2       1.575       1.600       1.52       1.50       I/m       I/m       -6.25%         primary       test pt 3       1.572       1.590       1.52       1.50       I/m       I/m       -6.25%         Sensor Component       Leak Test       Condition       Good       Status       pass       Sensor       Status       pass         Sensor Component       Filter Position       Condition       Good       Status       pass       Sensor       Status       pass <td></td> <td></td> <td></td> <td></td> <td></td> <td>Cart Data</td> <td>2/5</td> <td>/2015</td> <td></td> <td>0 99996</td>						Cart Data	2/5	/2015		0 99996	
DAS 1:       DAS 2:       Cal Factor Zero       0         A Avg % Diff: A Max % Di       A Avg % Diff: A Max % Di       A Avg % Diff: A Max % Di       Cal Factor Full Scale       0.98         6.05%       6.25%       Cal Factor Full Scale       0.98         6.05%       6.25%       Cal Factor Full Scale       0.98         Desc.       Test type       Input I/m       Input Corr       MfcDisp.       OutputSignal       Output S E       InputUnit       OutputSignal       Perturn I         primary       pump off       0.000       0.000       0.000       0.000       Vm       Vm         primary       leak check       0.000       0.000       0.000       0.000       Vm       Vm       -6.25%         primary       test pt 1       1.574       1.600       1.52       1.50       Vm       Vm       -6.25%         primary       test pt 2       1.575       1.600       1.52       1.50       Vm       Vm       -6.25%         primary       test pt 3       1.572       1.590       1.52       1.50       Vm       Vm       -6.25%         Sensor Component       Tubing Condition       Condition       Good       Status       pass         Sensor Compon							2,0			0.00000	
A Avg % Diff: A Max % Di       A Avg %Dif       A Max % Di       Cal Factor Full Scale       0.98         6.05%       6.25%       Rotometer Reading:       1.5         Desc.       Test type       Input I/m       Input Corr       MfcDisp.       OutputSignal       Output S E       InputUnit       OutputSignal/PetDifference         primary       pump off       0.000       0.000       0.000       0.000       1/m       1/m       1/m         primary       leak check       0.000       0.000       0.000       0.000       1/m       1/m       -6.25%         primary       test pt 1       1.574       1.600       1.52       1.520       1.50       1/m       1/m       -6.25%         primary       test pt 2       1.575       1.600       1.52       1.50       1/m       1/m       -6.25%         primary       test pt 3       1.572       1.590       1.52       1.50       1/m       1/m       -5.66%         Sensor Component       Leak Test       Condition       Good       Status       pass       Sensor       Sensor       Sensor       Status       pass         Sensor Component       Filter Position       Condition       Good       Status       pass	DAS 1: DAS 2:				Cal Factor Z	ero		0			
6.05%       6.25%       Rotometer Reading:       1.5         Desc.       Test type       Input I/m       Input Corr       MfcDisp.       OutputSignal       Output S E       InputUnit       OutputSignal       PetDifference         primary       pump off       0.000       0.000       0.000       0.000       0.00       I/m       I/m       I/m         primary       leak check       0.000       0.000       0.000       0.000       0.00       I/m       I/m       I/m         primary       leak check       0.000       0.000       0.000       0.000       0.00       I/m       I/m       I/m         primary       test pt 1       1.574       1.600       1.52       1.520       1.50       I/m       I/m       -6.25%         primary       test pt 3       1.572       1.590       1.52       1.50       I/m       I/m       -6.25%         Sensor Component       Leak Test       Condition       Good       Status       pass       Sensor       Status       pass         Sensor Component       Filter Position       Condition       Good       Status       pass       Sensor       Status       pass         Sensor Component       Filter Di	A Avg % Diff: .	A Max % Di	A Avg %	Dif A Max	% Di	Cal Factor F	ull Scale	0	.98		
Desc.         Test type         Input I/m         Input Corr_         MfcDisp.         OutputSignal         Output S E         InputUnit         OutputSignal         PetDifference           primary         pump off         0.000         0.000         0.000         0.000         0.000         1/m         1/m         1/m           primary         leak check         0.000         0.000         0.000         0.000         1/m         1/m         1/m           primary         leak check         0.000         0.000         1.52         1.520         1.50         1/m         1/m         -6.25%           primary         test pt 2         1.575         1.600         1.52         1.520         1.50         1/m         1/m         -6.25%           primary         test pt 3         1.572         1.590         1.52         1.50         1/m         1/m         -6.25%           Sensor Component         Leak Test         Condition         Good         Status         pass         Sensor         Status         pass           Sensor Component         Filter Position         Condition         Good         Status         pass         Sensor         Status         pass           Sensor Component	6.05%	6.25%				<b>Rotometer R</b>	eading:		1.5		
primary         pump off         0.000         0.000         0.000         0.000         1/m         1/m           primary         leak check         0.000         0.000         0.000         0.000         1/m         1/m         1/m           primary         test pt 1         1.574         1.600         1.52         1.520         1.50         1/m         1/m         -6.25%           primary         test pt 2         1.575         1.600         1.52         1.520         1.50         1/m         1/m         -6.25%           primary         test pt 3         1.572         1.600         1.52         1.520         1.50         1/m         1/m         -6.25%           primary         test pt 3         1.572         1.590         1.52         1.520         1.50         1/m         1/m         -6.25%           primary         test pt 3         1.572         1.590         1.52         1.520         1.50         1/m         1/m         -6.25%           Sensor Component         Leak Test         Condition         Good         Status         pass         Sensor Component         Filter Position         Condition         Good         Status         pass         Sensor Component	Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignal	PctDifference	
primary         leak check         0.000         0.000         0.000         0.000         1/m         1/m           primary         test pt 1         1.574         1.600         1.52         1.520         1.50         1/m         1/m         -6.25%           primary         test pt 2         1.575         1.600         1.52         1.520         1.50         1/m         1/m         -6.25%           primary         test pt 3         1.572         1.590         1.52         1.520         1.50         1/m         1/m         -6.25%           primary         test pt 3         1.572         1.590         1.52         1.50         1/m         1/m         -6.25%           Sensor Component         Leak Test         Condition         Good         Status         pass           Sensor Component         Tubing Condition         Condition         Good         Status         pass           Sensor Component         Filter Position         Condition         Good         Status         pass           Sensor Component         Rotometer Condition         Condition         Clean and dry         Status         pass           Sensor Component         Filter Distance         Condition         4.0 cm	primary	pump off	0.000	0.000	0.00	0.000	0.00	l/m	l/m		
primary       test pt 1       1.574       1.600       1.52       1.520       1.50       I/m       I/m       I/m       -6.25%         primary       test pt 2       1.575       1.600       1.52       1.520       1.50       I/m       I/m       I/m       -6.25%         primary       test pt 2       1.575       1.600       1.52       1.520       1.50       I/m       I/m       I/m       -6.25%         primary       test pt 3       1.572       1.590       1.52       1.520       1.50       I/m       I/m       -6.25%         Sensor Component       Leak Test       Condition       Status       pass       Sensor Component       I/m       I/m       -5.66%         Sensor Component       Tubing Condition       Condition       Good       Status       pass       Sensor Component       Filter Position       Condition       Good       Status       pass       Sensor Component       Rotometer Condition       Condition       Clean and dry       Status       pass       Sensor Component       Moisture Present       Condition       No moisture present       Status       pass       Sensor Component       Filter Distance       Condition       2.0 cm       Status       pass       Sensor Component	primary	leak check	0.000	0.000	0.00	0.000	0.00	l/m	l/m		
primarytest pt 21.5751.6001.521.5201.501/m1/m-6.25%primarytest pt 31.5721.5901.521.5201.501/m1/m-5.66%Sensor ComponentLeak TestConditionGoodStatuspassSensor ComponentTubing ConditionConditionGoodStatuspassSensor ComponentFilter PositionConditionGoodStatuspassSensor ComponentFilter PositionConditionClean and dryStatuspassSensor ComponentRotometer ConditionConditionClean and dryStatuspassSensor ComponentMoisture PresentConditionConditionQuerter StatuspassSensor ComponentFilter DistanceCondition2.0 cmStatuspassSensor ComponentFilter DepthCondition2.0 cmStatuspassSensor ComponentFilter AzimuthCondition90 degStatuspass	primary	test pt 1	1.574	1.600	1.52	1.520	1.50	l/m	l/m	-6.25%	
primary       test pt 3       1.572       1.590       1.52       1.50       1/m       1/m       -5.66%         Sensor Component       Leak Test       Condition       Status       pass         Sensor Component       Tubing Condition       Condition       Good       Status       pass         Sensor Component       Filter Position       Condition       Good       Status       pass         Sensor Component       Filter Position       Condition       Good       Status       pass         Sensor Component       Rotometer Condition       Condition       Clean and dry       Status       pass         Sensor Component       Moisture Present       Condition       No moisture present       Status       pass         Sensor Component       Filter Distance       Condition       4.0 cm       Status       pass         Sensor Component       Filter Depth       Condition       2.0 cm       Status       pass         Sensor Component       Filter Azimuth       Condition       90 deg       Status       pass	primary	test pt 2	1.575	1.600	1.52	1.520	1.50	l/m	l/m	-6.25%	
Sensor ComponentLeak TestConditionStatuspassSensor ComponentTubing ConditionConditionGoodStatuspassSensor ComponentFilter PositionConditionGoodStatuspassSensor ComponentRotometer ConditionConditionClean and dryStatuspassSensor ComponentMoisture PresentConditionNo moisture presentStatuspassSensor ComponentFilter DistanceCondition4.0 cmStatuspassSensor ComponentFilter DistanceCondition2.0 cmStatuspassSensor ComponentFilter AzimuthCondition90 degStatuspass	primary	test pt 3	1.572	1.590	1.52	1.520	1.50	l/m	l/m	-5.66%	
Sensor ComponentTubing ConditionConditionGoodStatuspassSensor ComponentFilter PositionConditionGoodStatuspassSensor ComponentRotometer ConditionConditionClean and dryStatuspassSensor ComponentMoisture PresentConditionNo moisture presentStatuspassSensor ComponentFilter DistanceCondition4.0 cmStatuspassSensor ComponentFilter DepthCondition2.0 cmStatuspassSensor ComponentFilter DepthCondition90 degStatuspass	Sensor Compo	onent Leak Tes	t		Conditio	n		Statu	1s pass		
Sensor ComponentFilter PositionConditionGoodStatuspassSensor ComponentRotometer ConditionConditionClean and dryStatuspassSensor ComponentMoisture PresentConditionNo moisture presentStatuspassSensor ComponentFilter DistanceCondition4.0 cmStatuspassSensor ComponentFilter DepthCondition2.0 cmStatuspassSensor ComponentFilter AzimuthCondition90 degStatuspass	Sensor Compo	onent Tubing C	ondition		Conditio	n Good		Statu	1s pass		
Sensor ComponentRotometer ConditionConditionClean and dryStatuspassSensor ComponentMoisture PresentConditionNo moisture presentStatuspassSensor ComponentFilter DistanceCondition4.0 cmStatuspassSensor ComponentFilter DepthCondition2.0 cmStatuspassSensor ComponentFilter AzimuthCondition90 degStatuspass	Sensor Component Filter Position			Conditio	n Good		Statu	1s pass			
Sensor ComponentMoisture PresentConditionNo moisture presentStatuspassSensor ComponentFilter DistanceCondition4.0 cmStatuspassSensor ComponentFilter DepthCondition2.0 cmStatuspassSensor ComponentFilter AzimuthCondition90 degStatuspass	Sensor Component Rotometer Condition			Conditio	n Clean and dry		Statu	1s pass			
Sensor Component       Filter Distance       Condition       4.0 cm       Status       pass         Sensor Component       Filter Depth       Condition       2.0 cm       Status       pass         Sensor Component       Filter Azimuth       Condition       90 deg       Status       pass	Sensor Component Moisture Present			Conditio	n No moisture p	resent	Statu	1s pass	pass		
Sensor Component       Filter Depth       Condition       2.0 cm       Status       pass         Sensor Component       Filter Azimuth       Condition       90 deg       Status       pass	Sensor Component Filter Distance			Conditio	<b>n</b> 4.0 cm		Statu	1s pass			
Sensor Component     Filter Azimuth     Condition     90 deg     Status     pass	Sensor Component Filter Depth			Conditio	n 2.0 cm		Statu	1s pass			
	Sensor Component Filter Azimuth				Conditio	n 90 deg		Statu	Status pass		
Sensor Component System Memo Condition Status pass	Sensor Compo	onent System M	lemo		Conditio	n		Statu	1s pass		

### **Ozone Data Form**

Mfg	Se	rial Number Tag	Site	Те	chnician		Site Visit Date	e Parame	ter Owner ID
ThermoElec	tron Inc 10	030244808	LRL117	Sa	andy Gre	nville	11/01/2015	Ozone	000701
Slope: Intercept CorrCoff	0.99066         Slope:         0.000           t         -1.30958         Intercept         0.000           f         0.99994         CorrCoff         0.0000		0.0000	0 0	Mfg Serial Number Tfer ID		ThermoElectro 0419606966 01112	n Inc Par Tfe	rameter ozone er Desc. Ozone primary stan
DAS 1: A Avg % D 3.5	biff: A Max	DAS 2: <b>A Avg %</b> 4.9%	Dif A Max	% Di	Slope Cert Da	nte	0.993	84 Inter	cept         -0.40946           Coff         1.00000
UseDes	cription	ConcGroup	Tfer Raw	Tfer	Corr	Si	te S	ite Unit	PctDifference
prin	nary	1	-0.01	0.	40	-0.	67 ppb		4.050/
prin prin	nary	2	29.90	30	.49	29. 48	01 ppb		-4.85%
prin	nary	4	80.20	81	.00	78.	.42 ppb		-3.30%
prin	nary	5	109.60	110	).69	108	.90 ppb		-1.62%
Sensor Co	omponent	Sample Train		Conditi	on Good			Status	pass
Sensor Co	omponent	Inlet Filter Conditio	n	Conditi	on Clean	1		Status	pass
Sensor Co	omponent	Battery Backup		Conditi	on N/A			Status	pass
Sensor Co	omponent	Offset		Conditi	on -0.10			Status	pass
Sensor Co	omponent	Span		Conditi	on 1.011			Status	pass
Sensor Co	omponent	Zero Voltage		Condition N/A				Status	pass
Sensor Co	omponent	Fullscale Voltage		Conditi	on N/A			Status	pass
Sensor Co	omponent	Cell A Freq.		Condition 108.5 kHz				Status	pass
Sensor Co	omponent	Cell A Noise		Conditi	on 1.2 pp	ob		Status	pass
Sensor Co	omponent	Cell A Flow		Conditi	on 0.67 l	pm		Status	pass
Sensor Co	omponent	Cell A Pressure		Conditi	on 693.7	mmHg		Status	pass
Sensor Co	omponent	Cell A Tmp.		Conditi	on 32.3 (	C		Status	pass
Sensor Co	omponent	Cell B Freq.		Conditi	on 94.3 k	κHz		Status	pass
Sensor Co	omponent	Cell B Noise		Conditi	on 1.2 pp	ob		Status	pass
Sensor Co	omponent	Cell B Flow		Conditi	on 0.72 l	pm		Status	pass
Sensor Co	omponent	Cell B Pressure		Conditi	on			Status	pass
Sensor Co	omponent	Cell B Tmp.		Conditi	on			Status	pass
Sensor Co	omponent	Line Loss		Conditi	on Not te	ested		Status	pass
Sensor Co	omponent	System Memo		Conditi	on			Status	pass

# **Temperature Data Form**

Mfg	Serial Number	<b>Fag Site</b>	r	Technician		Site V	isit Date	Param	eter	<b>Owner ID</b>	
RM Young	12792	LRL117		Sandy	/ Grenville	11/01	/2015	Temper	ature	06245	
				Mfg		Extec	h	Pa	rameter Te	mperature	
				Serial Number		H2327	H232734 Tf		fer Desc. R	D	
				Tfer ID		01227	,				
DAS 1:	DAS	2:		Slo	ope	1.00343 Inter		rcept	-0.064	09	
Abs Avg Err Abs Max Er Abs Avg Err Abs Max			Max Er	x Er Cert Date			1/30/201	5 Cor	rCoff	1.000	00
0.21	0.30										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal OutputSignalEng		OSE Unit	Difference		
primary Ter	np Low Range	0.04	0.10		0.000		0.1	l	С	0.02	
primary Ter	np Mid Range	25.38	25.36	6	0.000		25.	1	С	-0.3	
primary Ter	np High Range	48.47	48.37	7	0.000		48.	1	С	-0.3	
Sensor Compo	nent Shield		Condi	ition N	Moderately cle	an		Status	pass		
Sensor Component Blower				Condition N/A				Status	pass		
Sensor Component Blower Status Switch				Condition N/A				Status	IS pass		
Sensor Compo	nent System Memo		Condi	Condition				Status pass			

# Shelter Temperature Data For

Mfg	Serial Number Ta	ng Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	LRL117	Sandy Grenville	11/01/2015	Shelter Temperature	none
DAS 1:	DAS 2	:	Mfg	Extech	Parameter She	elter Temperatur
Abs Avg Err Abs	0.68 Abs A	g Err Abs Max Er	Serial Number	H232734	Tfer Desc. RT	0
	<u> </u>		Tfer ID	01227		
			Slope	1.0034	3 Intercept	-0.06409
			Cert Date	1/30/201	5 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	21.50	21.49	0.000	21.7	С	0.18
primary	Temp Mid Range	21.66	21.65	0.000	22.3	С	0.68
primary	Temp Mid Range	21.42	21.41	0.000	22.0	С	0.56

#### Infrastructure Data For

Site ID	LRL117	Technicia Sandy	Grenville Site Visit Date 11/01/2015
Shelter	Make	Shelter Model	Shelter Size
Ekto		8810	640 cuft

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

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

#### 2 Parameter: SiteOpsProcedures

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

#### 3 Parameter: ShelterCleanNotes

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

Field Systems Da	Feld Systems Data FormF-02058-1500-S1-rev002											
Site ID LRL117	Technician Sandy Grenville	Site Visit Date 11/0	1/2015									
Sita Spansor (agancy)	FPA	USGS Map										
Site Sponsor (agency)		Man Scale										
Operating Group		Map State										
AQS #	42-111-9991	Map Date										
Meteorological Type	Climatronics											
Air Pollutant Analyzer	Ozone	QAPP Latitude										
<b>Deposition Measurement</b>	dry, wet	QAPP Longitude										
Land Use	woodland - mixed	<b>QAPP Elevation Meters</b>										
Terrain	complex	<b>QAPP Declination</b>										
<b>Conforms to MLM</b>	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 🗹	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										
<b>Backup Operator</b>		Security Fence	Locked gate									
Backup Op. Phone #		Secure Shelter										
Backup Op. E-mail		Stable Entry Step 🗹										
Shelter Working Room ✓	Make Ekto Mo	odel 8810	Shelter Size 640 cuft									
Shelter Clean	Notes The shelter has been repaired	and is in very good condition.	A new peaked roof has been installed.									
Site OK	Notes											
Driving Directions From	Somerset take 30 west											

LRL117

#### F-02058-1500-S2-rev002

Site ID

Technician Sandy Grenville

Site Visit Date 11/01/2015

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

Siting Distances OK **Siting Criteria Comment** 

Fi	eld Sy	stems Data F	orm		F-02058-1500-S3-rev				
Site	e ID	LRL117	Technician	Sandy Grenville		Site Visit Date	11/01/2015		
1	Are win being in	d speed and direction fluenced by obstructi	sensors sited soons?	) as to avoid	✓	N/A			
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)					N/A			
3	Are the	tower and sensors plu	ımb?		✓	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 <b>p</b>	olumb?		✓	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 o etc?	effects from bui	ldings, 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	30 degrees?			N/A			

#### F-02058-1500-S4-rev002

Site	e ID	LRL117	Technician	Sandy Grenville		Site Visit Date	11/01/2015	
1	Do all th condition	e meterological senso n, and well maintaine	rs appear to be d?	intact, in good				
2	Are all the reporting	he meteorological sen g data?	sors operationa	l online, and				
3	Are the s	shields for the temper	ature and RH s	ensors clean?	✓	Moderately clean		
4	Are the aspirated motors working?				✓	N/A		
5	Is the solar radiation sensor's lens clean and free of scratches?				✓	N/A		
6	Is the su	rface wetness sensor §	grid clean and u	indamaged?	✓	N/A		
7	Are the s condition	sensor signal and pow n, and well maintaine	er cables intact d?	, in good	✓			
8	Are the s from the	sensor signal and pow elements and well ma	er cable connec aintained?	ctions protected	✓			

Fi	eld Systems Data Form		F-02058-1500-85-rev002
Site	LRL117 Technician Sandy Grenville		Site Visit Date 11/01/2015
	Siting Criteria: Are the pollutant analyzers and deposition eq	uip:	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	ma	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓	
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)		At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?	✓	
8	Are there moisture traps in the sample lines?		Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry

Fi	eld System	is Data Fo	orm					F-020	)58-15	00-S6-rev002
Site	e ID LRL11	7	Technician	Sandy Grenville	;	Site Visit	t Date 11	1/01/2015		
	DAS, sensor tr	anslators, and p	peripheral equi	pment operatio	<u>ns a</u>	nd maintenar	<u>1ce</u>			
1	Do the DAS inswell maintaine	struments appea d?	ar to be in good	l condition and	✓					
2 Are all the components of the DAS operational? (printers, modem, backup, etc)										
<b>3</b> Do the analyzer and sensor signal leads pass through lightning protection circuitry?					✓	Met sensors	only			
4	Are the signal well maintaine	connections pro d?	otected from the	e weather and	✓					
5	Are the signal	leads connected	l to the correct	DAS channel?	✓					
6	Are the DAS, s grounded?	ensor translato	rs, and shelter	properly	✓					
7	Does the instru	ment shelter ha	ave a stable pov	wer source?	✓					
8	Is the instrume	ent shelter temp	erature contro	lled?	✓					
9	Is the met towe	er stable and gr	ounded?			Stable		(	Grounded	
10	Is the sample to	ower stable and	l grounded?							
11	Tower commen	nts?				Sample towe	r not grou	unded		

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

Fie	ld Systems Data	a For	·m				<b>F-02</b>	2058-	1500-S	7-rev002
Site	ID LRL117		Techn	ician Sano	dy Grenville	Site Visit Date	1/01/201	5		
De	ocumentation									
De	bes the site have the requ	ired ins	strumen	t and equi	<u>pment manuals?</u>		**			
Wind	l speed sensor	Yes		N/A	Data logger		Yes	No	N/A	
Wind	l direction sensor				Data logger					
Tem	perature sensor				Strip chart re	ecorder				
Relat	tive humidity sensor			$\checkmark$	Computer					
Solar	radiation sensor			$\checkmark$	Modem			$\checkmark$		
Surfa	ace wetness sensor			$\checkmark$	Printer				$\checkmark$	
Wind	l sensor translator			$\checkmark$	Zero air pum	ւթ				
Temj	perature translator				Filter flow pu	սաթ				
Hum	idity sensor translator				Surge protec	tor			$\checkmark$	
Solar	radiation translator			$\checkmark$	UPS				$\checkmark$	
Tippi	ing bucket rain gauge			$\checkmark$	Lightning pr	otection device			$\checkmark$	
Ozon	e analyzer		$\checkmark$		Shelter heate	er		$\checkmark$		
Filter	r pack flow controller		$\checkmark$		Shelter air co	onditioner		$\checkmark$		
Filter	r pack MFC power suppl	ly 🗌	$\checkmark$							
Ī	Does the site have the req	uired a	nd mos	t recent Q	C documents and re	eport forms?				
		Pres	ent				Curre	ent		
Stati	on Log						$\checkmark$			
SSRI	7						$\checkmark$			
Site (	<b>Ops Manual</b>		□ N	ot present						
HAS	Р		□ N	ot present						
Field	<b>Ops Manual</b>									
Calib	oration Reports						$\checkmark$			
Ozon	e z/s/p Control Charts	[								
Prev	entive maintenance scheo	lule								
1	Is the station log properl	y comp	leted du	iring every	v site visit? 🔽					
2	Are the Site Status Repo current?	rt Forn	ıs being	completed	l and 🔽					
3	Are the chain-of-custody sample transfer to and fi	forms om lab	properl ?	y used to d	locument 🔽					
4	Are ozone z/s/p control c current?	harts p	roperly	completed	and 🗌 Con	trol charts not us	ed			

Site	ID LRL117 Technician Sandy Grenville	Site Visit Date	11/01/2015	
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	Compliant
Multipoint Calibrations	$\checkmark$	Semiannually	$\checkmark$
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	$\checkmark$	Weekly	$\checkmark$
Test Surface Wetness Response	$\checkmark$	N/A	$\checkmark$

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

QC Check Performed	Free	quency	Compliant
Multi-point Calibrations	✓ Sem	niannually	
Automatic Zero/Span Tests	✓ Dail	у	
Manual Zero/Span Tests			
Automatic Precision Level Tests	✓ Dail	у	
Manual Precision Level Test			
Analyzer Diagnostics Tests			
In-line Filter Replacement (at inlet)	Ever	ry 2 weeks	
In-line Filter Replacement (at analyze	✓ N/A		
Sample Line Check for Dirt/Water	✓ Wee	ekly	
Zero Air Desiccant Check	✓ Wee	ekly	
1 Do multi-point calibration gases go the sample train including all filters?	rough the comp	plete	
2 Do automotio and manual alala gagage	as through the		

- 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?

SSRF, logbook, call-in

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

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

F-02058-1500-S8-rev002

#### **Field Systems Data Form** F-02058-1500-S9-rev002 LRL117 Sandy Grenville Site Visit Date 11/01/2015 Site ID Technician Site operation procedures Is the filter pack being changed every Tuesday as scheduled? Filter changed mornings 1 Are the Site Status Report Forms being completed and filed 🗹 2 correctly? No longer required Are data downloads and backups being performed as 3 scheduled? ✓ SSRF, logbook Are general observations being made and recorded? How? 4 $\checkmark$ Are site supplies on-hand and replenished in a timely 5 fashion? SSRF, logbook, call-in Are sample flow rates recorded? How? 6 $\checkmark$ Are samples sent to the lab on a regular schedule in a timely 🗹 7 fashion? ✓ Clean gloves on and off Are filters protected from contamination during handling 8 and shipping? How? $\checkmark$ Are the site conditions reported regularly to the field 9 operations manager or staff? **OC Check Performed** Frequency Compliant Semiannually $\checkmark$ **Multi-point MFC Calibrations** ✓ Weekly $\checkmark$ **Flow System Leak Checks Filter Pack Inspection** ✓ ✓ Weekly **Flow Rate Setting Checks** ✓ ✓ Weekly Visual Check of Flow Rate Rotometer

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

✓

 $\checkmark$ 

Semiannually

✓ Weekly

**In-line Filter Inspection/Replacement** 

Sample Line Check for Dirt/Water

LRL117

#### F-02058-1500-S10-rev002

Site ID

Techn

Technician Sandy Grenville

Site Visit Date 11/01/2015

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
Modem	Raven	V4221-V	0802325832	06383
Ozone	ThermoElectron Inc	49i A1NAA	1030244808	000701
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200020	000444
Sample Tower	Aluma Tower	A	none	03446
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

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
SHN	418-Eric H	lebert-11/06/2015				
1	11/6/2015	Computer	Hewlett Packard	none	8460p	CNU13607B3
2	11/6/2015	DAS	Environmental Sys Corp	90603	8816	2272
3	11/6/2015	Elevation	Elevation	None	1	None
4	11/6/2015	Filter pack flow pump	Thomas	00443	107CA110	0288714888
5	11/6/2015	flow rate	Tylan	03942	FC280	AW9605202
6	11/6/2015	Infrastructure	Infrastructure	none	none	none
7	11/6/2015	MFC power supply	Tylan	03485	RO-32	FP9404009
8	11/6/2015	Ozone	ThermoElectron Inc	none	49i A3NAA	0903334535
9	11/6/2015	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460009
10	11/6/2015	Sample Tower	Aluma Tower	923307	В	none
11	11/6/2015	Shelter Temperature	ARS	none	none	none
12	11/6/2015	Siting Criteria	Siting Criteria	None	1	None
13	11/6/2015	Temperature	RM Young	none	41342VC	14265
14	11/6/2015	Zero air pump	Werther International	none	C 70/4	000855578

### **DAS Data Form**

DAS Time Max Error: 0.57

Mfg	Serial Nu	imber Site	Т	echnician	Site Visit Date	Parameter	Use Desc.
Environmenta	l Sys 2272	SHN	I418 E	Eric Hebert	11/06/2015	DAS	Primary
Das Date:	11/6 /2015	Audit Date	11/6 /2015	Mfg	Datel	Parameter	DAS
Das Time: Das Day:	11:25:26 310	Audit Time Audit Day	11:26:00 310	Serial Number	4000392	Tfer Desc.	Source generator (D
Low Channe	l:	High Channel	:	Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.000	0.0003	0.0001	0.0003	Cert Date	1/22/201	5 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	86590148	Tfer Desc.	DVM
				Tfer ID	01310		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/22/201	5 CorrCoff	1.00000
Channel	Input D	OVM Output	DAS Output	InputUnit	OutputUnit	Difference	
2	0.0000	0.0000	0.0000	V	V	0.0000	
2	0.1000	0.1000	0.1000	V	V	0.0000	
2	0.3000	0.2999	0.3000	V	V	0.0001	
2	0.5000	0.4999	0.5001	V	V	0.0002	
2	0.7000	0.6999	0.7001	V	V	0.0002	
2	0.9000	0.8999	0.9001	V	V	0.0002	
2	1.0000	0.9999	1.0002	V	V	0.0003	

### Flow Data Form

Mfg	Serial Nun	nber Tag	Site	Te	chnician	Site Visit D	ate Param	eter	<b>Owner ID</b>
Tylan	AW960520	)2	SHN418	Er	ic Hebert	11/06/2015	flow rat	e	03942
Mfg	Tylan				Mfg	BIOS	P	arameter Flow	w Rate
<b>SN/Owner ID</b>	FP9404009	03485			Serial Number	131818	Т	fer Desc. BIC	S 220-H
Parameter	MFC power su	oply			Tfer ID	01417			
					Slope	1.(	00316 Inte	ercept	-0.00540
					Cert Date	1/7	7/2015 Cor	rCoff	1.00000
DAS 1:		<b>DAS 2:</b>			Cal Factor Z	ero	-0.18	7	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	4.85	9	
1.81%	2.04%				<b>Rotometer R</b>	eading:	1.	6	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.21	0.231	0.05	l/m	l/m	
primary	leak check	0.000	0.000	0.22	0.245	0.05	l/m	l/m	
primary	test pt 1	1.473	1.470	1.66	1.673	1.50	l/m	l/m	2.04%
primary	test pt 2	1.477	1.480	1.66	1.673	1.50	l/m	l/m	1.35%
primary	test pt 3	1.472	1.470	1.66	1.673	1.50	l/m	l/m	2.04%
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	sition		Conditio	Poor		Status	Fail	
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	<b>5.5</b> cm		Status	pass	
Sensor Comp	onent Filter Dep	oth		Conditio	<b>n</b> -0.2 cm		Status	pass	
Sensor Comp	onent Filter Azi	muth		Conditio	<b>270 deg</b>		Status	pass	
Sensor Comp	onent System M	/lemo		Conditio	See comments	3	Status	pass	

### **Ozone Data Form**

Mfg S	erial Number Tag	Site	Techr	nician	Site Visit Date	Paramet	er Owner ID
ThermoElectron Inc	)903334535	SHN418	Eric I	Hebert	11/06/2015	Ozone	none
Slope: 0.9 Intercept -0.3 CorrCoff 1.0	96564Slope:36003Intercept00000CorrCoff	0.0000	0 M 0 Se 0 Tf	fg erial Number fer ID	ThermoElectron 49CPS-70008-3 01110	Inc Par 64 Tfe	rameter ozone r Desc. Ozone primary stan
DAS 1: A Avg % Diff: A Ma 4.1%	DAS 2: x % Di 4.6%	6Dif A Max	% Di	ope ert Date	1.0113 9/21/201	0 Intero	cept         -0.21263           Coff         1.00000
UseDescription primary primary	ConcGroup 1 2	Tfer Raw 0.46 26.77	Tfer Co 0.66 26.68	rr Sir 0.2 25.	te Sit 28 ppb 46 ppb	e Unit	PctDifference
primary primary primary	3 4 5	55.12 82.08 105.31	54.71 81.37 104.34	52. 78. 100	35         ppb           27         ppb           .40         ppb		-4.31% -3.81% -3.78%
Sensor Component Sensor Component Sensor Component	Inlet Filter Condition	n	Condition Condition Condition	Clean N/A		Status F Status F Status F	Dass Dass Dass
Sensor Component	Offset		Condition	0.40		Status <b>F</b>	Dass
Sensor Component Sensor Component	Span Zero Voltage		Condition Condition	0.993 0.0013		Status F Status F	Dass
Sensor Component	Fullscale Voltage		Condition	1.0010		Status <b>F</b>	Dass
Sensor Component	Cell A Freq.		Condition Condition	80.7 kHz 0.6 ppb		Status F Status F	Dass
Sensor Component	Cell A Flow		Condition	0.65 lpm		Status [	Dass
Sensor Component	Cell A Pressure		Condition Condition	659.9 mmHg 33.9 C		Status F	Dass
Sensor Component	Cell B Freq.		Condition	85.4 kHz		Status [	Dass
Sensor Component	Cell B Noise		<b>Condition</b>	0.4 ppb		Status F	Dass
Sensor Component	Cell B Pressure		Condition			Status F	Dass
Sensor Component	Cell B Tmp.		Condition			Status F	Dass
Sensor Component	System Memo		Condition Condition	INOT TESTED		Status F Status F	Dass

# **Temperature Data Form**

Mfg	Serial Number Ta	ag Site		Techni	ician	Site V	visit Date	Param	eter	<b>Owner ID</b>	
RM Young	14265	SHN418		Eric H	ebert	11/06	6/2015	Temper	ature	none	
				Mf	g	Fluke		Pa	rameter Te	mperature	
				Ser	rial Number	20850	)85	Tf	er Desc. R	D	
	Serial Number       2085085       Tfer Desc. RTD         OAS 1:       DAS 2:       01226         bs Avg Err       Abs Max Er       Abs Avg Err       Abs Max Er         0.14       0.22       0.120       1/30/2015       Corr Coff       1.00000         0.14       0.22       0.13       0.21       0.000       0.2       C       0         primary       Temp Mid Range       29.95       30.00       0.000       29.8       C       -0.22										
DAS 1:	DAS 2	2:		Slo	pe		1.0010	5 Inte	rcept	-0.07989	9
Abs Avg Err Al	os Max Er Abs A	vg Err Abs	Max Er	Ce	rt Date		1/30/201	5 Cor	rCoff	1.00000	C
0.14	0.22										
UseDesc.	Test type I	nputTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Tem	p Low Range	0.13	0.21		0.000		0.2	2	С	0	
primary Tem	p Mid Range	29.95	30.0	0	0.000		29.	8	С	-0.22	
primary Tem	p High Range	43.75	43.7	8	0.000		43.	6	С	-0.2	
Sensor Compon	ent Shield		Cond	ition C	Clean			Status	pass		
Sensor Compon	Sensor Component         Blower         Condition         Functioning         Status         pass										
Sensor Compon	ent Blower Status Status	witch	Cond	ition 🛚	I/A			Status	pass		
Sensor Compon	ent System Memo		Cond	ition S	See comments			Status	pass		

# Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	SHN418	Eric Hebert	11/06/2015	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter She	lter Temperatur
Abs Avg Err Abs 0.59	0.76 Abs Av	g Err Abs Max Er	Serial Number	2085085	Tfer Desc. RTE	)
	<u> </u>		Tfer ID	01226		
			Slope	1.0010	5 Intercept	-0.07989
			Cert Date	1/30/201	5 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.04	25.09	0.000	24.7	С	-0.42
primary	Temp Mid Range	25.38	25.43	0.000	24.9	С	-0.58
primary	Temp Mid Range	23.45	23.51	0.000	24.3	С	0.76

#### Infrastructure Data For

Site ID	SHN418	Technicia Eri	ic Hebert Site Visit Date 11/06/2015
Shelter M	ſake	Shelter Model	Shelter Size
Ekto		8814	896 cuft

Sensor Component Sample Tower Type	Condition	Туре В	Status	pass
Sensor Component Conduit	Condition	Good	Status	pass
Sensor Component Met Tower	<b>Condition</b>	Good	Status	pass
Sensor Component Moisture Trap	Condition	Not installed	Status	pass
Sensor Component Power Cables	Condition	Good	Status	pass
Sensor Component Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component Rotometer	Condition	Installed	Status	pass
Sensor Component Sample Tower	Condition	Good	Status	pass
Sensor Component Shelter Condition	Condition	Good	Status	pass
Sensor Component Shelter Door	Condition	Fair	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.	Hazar	d Problem
Flow Rate	SHN418	Eric Hebert	11/06/2015	Moisture Present	Tylan	56		
The filter sample tu	ibing has drops of n	noisture in low secti	ons outside the	shelter.				
Flow Rate	SHN418	Eric Hebert	11/06/2015	Filter Depth	Tylan	56		
The filter attachment orientation.	nt plate is mounted	too low in the enclo	sure resulting in	the filter being exp	osed to wind	-driven rain and in the	he standa	rd geometric

# **Field Systems Comments**

#### 1 Parameter: SiteOpsProcedures

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

2 Parameter: ShelterCleanNotes

The shelter is in good condition, clean and well organized

3 Parameter: MetSensorComme

The temperature sensor has been moved from 10 meters to approximately 2 meters above ground. Currently recorded temperature data are not comparable to previously measured temperature data.

Field Systems Data Form	

### F-02058-1500-S1-rev002

Site ID	SHN418		Fechnician Eric Heb	ert	Site Visit Date 11/0		6/2015		
Site Sponsor	(agency)	NPS/EPA			USGS Map		Big Meadows		
Operating Group		NPS			Map Scale				
AOS #	<b>-</b> P	51-113-003			Map Date				
Meteorologic	al Tyne	Climatronic	S				<u> </u>		
Air Pollutant	Analyzer	Ozone, PM2	2.5		OAPP Latitude				
Deposition M	leasurement	drv. wet. Ho	1. IMPROVE		OAPP Longitude				
Land Use	icușui chicht	woodland -	mixed		OAPP Flevetion	Meters			
Terrain					OAPP Declination	100015			
Conforms to	MIM	No			OAPP Declination	n Data			
	14112141				QAPP Declination Date				
Site Telephor	ne				Audit Latitude		38.5231		
Site Address	1	Shenandoah National Park			Audit Longitude			-	-78.43471
Site Address	2	3655 US Hwy 211 East		Audit Elevation		1068		1068	
County		Madison		Audit Declination		-9.9			
City, State		Luray, VA		Present					
Zip Code		22835			Fire Extinguisher ☑ Inspected Oct 2013			013	
Time Zone		Eastern		First Aid Kit	$\checkmark$				
Primary Ope	erator				Safety Glasses				
Primary Op.	Phone #			Safety Hard Hat					
Primary Op.	E-mail			Climbing Belt					
Backup Oper	rator			Security Fence					
Backup Op. Phone #				Secure Shelter					
Backup Op. E-mail				Stable Entry Step					
Shelter Working Room		Make E	kto	odel 8814		Shelter Size	896 cuft		
Shelter Clear	<b>1</b>	Notes Th	ne shelter is in good co	onditio	n, clean and well org	anized			
Site OK	$\checkmark$	Notes							
<b>Driving Directions</b> Note: arrange for a "EB submaster" key 4 days in advance to be left at Big Meadows Visitor Center. From DC take 460 west to 29N to 33W to Skyline Drive North. Exit into Big Meadows Visitors Center. Go toward lodge and take the first right. Take the gravel road from the parking lot on the left to the site.									

SHN418

#### F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 11/06/2015

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	10 - 30 m	
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	ID SHN418 Technician Eric Hebert		Site Visit Date 11/06/2015
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	<b>·</b>	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 temperature sensor has been moved from 10 meters to approximately 2 meters above ground. Currently recorded temperature data are not comparable to previously measured temperature data.

#### F-02058-1500-S4-rev002

Site	e ID	SHN418	Technician	Eric Hebert		Site Visit Date	11/06/2015	
1 2	<ol> <li>Do all the meterological sensors appear to be intact, in good condition, and well maintained?</li> <li>Are all the meteorological sensors operational online, and reporting data?</li> </ol>				<ul><li>✓</li></ul>			
3	Are the shields for the temperature and RH sensors clean?			ensors clean?	✓			
4	Are the aspirated motors working?							
5	Is the solar radiation sensor's lens clean and free of scratches?		free of	✓	N/A			
6	Is the su	rface wetness sensor g	grid clean and u	indamaged?	✓	N/A		
7 8	Are the s condition Are the s	sensor signal and pow n, and well maintained sensor signal and pow	er cables intact d? er cable connec	, in good ctions protected	<b>&gt;</b>			
	from the	elements and well ma	aintained?					
Fi	eld Systems Data Form		F-02058-1500-S5-rev002					
------	--	-------------	---					
Site	ID SHN418 Technician Eric Hebert		Site Visit Date 11/06/2015					
	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	l ma	intenance					
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓						
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓						
3	Describe ozone sample tube.		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?		Clean and dry					

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S6-rev002				
Site	e ID	SHN418	Technician	Eric Hebert		Site Visit I	Date 1	1/06/2015		
	<u>DAS, se</u>	nsor translators, and	peripheral equi	pment operatio	<u>ns a</u>	nd maintenanc	e			
1	Do the I 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 signalyzer and sensor signation generation circuitry	gnal leads pass ( ?	through	✓	Met sensors or	ıly			
4	Are the well ma	signal connections pro intained?	otected from the	e weather and	✓					
5	Are the	signal leads connected	to the correct	DAS channel?	✓					
6	Are the grounde	DAS, sensor translato ed?	ors, and shelter	properly	✓					
7	Does the	e instrument shelter h	ave a stable pov	ver source?	✓					
8	Is the in	strument shelter temp	oerature control	led?						
9	Is the m	et tower stable and gr	ounded?			Stable		(	Grounded	
10	Is the sa	mple tower stable and	l grounded?						<ul><li>▼</li></ul>	
11	Tower o	comments?								

Fiel	ld Systems Data	Fo	rm				<b>F-02</b>	058	-1500- <b>S7-rev</b> 00
Site I	D SHN418		Tec	hnician	Eric Hebert	Site Visit Date	11/06/2015		
<u>Do</u>	<u>cumentation</u>								
Do	es the site have the requir	ed in	strum	ent and	equipment manual	<u>s?</u>			
		Yes	No	N/2	Α		Yes	No	N/A
Wind	speed sensor	$\checkmark$			Data log	gger			
Wind	direction sensor	$\checkmark$			Data log	gger			$\checkmark$
Temp	perature sensor	$\checkmark$			Strip ch	art recorder			$\checkmark$
Relat	ive humidity sensor		$\checkmark$		Comput	er		✓	
Solar	radiation sensor	✓			Modem				
Surfa	ce wetness sensor			✓	Printer				
Wind	sensor translator			✓	Zero air	· pump			
Temp	erature translator			$\checkmark$	Filter flo	ow pump			
Humi	dity sensor translator			✓	Surge p	rotector		$\checkmark$	
Solar	radiation translator			$\checkmark$	UPS				
Tippi	ng bucket rain gauge	$\checkmark$			Lightnii	ng protection device	•	✓	
Ozon	e analyzer	$\checkmark$			Shelter	heater		$\checkmark$	
Filter	pack flow controller		$\checkmark$		Shelter	air conditioner			
Filter	pack MFC power supply		$\checkmark$						
D	oes the site have the requi	ired a	und m	ost rece	nt QC documents a	nd report forms?			
		Pres	sent				Curre	nt	
Statio	on Log	[	✓	Datavie	W		$\checkmark$		
SSRF	1	[	✓				$\checkmark$		
Site C	Dps Manual	[	✓				$\checkmark$		
HASI	?	[	✓						
Field	Ops Manual	[	✓						
Calib	ration Reports	[	✓	9/16/20	15		$\checkmark$		
Ozon	e z/s/p Control Charts	[							
Preve	entive maintenance schedu	le [							
1 I	s the station log properly	comp	oleted	during	every site visit? ✔	Dataview			
2 A	Are the Site Status Report current?	Form	ns bei	ng comp	pleted and	Flow section only			
3 A s	Are the chain-of-custody for a standard standa	orms m lab	prop o?	erly used	d to document 🔽				
4 A	Are ozone z/s/p control cha current?	arts p	roper	ly comp	oleted and 🔽	Dataview			
Provi natur	de any additional explana al or man-made, that may	tion ( affe	photo ct the	graph o monitor	or sketch if necessar ring parameters:	y) regarding condit	tions listed a	above,	or any other features,

#### F-02058-1500-S8-rev002

Site	ID	SHN418	Technician	Eric Hebert	 Site Visit Date	11/06/2015	
1	<u>Site ope</u> 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 training	backup operator atte course? If yes, when	nded a formal ( and who instru	CASTNET cted?			
3	Is the sit	e visited regularly on ?	the required <b>T</b> u	ıesday			
4	Are the s flollowed	standard CASTNET of by the site operator?	operational pro	cedures being			
5	Is the sit the requ	e operator(s) knowled ired site activities? (in	lgeable 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	$\checkmark$	Semiannually	$\checkmark$
Visual Inspections	✓	Weekly	$\checkmark$
Translator Zero/Span Tests (climatronics)		N/A	$\checkmark$
Manual Rain Gauge Test	✓	N/A	$\checkmark$
Confirm Reasonableness of Current Values	✓	Weekly	$\checkmark$
Test Surface Wetness Response	✓	N/A	$\checkmark$

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

QC	C Ch	eck	Per	forr	ned	

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

- **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?

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

✓

✓

✓

Dataview

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

#### Compliant

#### F-02058-1500-S9-rev002

Sit	e ID	SHN418	Techni	cian	Eric Hebert		Site Visit Date	11/06/2015			
	Site operation procedures										
1	Is the fil	ter pack being change	d every T	iesda	y as scheduled?		Filter changed morir	nings			
2	Are the correctly	Site Status Report For y?	ms being	comp	oleted and filed	✓					
3	Are data	a downloads and backu ed?	ıps being	perfo	ormed as		No longer required				
4	Are gen	eral observations being	g made an	d rec	corded? How?	✓	SSRF				
5	Are site fashion?	supplies on-hand and	replenisho	ed in	a timely	✓					
6	Are sam	ple flow rates recorded	d? How?			✓	SSRF				
7	Are sam fashion?	ples sent to the lab on	a regular	sche	dule in a timely	✓					
8	Are filte and ship	ers protected from cont oping? How?	aminatio	ı dur	ing handling	✓	Clean gloves on and	d off			
9	Are the operation	site conditions reporte ons manager or staff?	d regular	y to 1	the field						
QC	Check P	erformed		Free	luency			Compliant			
I	Multi-poir	nt MFC Calibrations	$\checkmark$	Sem	iannually			$\checkmark$			
]	Flow Syste	em Leak Checks	$\checkmark$	Wee	kly			$\checkmark$			
]	Filter Pac	k Inspection									
]	Flow Rate	Setting Checks	✓	Wee	kly						
1	Visual Ch	eck of Flow Rate Rotor	meter 🗹	Wee	kly						
]	In-line Fil	ter Inspection/Replace	ment 🗹	As n	eeded						
5	Sample Li	ne Check for Dirt/Wat	er 🗸	Wee	kly						

SHN418

### F-02058-1500-S10-rev002

Technician Eric Hebert

Site Visit Date 11/06/2015

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	8460p	CNU13607B3	none
DAS	Environmental Sys Cor	8816	2272	90603
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	0288714888	00443
flow rate	Tylan	FC280	AW9605202	03942
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP9404009	03485
Ozone	ThermoElectron Inc	49i A3NAA	0903334535	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	CM08460009	none
Sample Tower	Aluma Tower	В	none	923307
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	14265	none
Zero air pump	Werther International	C 70/4	000855578	none

# Site Inventory by Site Visit

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
WSP	144-Eric H	lebert-11/09/2015				
1	11/9/2015	Computer	Dell	07037	Inspiron 15	Unknown
2	11/9/2015	DAS	Campbell	000430	CR3000	2525
3	11/9/2015	Elevation	Elevation	None	1	None
4	11/9/2015	Filter pack flow pump	Thomas	00087	107CA110	83403-10
5	11/9/2015	Flow Rate	Арех	000639	AXMC105LPMDPCV	54780
6	11/9/2015	Infrastructure	Infrastructure	none	none	none
7	11/9/2015	Modem	Raven	06454	V4221-V	0808338332
8	11/9/2015	Ozone	ThermoElectron Inc	000734	49i A1NAA	1105347317
9	11/9/2015	Ozone Standard	ThermoElectron Inc	000543	49i A3NAA	0929938240
10	11/9/2015	Sample Tower	Aluma Tower	000126	В	none
11	11/9/2015	Shelter Temperature	Campbell	none	107-L	none
12	11/9/2015	Siting Criteria	Siting Criteria	None	1	None
13	11/9/2015	Temperature	RM Young	06387	41342VC	13960
14	11/9/2015	Zero air pump	Werther International	06880	C 70/4	000814273

## **DAS Data Form**

DAS Time Max Error:

0.02

Mfg	Serial	Number Site	J	Fechnician	Site Visit Date	Parameter	Use Desc.
Campbell	2525	WS	SP144	Eric Hebert	11/09/2015	DAS	Primary
Das Date:	11/9 /2015	Audit Date	11/9 /2015	Mfg	Datel	Parameter	DAS
Das Time:	313	Audit Day	313	Serial Number	4000392	Tfer Desc.	Source generator (D
Low Channe	l:	High Channe	el:	Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0000	0.0	0.000	0.0000	Cert Date	1/22/201	5 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	86590148	Tfer Desc.	DVM
				Tfer ID	01310		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/22/201	5 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	) V	V	0.0000	
7	0.1000	0.1000	0.1000	) V	V	0.0000	
7	0.3000	0.3000	0.3000	) V	V	0.0000	
7	0.5000	0.5000	0.5000	) V	V	0.0000	
7	0.7000	0.7000	0.7000	) V	V	0.0000	
7	0.9000	0.9000	0.9000	) V	V	0.0000	
7	1.0000	1.0000	1.0000	) V	V	0.0000	

## Flow Data Form

Mfg	fg Serial Number Tag Site		Тес	chnician	Site Visit I	Date Param	eter	Owner ID	
Apex	54780		WSP144	Eri	ic Hebert	11/09/2015	5 Flow R	ate	000639
				ſ	Mfg	BIOS	P	arameter Flo	w Rate
					Serial Number	131818	Т	fer Desc. BIC	)S 220-H
					Tfer ID	01417			
					Slope	1.	00316 Inte	ercept	-0.00540
					Cert Date	1/7	7/2015 <b>Cor</b>	rCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero		0	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	1.0	)1	
2.17%	2.60%				<b>Rotometer R</b>	eading:	1.	.3	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.15	0.000	0.09	l/m	l/m	
primary	test pt 1	1.535	1.540	1.48	0.000	1.50	l/m	l/m	-2.60%
primary	test pt 2	1.530	1.530	1.48	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 3	1.526	1.530	1.48	0.000	1.50	l/m	l/m	-1.96%
Sensor Comp	onent Leak Tes	t		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	s pass	
Sensor Comp	onent Filter Dis	tance		Conditio	<b>n</b> 4.0 cm		Status	pass	
Sensor Comp	onent Filter Dep	oth		Conditio	<b>n</b> 3.0 cm		Status	pass	
Sensor Comp	onent Filter Azi	muth		Conditio	n 235 deg		Status	pass	
Sensor Comp	onent System N	/lemo		Conditio	n		Status	pass	

## **Ozone Data Form**

Mfg	Se	rial Number Tag	Site	Те	echnician		Site Visit Date	Parame	eter Owner ID
ThermoElectro	n Inc 11	105347317	WSP144	E	ric Hebert		11/09/2015	Ozone	000734
Slope:         0.98867         Slope:           Intercept         -0.62015         Intercept           CorrCoff         0.99997         CorrCoff			0.0000 0.0000 0.0000	Mfg       000       000       Serial Number       000		ThermoElectron IncPar49CPS-70008-364Tfe01110		rameter ozone er Desc. Ozone primary stan	
DAS 1:     DAS 2:       A Avg % Diff: A Max % Di     A Avg % Dif       2.2%     3.4%					% Di Cert Date		9/21/20	1.01130         Intercept         -0           9/21/2015         CorrCoff         1	
UseDescrip primar primar primar	otion y y y	ConcGroup 1 2 3 4	Tfer Raw 0.28 28.54 54.75 80.88	Tfer 0. 28 54	Corr .48 3.43 4.34	Si -0. 27. 53. 79	te Si 28 ppb 46 ppb 27 ppb 02 ppb	te Unit	PctDifference -3.41% -1.97%
primar	y Y	5	102.28	10	1.34	99.	20 ppb		-2.11%
Sensor Com Sensor Com Sensor Com	ponent	Sample Train Inlet Filter Conditio Battery Backup	n	Conditi Conditi Conditi	ion Good ion Clean ion N/A			Status Status Status	pass pass
Sensor Com	ponent	Offset		Conditi	ion 0.40			Status	pass
Sensor Com	ponent	Span		Conditi	ion 0.997			Status	pass
Sensor Com	ponent	Zero Voltage		Conditi	ion N/A			Status	pass
Sensor Com	ponent	Fullscale Voltage		Conditi	ion N/A			Status	pass
Sensor Com	ponent	Cell A Freq.		Conditi	ion 95.6 k	ίHz		Status	pass
Sensor Com	ponent	Cell A Noise		Conditi	ion 0.8 pp	b		Status	pass
Sensor Com	ponent	Cell A Flow		Conditi	ion 0.72 l	pm		Status	pass
Sensor Com	ponent	Cell A Pressure		Conditi	ion 738.4	mmHg		Status	pass
Sensor Com	ponent	Cell A Tmp.		Conditi	ion 32.9 (	2		Status	pass
Sensor Com	ponent	Cell B Freq.		Conditi	ion 92.2 k	Hz		Status	pass
Sensor Com	ponent	Cell B Noise		Conditi	ion 1.1 pp	b		Status	pass
Sensor Com	ponent	Cell B Flow		Conditi	ion 0.69 l	pm		Status	pass
Sensor Com	ponent	Cell B Pressure		Conditi	ion			Status	pass
Sensor Com	ponent	Cell B Tmp.		Conditi	ion			Status	pass
Sensor Com	ponent	Line Loss		Conditi	ion Not te	sted		Status	pass
Sensor Com	ponent	System Memo		Conditi	ion			Status	pass

# **Temperature Data Form**

Mfg	Serial Number	<b>Fag Site</b>	,	Techni	Fechnician		Site Visit Date Parame		eter	<b>Owner ID</b>
RM Young	13960	WSP144		Eric H	ebert	11/09	9/2015	Temper	ature	06387
		Mf	g	Fluke		Pa	rameter Te	mperature		
					Serial Number		2085085 Ti		er Desc. R	D
				Tfe	er ID	01226	3			
DAS 1:	DAS	2:		Slo	ре		1.0010	5 Inte	rcept	-0.07989
Abs Avg Err Abs Max Er Abs Avg Err Abs Ma				ax Er Cert Date			1/30/2015 CorrCoff		rCoff	1.00000
0.22	0.38			L						
UseDesc.	Test type	InputTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference
primary T	Temp Low Range	0.03	0.11		0.000	0.2		С	0.08	
primary T	Temp Mid Range	19.00	19.0	6	0.000		18.	9	С	-0.19
primary T	Temp High Range	48.75	48.7	8	0.000		48.	4	С	-0.38
Sensor Comp	onent Shield		Cond	ition C	Clean			Status	pass	
Sensor Comp	Cond	ition N	I/A			Status	pass			
Sensor Comp	Cond	Condition N/A				Status	us pass			
Sensor Comp	onent System Memo		Cond	Condition				Status	pass	

# Shelter Temperature Data For

Mfg	Serial Number Tag Site Technicia		Technician	Site Visit Date	Parameter	Owner ID	
Campbell	none	WSF	P144	Eric Hebert	11/09/2015 Shelter Temperatu		none
DAS 1:	DAS	2:		Mfg	Fluke	Parameter She	elter Temperatur
Abs Avg Err Abs	0.89 Abs 2	Avg Err	Abs Max Er	Serial Number	2085085	Tfer Desc. RTI	)
				Tfer ID	01226	]	
				Slope	1.0010	5 Intercept	-0.07989
				Cert Date	1/30/201	5 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	20.72	20.78	0.000	21.1	С	0.31
primary	Temp Mid Range	22.00	22.06	0.000	23.0	С	0.89
primary	Temp Mid Range	22.66	22.72	0.000	23.5	С	0.75

#### Infrastructure Data For

Site ID	WSP144	Technicia Er	Eric Hebert Site Visit Date 11/09/2015
Shelter N	lake	Shelter Model	Shelter Size
Ekto		8810	640 cuft

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

# **Field Systems Comments**

**1 Parameter:** SiteOpsProcedures

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

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

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

## F-02058-1500-S1-rev002

Site ID	WSP144			Technician	Eric Hebert	Site Visit I	Date 11/09	9/2015	]	
		_						<b></b>		
Site Sponsor (	(agency)	E	EPA			USGS Map		Pennington		
<b>Operating Gr</b>	roup	1	NJDEP / '	WCRC		Map Scale				
AQS #		3	34-021-99	991		Map Date				
Meteorologica	al Type	F	R.M. You	ng						
Air Pollutant	Analyzer		Ozone			QAPP Latitude				
Deposition M	easureme	ent 🤇	dry, PM2.	.5, PM10		QAPP Longitude				
Land Use		١	woodland, urban agriculture			QAPP Elevation	Meters			
Terrain		r	rolling			QAPP Declination	n			
Conforms to N	MLM	١	Marginall	y		QAPP Declination	n Date			
Site Telephon	ie					Audit Latitude			40.3123	303
Site Address	1	١	WCRC-F	A		Audit Longitude			-74.8726	363
Site Address 2	2	C	Church R	d.		Audit Elevation				59
County		١	Mercer			Audit Declination	l	-12.5		
City, State		-	Titusville,	NJ		I	Present			
Zip Code		C	08560			Fire Extinguisher		dated 2015		
Time Zone		E	Eastern			First Aid Kit	$\checkmark$			
Primary Ope	rator					Safety Glasses	$\checkmark$			
Primary Op.	Phone #					Safety Hard Hat	$\checkmark$			
Primary Op.	E-mail					Climbing Belt				
Backup Oper	ator					Security Fence	$\checkmark$			
Backup Op.	Phone #					Secure Shelter	$\checkmark$			
Backup Op.	E-mail					Stable Entry Step				
Shelter Work	ting Room		Make	Ekto	M	odel 8810		Shelter Size	640 cuft	
Shelter Clean	1		Notes	The shelter is i	n good conditio	n, clean, very neat, a	and well or	ganized.		
Site OK			Notes							
Driving Direc	ctions ju th W to ar	rom P ist ove le parl /CRC- p of tl rea.	Philadelph er the brid k. Turn r -FA on th he hill an	ia take I-95 no dge. Continue ight onto Chur le right. The co d turn right alo	rth. Cross the I approximately 4 ch road at the tr ombination to th ng the edge of t	Delaware River into N miles through the tr affic light. Continue e lock is 1903. Cont he field. Follow the g	New Jerse affic light approxima tinue throu gravel roa	y and take the fir at the intersectio ately 0.5 miles to igh the gate up th d to the site in th	st exit, route 29 nort n of 546 and throug the gate for the ne gravel road to the e chain-link fenced	th, h €

WSP144

#### F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 11/09/2015

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	20 km	
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		$\checkmark$

Siting Distances OK

**Siting Criteria Comment** 

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

Fi	eld Sy	stems Data Fo	orm				F-02058-15	500-S3-rev002
Site	e ID	WSP144	Technician E	ric Hebert		Site Visit Date	11/09/2015	]
1	Are wind being inf	d speed and direction fluenced by obstructio	sensors sited so a	as to avoid	✓	N/A		
2	Are wind (i.e. wind horizont tower in	d sensors mounted so d sensors should be m tally extended boom > to the prevailing wind	as to minimize to ounted atop the t 2x the max diam	ower effects? cower or on a eter 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 p och as buildings,	oositioned to walls, etc?	✓			
5	Are tem condition surface a standing	perature and RH sens ns? (i.e. ground below and not steeply sloped g water should be avoi	ors sited to avoic sensors should b . Ridges, hollows ded)	l unnatural be natural , and areas of				
6	Is the so	lar radiation sensor p	lumb?		✓	N/A		
7	Is it sited	d to avoid shading, or	any artificial or	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 build	ings, trees,	✓	N/A		
10	Is the su facing n	rface wetness sensor s orth?	ited with the grid	d surface	✓	N/A		
11	Is it incl	lined approximately 3	0 degrees?		✓	N/A		

#### F-02058-1500-S4-rev002

Site	e ID	WSP144	Technician	Eric Hebert		Site Visit Date	11/09/2015	
1 2 3	Do all th condition Are all t reportin Are the s	e meterological senso n, and well maintaine he meteorological sen g data? shields for the temper	rs appear to be d? sors operationa ature and RH s	intact, in good I online, and sensors clean?	<b>&gt;</b> <b>&gt;</b>			
4	Are the	aspirated motors wor	king?		$\checkmark$			
5	Is the so scratche	lar radiation sensor's s?	lens clean and f	free of		N/A		
6	Is the su	rface wetness sensor g	grid clean and u	indamaged?	✓	N/A		
7 8	Are the s condition Are the s from the	sensor signal and pow n, and well maintaine sensor signal and pow e elements and well ma	ver cables intact d? ver cable connec aintained?	t, in good ctions protected	<b>&gt;</b>			

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Sit	WSP144 Technician Eric Hebert		Site Visit Date 11/09/2015
	Siting Criteria: Are the pollutant analyzers and deposition e	quip	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	l ma	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓	
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	✓	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?	✓	
8	Are there moisture traps in the sample lines?	✓	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry

Fi	eld Systems Dat	a Form		F-02058-1500-S6-rev002				
Site	e ID WSP144	Technician	Eric Hebert	Site Vis	it Date 11/09/201	5		
	DAS, sensor translators	s, and peripheral equip	pment operations	and maintena	ince			
1	Do the DAS instruments well maintained?	s appear to be in good	condition and 🔽					
2	Are all the components modem, backup, etc)	of the DAS operation	al? (printers, 🛛 🔽	]				
3	Do the analyzer and sen lightning protection circ	isor signal leads pass t cuitry?	through 🔽	Met sensors	only			
4	Are the signal connection well maintained?	ons protected from the	e weather and					
5	Are the signal leads con	nected to the correct	DAS channel? 🔽					
6	Are the DAS, sensor tra grounded?	unslators, and shelter	properly 🗸	]				
7	Does the instrument she	elter have a stable pow	ver source?	]				
8	Is the instrument shelte	r temperature control	lled? ✓					
9	Is the met tower stable :	and grounded?		Stable		Grounded		
10	Is the sample tower stat	ble and grounded?						
11	Tower comments?			Met tower re	emoved	V		

Fie	eld Sy	stems Data l	Foi	rm					<b>F-0</b> 2	2058-	-1500-	S7-rev	v <b>002</b>
Site	ID	WSP144		Tecl	nnician	Eric Hebert		Site Visit Date	1/09/201	5			
D	ocument	ation											
D	oes the s	ite have the require	d ins	strum	ent and	equipment m	anuals?						
		 }	les	No	N/	A			Yes	No	N/A		
Win	d speed s	sensor			$\checkmark$	Da	ata logger			$\checkmark$			
Win	d directi	on sensor			$\checkmark$	Da	ata logger				$\checkmark$		
Tem	perature	e sensor	✓			St	trip chart	recorder			$\checkmark$		
Rela	tive hun	nidity sensor			$\checkmark$	C	omputer		$\checkmark$				
Sola	r radiati	on sensor			$\checkmark$	Μ	lodem			$\checkmark$			
Surf	ace wetn	ess sensor			$\checkmark$	Pr	rinter				$\checkmark$		
Win	d sensor	translator			$\checkmark$	Ze	ero air pu	mp		✓			
Tem	perature	e translator			$\checkmark$	Fi	ilter flow <b>p</b>	oump		✓			
Hun	nidity ser	nsor translator			$\checkmark$	Su	urge prote	ctor			$\checkmark$		
Sola	r radiati	on translator			$\checkmark$	U	PS			$\checkmark$			
Тірр	oing bucl	ket rain gauge			$\checkmark$	Li	ightning p	rotection device			$\checkmark$		
Ozoi	ne analyz	zer	✓			Sh	helter heat	er		✓			
Filte	er pack fl	ow controller	✓			Sh	helter air c	conditioner	$\checkmark$				
Filte	er pack N	<b>IFC power supply</b>			$\checkmark$								
	Does the	site have the requir	ed a	nd m	ost rece	nt QC docum	ents and r	<u>eport forms?</u>					
			Pres	ent					Curre	ent			
Stati	ion Log			<b>~</b>					$\checkmark$				
SSR	F		•	✓					$\checkmark$				
Site	Ops Ma	nual	•	✓	Oct 201	11			$\checkmark$				
HAS	SP		ŀ	✓	Oct 201	11			$\checkmark$				
Field	l Ops Ma	anual	•	✓					$\checkmark$				
Cali	bration l	Reports											
Ozoi	ne z/s/p (	<b>Control Charts</b>											
Prev	entive m	aintenance schedul	<b>e</b> [										
1	Is the st	ation log properly c	omp	leted	during	every site visi	it? <b>∠</b>						
2	Are the current	Site Status Report I ?	Forn	ns bei	ng comj	pleted and							
3	Are the sample	chain-of-custody fo transfer to and from	rms 1 lab	propo ?	erly use	d to documen	t 🗹						
4	Are ozo	ne z/s/p control chai	rts p	roper	lv comr	oleted and	Co	ntrol charts not us	ed				

current?

#### F-02058-1500-S8-rev002

Site	e ID	WSP144	Technician	Eric Hebert	Site Visit Date	11/09/2015	
1	<u>Site ope</u> Has the course?	<u>ration procedures</u> site operator attende If yes, when and who	d 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 sit schedule	e visited regularly on ?	the required T	uesday			
4	Are the s flollowed	standard CASTNET of by the site operator?	operational pro	cedures being			
5	Is the sit the requi	e operator(s) knowled ired site activities? (ir	lgeable of, and a	able to perform entation)			
					 1		

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	✓	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	$\checkmark$	Semiannually	
Automatic Zero/Span Tests	$\checkmark$	Daily	
Manual Zero/Span Tests			
Automatic Precision Level Tests	$\checkmark$	Daily	
Manual Precision Level Test			
Analyzer Diagnostics Tests	$\checkmark$	Weekly	
In-line Filter Replacement (at inlet)	$\checkmark$	Every 2 weeks	
In-line Filter Replacement (at analyze		N/A	
Sample Line Check for Dirt/Water	$\checkmark$	Weekly	
Zero Air Desiccant Check	$\checkmark$	Weekly	
1 Do multi-point calibration gases go the sample train including all filters?	rough the	e complete	
$7 = 100$ sufomstic and manual $\frac{7}{s}$ n gasses	go throu	gh the 💌	

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

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

SSRF, logbook, call-in

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

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

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

Site	WSP144 Tech	hnic	Eric Hebert		Site Visit Date 11/09/2015			
	Site operation procedures							
1	Is the filter pack being changed every	y Tu	iesday as scheduled?		Filter changed morinings			
2	Are the Site Status Report Forms bei correctly?	i <b>ng</b> (	completed and filed	✓				
3	Are data downloads and backups bei scheduled?	ing J	performed as		No longer required			
4	Are general observations being made	e an	d recorded? How?	✓	SSRF, logbook			
5	Are site supplies on-hand and replent fashion?	ishe	ed 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 contamina and shipping? How?	tion	ı during handling	✓	Clean gloves on and off			
9	Are the site conditions reported regulations manager or staff?	larl	y to the field					
QC	Check Performed		Frequency		Compliant			
N	Iulti-point MFC Calibrations		Semiannually					
F	low System Leak Checks		Weekly					
F	Filter Pack Inspection							
F	Flow Rate Setting Checks							
V	Visual Check of Flow Rate Rotometer Veekly							
I	In-line Filter Inspection/Replacement							
S	ample Line Check for Dirt/Water	✓	Weekly					

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07037
DAS	Campbell	CR3000	2525	000430
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	83403-10	00087
Flow Rate	Apex	AXMC105LPMDPC	54780	000639
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0808338332	06454
Ozone	ThermoElectron Inc	49i A1NAA	1105347317	000734
Ozone Standard	ThermoElectron Inc	49i A3NAA	0929938240	000543
Sample Tower	Aluma Tower	В	none	000126
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	13960	06387
Zero air pump	Werther International	C 70/4	000814273	06880

Technician Eric Hebert

## **Field Systems Data Form**

WSP144

Site ID

**Site Visit Sensors** 

#### F-02058-1500-S10-rev002

Site Visit Date 11/09/2015

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number				
VPI	PI120-Sandy Grenville-11/19/2015									
1	11/19/2015	Computer	Dell	07032	Inspiron 15	Unknown				
2	11/19/2015	DAS	Campbell	000402	CR3000	2514				
3	11/19/2015	Elevation	Elevation	None	1	None				
4	11/19/2015	Filter pack flow pump	Thomas	02751	107CAB18	1192001884				
5	11/19/2015	Flow Rate	Арех	000591	AXMC105LPMDPCV	illegible				
6	11/19/2015	Infrastructure	Infrastructure	none	none	none				
7	11/19/2015	Modem	Raven	06586	V4221-V	0844350237				
8	11/19/2015	Ozone	ThermoElectron Inc	000628	49i A1NAA	1009241786				
9	11/19/2015	Ozone Standard	ThermoElectron Inc	000443	49i A3NAA	CM08200019				
10	11/19/2015	Sample Tower	Aluma Tower	06641	В	unknown				
11	11/19/2015	Shelter Temperature	Campbell	none	107-L	none				
12	11/19/2015	Siting Criteria	Siting Criteria	None	1	None				
13	11/19/2015	Temperature	Climatronics	06700	100093	none				
14	11/19/2015	Zero air pump	Werther International	06907	C 70/4	000829179				

## **DAS Data Form**

DAS Time Max Error:

0

Mfg	Serial N	lumber Site	J	<b>Fechnician</b>	Site Visit Date	Parameter	Use Desc.
Campbell	2514	VPI	120	Sandy Grenville	11/19/2015	DAS	Primary
Das Date:	11/19/2015	Audit Date	11/19/2015	Mfg	Datel	Parameter	DAS
Das Time:	323	Audit Day	323	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Channe	l:	High Channe	l:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:				
0.0000	0.000	0.0000	0.0001				
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/22/201	5 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	0.1000	V	V	0.0001	
7	0.3000	0.2998	0.2998	S V	V	0.0000	
7	0.5000	0.4997	0.4997	V	V	0.0000	
7	0.7000	0.6996	0.6996	V	V	0.0000	
7	0.9000	0.8995	0.8994	V	V	-0.0001	
7	1.0000	0.9993	0.9993	V	V	0.0000	

## Flow Data Form

Mfg	Serial Num	iber Tag S	Site	Тес	hnician	Site Visit I	Date Paran	neter	<b>Owner ID</b>
Арех	illegible		VPI120	Sa	ndy Grenville	11/19/2015	5 Flow F	Rate	000591
					Mfg	BIOS Parameter Flow Rate			ow Rate
					Serial Number	103471	Т	fer Desc. ne	xus
					Tfer ID	01420			
					Slope	0.	96664 Int	ercept	0.03078
					Cert Date	2/	5/2015 <b>Co</b>	rrCoff	0.99996
					Mfg	BIOS	P	arameter Flo	ow Rate
					Serial Number	103424	Г	fer Desc. Bl	OS cell
					Tfer ID	01410			
					Slope	0.	96664 Int	ercept	0.03078
					Cert Date	2/	5/2015 <b>Co</b> l	rrCoff	0.99996
DAS 1: DAS 2:			L	Cal Factor Z	ero	-0.0	)5		
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	% Di	Cal Factor F	ull Scale	0.9	95	
3.02%	3.23%				Rotometer R	eading:	1.4	45	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignal	ll PctDifference
primary	pump off	0.000	0.000	0.02	0.020	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.020	-0.04	l/m	l/m	
primary	test pt 1	1.525	1.550	1.55	1.550	1.50	l/m	l/m	-3.23%
primary	test pt 2	1.526	1.550	1.55	1.550	1.50	l/m	l/m	-3.23%
primary	test pt 3	1.523	1.540	1.55	1.550	1.50	l/m	l/m	-2.60%
Sensor Comp	onent Leak Tes	t		Conditio	n		Status		
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Comp	onent Filter Pos	ition		Conditio	n Fair		Status	pass	
Sensor Comp	onent Rotomete	er Conditior	1	Conditio	n Clean and dry		Status	pass	
Sensor Component Moisture Present			Conditio	n No moisture p	resent	Status	pass		
Sensor Component Filter Distance			Conditio	<b>n</b> 4.1 cm		Status	pass		
Sensor Comp	onent Filter Dep	oth		Conditio	<b>n</b> 0 cm		Status	pass	
Sensor Comp	onent Filter Azir	muth		Conditio	n 200 deg		Status	pass	
Sensor Comp	onent System M	lemo		Conditio	on Status			pass	

## **Ozone Data Form**

Mfg	Serial Number Tag	Site	Tech	nician	Site Visit Date	Paramet	er Owner ID
ThermoElectron Inc	1009241786	VPI120	Sanc	dy Grenville	11/19/2015	Ozone	000628
Slope:         0.99265         Slope:         0.0000           Intercept         -0.28599         Intercept         0.0000           CorrCoff         0.99998         CorrCoff         0.0000			Mfg Serial Number		Inc Para	ameter ozone r Desc. Ozone primary stan	
DAS 1: A Avg % Diff: A M 1.1%	DAS 2: Iax % Di A Avg % 1.5%	6Dif A Max	% Di	lope 'ert Date	0.9938 6/25/20	<ul><li>Interc</li><li>CorrC</li></ul>	-0.40946           Coff         1.00000
UseDescription primary	ConcGroup 1	Tfer Raw -0.01	Tfer Cc 0.40	orr Si 0.0	te Sir 01 ppb	te Unit	PctDifference
primary primary primary	3 4 5	50.15 79.52	50.39 50.87 80.42	2 110	.42         ppb           .09         ppb           .25         ppb           .30         ppb		-0.30% -1.53% -1.45%
Sensor Component Sensor Component	1t     Sample Train       1t     Inlet Filter Condition	0n	Condition Condition	Good Clean		Status P Status P	pass pass
Sensor Componen Sensor Componen	nt Battery Backup		Condition Condition	N/A 0.60		Status P Status P	pass
Sensor Componen Sensor Componen	nt Span nt Zero Voltage		Condition Condition	1.007 N/A		Status P Status P	pass
Sensor Componen Sensor Componen	t Fullscale Voltage		Condition Condition	N/A 88.9 kHz		Status P Status P	pass
Sensor Componer Sensor Componer	nt Cell A Noise		Condition Condition	0.4 ppb 0.69 lpm		Status P Status P	bass
Sensor Componen Sensor Componen	t Cell A Pressure		Condition Condition	662 mmHg 34.0 C		Status P Status P	pass
Sensor Componer	nt Cell B Freq.		Condition Condition	92.2 kHz 0.4 ppb		Status P Status P	pass
Sensor Componer	t Cell B Flow		Condition	0.80 lpm		Status P	pass
Sensor Componen	nt Cell B Tmp.		Condition			Status P Status P	pass
Sensor Componer Sensor Componer	nt Line Loss		Condition Condition			Status P Status P	pass

# **Temperature Data Form**

Mfg	Serial Number	Tag Site	1	Technician		Site V	isit Date	Param	eter	<b>Owner ID</b>	
Climatronics	none	VPI120		Sandy	Grenville	11/19	)/2015	Temper	ature	06700	
				Mf	g	Extec	n	Pa	arameter Te	mperature	
				Serial Number		H232734 Tf		fer Desc. R	D		
				Tfe	er ID	01227					
DAS 1:	DAS	S 2:		Slo	ре		1.0034	3 Inte	rcept	-0.06409	ð
Abs Avg Err Abs Max Er Abs Avg Err Abs Max		Max Er	ix Er Cert Date		1/30/2015 Cor		rCoff	1.00000	)		
0.03	0.05										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal OutputSignalE		gnalEng	OSE Unit	Difference	
primary Te	emp Low Range	0.05	0.11		0.000		0.2		С	0.05	
primary Te	emp Mid Range	25.35	25.33		0.000		25.	3	С	0.01	
primary Te	emp High Range	49.17	49.07		0.000		49.	1	С	0.03	
Sensor Compo	onent Shield		Condi	tion N	loderately clea	an		Status	pass		
Sensor Component Blower				Condition Functioning				Status	pass		
Sensor Component Blower Status Switch				Condition N/A				Status	pass		
Sensor Compo	onent System Memo		Condi	Condition				Status	pass		

# Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell none VPI120 Sandy (		Sandy Grenville	11/19/2015	Shelter Temperature	none	
DAS 1:	<b>DAS 2:</b>		Mfg	Extech	Parameter She	lter Temperatur
Abs Avg Err Abs	Max Er     Abs Avg       0.40	; Err Abs Max Er	Serial Number	H232734	Tfer Desc. RT	)
			Tfer ID	01227		
			Slope	1.0034	3 Intercept	-0.06409
			Cert Date	1/30/201	5 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.72	22.71	0.000	23.0	С	0.26
primary	Temp Mid Range	22.57	22.56	0.000	22.7	С	0.13
primary	Temp Mid Range	21.96	21.95	0.000	22.4	С	0.4

#### Infrastructure Data For

Site ID	VPI120	Technicia Sandy G	Grenville Site Visit Date 11/19/2015
Shelter	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2107-3)	640 cuft
and the property of the			

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

# **Field Systems Comments**

#### 1 Parameter: SitingCriteriaCom

The site is on a wooded hillside. The met gear and sample inlet are at the tree tops of the downhill trees. The uphill tree line is 30 meters away.

#### 2 Parameter: ShelterCleanNotes

The shelter roof has been recently repaired due to additional leaks. The shelter is clean, neat, and well organized.

Field Systems Da	ata Form	I	F-02058-1500-S1-rev002		
Site ID VPI120	Technician Sandy Grenvill	e Site Visit Date 11/1	9/2015		
Site Sponsor (agency)	EPA	USGS Map	Eggleston		
<b>Operating Group</b>	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 🗹	Inspected March 2009		
Time Zone	Eastern	First Aid Kit			
Primary Operator		Safety Glasses 🔽			
Primary Op. Phone #		Safety Hard Hat 🔽			
Primary Op. E-mail		Climbing Belt			
<b>Backup Operator</b>		Security Fence			
Backup Op. Phone #		Secure Shelter			
Backup Op. E-mail		Stable Entry Step 🗹			
Shelter Working Room	Make Ekto M	odel 8810 (s/n 2107-3)	Shelter Size 640 cuft		
Shelter Clean	Notes The shelter roof has been recovered well organized.	ently repaired due to additional	leaks. The shelter is clean, neat, and		
Site OK	Notes				

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

Technician Sandy Grenville

Site Visit Date 11/19/2015

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

#### Siting Distances OK

#### **Siting Criteria Comment**

The site is on a wooded hillside. The met gear and sample inlet are at the tree tops of the downhill trees. The uphill tree line is 30 meters away.

Fi	eld Sy	stems Data F	orm		F-02058-1500-S3-rev0					002
Site	e ID	VPI120	Technician	Sandy Grenville		Site Visit Date	11/19/2015		]	
1	Are win being in	nd speed and direction nfluenced by obstructi	sensors sited so ons?	as to avoid	✓	N/A				
2	Are win (i.e. win horizon tower in	nd sensors mounted so nd sensors should be n ntally extended boom > nto the prevailing win	as to minimize nounted atop the >2x the max dian d)	tower effects? e tower or on a neter of the		N/A				
3	Are the	e tower and sensors plu	ımb?		✓	N/A				
4	Are the avoid r	e temperature shields j adiated heat sources s	oointed north or uch as buildings	positioned to , walls, etc?	✓					
5	Are ten conditio surface standin	nperature and RH sen ons? (i.e. ground below and not steeply sloped g water should be avo	sors sited to avo v sensors should d. Ridges, hollov ided)	id unnatural be natural vs, and areas of						
6	Is the s	olar radiation sensor <b>p</b>	olumb?		✓	N/A				
7	Is it site	ed to avoid shading, or	any artificial o	r reflected light?	✓	N/A				
8	Is the r	ain gauge plumb?			✓	N/A				
9	Is it site towers,	ed to avoid sheltering o etc?	effects from buil	dings, trees,	✓	N/A				
10	Is the st facing 1	urface wetness sensor 10rth?	sited with the g	id surface	✓	N/A				
11	Is it in	clined approximately 3	30 degrees?		✓	N/A				

### F-02058-1500-S4-rev002

Site	e ID	VPI120	Technician	Sandy Grenville		Site Visit Date 11/19/2015	
1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?						
2	2 Are all the meteorological sensors operational online, and reporting data?						
3	Are the	shields for the temper	ature and RH s	sensors clean?	✓	Moderately clean	
4	Are the	aspirated motors wor	king?				
5	Is the sol scratche	lar radiation sensor's s?	lens clean and	free of		N/A	
6	Is the su	rface wetness sensor g	grid clean and u	indamaged?	✓	N/A	
7	Are the s condition	sensor signal and pow n, and well maintaine	ver cables intact d?	, in good			
8	Are the s from the	sensor signal and pow elements and well ma	ver cable connec aintained?	ctions protected	✓		
Fi	eld Systems Data Form		F-02058-1500-S5-rev002				
------	--	-------------	---				
Site	ID VPI120 Technician Sandy Grenville		Site Visit Date 11/19/2015				
	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	<u>l ma</u>	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 18 meters				
4	Describe dry dep sample tube.		3/8 teflon by 18 meters				
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	✓	At inlet only				
6	Are sample lines clean, free of kinks, moisture, and obstructions?						
7	Is the zero air supply desiccant unsaturated?	✓					
8	Are there moisture traps in the sample lines?	✓	Flow line only				
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry				

Fi	eld Sy	stems Data Fo	orm			<b>F-02</b>	2058-15	00-S6-rev002	
Site ID VPI120 Technician		Sandy Grenville	;	Site Visit Date	11/19/201	5			
	DAS, se	nsor translators, and j	peripheral equi	pment operatio	ns a	nd maintenance			
1	Do the I well mai	OAS 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	3 Do the analyzer and sensor signal leads pass through lightning protection circuitry?					Met sensors only			
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 d?	rs, and shelter	properly	✓				
7	Does the	instrument shelter h	ave a stable pov	wer source?	✓				
8	Is the in	strument shelter temp	perature contro	lled?	✓				
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	l grounded?						
11	Tower c	omments?						V	

Field Systems Data Form							-1500-S7-rev002
Site ID	VPI120	Tecl	hnician	Sandy Grenville Site Visit Date	e 11/19/2015	5	
Documen	<u>tation</u>						
<b>Does the</b>	site have the required	instrum	ent and	equipment manuals?			
Wind speed Wind direct Temperatur Relative hur Solar radiat Surface weth Wind sensor Temperatur	Ye sensor	s No		A Data logger Data logger Strip chart recorder Computer Modem Printer Zero air pump Filter flow pump	Yes □ □ □ □		
Humidity se Solar radiat Tipping buc Ozone analy Filter pack f	nsor translator			Surge protector UPS Lightning protection devic Shelter heater Shelter air conditioner	□ • • •		
Does the	e site have the required	l and m	ost recei	nt OC documents and report forms?			
Station Log	e site nave the required Pr	esent		nt QC documents and report forms?	Curre	ent	
SSRF Site Ops Ma HASP	nual	<ul><li></li><li></li><li></li></ul>	Oct 200 Feb 201	1 4			
Field Ops M Calibration Ozone z/s/p	lanual Reports Control Charts		July 199	90			
Preventive n	naintenance schedule						

- 1 Is the station log properly completed during every site visit?  $\checkmark$
- 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?

Control charts not used

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:

✓

#### **VPI120** Site ID Technician Sandy Grenville Site Visit Date 11/19/2015 **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? ✓ Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 🗹 5 the required site activities? (including documentation)

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

QC Check Performed		Frequency	Com
Multipoint Calibrations	$\checkmark$	Semiannually	$\checkmark$
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	$\checkmark$	Weekly	$\checkmark$
Test Surface Wetness Response	$\checkmark$	N/A	$\checkmark$

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	$\checkmark$	Semiannually	
Automatic Zero/Span Tests	$\checkmark$	Daily	
Manual Zero/Span Tests	$\checkmark$	As needed	
Automatic Precision Level Tests	$\checkmark$	Daily	
Manual Precision Level Test	$\checkmark$	As needed	
Analyzer Diagnostics Tests	$\checkmark$	Weekly	
In-line Filter Replacement (at inlet)	$\checkmark$	Every 2 weeks	
In-line Filter Replacement (at analyze	$\checkmark$	N/A	
Sample Line Check for Dirt/Water			
Zero Air Desiccant Check	$\checkmark$	Weekly	
1 Do multi-point calibration gases go the sample train including all filters?	rough the	e complete	
2 Do automatic and manual z/s/n gasses	go throu	gh the 🗹	

2 Do automatic and manual 2/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:

✓

logbook, call-in

### F-02058-1500-S8-rev002

Compliant

Field S	Systems Data Fo	orm	F-02058-1500-S9-rev002
Site ID	VPI120	Technician Sandy Grenville	Site Visit Date 11/19/2015
Site o	peration procedures		

1	Is the filter pack being changed every	y Tuesday as scheduled?		Filter changed morinings		
2	Are the Site Status Report Forms be 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	e and recorded? How?	✓	SSRF, logbook		
5	Are site supplies on-hand and replenished in a timely fashion?					
6	Are sample flow rates recorded? How	v?	✓	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 regu operations manager or staff?	larly 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 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

Techn

Technician Sandy Grenville

Site Visit Date 11/19/2015

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	Raven	V4221-V	0844350237	06586
Ozone	ThermoElectron Inc	49i A1NAA	1009241786	000628
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200019	000443
Sample Tower	Aluma Tower	В	unknown	06641
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	Climatronics	100093	none	06700
Zero air pump	Werther International	C 70/4	000829179	06907

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number							
PAR	AR107-Sandy Grenville-11/21/2015												
1	11/21/2015	Computer	Dell	07072	Inspiron 15	Unknown							
2	11/21/2015	DAS	Campbell	000333	CR3000	2112							
3	11/21/2015	Elevation	Elevation	None	1	None							
4	11/21/2015	Filter pack flow pump	Thomas	00859	107CA18	missing							
5	11/21/2015	Flow Rate	Арех	000803	AXMC105LPMDPCV	50752							
6	11/21/2015	Infrastructure	Infrastructure	none	none	none							
7	11/21/2015	Modem	Raven	06607	H4222-C	0844356054							
8	11/21/2015	Ozone	ThermoElectron Inc	000685	49i A1NAA	1030244789							
9	11/21/2015	Ozone Standard	ThermoElectron Inc	000436	49i A3NAA	CM08200012							
10	11/21/2015	Sample Tower	Aluma Tower	000838	В	unknown							
11	11/21/2015	Shelter Temperature	Campbell	none	107-L	none							
12	11/21/2015	Siting Criteria	Siting Criteria	None	1	None							
13	11/21/2015	Temperature	RM Young	04316	41342VO	4013							
14	11/21/2015	Zero air pump	Werther International	06932	C 70/4	000829174							

## **DAS Data Form**

DAS Time Max Error:

ror: 0

Mfg	Afg Serial Number Site		]	Fechnician	Site Visit Date	Parameter	Use Desc.
Campbell	2112	PAR	8107	Sandy Grenville	11/21/2015	DAS	Primary
Das Date:	11/21/2015	Audit Date	11/21/2015	Mfg	Datel	Parameter	DAS
Das Time: Das Day:	325	Audit Time	325	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Channe	el:	High Channel	l:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:				
0.000	0.0001	0.0000	0.0001				
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/22/201	5 CorrCoff	1.00000
Channel	Input I	OVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	) V	V	0.0000	
7	0.1000	0.0999	0.0999	) V	V	0.0000	
7	0.3000	0.2997	0.2998	8 V	V	0.0001	
7	0.5000	0.4996	0.4996	5 V	V	0.0000	
7	0.7000	0.6995	0.6995	5 V	V	0.0000	
7	0.9000	0.8994	0.8994	4 V	V	0.0000	
7	1.0000	0.9993	0.9993	3 V	V	0.0000	

# Flow Data Form

Mfg	Serial Num	iber Tag Site		Тес	hnician	Site Visit D	ate Paran	neter	Owner ID
Apex	50752		PAR107	Sa	ndy Grenville	11/21/2015	Flow F	late	000803
				Γ	Mfo	BIOS	р	arameter Flow	w Rate
					~	400.474			
					Serial Number	103471	1	fer Desc. nex	us
					Tfer ID	01420			
					Slope	0.9	96664 Int	ercept	0.03078
					Cert Date	2/5	/2015 <b>Co</b>	rrCoff	0.99996
					Mfg	BIOS	P	arameter Flow	w Rate
					Serial Number	103424	Г	fer Desc. BIO	S cell
					Tfer ID	01410			
					Slope	0.9	96664 Int	ercept	0.03078
					Cert Date	2/5	6/2015 <b>Co</b>	rrCoff	0.99996
DAS 1:		DAS 2:		L	Cal Factor Z	ero	-0.(	)2	
A Avg % Diff: A	A Max % Di	A Avg %l	Dif A Max	% Di	Cal Factor F	ull Scale	0.9	96	
3.02%	3.23%				Rotometer R	eading:	1	.5	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.00	-0.030	-0.03	l/m	l/m	
primary	test pt 1	1.525	1.550	1.54	1.540	1.50	l/m	l/m	-3.23%
primary	test pt 2	1.526	1.550	1.54	1.540	1.50	l/m	l/m	-3.23%
primary	test pt 3	1.523	1.540	1.54	1.540	1.50	l/m	l/m	-2.60%
Sensor Compo	nent Leak Tes	t		Conditio	n		Status	pass	
Sensor Compo	nent Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Compo	onent Filter Pos	sition		Conditio	n Good		Status	pass	
Sensor Compo	nent Rotomete	er Condition	1	Conditio	Clean and dry		Status	pass	
Sensor Component Moisture Present			Conditio	n No moisture p	resent	Status	pass		
Sensor Component Filter Distance			Conditio	n 5.5 cm		Status	pass		
Sensor Component Filter Depth			Conditio	n 2.5 cm		Status	pass		
Sensor Compo	nent Filter Azir	muth		Conditio	n 95 deg		Status	pass	
Sensor Compo	onent System M	lemo		Conditio	n		Status	pass	

## **Ozone Data Form**

Mfg	Serial Number Tag Site Tech		chnician Site Visit		Site Visit Da	te Paramo	eter Owner ID		
ThermoElectron Ir	nc 1030244789	PA	R107	Sa	andy Grei	nville	11/21/2015	Ozone	000685
Slope:1.00098Slope:Intercept-0.89739InterceptCorrCoff0.99999CorrCoff		0.00000 0.00000 0.00000		Mfg Serial Number Tfer ID		ThermoElectron IncPar0419606966Tfe01112		<b>rameter</b> ozone	
DAS 1: A Avg % Diff: A 1.6%	Max % Di         A A           2.7%	5 2: vg %Dif	A Max	% Di	Slope Cert Da	ıte	0.99 6/25/2	2015 Corr	rcept -0.40946 rCoff 1.00000
UseDescription primary primary primary primary	On         ConcGrou           1         2           3         4	ıp T	fer Raw -0.02 29.94 49.91 79.57	Tfer 0 30 50 80	Corr 39 .53 .63 .47	Si -0. 29. 49. 79.	te ppb 40 ppb 72 ppb 53 ppb 61 ppb	Site Unit	PctDifference -2.65% -2.17% -1.07%
primary	5		109.77	110	).86	110	.20 ppb	States	-0.60%
Sensor Compo Sensor Compo Sensor Compo Sensor Compo	nent Inlet Filter Co nent Battery Backu nent Offset	ndition		Condition Condition Condition	on Good on Mode on N/A on 0.50	rately clea	an	Status Status Status Status Status	pass pass pass pass pass pass pass pass
Sensor Compo Sensor Compo	nent Span nent Zero Voltage			Condition 0.997 Condition N/A				Status Status	pass
Sensor Compo Sensor Compo	nent Fullscale Volt	age		Condition N/A Condition 93.5 kHz				Status Status	pass pass
Sensor Compo Sensor Compo	nent Cell A Noise			Condition Condition	on 1.4 pp on 0.62 l	pm		Status Status	pass pass
Sensor Compo	nent Cell A Pressu	re		Condition Condition	on 683.4	mmHg C		Status Status	pass
Sensor Compo	nent Cell B Freq.			Conditi	on 92.3 k	κHz		Status	pass
Sensor Compo Sensor Compo	nent Cell B Noise			Conditi Conditi	on 0.9 pp on 0.52 l	pm		Status Status	pass pass
Sensor Compo		re		Conditi	on			Status	pass
Sensor Compo Sensor Compo	nent Cell B Tmp.			Conditi Conditi	on on Not te	ested		Status Status	pass
Sensor Compo	nent System Mem	)		Conditi	on			Status	pass

# **Temperature Data Form**

Mfg	Serial Number	Tag Site	1	Technician S		Site V	isit Date	Param	eter	<b>Owner ID</b>	
RM Young	4013	PAR107		Sandy	Grenville	11/21	1/2015	Temper	ature	04316	
				Mfg		Extec	h	Pa	arameter Te	mperature	
				Serial Number		H232	734	T	fer Desc. R	D	
			Tfer ID		01227	7					
DAS 1. DAS 2.				Slo	pe	1.00343 Intercept		rcept	-0.06409		
Abs Avg Err Abs Max Er Abs Avg Err Abs Ma		Max Er	x Er Cert Date			1/30/201	5 Cor	rCoff	1.00000		
0.05	0.10										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmp	Signal	gnal OutputSignalEng		OSE Unit	Difference	
primary Te	emp Low Range	0.01	0.07		0.000		0.1	l	С	0.02	
primary Te	emp Mid Range	25.14	25.12		0.000		25.	0	С	-0.1	
primary Te	emp High Range	47.54	47.44	-	0.000		47.	5	С	0.02	
Sensor Compo	onent Shield		Condi	tion C	Clean			Status	pass		
Sensor Component Blower			Condi	Condition N/A				Status	pass		
Sensor Component Blower Status Switch				Condition N/A				Status	pass		
Sensor Component System Memo				Condition				Status	pass		

# Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	PAR107	Sandy Grenville	11/21/2015	Shelter Temperature	none
DAS 1:	<b>DAS 2:</b>		Mfg	Extech	Parameter She	lter Temperatur
Abs Avg Err Abs	0.29 Abs Avg	g Err Abs Max Er	Serial Number	H232734	Tfer Desc. RT	)
			Tfer ID	01227		
			Slope	1.0034	3 Intercept	-0.06409
			Cert Date	1/30/201	5 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.39	22.38	0.000	22.3	С	-0.09
primary	Temp Mid Range	20.88	20.87	0.000	21.2	С	0.29
primary	Temp Mid Range	21.69	21.68	0.000	21.9	С	0.22

#### Infrastructure Data For

Site ID	PAR107	Technicia	Sandy Grenville	Site Visit Date 11/21/2015
Shelter M	lake	Shelter Model	Shelto	er Size
Ekto		8810	640 ci	uft
and the second second		State of the second sec		

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: DasComments

The meteorological tower has been removed and the temperature sensor has been mounted on the sample tower.

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

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

Field Systems Da	ata Form	H	F-02058-1500-S1-rev002		
Site ID PAR107	Technician Sandy Grenville	e Site Visit Date 11/2	1/2015		
Site Sponsor (agency)	EPA/USFS	USGS Map	Parsons		
Operating Group	USES	Map Scale			
AOS #	54_093_9991	Man Date			
AQS#	Climatronico	<b>F</b>			
Meteorological Type					
Air Pollutant Analyzer	Uzone	QAPP Latitude			
Deposition Measurement	dry, wet	QAPP Longitude			
Land Use	woodland - mixed	<b>QAPP Elevation Meters</b>			
Terrain	complex	<b>QAPP Declination</b>			
Conforms to MLM	No	QAPP Declination Date			
Site Telephone		Audit Latitude	39.090434		
Site Address 1	USFS Timber & Watershed Lab	Audit Longitude	-79.661742		
Site Address 2	Rt. 219, Nursery Bottom	Audit Elevation	510		
County	Parsons	Audit Declination	-9		
City, State	Parsons, WV	Present			
Zip Code	26287	Fire Extinguisher 🗹	Inspected Nov 2015		
Time Zone	Eastern	First Aid Kit			
Primary Operator		Safety Glasses			
Primary Op. Phone #		Safety Hard Hat 🔽			
Primary Op. E-mail		Climbing Belt			
Backup Operator		Security Fence			
Backup Op. Phone #		Secure Shelter			
Backup Op. E-mail		Stable Entry Step 🗹			
Shelter Working Room ✓	Make Ekto M	odel 8810	Shelter Size 640 cuft		
Shelter Clean	Notes The shelter is in good condition	n, clean, neat, and well organiz	zed.		
Site OK	Notes				
Driving Directions Take Reserved	highway 33W to Elkins WV. Turn onto 1 voir. The site entrance is on the right ne	9N to Parsons. Continue throu xt to the visitors center.	ugh town to the Nursery Bottom		

PAR107

### F-02058-1500-S2-rev002

Site ID

Technician Sandy Grenville

Site Visit Date 11/21/2015

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	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		$\checkmark$

Siting Distances OK

**Siting Criteria Comment** 

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

Fi	eld Sy	stems Data F	orm				F-0205	58-1	500-S3-re	v002
Site	e ID	PAR107	Technician	Sandy Grenville		Site Visit Date	11/21/2015		]	
1	Are win being in	d speed and direction fluenced by obstructi	sensors sited so ons?	as to avoid	✓	N/A				
2	<ul> <li>Are wind sensors mounted so as to minimize tower effects?</li> <li>(i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom &gt;2x the max diameter of the tower into the prevailing wind)</li> </ul>					N/A				
3	Are the	tower and sensors plu	ımb?		✓	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 <b>p</b>	olumb?			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 o etc?	effects from buil	dings, trees,	✓	N/A				
10	Is the su facing n	urface wetness sensor orth?	sited with the gr	id surface		N/A				
11	Is it inc	lined approximately 3	30 degrees?			N/A				

### F-02058-1500-S4-rev002

Sit	e ID	PAR107	Technician	Sandy Grenville		Site Visit Date	11/21/2015	
1	Do all th condition	e meterological senso n, and well maintaine	rs appear to be d?	intact, in good	<ul><li>✓</li></ul>			
2 Are all the meteorological sensors operational online, and reporting data?								
3	Are the	shields for the temper	ature and RH s	ensors clean?	✓			
4	Are the aspirated motors working?					N/A		
5	Is the solar radiation sensor's lens clean and free of scratches?				✓	N/A		
6	Is the surface wetness sensor grid clean and undamaged?				✓	N/A		
7	Are the sensor signal and power cables intact, in good condition, and well maintained?				✓			
8	Are the s from the	sensor signal and pow elements and well m	ver cable connec aintained?	ctions protected				

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	ID PAR107 Technician Sandy Grenville	•	Site Visit Date 11/21/2015
	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	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓	
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	✓	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?	✓	
8	Are there moisture traps in the sample lines?	✓	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry

Fi	eld Sy	stems Data F	orm				<b>F-02</b>	2058-15	00-S6-rev002
Site	e ID	PAR107	Technician	Sandy Grenville	;	Site Visit Da	te 11/21/201	5	
	DAS, se	ensor translators, and	peripheral equi	pment operatio	<u>ns a</u>	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 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	d to the correct	DAS channel?	✓				
6	Are the ground	DAS, sensor translate ed?	ors, and shelter	properly					
7	Does th	e instrument shelter h	ave a stable pov	ver source?	✓				
8	Is the ir	istrument shelter temj	perature contro	lled?	✓				
9	Is the m	net tower stable and g	rounded?			Stable		Grounded	
10	Is the sa	ample tower stable and	d grounded?						
11	Tower	comments?				Met tower remove	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:

The meteorological tower has been removed and the temperature sensor has been mounted on the sample tower.

Fie	eld Sys	stems Data	Foi	rm				<b>F-0</b> 2	2058-	-1500- <b>S7-rev</b> 002
Site	ID	PAR107		Tech	nician	Sandy Grenville	Site Visit Date	11/21/201	5	
D	ocumenta	<u>ition</u>								
D	oes the sit	te have the requi	red in	strum	ent and	equipment ma	nuals?			
Win Win Tem Rela Sola Surf Win Tem Hun Sola Tipp Ozon Filte	d speed so d directio perature tive humi r radiatio ace wetne d sensor t perature nidity sens r radiatio sing bucko ne analyzo r pack flo r pack M	ensor n sensor sensor dity sensor n sensor ss sensor ranslator translator translator or translator n translator et rain gauge er w controller	Yes		N// V V V V V V V V V V V V V V V V V V	A Dat Dat Stri Cor Mod Prin Zer Filt Sur UPS Lig She She	a logger a logger p chart recorder nputer dem nter o air pump er flow pump ge protector S htning protection device lter heater lter air conditioner	Yes		N/A  V V V V V V V V V V V V V V V V V V
]	Does the s	site have the requ	ired a	nd mo	ost rece	nt QC docume	nts and report forms?			
-			Pres	ent	<u>, , , , , , , , , , , , , , , , , , , </u>	in ge uteuner	nts and report forms.	Curre	ent	
Stati SSR Site HAS Field Calil	ion Log F Ops Man SP I Ops Mai bration R	ual nual eports	: [ [ [ [ [	<b>&gt;</b> <b>&gt;</b> <b>&gt;</b>	Feb 201	14				
Ozoi	ne z/s/p C	ontrol Charts	[							
Prev	entive ma	intenance sched	ule							
1	Is the sta	tion log properly	comp	leted	during	every site visit?	Minimal information			
2	Are the S current?	ite Status Repor	t Forn	ns beii	ng comp	pleted and				
3	Are the c	hain-of-custody	forms	prope	rly used	d to document				

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

sample transfer to and from lab?

Control charts not used

#### PAR107 Technician Sandy Grenville Site Visit Date 11/21/2015 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 $\checkmark$ 3 schedule? ✓ Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 🗹 5 the required site activities? (including documentation)

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

QC Check Performed		Frequency	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?

complete sample train including all filters?

reported? If yes, how?

3

Are the automatic and manual z/s/p checks monitored and

QC Check Performed	Frequency	Compliant
Multi-point Calibrations	Semiannually	
Automatic Zero/Span Tests	Daily	
Manual Zero/Span Tests	As needed	
Automatic Precision Level Tests	Daily	
Manual Precision Level Test	As needed	
Analyzer Diagnostics Tests	Weekly	
In-line Filter Replacement (at inlet)	Every 2 weeks	
In-line Filter Replacement (at analyze	N/A	
Sample Line Check for Dirt/Water	Weekly	
Zero Air Desiccant Check	Weekly	
<ol> <li>Do multi-point calibration gases go through sample train including all filters?</li> <li>Do automatic and manual z/s/p gasses go thr</li> </ol>	the complete	

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

✓

SSRF, call-in

### F-02058-1500-S8-rev002

#### **Field Systems Data Form** F-02058-1500-S9-rev002 Site ID PAR107 Sandy Grenville Site Visit Date 11/21/2015 Technician Site operation procedures Is the filter pack being changed every Tuesday as scheduled? Filter changed at noon 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 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 ✓ Are samples sent to the lab on a regular schedule in a timely 🗹 7 fashion? ✓ Clean gloves on and off Are filters protected from contamination during handling 8 and shipping? How? ✓ Are the site conditions reported regularly to the field 9 operations manager or staff? **OC Check Performed** Frequency Compliant

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

PAR107

### F-02058-1500-S10-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 11/21/2015

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	Raven	H4222-C	0844356054	06607
Ozone	ThermoElectron Inc	49i A1NAA	1030244789	000685
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	000829174	06932

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CDR	2119-Sandy	Grenville-11/22/2015				
1	11/22/2015	Computer	Dell	07071	Inspiron 15	Unknown
2	11/22/2015	DAS	Campbell	000339	CR3000	2118
3	11/22/2015	Elevation	Elevation	None	1	None
4	11/22/2015	Filter pack flow pump	Thomas	06027	107CAB18	060400022672
5	11/22/2015	Flow Rate	Арех	000660	AXMC105LPMDPCV	54747
6	11/22/2015	Infrastructure	Infrastructure	none	none	none
7	11/22/2015	Modem	Raven	06592	V4221-V	0844350437
8	11/22/2015	Ozone	ThermoElectron Inc	000623	49i A1NAA	1009241790
9	11/22/2015	Ozone Standard	ThermoElectron Inc	000365	49i A3NAA	0726124688
10	11/22/2015	Sample Tower	Aluma Tower	928376	В	AT-51060-56
11	11/22/2015	Shelter Temperature	Campbell	none	107-L	none
12	11/22/2015	Siting Criteria	Siting Criteria	None	1	None
13	11/22/2015	Temperature	RM Young	04448	41342	4546
14	11/22/2015	Zero air pump	Werther International	06903	C 70/4	000899159

## **DAS Data Form**

DAS Time Max Error: 0.13

Mfg	Serial Nu	mber Site	r	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2118	CDR	8119	Sandy Grenville	11/22/2015	DAS	Primary
Das Date:	11/22/2015	Audit Date	11/22/2015	Mfg	Datel	Parameter	DAS
Das Time: Das Day:	326	Audit Time Audit Day	326	Serial Number	15510194	Tfer Desc.	Source generator (D
Mfg         Serial Number         Site           Campbell         2118         CDR119           Das Date:         11/22/2015         Audit Date         11/22/2015           Das Time:         14:51:00         Audit Time         14:50:52           Das Day:         326         Audit Day         326           Low Channel:         High Channel:         Max Diff:         Max Diff:           Avg Diff:         Max Diff:         Avg Diff:         Max Diff:           0.0002         0.0002         0.0002         0.0002           0.0002         0.0002         0.0002         0.000           0.0002         0.0002         0.0002         0.000           0.0002         0.0001         0.00         0.00           7         0.1000         -0.0001         0.0           7         0.3000         0.2997         0.2           7         0.5000         0.4996         0.4           7         0.7000         0.6995         0.6           7         0.9000         0.8994         0.8           7         1.0000         0.9993         0.9		:	Tfer ID	01320			
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:				
0.0002	0.0002	0.0002	0.0002				
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/22/201	5 CorrCoff	1.00000
Channel	Input D'	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.0001	0.0000	0 V	V	0.0001	
7	0.1000	0.0998	0.1000	0 V	V	0.0002	
7	0.3000	0.2997	0.2998	8 V	V	0.0001	
7	0.5000	0.4996	0.4997	7 V	V	0.0001	
7	0.7000	0.6995	0.6997	7 V	V	0.0002	
7	0.9000	0.8994	0.8996	6 V	V	0.0002	
7	1.0000	0.9993	0.9995	5 V	V	0.0002	

# Flow Data Form

Mfg	Serial Num	ber Tag S	Site	Tec	hnician	Site Visit I	Date Paran	neter	<b>Owner ID</b>
Apex	54747		CDR119	Sa	ndy Grenville	11/22/2015	5 Flow F	Rate	000660
					Mfg	BIOS	F	Parameter Flo	ow Rate
					Serial Number	103471		fer Desc. ne	exus
					Tfor ID	01420			
						01420		_	
					Slope	0.	96664 Int	ercept	0.03078
					Cert Date	2/5	5/2015 <mark>Co</mark>	rrCoff	0.99996
					Mfg	BIOS	F	Parameter Flo	ow Rate
					Serial Number	103424	1	fer Desc. Bl	OS cell
					Tfer ID	01410			
					Slope	0.	96664 Int	ercept	0.03078
					Cert Date	2/5	5/2015 <mark>Co</mark>	rrCoff	0.99996
DAS 1:		DAS 2:		L	Cal Factor Z	ero	0.	06	
A Avg % Diff: A	Max % Di	A Avg %	Dif A Max	% Di	Cal Factor F	ull Scale	1.	05	
2.60%	2.60%				Rotometer R	eading:	1.	55	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSigna	ll PctDifference
primary p	ump off	0.000	0.000	-0.38	-0.040	0.02	l/m	l/m	
primary le	eak check	0.000	0.000	0.00	0.000	0.06	l/m	l/m	
primary te	est pt 1	1.516	1.540	1.44	1.450	1.50	l/m	l/m	-2.60%
primary te	est pt 2	1.517	1.540	1.45	1.450	1.50	l/m	l/m	-2.60%
primary te	est pt 3	1.518	1.540	1.45	1.450	1.50	l/m	l/m	-2.60%
Sensor Compon	ent Leak Test	t		Conditio	n		Statu	s pass	
Sensor Compon	ent Tubing Co	ondition		Conditio	n Good		Statu	s pass	
Sensor Compon	ent Filter Pos	ition		Conditio	n Good		Statu	s pass	
Sensor Compon	ent Rotomete	er Conditior	1	Conditio	n Clean and dry		Statu	s pass	
Sensor Compon	ent Moisture	Present		Conditio	n No moisture p	resent	Statu	s pass	
Sensor Component Filter Distance				Conditio	<b>n</b> 5.0 cm	n 5.0 cm		s pass	
Sensor Compon	Filter Dep	oth		Conditio	n 0.2 cm		Statu	s pass	
Sensor Compon	ent Filter Azir	nuth		Conditio	n 95 deg		Statu	s pass	
Sensor Compon	ent System M	lemo		Conditio	n		Statu	s pass	

## **Ozone Data Form**

Mfg	Serial Number Tag	Site	Tee	chnician		Site Visit Date	Paramet	ter Owner ID
ThermoElectron In	c 1009241790	CDR119	Sa	andy Grei	nville	11/22/2015	Ozone	000623
Slope: Intercept CorrCoff	0.98679         Slope:           -0.73121         Intercept           0.99994         CorrCoff	0.0000		Mfg Serial N Tfer ID	umber	ThermoElectror 0419606966 01112	n Inc Par	rameter ozone or Desc. Ozone primary stan
DAS 1: A Avg % Diff: A 2.9%	DAS 2:           Max % Di         A Avg %           4.4%	6Dif A Max	% Di	Slope Cert Da	ıte	0.9938 6/25/20	34 Inter 15 Corre	cept         -0.40946           Coff         1.00000
UseDescriptio primary primary	n ConcGroup 1 2	Tfer Raw -0.04 30.00	Tfer 0.3 30.	Corr 37 59	Si -0. 29.	te Si 10 ppb 26 ppb	te Unit	PctDifference -4.35%
primary primary primary	3 4 5	49.88 79.80 109.40	50. 80. 110	60 70 .49	49. 78. 108	31         ppb           22         ppb           .80         ppb	Status -	-2.55% -3.07% -1.53%
Sensor Compor Sensor Compor Sensor Compor	Interference         Sample Train           Interference         Interference           Interference         Battery Backup	on	Condition Condition	on Clean			Status Status	pass
Sensor Compor	nent Offset		Conditio	<b>on</b> 0.3			Status	pass
Sensor Compor Sensor Compor	nent Span nent Zero Voltage		Condition Condition	on 0.993 on N/A			Status   Status	pass
Sensor Compor	Fullscale Voltage		Conditio	<b>N/A</b>	·U-7		Status	pass
Sensor Compor	tent Cell A Noise		Conditio	on 0.8 pr	b		Status	pass
Sensor Compor	Cell A Flow		Conditio	<b>0.71</b> 0.71 l	pm		Status	pass
Sensor Compor	tent Cell A Pressure		Conditio	on 719.2	nim⊓y C		Status Status	pass
Sensor Compor	tent Cell B Freq.		Conditio	on 88.9 k	ίHz		Status	pass
Sensor Compor	tent Cell B Noise		Condition Condition	on 1.1 pp 0.72 l	ob om		Status	pass
Sensor Compor	tent Cell B Pressure		Conditio	on			Status	pass
Sensor Compor	Cell B Tmp.		Conditio		eted		Status	pass
Sensor Compor	Int Line Loss           Ient         System Memo		Conditio				Status   Status	pass

# **Temperature Data Form**

Mfg	Serial Number	Tag Site	T	[echni	ician	Site V	isit Date	Param	eter	<b>Owner ID</b>
RM Young	4546	CDR119	:	Sandy	Grenville	11/22	2/2015	Temper	rature	04448
				Mf	ġ	Extec	h	Pa	rameter Te	mperature
				Ser	rial Number	H232	734	Tf	er Desc. R	D
				Tfe	er ID	01227	,			
DAS 1:	DAS	2:		Slo	pe		1.0034	3 Inte	rcept	-0.06409
Abs Avg Err	Abs Max Er Abs	Avg Err Abs	Max Er	Ce	rt Date		1/30/201	5 Cor	rCoff	1.00000
0.19	0.22			L						
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference
primary T	emp Low Range	0.77	0.83		0.000		0.6	5	С	-0.22
primary T	emp Mid Range	25.26	25.24		0.000		25.	0	С	-0.2
primary T	emp High Range	48.30	48.20		0.000		48.	0	С	-0.16
Sensor Comp	onent Shield		Condi	tion C	Clean			Status	pass	
Sensor Component Blower Condition					I/A			Status	pass	
Sensor Comp	onent Blower Status	Switch	Condi	tion N	I/A			Status	pass	
Sensor Comp	onent System Memo		Condi	tion				Status	pass	

# Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CDR119	Sandy Grenville	11/22/2015	Shelter Temperature	none
DAS 1:	<b>DAS 2:</b>		Mfg	Extech	Parameter She	lter Temperatur
Abs Avg Err Abs	Max Er Abs Avg 0.41	<u>; Err</u> Abs Max Er	Serial Number	H232734	Tfer Desc. RT	)
			Tfer ID	01227		
			Slope	1.0034	3 Intercept	-0.06409
			Cert Date	1/30/201	5 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	13.60	13.62	0.000	13.8	С	0.18
primary	Temp Mid Range	18.89	18.89	0.000	19.3	С	0.41
primary	Temp Mid Range	20.89	20.88	0.000	21.1	С	0.18

#### Infrastructure Data For

Site ID	CDR119	Technicia	Sandy Grenville	Site Visit Date	11/22/2015
Shelter M	lake	Shelter Model	Shelt	er Size	
Ekto		8810	640 c	suft	

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: SiteOpsProcComm

The filter handling procedures have improved since the previous site audit visit.

#### 2 Parameter: SitingCriteriaCom

Site is in a wooded valley, within 30 meters of a lightly traveled road. Large diesel trucks use the road.

#### 3 Parameter: ShelterCleanNotes

The shelter has been refurbished since the previous site audit visit.

#### 4 Parameter: MetOpMaintCom

The temperature sensor has been moved to a naturally aspirated shield on the sample tower. The meteorological tower has been removed.

Field Systems Da	ata Form	F-02058-1500-S1-rev002				
Site ID CDR119	Technician Sandy Grenvill	e Site Visit Date 11/2	2/2015			
Site Sponsor (agency)	EPA	USGS Map	Glenville			
<b>Operating Group</b>	private, WV parks dept	Map Scale				
AQS #	54-021-9991	Map Date				
Meteorological Type	Climatronics					
Air Pollutant Analyzer	Ozone	QAPP Latitude				
<b>Deposition Measurement</b>	dry, wet	QAPP Longitude				
Land Use	woodland - mixed	<b>QAPP Elevation Meters</b>				
Terrain	complex	QAPP Declination				
Conforms to MLM	No	QAPP Declination Date				
Site Telephone		Audit Latitude	38.879503			
Site Address 1	Cedar Creek St. Park	Audit Longitude	-80.847677			
Site Address 2		Audit Elevation	240			
County	Gilmer	Audit Declination	-8			
City, State	Glenville, WV	Present				
Zip Code	26351	Fire Extinguisher 🗹	Inspected Oct 2015			
Time Zone	Eastern	First Aid Kit				
Primary Operator		Safety Glasses				
Primary Op. Phone #		Safety Hard Hat 🗹				
Primary Op. E-mail		Climbing Belt				
<b>Backup Operator</b>		Security Fence				
Backup Op. Phone #		Secure Shelter				
Backup Op. E-mail		Stable Entry Step 🗹				
Shelter Working Room ✓	Make Ekto M	odel 8810	Shelter Size 640 cuft			
Shelter Clean	Notes The shelter has been refurbish	ned since the previous site auc	lit visit.			
Site OK	Notes					
Driving Directions						

CDR119

### F-02058-1500-S2-rev002

Site ID

Technician Sandy Grenville

Site Visit Date 11/22/2015

Potential Interferent	Minimum Distance From Measurement Apparatus	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	30 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	25 m	
Obstacles to wind	10 times obstacle height		

Siting Distances OK

**Siting Criteria Comment** 

Site is in a wooded valley, within 30 meters of a lightly traveled road. Large diesel trucks use the road.

Field Systems Data Form						F-02058-1500-S3-rev002				2
Site	e ID	CDR119	Technician	Sandy Grenville		Site Visit Date	11/22/2015		]	
1	Are win being in	d speed and direction fluenced by obstruction	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	ımb?		✓	N/A				
4	Are the avoid ra	temperature shields p idiated heat sources s	oointed north or uch as buildings	positioned to , walls, etc?	✓					
5	Are tem conditio surface standing	perature and RH sen ns? (i.e. ground belov and not steeply sloped g water should be avo	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	olumb?		✓	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 o etc?	effects from buil	dings, trees,	✓	N/A				
10	Is the su facing n	urface wetness sensor orth?	sited with the gr	id surface		N/A				
11	Is it inc	lined approximately 3	30 degrees?			N/A				

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Site	e ID	CDR119	Technician	Sandy Grenville		Site Visit Date	11/22/2015	
1 Do all the meterological sensors appear to be intact, in good condition, and well maintained?								
2	Are all t reportin	he meteorological sen g data?	sors operationa	l online, and	⊻			
3	Are the	shields for the temper	ature and RH s	ensors clean?	✓			
4	Are the	aspirated motors wor	king?			N/A		
5	Is the so scratche	lar radiation sensor's s?	lens clean and f	free of		N/A		
6	Is the su	rface wetness sensor g	grid clean and u	indamaged?	✓	N/A		
7	Are the conditio	sensor signal and pow n, and well maintaine	er cables intact d?	, in good		N/A		
8	Are the from the	sensor signal and pow e elements and well m	er cable connec aintained?	tions protected		N/A		

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

The temperature sensor has been moved to a naturally aspirated shield on the sample tower. The meteorological tower has been removed.
Fi	eld Systems Data Form		F-02058-1500-85-rev002
Sit	e ID CDR119 Technician Sandy Grenville		Site Visit Date 11/22/2015
	Siting Criteria: Are the pollutant analyzers and deposition ec	luip	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?	✓	25 meters from trees
	Pollutant analyzers and deposition equipment operations and	ma	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓	
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)		At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?	✓	
8	Are there moisture traps in the sample lines?		Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	✓	Clean and dry

Fi	eld Sy	stems Data Fo					<b>F-02</b>	2058-15	500-S6-rev002	
Site	e ID	CDR119	Technician	Sandy Grenville	;	Site Vis	it Date	11/22/201	5	
	DAS, se	nsor translators, and p	eripheral equi	pment operatio	ns a	nd maintena	nce			
1 Do the DAS instruments appear to be in good condition and well maintained?										
2	Are all t modem,	he components of the l backup, etc)	DAS operation	al? (printers,	✓					
3	Do the a lightning	nalyzer and sensor sig g protection circuitry?	nal leads pass	through	✓	Met sensors	only			
4	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 translator d?	rs, and shelter	properly	✓					
7	Does the	e instrument shelter ha	we a stable pov	ver source?	✓					
8	Is the in	strument shelter temp	erature contro	lled?	✓					
9	Is the m	et tower stable and gro	ounded?			Stable			Grounded	
10	Is the sa	mple tower stable and	grounded?							
11	Tower c	omments?				Met tower re	emoved		$\checkmark$	

Field S	Systems Data F	orn	1			<b>F-02</b>	2058-1	1500-S7-rev002
Site ID	CDR119	Т	echnician	Sandy Grenville	Site Visit Date	11/22/2015	5	
Docum	entation							
Does th	e site have the required	instri	ument and	equipment manual	\$?			
Does th	Ye	S	No N/	4		Yes	No	N/A
Wind spee	ed sensor			Data log	ger			
Wind dire	ection sensor			Data log	ger			$\checkmark$
Temperat	ure sensor			Strip ch	art recorder			$\checkmark$
Relative h	umidity sensor			Comput	er	$\checkmark$		
Solar radi	ation sensor			Modem			$\checkmark$	
Surface w	etness sensor			Printer				
Wind sens	or translator	]		Zero aii	. pump			
Temperat	ure translator			Filter fl	ow pump		$\checkmark$	
Humidity	sensor translator			Surge p	rotector			$\checkmark$
Solar radi	ation translator			UPS				$\checkmark$
Tipping b	ucket rain gauge 🛛 🗌			Lightni	ng protection device			$\checkmark$
Ozone ana	alyzer			Shelter	heater		$\checkmark$	
Filter pacl	k flow controller			Shelter	air conditioner	$\checkmark$		
Filter pacl	k MFC power supply							
Does t	the site have the require	d and	most rece	nt QC documents a	nd report forms?			
	Р	resent	t			Curre	ent	
Station Lo	g	$\checkmark$				$\checkmark$		
SSRF		$\checkmark$				$\checkmark$		
Site Ops M	Aanual	$\checkmark$	Jul 200	6				
HASP		$\checkmark$	Nov 20	09				
Field Ops	Manual	$\checkmark$	2001					
Calibratio	on Reports	$\checkmark$						
Ozone z/s/	p Control Charts							
Preventive	e maintenance schedule							
1 Is the	e station log properly co	mplet	ed during	every site visit? ✔				
2 Are t curre	he Site Status Report Fe ent?	orms l	being comj	pleted and				
3 Are t samp	he chain-of-custody form le transfer to and from	ns pro lab?	operly use	d to document 🔽				
4 Are o curre	ozone z/s/p control chart ent?	s proj	perly comp	oleted and	Control charts not us	ed		

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Site	e ID	CDR119	Technician	Sandy Grenville		Site Visit Date	11/22/2015		
1	<u>Site ope</u> Has the course?	eration procedures e site operator attende ? If yes, when and who	d a formal CAS instructed?	TNET training					
2	2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?								
3	Is the sit	te visited regularly on e?	the required T	uesday					
4	Are the flollowed	standard CASTNET of by the site operator?	operational pro	cedures being					
5	Is the sit the requ	te operator(s) knowled ired site activities? (ir	lgeable 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	✓	N/A	$\checkmark$
Confirm Reasonableness of Current Values	✓	N/A	$\checkmark$
Test Surface Wetness Response	$\checkmark$	N/A	$\checkmark$

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations		Semiannually	
Automatic Zero/Span Tests	$\checkmark$	Daily	
Manual Zero/Span Tests			
Automatic Precision Level Tests	$\checkmark$	Daily	
Manual Precision Level Test			
Analyzer Diagnostics Tests	$\checkmark$	Weekly	
In-line Filter Replacement (at inlet)	$\checkmark$	Every 2 weeks	
In-line Filter Replacement (at analyze		N/A	
Sample Line Check for Dirt/Water	$\checkmark$	Weekly	
Zero Air Desiccant Check	$\checkmark$	Weekly	
1 Do multi-point calibration gases go th sample train including all filters?	rough the	e complete	
7 Do automatic and manual 7/s/n gasses	go throu	gh the 🖳	

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

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

SSRF, logbook, call-in

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

Site	e ID	CDR119	Technicia	n Sandy Grenville		Site Visit Date	11/22/2015		
	<u>Site ope</u>	ration procedures							
1	Is the fil	lter pack being change	d every Tue	sday as scheduled		Filter changed after	noons		
2	Are the correctly	Site Status Report For y?	ms being co	mpleted and filed	✓				
3	Are dat schedule	a downloads and backu ed?	ıps being pe	rformed as		No longer required			
4	Are gen	eral observations being	g made and	recorded? How?		SSRF, logbook			
5	Are site fashion	supplies on-hand and	replenished	in a timely					
6	6 Are sample flow rates recorded? How?					SSRF, logbook, call-in			
7	Are sam fashion	ples sent to the lab on	a regular sc	hedule in a timely	✓				
8	Are filte and ship	ers protected from cont oping? How?	amination o	luring handling	✓	One set of gloves o	nly		
9	Are the operation	site conditions reporte ons manager or staff?	d regularly	to the field	✓				
QC	Check P	erformed	F	requency			Compliant		
N	/Iulti-poir	nt MFC Calibrations	✓ S	emiannually			$\checkmark$		
F	low Syste	em Leak Checks	<b>v</b>	eekly			$\checkmark$		
F	ilter Pac	k Inspection							
F	low Rate	Setting Checks	✓ M	/eekly			$\checkmark$		
V	visual Ch	eck of Flow Rate Rotor	meter 🗹 🛛	/eekly					
I	n-line Fil	ter Inspection/Replace	ment 🗹 S	emiannually					
S	ample Li	ine Check for Dirt/Wat	er 🗹 🕅	eekly					
Drow	ido onv o	dditional avalenation	nhotograph	or skatch if naces	COM	) regarding conditi	one listed above or a	ny other features	

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

The filter handling procedures have improved since the previous site audit visit.

CDR119

### F-02058-1500-S10-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 11/22/2015

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07071
DAS	Campbell	CR3000	2118	000339
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	060400022672	06027
Flow Rate	Apex	AXMC105LPMDPC	54747	000660
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0844350437	06592
Ozone	ThermoElectron Inc	49i A1NAA	1009241790	000623
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124688	000365
Sample Tower	Aluma Tower	В	AT-51060-56	928376
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	4546	04448
Zero air pump	Werther International	C 70/4	000899159	06903

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
BWR	139-Eric H	lebert-11/24/2015				
1	11/24/2015	Computer	Dell	000321	D520	unknown
2	11/24/2015	DAS	Campbell	000431	CR3000	2536
3	11/24/2015	Elevation	Elevation	None	1	None
4	11/24/2015	Filter pack flow pump	Thomas	06031	107CAB18	608102A
5	11/24/2015	Flow Rate	Арех	000670	AXMC105LPMDPCV	54758
6	11/24/2015	Infrastructure	Infrastructure	none	none	none
7	11/24/2015	Modem	Raven	06456	V4221-V	0808507415
8	11/24/2015	Ozone	ThermoElectron Inc	000731	49i A1NAA	1105347309
9	11/24/2015	Ozone Standard	ThermoElectron Inc	000697	49i A3NAA	1030244814
10	11/24/2015	Sample Tower	Aluma Tower	missing	В	none
11	11/24/2015	Shelter Temperature	Campbell	none	107-L	none
12	11/24/2015	Siting Criteria	Siting Criteria	None	1	None
13	11/24/2015	Temperature	RM Young	04315	41342	4012
14	11/24/2015	Zero air pump	Werther International	06877	C 70/4	000815258

## **DAS Data Form**

DAS Time Max Error:

0.02

Mfg	Serial	l Number Site		<b>Fechnician</b>	cian Site Visit Date		Use Desc.	
Campbell	2536	2536 BWR139		Eric Hebert	11/24/2015	DAS	Primary	
Das Date:	11/24/2015	Audit Date	11/24/2015	Mfg	Datel	Parameter	DAS	
Das Time:	329	Audit Time	329	Serial Number	4000392	4000392 <b>Tfer Desc.</b>		
Low Channe	l:	High Channe	el:	Tfer ID	01321			
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000	
0.000	1 0.0	0.0002 0.0001 0.000		Cert Date	1/22/201	5 CorrCoff	1.00000	
				Mfg	Fluke	Parameter	DAS	
				Serial Number	86590148	Tfer Desc.	DVM	
				Tfer ID	01310			
				Slope	1.0000	0 Intercept	0.00000	
				Cert Date	1/22/201	5 CorrCoff	1.00000	
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference		
7	0.0000	0.0000	0.0000	V	V	0.0000		
7	0.1000	0.1000	0.1000	V	V	0.0000		
7	0.3000	0.3001	0.3001	V	V	0.0000		
7	0.5000	0.5001	0.5001	V	V	0.0000		
7	0.7000	0.7001	0.7002	V	V	0.0001		
7	0.9000	0.9001	0.9002	V	V	0.0001		
7	1.0000	1.0001	1.0003	V	V	0.0002		

## Flow Data Form

Mfg	Serial Nun	ıber Tag	Site	Te	chnician	Site Visit I	Date Param	neter	Owner ID
Apex	54758		BWR139	Er	ic Hebert	11/24/201	11/24/2015 Flow R		000670
					Mfg	BIOS	Р	arameter Flo	w Rate
					Serial Number	131818	Т	fer Desc. BIC	DS 220-H
					Tfer ID	01417			
					Slope	1.	00316 Inte	ercept	-0.00540
					Cert Date	1/	7/2015 Cor	rCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero	0	.1	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale	1.1	1	
4.17%	4.17%				<b>Rotometer</b> R	eading:	1.4	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	0.11	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.12	l/m	l/m	
primary	test pt 1	1.441	1.440	1.38	0.000	1.50	l/m	l/m	4.17%
primary	test pt 2	1.443	1.440	1.38	0.000	1.50	l/m	l/m	4.17%
primary	test pt 3	1.442	1.440	1.38	0.000	1.50	l/m	l/m	4.17%
Sensor Comp	onent Leak Tes	t		Conditio	on	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 Conditic	n	Conditio	Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	No moisture pr	resent	Status	pass	
Sensor Component Filter Distance				Conditio	<b>n</b> 5.0 cm	Status	pass		
Sensor Comp	onent Filter Dep	oth		Conditio	<b>n</b> 4.0 cm		Status	pass	
Sensor Comp	onent Filter Azir	muth		Conditio	n 45 deg		Status	pass	
Sensor Comp	onent System M	lemo		Conditio	n		Status	pass	

## **Ozone Data Form**

Mfg	Ser	rial Number Tag	Site	Те	echnician		Site Visit Date	Parame	eter Owner ID
ThermoElectror	n Inc 11	05347309	BWR139	E	ric Hebert		11/24/2015	Ozone	000731
Slope: Intercept CorrCoff	1.01 -0.50 0.99	015Slope:418Intercept999CorrCoff	0.0000	0 0 0	Mfg Serial Number		ThermoElectror 49CPS-70008-3 01110	n Inc Pa 364 Tfe	rameter ozone er Desc. Ozone primary stan
DAS 1: A Avg % Diff: 0.5%	A Max	DAS 2: % Di 0.8%	Dif A Max	% Di	Slope Cert Da	te	1.011: 9/21/20	30 Inter 15 Corr	-0.21263 •Coff 1.00000
UseDescrip primary primary	otion /	ConcGroup 1 2	Tfer Raw 0.31 28.28	Tfer 0. 28	Corr 51 .17	Si -0. 27.	te Si 13 ppb 96 ppb	te Unit	PctDifference -0.75%
primary primary primary	7 7 7	3 4 5	50.86 79.69 107.01	50 79 100	0.50 0.00 6.02	50. 79. 106	70         ppb           43         ppb           .40         ppb		0.40% 0.54% 0.36%
Sensor Com Sensor Com	ponent S ponent [	Sample Train nlet Filter Conditio	n	Conditi Conditi	ion Good			Status Status	pass
Sensor Com	ponent	Dffset		Conditi	ion 0.000			Status Status	pass
Sensor Com	ponent	Zero Voltage		Condition N/A				Status	pass
Sensor Com	ponent	Cell A Freq.		Condition 103.1 kHz				Status	pass
Sensor Com	ponent (	Cell A Flow		Condition 0.8 ppb Condition 0.71 lpm				Status	pass
Sensor Com	ponent C	Cell A Pressure		Condition 747.8 mmHg Condition 32.3 C				Status Status	pass
Sensor Component       Cell B Freq.         Sensor Component       Cell B Noise			Conditi Conditi	Condition 81.4 kHz Condition 0.9 ppb			Status Status	pass	
Sensor Com	ponent ( ponent (	Cell B Flow		Conditi Conditi	ion 0.73   ion	om		Status Status	pass
Sensor Component       Cell B Tmp.         Sensor Component       Line Loss			Conditi Conditi	Condition Not tested			Status Status	pass pass	
Sensor Com	ponent S	System Memo		Conditi	on			Status	pass

# **Temperature Data Form**

Mfg	Serial Number T	ag Site		Techni	ician	Site V	visit Date	Param	eter	Owner ID	
RM Young	4012	BWR139		Eric H	ebert	11/24	4/2015	Temper	ature	04315	
				Mf	ġ	Fluke		Pa	rameter Te	mperature	
				Serial Number		20850	)85	Tf	fer Desc. R	D	
				Tfe	er ID	01226	3				
DAS 1:	DAS	2:		Slo	pe		1.0010	5 Inte	rcept	-0.07989	1
Abs Avg Err Abs Max Er Abs Avg Err Abs Max		Max Er	ax Er Cert Date			1/30/201	5 Cor	rCoff	1.00000	1	
0.09	0.12										
UseDesc.	Test type	InputTmpRaw	InputTm	oCorr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Tem	p Low Range	0.04	0.12	2	0.000		0.2		С	0.08	
primary Tem	p Mid Range	24.06	24.1	1	0.000		24.	0	С	-0.07	
primary Tem	p High Range	49.65	49.6	8	0.000		49.	6	С	-0.12	
Sensor Compone	ent Shield		Cond	ition N	Aoderately clea	an		Status	pass		
Sensor Component Blower Con			Cond	Condition N/A				Status	pass		
Sensor Component Blower Status Switch Con				Condition N/A				Status	pass		
Sensor Component System Memo Con					Condition				pass		

# Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	BWR139	Eric Hebert	11/24/2015	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter She	Iter Temperatur
Abs Avg Err Abs	0.31 Abs Avg	Err Abs Max Er	Serial Number	2085085	Tfer Desc. RTD	)
	(		Tfer ID	01226		
			Slope	1.0010	5 Intercept	-0.07989
			Cert Date	1/30/201	5 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	20.80	20.86	0.000	21.2	С	0.31
primary	Temp Mid Range	25.21	25.26	0.000	25.3	С	0.01
primary	Temp Mid Range	26.03	26.08	0.000	26.1	С	-0.02

#### Infrastructure Data For

Site ID	BWR139	Technicia Eric	ric Hebert Site Visit Date 11/24/2015
Shelter M	Make	Shelter Model	Shelter Size
Ekto		8810	640 cuft
and a state of the			

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

# **Field Systems Comments**

#### 1 Parameter: DasComments

The meteorological tower is no longer in service. The temperature sensor has been moved to the sample tower and is installed in a naturally aspirated shield.

2 Parameter: SiteOpsProcedures

The ozone sample train is leak checked every two weeks following the inlet filter change.

3 Parameter: SitingCriteriaCom

Very light agriculture activities near site, not harvested, just to provide food for wildlife.

#### 4 Parameter: ShelterCleanNotes

The shelter is showing signs of deterioration with leaks and rot at bottom of walls.

### F-02058-1500-S1-rev002

Site ID	BWR139	Techi	nician Eric Hebert	Site Visit I	Date 11/2	4/2015		
Site Sponsor (	(agency)	EPA		USGS Map				
Operating Gr	oup	BNWR/private		Map Scale				
AQS #		24-019-9991		Map Date				
Meteorologica	al Type	R.M. Young						
Air Pollutant	Analyzer	Ozone		QAPP Latitude				
<b>Deposition Measurement</b>		dry		QAPP Longitude				
Land Use		woodlands - mixe	ed, wetlands	QAPP Elevation	Meters			
Terrain		flat		QAPP Declination	n			
Conforms to N	MLM	Yes		QAPP Declination	n Date			
Site Telephon	e			Audit Latitude			38.444971	
Site Address 1	1	Blackwater Nat V	Vildlife Refuge	Audit Longitude			-76.111274	
Site Address 2		2145 Key Wallac	e Dr.	Audit Elevation			1	
County		Dorchester		Audit Declination		-11.2		
City, State		Cambridge, MD		I	Present			
Zip Code		21613		Fire Extinguisher		dated 2015		
Time Zone		Eastern		First Aid Kit	$\checkmark$			
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				
Shelter Work	ing Room <b></b> ✓	Make Ekto	M	odel 8810		Shelter Size	640 cuft	
Shelter Clean		Notes The she	elter is showing signs o	f deterioration with le	eaks and	rot at bottom of v	valls.	
Site OK	$\checkmark$	Notes						
Driving Directions From I95 take route 50 east to Cambridge, MD. At mile marker 81 turn right on Woods Rd. Continue approximately 1 mile to the stop sign, turn right onto SR 16 west. Continue approximately 1.7 miles, past the school, and turn left onto Egypt Road. Continue approximately 7.1 miles to the stop sign. Turn right onto Key Wallace Drive towards the visitors center. Continue approximately 0.8 mile to the gate on the left. The site will be visible.								

**BWR139** 

#### F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 11/24/2015

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	10 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** 

Very light agriculture activities near site, not harvested, just to provide food for wildlife.

Fi	eld Sy	stems Data Fo	orm	F-02058-1500-S3-rev002					
Site	e ID	BWR139	Technician Eric Hebert		Site Visit Date 11/24/2015	]			
1 2	Are wind being in Are wind	d speed and direction fluenced by obstructio d sensors mounted so	sensors sited so as to avoid ns? as to minimize tower effects?	<ul><li></li></ul>	N/A N/A				
	(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 plu	mb?	✓	N/A				
4	Are the avoid ra	temperature shields p diated heat sources su	ointed north or positioned to ch as buildings, walls, etc?						
5	Are tem conditio surface a standing	perature and RH sens ns? (i.e. ground below and not steeply sloped g water should be avoi	ors sited to avoid unnatural sensors should be natural . Ridges, hollows, and areas of ded)						
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 buildings, trees,	✓	N/A				
10	Is the su facing n	rface wetness sensor s orth?	ited with the grid surface		N/A				
11	Is it inc	lined approximately 3	0 degrees?		N/A				
					L				

### F-02058-1500-S4-rev002

Site	e ID	BWR139	Technician	Eric Hebert		Site Visit Date 11/24/2015	
1	Do all th conditio	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 operational	online, and	✓		
3	Are the	shields for the temper	ature and RH s	ensors clean?	✓	Moderately clean	
4	Are the	aspirated motors wor	king?		✓	N/A	
5	Is the so scratche	lar 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 conditio	sensor signal and pow n, and well maintaine	er cables intact, d?	, in good	✓	N/A	
8	Are the from the	sensor signal and pow e elements and well ma	er cable connec aintained?	tions protected	✓	N/A	

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	BWR139 Technician Eric Hebert		Site Visit Date 11/24/2015
	Siting Criteria: Are the pollutant analyzers and deposition ec	uip	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	ma	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?		
2	Are the analyzers and monitors operational, on-line, and reporting data?		
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)		At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?		
7	Is the zero air supply desiccant unsaturated?	✓	
8	Are there moisture traps in the sample lines?		Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S6-rev002						
Site	e ID	BWR139	Technician	Eric Hebert		Site Vis	it Date	11/24/2015	5			
	DAS, se	nsor translators, and p	eripheral equip	oment operatio	<u>ns a</u>	nd maintena	ince					
1	Do the I well ma	DAS instruments appea intained?	ar to be in good	condition and	✓							
2	Are all t modem,	he components of the backup, etc)	al? (printers,	✓								
3	Do the a lightnin	nalyzer and sensor sig g protection circuitry?	nal leads pass t	hrough	✓	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 d?	rs, and shelter <b>j</b>	properly	✓							
7	Does the	e instrument shelter ha	ive a stable pow	ver source?	✓							
8	Is the in	strument shelter temp	erature control	led?	✓							
9	Is the m	et tower stable and gro	ounded?			Stable			Groundee	d		
10	Is the sa	mple tower stable and	grounded?						$\checkmark$			
11	Tower c	omments?										

The meteorological tower is no longer in service. The temperature sensor has been moved to the sample tower and is installed in a naturally aspirated shield.

rield Systems Data Fo	eld Systems Data Form										
Site ID BWR139	Technician	Eric Hebert Site Visit Date	11/24/2015								
<b>Documentation</b>											
Does the site have the required in	nstrument and	equipment manuals?									
Yes	No N/	Α	Yes	No N/A							
Wind speed sensor		Data logger									
Wind direction sensor		Data logger									
Temperature sensor		Strip chart recorder									
Relative humidity sensor		Computer									
Solar radiation sensor		Modem									
Surface wetness sensor		Printer									
Wind sensor translator		Zero air pump									
Temperature translator		Filter flow pump									
Humidity sensor translator		Surge protector									
Solar radiation translator		UPS									
Tipping bucket rain gauge		Lightning protection device									
Ozone analyzer		Shelter heater									
Filter pack flow controller		Shelter air conditioner	$\checkmark$								
Filter pack MFC power supply											
Does the site have the required	and most rece	nt QC documents and report forms?									
Pre	esent		Curren	t							
Station Log			$\checkmark$								
SSRF			$\checkmark$								
Site Ops Manual											
HASP											
Field Ops Manual											
Calibration Reports											
Ozone z/s/p Control Charts											
Preventive maintenance schedule											
1 Is the station log properly com	pleted during	every site visit? 🔽									
2 Are the Site Status Report For current?	ms being com	pleted and									
3 Are the chain-of-custody form sample transfer to and from la	s properly use b?	d to document 🔽									
4 Are ozone z/s/p control charts current?	properly com	Deted and Control charts not us	ed								
Provide any additional explanation natural or man-made, that may affe	(photograph of the monito	or sketch if necessary) regarding condition	ons listed al	bove, or any other features,							

#### F-02058-1500-S8-rev002

Site	ID	BWR139	Technician	Eric Hebert		Site Visit Date	11/24/2015	
	Site ope	eration procedures						
1	Has the course?	site operator attended If yes, when and who	d a formal CAS instructed?	TNET training				
2	Has the training	backup operator atte g course? If yes, when	nded a formal ( and who instru	CASTNET cted?				
3	Is the sit schedule	e visited regularly on ?	the required T	uesday				
4	Are the s flollowed	standard CASTNET of by the site operator?	operational pro	cedures being				
5	Is the sit the requ	e operator(s) knowled ired site activities? (in	lgeable of, and a	able to perform entation)				
	Are regi	lar operational OA/C	)C checks perfo	rmed on meteor	rologic	al 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	✓	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	$\checkmark$	Semiannually	
Automatic Zero/Span Tests	$\checkmark$	Daily	$\checkmark$
Manual Zero/Span Tests			$\checkmark$
Automatic Precision Level Tests	$\checkmark$	Daily	$\checkmark$
Manual Precision Level Test			
Analyzer Diagnostics Tests		Weekly	
In-line Filter Replacement (at inlet)	$\checkmark$	Every 2 weeks	
In-line Filter Replacement (at analyze		N/A	$\checkmark$
Sample Line Check for Dirt/Water		Weekly	$\checkmark$
Zero Air Desiccant Check	✓	Weekly	$\checkmark$
1 Do multi-point calibration gases go the	rough the	e complete Unknown	

✓

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

3

complete sample train including all filters?		
Are the automatic and manual z/s/p checks monitored and	✓	SSRF, logbook, call-in
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 is leak checked every two weeks following the inlet filter change.

#### **Field Systems Data Form** F-02058-1500-S9-rev002 **BWR139** Eric Hebert Site Visit Date 11/24/2015 Technician Site operation procedures Is the filter pack being changed every Tuesday as scheduled? Filter changed mornings 90%

✓

 $\checkmark$ 

 $\checkmark$ 

✓

 $\checkmark$ 

No longer required

SSRF, logbook, call-in

Clean gloves on and off

Compliant

 $\checkmark$ 

 $\checkmark$ 

✓

✓

✓

 $\checkmark$ 

SSRF, logbook

- Are the Site Status Report Forms being completed and filed 🗹 2 correctly?
- Are data downloads and backups being performed as 3 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 fashion?
- 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?

#### **OC Check Performed**

Site ID

1

6

### Frequency Semiannually ✓ Weekly

✓ Weekly

✓ Weekly

✓ Weekly

Semiannually

**Flow System Leak Checks Filter Pack Inspection** 

**Multi-point MFC Calibrations** 

- **Flow Rate Setting Checks**
- Visual Check of Flow Rate Rotometer
- **In-line Filter Inspection/Replacement**
- Sample Line Check for Dirt/Water

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000321
DAS	Campbell	CR3000	2536	000431
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	608102A	06031
Flow Rate	Apex	AXMC105LPMDPC	54758	000670
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0808507415	06456
Ozone	ThermoElectron Inc	49i A1NAA	1105347309	000731
Ozone Standard	ThermoElectron Inc	49i A3NAA	1030244814	000697
Sample Tower	Aluma Tower	В	none	missing
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	4012	04315
Zero air pump	Werther International	C 70/4	000815258	06877

Technician Eric Hebert

# **Field Systems Data Form**

BWR139

Site ID

**Site Visit Sensors** 

### F-02058-1500-S10-rev002

Site Visit Date 11/24/2015

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CND	125-Sandy	Grenville-12/01/2015				
1	12/1/2015	Computer	Dell	000254	D520	unknown
2	12/1/2015	DAS	Campbell	000499	CR3000	3816
3	12/1/2015	Elevation	Elevation	None	1	None
4	12/1/2015	Filter pack flow pump	Thomas	01235	107CA18	illegible
5	12/1/2015	Flow Rate	Арех	000838	AXMC105LPMDPCV	54781
6	12/1/2015	Infrastructure	Infrastructure	none	none	none
7	12/1/2015	Modem	Raven	06596	V4221-V	0844350327
8	12/1/2015	Ozone	ThermoElectron Inc	000692	49i A1NAA	1030244803
9	12/1/2015	Ozone Standard	ThermoElectron Inc	000376	49i A3NAA	0726124693
10	12/1/2015	Sample Tower	Aluma Tower	03495	A	none
11	12/1/2015	Shelter Temperature	Campbell	none	107-L	none
12	12/1/2015	Siting Criteria	Siting Criteria	None	1	None
13	12/1/2015	Temperature	RM Young	06402	41342VC	14035
14	12/1/2015	Zero air pump	Werther International	06868	C 70/4	000814284

## **DAS Data Form**

DAS Time Max Error: 0.28

Mfg	Serial Nu	mber Site	1	<b>Fechnician</b>	Site Visit Date	Parameter	Use Desc.
Campbell	3816	CNE	0125	Sandy Grenville	12/01/2015	DAS	Primary
Das Date:         12/1 /2015           Das Time:         15:21:46           Das Day:         335           Low Channel:         H           Avg Diff:         Max Diff:         A           0.0001         0.0001         0.0001		Audit Date Audit Time Audit Day High Channel Avg Diff: 0.0001	12/1 /2015 15:21:29 335 : Max Diff: 0.0001	Mfg Serial Number Tfer ID	Datel 15510194 01320	Parameter Tfer Desc.	DAS Source generator (D
				Mfg Serial Number Tfer ID Slope Cert Date	Fluke 95740135 01311 1.0000 1/22/201	Parameter Tfer Desc.	DAS DVM 0.00000 1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.0001	0.0000	V	V	0.0001	
7	0.1000	0.0998	0.0999	V	V	0.0001	
7	0.3000	0.2997	0.2998	V	V	0.0001	
7	0.5000	0.4995	0.4996	V	V	0.0001	
7	0.7000	0.6995	0.6996	V	V	0.0001	
7	0.9000	0.8993	0.8994	V	V	0.0001	
7	1.0000	0.9992	0.9993	V	V	0.0001	

# Flow Data Form

Mfg	Mfg Serial Number Tag Site			Тес	hnician	Site Visit D	ate Parai	neter	eter Owner ID	
Apex	54781		CND125	Sa	ndy Grenville	12/01/2015	Flow F	Rate	000838	
				Γ	Mfo	BIOS		Parameter Flow Rate		
					·····5	400474				
					Serial Number	103471		Ifer Desc. nex	lus	
					Tfer ID	01420				
					Slope	0.9	96664 Int	tercept	0.03078	
					Cert Date	2/5	5/2015 <b>Co</b>	orrCoff	0.99996	
					Mfg	BIOS	]	Parameter Flo	w Rate	
					Serial Number	103424		Ffer Desc. BIC	)S cell	
					Tfer ID	01410				
					Slope	0.9	96664 Int	tercept	0.03078	
					Cert Date	2/5	5/2015 <b>Co</b>	orrCoff	0.99996	
DAS 1: DAS 2:					Cal Factor Z	ero	-0.	01		
A Avg % Diff: A Max % Di A Avg %Dif A Max %				% Di	Cal Factor F	ull Scale	1.	02		
1.96%	1.96%				<b>Rotometer R</b>	eading:	1.	35		
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference	
primary	pump off	0.000	0.000	0.00	0.000	-0.01	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	1.506	1.530	1.46	1.460	1.50	l/m	l/m	-1.96%	
primary	test pt 2	1.511	1.530	1.47	1.460	1.50	l/m	l/m	-1.96%	
primary	test pt 3	1.505	1.530	1.47	1.460	1.50	l/m	l/m	-1.96%	
Sensor Comp	onent Leak Tes	t		Conditio	n		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		Conditio	n Clean and dry		Statu	s pass		
Sensor Comp	Conditio	n No moisture p	resent	Statu	s pass					
Sensor Comp	Conditio	<b>n</b> 4.0 cm		Statu	s pass					
Sensor Comp	onent Filter Dep	oth		Conditio	<b>n</b> 0.7 cm		Statu	s pass		
Sensor Comp	onent Filter Azir	muth		Conditio	n 230 deg	Statu	s pass			
Sensor Component System Memo					on Status pass					

## **Ozone Data Form**

Mfg	Serial Number Tag Site			Technician			Site Visit Date	Paramet	ter Owner ID	
ThermoElectr	on Inc 10	030244803	CND125	S	andy Grer	nville	12/01/2015	Ozone	000692	
Slope: Intercept CorrCoff	0.97118         Slope:         0.00000           -0.05317         Intercept         0.00000           0.99999         CorrCoff         0.00000			D Mfg D Serial Number D Tfer ID			ThermoElectron 0419606966 01112	n Inc Par Tfe	rameter ozone er Desc. Ozone primary stan	
DAS 1: A Avg % Dif 2.9%	ff: A Max	DAS 2:	6Dif A Max	% Di	Slope Cert Da	ıte	0.993	9384         Intercept         -0.40946           2015         CorrCoff         1.00000		
UseDesci prima prima	ription try try	ConcGroup 1 2	Tfer Raw -0.12 30.04	Tfer 0. 30	29 0.63	Si 0.2 29.	te Si 21 ppb 84 ppb	te Unit	PctDifference -2.58%	
prima prima prima	ury ury ury	3 4 5	49.82 79.41 110.00	50 80 11	0.54 0.31 1.09	48. 78. 107	80         ppb           .08         ppb           .80         ppb		-3.44% -2.78% -2.96%	
Sensor Component       Sample Train         Sensor Component       Inlet Filter Condition				Condition Good Condition Clean				Status Status	s pass	
Sensor Component         Battery Backup           Sensor Component         Offset			Conditi Conditi	ion N/A			Status Status	pass		
Sensor Con Sensor Con	mponent	Zero Voltage		Condition N/A				Status	pass	
Sensor Col Sensor Col	mponent mponent	Cell A Freq.		Condition     N/A       Condition     97.2 kHz				Status	pass	
Sensor Con Sensor Con	mponent   mponent	Cell A Noise Cell A Flow		Condition       0.6 ppb         Condition       0.71 lpm				Status	pass	
Sensor Component       Cell A Pressure         Sensor Component       Cell A Tmp.			Condition728.0 mmHgCondition32.5 C				Status Status	pass		
Sensor Component       Cell B Freq.         Sensor Component       Cell B Noise			Condition 98.1 kHz Condition 0.9 ppb				Status Status	pass		
Sensor Component       Cell B Flow         Sensor Component       Cell B Pressure			Condition 0.85 lpm				Status Status	pass pass		
Sensor Component Cell B Tmp.			Conditi Conditi	ondition			Status Status	pass		
Sensor Component System Memo				Conditi	ion			Status	pass	

# **Temperature Data Form**

Mfg	Serial Number	Tag Site	1	[echni	echnician		Site Visit Date		eter	<b>Owner ID</b>	
RM Young	14035	CND125	;	Sandy Grenville			1/2015	Temper	rature	06402	
				Mfg			h	Ра	arameter Te	mperature	]
				Serial Number		H232 <sup>-</sup>	H232734 TI		fer Desc. R	D	
			Tfer ID		01227	7					
DAS 1:	DAS		Slope			1.0034	3 Inte	ercept -0.06409			
Abs Avg Err	Avg Err Abs	Max Er Cert Date			1/30/201	5 Cor	rCoff	1.00000			
0.16	0.30										
UseDesc.	Test type	InputTmpRaw	InputTmp	utTmpCorr. OutputTmpSi		Signal	ignal OutputSignalEng		OSE Unit	Difference	
primary T	Temp Low Range	0.11	0.17	0.17 0.000			0.2		С	-0.01	
primary T	Temp Mid Range	26.60	26.57	1	0.000		26.4		С	-0.17	
primary T	Temp High Range	48.80	48.70	)	0.000		49.	0	С	0.3	
Sensor Component Shield			Condi	tion C	Clean			Status	pass		
Sensor Component Blower			Condi	Condition N/A				Status	pass		
Sensor Component Blower Status Switch				Condition N/A				Status	pass		
Sensor Component System Memo				Condition				Status	pass		

# Shelter Temperature Data For

Mfg	Serial Number Tag Site		Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CND125	Sandy Grenville	12/01/2015	Shelter Temperature	none
DAS 1:	<b>DAS 2:</b>		Mfg	Extech	Parameter She	lter Temperatur
Abs Avg Err Abs	Max ErAbs Avg0.05	<u>g Err</u> Abs Max Er	Serial Number	H232734	Tfer Desc. RT	)
			Tfer ID	01227		
			Slope	1.0034	3 Intercept	-0.06409
			Cert Date	1/30/201	5 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.89	22.88	0.000	22.8	С	-0.05
primary	Temp Mid Range	23.33	23.31	0.000	23.3	С	-0.04
primary	Temp Mid Range	23.70	23.68	0.000	23.7	С	0.02

#### Infrastructure Data For

Site ID	CND125	Technicia	Sandy Grenville	Site Visit Date 12/01/2015
Shelter N	lake	Shelter Model	i Shel	lter Size
Ekto		8810	640 0	cuft
and the second se		NUMBER OF STREET		

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

# **Field Systems Comments**

#### 1 Parameter: SitingCriteriaCom

The land owner maintains a pine tree forest on the property within 50 meters of the site. The trees were planted just before the site was installed in 1990 and will be harvested in the near future.

#### 2 Parameter: ShelterCleanNotes

The shelter is well maintained, clean and well organized. However the shelter roof is leaking and several wall panels and parts of the floor are showing signs of rot.

#### 3 Parameter: MetOpMaintCom

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

Field Systems	s Data F	orm		1	-02058-1500-51-rev002		
Site ID CND12	5	Technician Sandy (	Grenville	e Site Visit I	Date 12/0	1/2015	
Site Sponsor (agency	) EPA			USGS Map			
<b>Operating Group</b>	private		Map Scale				
AQS #	37-123-	9991		Map Date			
Meteorological Type	Climatro	onics					
Air Pollutant Analyz	er Ozone		QAPP Latitude				
Deposition Measurem	nent dry, Hg,	PM2.5, PM10	QAPP Longitude				
Land Use	woodlar	d		QAPP Elevation N	Meters		
Terrain	rolling			QAPP Declination	n		
Conforms to MLM	Margina	lly		QAPP Declination	n Date		
Site Telephone			Audit Latitude		35.26333		
Site Address 1	136 Per	ry Drive	Audit Longitude		-79.83754		
Site Address 2				Audit Elevation		172	
County	Montgo	nery		Audit Declination	l	-8	
City, State	Candor,	NC	F	Present			
Zip Code	27229		Fire Extinguisher		Inspected Oct 2001		
Time Zone	Eastern			First Aid Kit	$\checkmark$		
Primary Operator				Safety Glasses	$\checkmark$		
Primary Op. Phone	#			Safety Hard Hat	$\checkmark$		
Primary Op. E-mail				Climbing Belt			
<b>Backup Operator</b>				Security Fence			
Backup Op. Phone #	£			Secure Shelter	$\checkmark$		
Backup Op. E-mail				Stable Entry Step			
Shelter Working Roo	om ✓ Make	Ekto	M	odel 8810		Shelter Size 640 cuft	
Shelter Clean	✓ Notes	The shelter is well mai several wall panels and	ntained, d parts (	, clean and well orga of the floor are showi	nized. Ho ina sians (	owever the shelter roof is leaking and of rot.	
Site OK	✓ Notes						
Driving Directions	oro take Hwy 220 (future o 220 south and 731 we west at the split. Take a n). Continue approximat v it to the end. The site i	outh to Candor. Exit tinue approximately diate right onto McC miles to Perry Drive d the house, drive an	t at 211 w 1.3 miles allum Rd. which is o ound the o	est to Candor. At the traffic light turn which will take you out of town. Bear (there is a sign for E-KU-SUMEE at in the left. Turn left onto the gravel grapevines on the left.			

### E 02050 1500 S1 war 002

**CND125** 

#### F-02058-1500-S2-rev002

Site ID

Techni

Technician Sandy Grenville

Site Visit Date 12/01/2015

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	40 m	
Obstacles to wind	10 times obstacle height		$\checkmark$

#### Siting Distances OK

#### **Siting Criteria Comment**

The land owner maintains a pine tree forest on the property within 50 meters of the site. The trees were planted just before the site was installed in 1990 and will be harvested in the near future.

Fi	eld Sy	stems Data F	orm			F-02058-1500-S3-rev002				
Site	e ID	CND125	Technician	Sandy Grenville		Site Visit Date	12/01/2015		]	
1	Are win being in	d speed and direction fluenced by obstruction	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	ımb?		✓	N/A				
4	4 Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?			positioned to , walls, etc?	✓					
5	5 Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)			id unnatural be natural vs, and areas of						
6	Is the so	lar radiation sensor <b>p</b>	olumb?		✓	N/A				
7	Is it site	d to avoid shading, or	any artificial or	r reflected light?		N/A				
8	Is the ra	in gauge plumb?			✓	N/A				
9	Is it site towers,	d to avoid sheltering o etc?	effects from buil	dings, trees,	✓	N/A				
10	Is the su facing n	urface wetness sensor orth?	sited with the gr	id surface		N/A				
11	Is it inc	lined approximately 3	30 degrees?			N/A				

#### F-02058-1500-S4-rev002

Site	e ID	CND125	Technician	Sandy Grenville		Site Visit Date	12/01/2015	
1 Do all the meterological sensors appear to be intact, in good condition, and well maintained?								
2	2 Are all the meteorological sensors operational online, and reporting data?							
3	Are the	shields for the temper	ature and RH s	ensors clean?				
4	Are the	aspirated motors wor	king?			N/A		
5	Is the so scratche	lar radiation sensor's s?	lens clean and f	free of		N/A		
6	Is the su	rface wetness sensor §	grid clean and u	indamaged?	✓	N/A		
7	Are the conditio	sensor signal and pow n, and well maintaine	er cables intact d?	, in good		N/A		
8	Are the from the	sensor signal and pow e elements and well ma	er cable connec aintained?	tions protected	✓	N/A		

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

The temperature sensor has been mounted on the sample tower in a naturally aspirated shield.
Field Systems Data Form			F-02058-1500-S5-rev002
Site	ID         CND125         Technician         Sandy Grenville	•	Site Visit Date 12/01/2015
	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	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓	
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	✓	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?	✓	
8	Are there moisture traps in the sample lines?	✓	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry

Fi	eld Sy	stems Data Fo	orm					<b>F-02</b>	2058-15	500-S6-rev002
Site	e ID	CND125	Technician	Sandy Grenville	;	Site Vis	it Date	12/01/201	5	]
	DAS, se	nsor translators, and p	eripheral equi	pment operatio	ns a	nd maintena	ince			
1	Do the I well mai	DAS instruments appea intained?	ar 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?	nal leads pass	through	✓					
4	Are the well mai	signal connections pro intained?	tected from the	e weather and	✓	Met sensors	only			
5	Are the	signal leads connected	to the correct	DAS channel?	✓					
6	Are the grounde	DAS, sensor translato d?	rs, and shelter	properly	✓					
7	Does the	e instrument shelter ha	ive a stable pov	ver source?	✓					
8	Is the in	strument shelter temp	erature contro	lled?	✓					
9	Is the m	et tower stable and gro	ounded?			Stable			Grounded	1
10	Is the sa	mple tower stable and	grounded?							
11	Tower c	omments?								

Fiel	d Systems l	Data Fo	rm				<b>F-02</b>	2058-	-1500-S7	-rev002
Site I	D CND125		Technie	cian San	dy Grenville	Site Visit Date	12/01/2015	5		
Do	<u>cumentation</u>									
Do	es the site have the	e required in	strument	and equ	ipment manuals?	-				
Wind Wind Temp Relati Solar Surfac Wind Temp Humio Solar Tippin Ozone	speed sensor direction sensor erature sensor ive humidity senso radiation sensor ce wetness sensor sensor translator erature translator dity sensor transla radiation translat ng bucket rain gau e analyzer	Yes □ □ □ or 1 1 1 1 1 1 1 1 1 1 1 1 1	No □ □ □ □ □ □ □ □ □ □ □ □ □ □	N/A V V V V V V V V V V V	Data logg Data logg Strip char Computer Modem Printer Zero air p Filter flow Surge pro UPS Lightning Shelter he	er er *t recorder • ump 7 pump tector protection devic ater	Yes □ □ □ □ □ □ □ □ □ □ □ □ □		N/A	
Filter	nack flow control	ler			Shelter au	r conditioner				
Filter	pack MFC power	supply				contantioner		_	_	
D	as the site have t	he required	and most	recent O	C documents and	l roport forms?				
<u>D</u>	oes the site have th	<u>Duo</u>	and most	<u>recent Q</u>	<u>e documents and</u>		Cum			
Statio SSRF Site O HASP Field O Calibi Ozone Preven	n Log Ops Manual Ops Manual ration Reports e z/s/p Control Cha ntive maintenance	arts e schedule	sent  ✓  ✓  ✓  ✓  ✓  ✓  ✓  ✓  ✓  ✓  ✓  ✓  ✓					nt		
1 Is	s the station log pi	roperly com	pleted du	ring ever	y site visit? 🔽					
2 A c	Are the Site Status urrent?	Report For	ns being	complete	d and 🔽					
3 A s	Are the chain-of-cu ample transfer to	istody forms and from lal	properly o?	v used to	document 🔽					
4 A c	Are ozone z/s/p con urrent?	ntrol charts j	oroperly	complete	d and 🗌 C	Control charts not u	used			
Provio natura	de any additional o al or man-made, t	explanation hat may affe	(photogra ct the mo	aph or sk mitoring	etch if necessary) parameters:	regarding condi	tions listed	above, o	or any other	features,

Site	ID	CND125	Technician	Sandy Grenville	Site Visit Date	12/01/2015	
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 training	backup operator atte g course? If yes, when	nded a formal ( and who instru	CASTNET cted?			
3	Is the sit schedule	e visited regularly on ?	the required <b>T</b> u	uesday			
4	Are the s flollowed	standard CASTNET o I by the site operator?	perational pro	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 regular operational QA/QC checks performed on meteorological instruments?

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

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

QC Check Performed		Frequency	Comp
Multi-point Calibrations		Semiannually	✓
Automatic Zero/Span Tests	$\checkmark$	Daily	$\checkmark$
Manual Zero/Span Tests	$\checkmark$	As needed	$\checkmark$
Automatic Precision Level Tests	$\checkmark$	Daily	$\checkmark$
Manual Precision Level Test	$\checkmark$	As needed	
Analyzer Diagnostics Tests	$\checkmark$	Weekly	
In-line Filter Replacement (at inlet)	$\checkmark$	Every 2 weeks	$\checkmark$
In-line Filter Replacement (at analyze		N/A	$\checkmark$
Sample Line Check for Dirt/Water	$\checkmark$	Weekly	
Zero Air Desiccant Check	$\checkmark$	Weekly	$\checkmark$
<ol> <li>Do multi-point calibration gases go the sample train including all filters?</li> <li>Do automatic and manual z/s/n gasses</li> </ol>	rough the	e complete	

	sumpte than metading an meets.
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:

SSRF, logbook, call-in

#### liant

F-02058-	1500_88_	rev002
1-02030-	-1200-20-	

Field S	ield Systems Data Form				F-02058-15	500-S9-rev002
Site ID	CND125	Technician	Sandy Grenville	Site Visit Date	12/01/2015	

Sit	te ID	CND125	Technicia	n Sandy Grenville		Site Visit Date	12/01/2015	
	<u>Site ope</u>	ration procedures						
1	Is the fil	ter pack being changed	l every Tues	day as scheduled	<b>&gt;</b>	Filter changed after	noons	
2	Are the correctly	Site Status Report Fori y?	ms being coi	npleted and filed	✓			
3	Are data schedule	a downloads and backu ed?	ps being per	rformed as		No longer required		
4	Are gen	eral observations being	made and r	ecorded? How?	✓	SSRF, logbook		
5	Are site fashion?	supplies on-hand and r	eplenished i	in a timely	✓			
6	Are sam	ple flow rates recorded	!? How?		✓	SSRF, logbook, cal	l-in	
7	Are sam fashion?	ples sent to the lab on a	a regular scl	nedule in a timely	✓			
8	Are filte and ship	rs protected from conta ping? How?	amination d	uring handling	✓	Clean gloves on an	d off	
9	Are the operatio	site conditions reported ns manager or staff?	l regularly t	o the field				
QC	Check Pe	erformed	Fr	equency			Compliant	
]	Multi-poir	t MFC Calibrations	✓ Se	miannually			$\checkmark$	
I	Flow Syste	em Leak Checks	V W	eekly			$\checkmark$	
]	Filter Pacl	k Inspection						
]	Flow Rate	Setting Checks		eekly				
1	Visual Ch	eck of Flow Rate Roton	neter 🗹 😡	eekly				
]	In-line Filt	ter Inspection/Replacer	nent 🗹 Se	emiannually				
3	Sample Li	ne Check for Dirt/Wate	er 🗹 W	eekly				

CND125

### F-02058-1500-S10-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 12/01/2015

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000254
DAS	Campbell	CR3000	3816	000499
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	illegible	01235
Flow Rate	Apex	AXMC105LPMDPC	54781	000838
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0844350327	06596
Ozone	ThermoElectron Inc	49i A1NAA	1030244803	000692
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124693	000376
Sample Tower	Aluma Tower	A	none	03495
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	14035	06402
Zero air pump	Werther International	C 70/4	000814284	06868

# **DAS Data Form**

DAS Time Max Error:

0

Mfg	Serial N	Number Site	1	<b>Technician</b>	Site Visit Date	Parameter	Use Desc.
Campbell	2511	PED	D108	Sandy Grenville	12/03/2015	DAS	Primary
Das Date:	12/3 /2015	Audit Date	12/3 /2015	Mfg	Datel	Parameter	DAS
Das Time:	337	Audit Time	337	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Channel:		High Channe	l:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:				
0.000	1 0.000	01 0.0001	0.0001				
				Mfg Serial Number Tfer ID Slope Cert Date	Fluke 95740135 01311 1.0000 1/22/201	Parameter Tfer Desc.	DAS DVM 0.00000 1.00000
Channel	Innut	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0001	V	V	0.0001	
7	0.1000	0.0999	0.0999	V	V	0.0000	
7	0.3000	0.2998	0.2997	V V	V	-0.0001	
7	0.5000	0.4996	0.4996	V	V	0.0000	
7	0.7000	0.6996	0.6995	V	V	-0.0001	
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 Num	iber Tag S	Site	Тес	Technician		Site Visit Date Parame		<b>Owner ID</b>	
Apex	54763		PED108	Sa	ndy Grenville	12/03/2015	Flow I	Rate	000666	
				Γ	Mfo	BIOS	BIOS		w Rate	
					·····5	400474				
					Serial Number	103471		Ifer Desc. nex	(US	
					Tfer ID	01420				
					Slope	0.9	96664 <b>In</b> t	tercept	0.03078	
				Cert Date	2/5	/2015 Co	orrCoff	0.99996		
					Mfg	BIOS	]	Parameter Flo	w Rate	
					Serial Number	103424		Ffer Desc. BIC	)S cell	
					Tfer ID	01410				
					Slope	0.9	)6664 <b>In</b> t	tercept	0.03078	
					Cert Date	2/5	/2015 Co	orrCoff	0.99996	
<b>DAS 1:</b>		L	Cal Factor Z	ero	-0.	02				
A Avg % Diff:	A Max % Di	A Avg %l	Dif A Max	% Di	Cal Factor F	ull Scale	0.	.96		
4.65%	5.06%				<b>Rotometer R</b>	eading:	1.	.55		
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	-0.02	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	1.560	1.580	1.56	1.560	1.50	l/m	l/m	-5.06%	
primary	test pt 2	1.553	1.570	1.56	1.560	1.50	l/m	l/m	-4.46%	
primary	test pt 3	1.554	1.580	1.56	1.560	1.51	l/m	l/m	-4.43%	
Sensor Compo	onent Leak Tes	t		Conditio	n		Status		pass	
Sensor Compo	onent Tubing C	ondition		Conditio	n Good		Statu	s pass		
Sensor Compo	onent Filter Pos	ition		Conditio	n Good		Statu	s pass		
Sensor Compo	onent Rotomete	er Condition	1	Conditio	n Clean and dry		Statu	s pass		
Sensor Compo	onent Moisture	Present		Conditio	n No moisture p	resent	Statu	s pass		
Sensor Comp	onent Filter Dist	ance		Conditio	<b>n</b> 4.0 cm		Statu	s pass		
Sensor Compo	onent Filter Dep	oth		Conditio	n 1.0 cm		Statu	s pass		
Sensor Comp	onent Filter Azir	nuth		Conditio	n 160 deg		Statu	s pass		
Sensor Compo	onent System M	lemo		Conditio	n		Statu	s pass		

# **Ozone Data Form**

Mfg	Serial Number Tag	Site	Tec	hnician		Site Visit Date	Paramet	ter Owner ID
ThermoElectron Inc	1105347319	PED108	Sar	ndy Grer	ville	12/03/2015	Ozone	000732
Slope:0.98554Slope:Intercept-0.67255InterceptCorrCoff0.99983CorrCoff		0.0000		Mfg Serial Number Tfer ID		ThermoElectror 0419606966 01112	n Inc Par	rameter ozone r Desc. Ozone primary stan
DAS 1: A Avg % Diff: A M 3.4%	DAS 2: Iax % Di A Avg % 5.9%	6Dif A Max 9	% Di	Slope Cert Da	te	0.9938 6/25/20	34 Inter 15 Corre	cept         -0.40946           Coff         1.00000
UseDescription primary primary primary	ConcGroup 1 2 3 4	Tfer Raw -0.04 29.98 50.00	Tfer C 0.3' 30.5 50.7	Corr 7 57 72	Si 0.3 28. 48. 70	te Si 38 ppb 77 ppb 52 ppb	te Unit	PctDifference
primary	5	109.99	111.0	08	108	.70 ppb		-2.14%
Sensor Component Sensor Component Sensor Component Sensor Component	nt Sample Train nt Inlet Filter Condition nt Battery Backup nt Offset	n 	Condition Condition Condition	n Good n Clean n N/A n 0.1			Status Status Status Status	pass pass pass pass
Sensor Component Sensor Component	nt Span nt Zero Voltage		Condition 0.995 Condition N/A				Status Status	Dass
Sensor Component	t Fullscale Voltage		Condition N/A Condition 94.1 kHz				Status	Dass
Sensor Component Sensor Component Sensor Component	nt Cell A Flow		Condition 1.2 ppb Condition 0.64 lpm				Status Status	Dass
Sensor Component Sensor Component	nt Cell A Tmp.		Condition	n 31.0 C n 107.5	; kHz		Status Status	Dass
Sensor Component     Cell B Noise       Sensor Component     Cell B Flow			Condition 1.1 ppb Condition 0.63 lpm				Status   Status	pass pass
Sensor Component Sensor Component	nt Cell B Pressure		Condition	n			Status Status	Dass
Sensor Component	nt Line Loss		Condition	n Not te	sted		Status   Status	bass bass

# **Temperature Data Form**

Mfg	Serial Number	Tag Site	J	<b>Fechn</b> i	echnician		isit Date	Param	eter	<b>Owner ID</b>
RM Young	14041	PED108		Sandy	Grenville	12/03	8/2015	Temper	rature	06408
				Mf	g	Extec	h	Pa	arameter Te	mperature
					Serial Number		734	Tf	fer Desc. R	D
				Tfer ID		01227	,			
DAS 1: DAS 2:				Slo	pe	1.00343 Inte		rcept	-0.06409	
Abs Avg Err Abs Max Er Abs Avg Err Abs Ma			Max Er	x Er Cert Date			1/30/2015 CorrCo		rCoff	1.00000
0.10	0.18									
UseDesc.	Test type	InputTmpRaw	InputTmp	outTmpCorr. OutputTmpS		Signal OutputSignalEng		gnalEng	OSE Unit	Difference
primary Te	emp Low Range	0.19	0.25		0.000	0.2		С	-0.07	
primary Te	emp Mid Range	24.91	24.89	)	0.000		24.7		С	-0.18
primary Te	emp High Range	47.66	47.56	5	0.000		47.	5	С	-0.06
Sensor Compo	onent Shield		Condi	tion	Clean			Status	pass	
Sensor Component Blower			Condi	tion N	I/A			Status	pass	
Sensor Component Blower Status Switch				Condition N/A				Status	pass	
Sensor Component System Memo				Condition				Status	pass	

# Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	PED108	Sandy Grenville	12/03/2015	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	Iter Temperatur
Abs Avg Err Abs	Max ErAbs Avg0.24	Err Abs Max Er	Serial Number	H232734 Tfer Desc. RTD		)
			Tfer ID	01227		
			Slope	1.0034	3 Intercept	-0.06409
			Cert Date	1/30/201	5 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	21.44	21.43	0.000	21.7	С	0.23
primary	Temp Mid Range	15.96	15.97	0.000	16.2	С	0.19
primary	Temp Mid Range	22.52	22.51	0.000	22.8	С	0.24

#### Infrastructure Data For

Site ID	PED108	Technicia Sandy G	Grenville Site Visit Date 12/03/2015
Shelter	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2116-13)	640 cuft
27.9 Consciences			

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 Da	ata Form	F-02058-1500-S1-rev00				
Site ID PED108	Technician Sandy Grenville	Site Visit Date 12/0	3/2015			
Site Sponsor (agency)	EPA	USGS Map	Green Bay			
<b>Operating Group</b>	Private	Map Scale				
AQS #	51-147-9991	Map Date				
Meteorological Type	Climatronics					
Air Pollutant Analyzer	Ozone	QAPP Latitude	37.1653			
<b>Deposition Measurement</b>	dry, wet	QAPP Longitude	-78.3070			
Land Use	woodland - mixed	<b>QAPP Elevation Meters</b>	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 Step 🔽				
Shelter Working Room	Make Ekto Mo	odel 8810 (s/n 2116-13)	Shelter Size 640 cuft			
Shelter Clean	Notes The shelter is in good conditio	n, clean, neat, and well organ	ized.			
Site OK	Notes					

Driving Directions From Farmville travel east on 460 approximately 1 mile. Turn right (south) onto route 696 toward Twin Lakes State Park. Continue approximately 8.5 miles on 696 (do not turn at the next sign for Twin Lakes State Park near the church) into the state forest. Turn left onto route 629 and continue approximately 1.3 miles. The site is not visible from the road, and is through a gate on a gravel road to the right.

**PED108** 

#### F-02058-1500-S2-rev002

Site ID

Technician Sandy Grenville

Site Visit Date 12/03/2015

Potential Interferent	Minimum Distance From Measurement	Distance	Pass =
	Apparatus		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	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 nine years to increase the size of the clearing. The tree line is encroaching again and is between 25 and 35 meters from the site.

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S3-r				
Site	e ID	PED108	Technician	Sandy Grenville		Site Visit Date	12/03/2015			
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 tally extended boom > to the prevailing wind	as to minimize ounted atop the 2x the max diar D	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 temp condition surface a 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 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, e	d to avoid sheltering e etc?	ffects from buil	dings, trees,		N/A				
10	Is the su facing no	rface wetness sensor s orth?	sited with the g	rid surface	✓	N/A				
11	Is it incl	lined approximately 3	0 degrees?		✓	N/A				
-						L				

### F-02058-1500-S4-rev002

Sit	e ID	PED108	Technician	Sandy Grenville		Site Visit Date	12/03/2015	
1	Do all th condition	e meterological senso 1, and well maintaine	rs appear to be d?	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?					N/A		
5	Is the so scratche	ar radiation sensor's s?	lens clean and f	free of	✓	N/A		
6	Is the su	rface wetness sensor	grid clean and u	indamaged?	✓	N/A		
7	Are the s condition	sensor signal and pow n, and well maintaine	ver cables intact d?	, in good	✓			
8	Are the s from the	sensor signal and pow elements and well m	ver cable connec aintained?	tions protected				

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Sit	PED108 Technician Sandy Grenville		Site Visit Date 12/03/2015
	Siting Criteria: Are the pollutant analyzers and deposition ec	uip	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	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 18 meters
4	Describe dry dep sample tube.		3/8 teflon by 18 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)		At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?	✓	
8	Are there moisture traps in the sample lines?		Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry

Fi	eld Sy	stems Data Fo	orm				F-02058-1500-S6-rev002					
Site	e ID	PED108	Technician	Sandy Grenville	;	Site Visit D	ate 12/03/20	15				
	DAS, sei	nsor translators, and	peripheral equi	pment operatio	<u>ns a</u>	nd maintenance	2					
1	Do the D well mai	AS instruments appentation of the second sec	ar 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 signalyzer and sensor signation set to be a set of the set	gnal leads pass ?	through	✓	Met sensors on	ly					
4	Are the well mai	signal connections prontained?	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 d?	ors, and shelter	properly	✓							
7	Does the	instrument shelter h	ave a stable pov	ver source?	✓							
8	Is the in	strument shelter temp	perature contro	lled?	✓							
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded				
10	Is the sa	mple tower stable and	l grounded?									
11	Tower c	omments?				Met tower remo	ved	Ľ				

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

Field S	Systems Data Fo	orm				<b>F-02</b>	<b>058-</b> ]	1500-S7-rev002
Site ID	PED108	Тес	chnician	Sandy Grenville	nville Site Visit Date			
<b>Docum</b>	<u>entation</u>							
Does th	e site have the required	instrur	nent and	equipment manuals?				
Wind spee Wind dire	ed sensor	s N ] [ ] [	0 N/. ] ✓ ] ✓	A Data logge Data logge	er er	Yes	No ✓	N/A □ ☑
Temperat	ure sensor			Strip char	t recorder			$\checkmark$
Relative h	umidity sensor			Computer		$\checkmark$		
Solar radi	iation sensor			Modem				
Surface w	etness sensor			Printer				$\checkmark$
Wind sens	sor translator			Zero air p	ump		✓	
Temperat	ure translator			Filter flow	pump		✓	
Humidity	sensor translator			Surge prot	tector		$\checkmark$	
Solar radi	ation translator			UPS			$\checkmark$	
Tipping b	ucket rain gauge 🛛 🗌			Lightning	protection device			$\checkmark$
Ozone ana	alyzer			Shelter he	ater		✓	
Filter pac	k flow controller			Shelter air	conditioner		$\checkmark$	
Filter pack	k MFC power supply							
Does t	the site have the required	l and n	<u>nost rece</u>	nt QC documents and	report forms?			
	Pr	esent				Curren	nt	
Station Lo	)g	$\checkmark$				$\checkmark$		
SSRF		$\checkmark$				$\checkmark$		
Site Ops N	Ianual	$\checkmark$	Oct 200	)1				
HASP		$\checkmark$	Feb 20	14		$\checkmark$		
Field Ops	Manual	$\checkmark$	July 19	99				
Calibratio	on Reports	$\checkmark$				$\checkmark$		
Ozone z/s/	p Control Charts							
Preventivo	e maintenance schedule							
1 Is the	e station log properly cor	npleteo	l during	every site visit? 🔽				
2 Are t curre	he Site Status Report Fo ent?	rms be	ing comj	pleted and 🔽				

3 Are the chain-of-custody forms properly used to document sample transfer to and from lab?

Control charts not used

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:

#### **PED108** Technician Sandy Grenville Site Visit Date 12/03/2015 Site ID **Site operation procedures** Has the site operator attended a formal CASTNET training 🖌 Trained in FL in 1987 and refresher course in July 2006 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 $\checkmark$ 3 schedule? ✓ Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 🗹 5 the required site activities? (including documentation)

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

QC Check Performed		Frequency	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	✓	N/A	$\checkmark$
Confirm Reasonableness of Current Values	✓	N/A	$\checkmark$
Test Surface Wetness Response	$\checkmark$	N/A	$\checkmark$

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

QC Check Performed		Frequency	Compliant							
Multi-point Calibrations	$\checkmark$	Semiannually								
Automatic Zero/Span Tests	$\checkmark$	Daily								
Manual Zero/Span Tests	$\checkmark$	As needed								
Automatic Precision Level Tests	$\checkmark$	Daily								
Manual Precision Level Test	$\checkmark$	As needed								
Analyzer Diagnostics Tests		Weekly								
In-line Filter Replacement (at inlet)	$\checkmark$	Every 2 weeks								
In-line Filter Replacement (at analyze	$\checkmark$	N/A								
Sample Line Check for Dirt/Water										
Zero Air Desiccant Check	$\checkmark$	Weekly								
1 Do multi-point calibration gases go the sample train including all filters?	Do multi-point calibration gases go through the complete sample train including all filters?									
2 Do automatic and manual z/s/p gasses	go throu	ign the								

- 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:

#### F-02058-1500-S8-rev002

✓ SSRF, call-in

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

Site	e ID	PED108	Technician	Sandy Grenville		Site Visit Date	12/03/2015			
	<u>Site op</u>	eration procedures								
1	Is the f	ilter pack being changed	d every Tuesda	ay as scheduled?		Flter changed morin	ings			
2	Are the correct	e Site Status Report For ly?	ms being com	pleted and filed	✓					
3	Are da schedu	ta downloads and backu led?	ips being perfo	ormed as		No longer required				
4	Are gei	neral observations being	g made and ree	corded? How?		SSRF				
5	Are site fashion	e supplies on-hand and 1 ?	replenished in	a timely						
6	Are sa	nple flow rates recorded	l? How?		✓	SSRF, call-in				
7	Are sar fashion	nples sent to the lab on a ?	a regular sche	dule in a timely	✓					
8	Are filt and shi	ers protected from cont pping? How?	amination du	ring handling	✓	One set of gloves only				
9	Are the operati	e site conditions reported ons manager or staff?	d regularly to	the field						
QC	Check F	Performed	Free	quency			Compliant			
N	<b>Aulti-po</b> i	int MFC Calibrations	✓ Sem	iannually						
F	Flow Syst	tem Leak Checks	✓ Wee	kly			$\checkmark$			
F	Filter Pa	ck Inspection								
F	low Rat	e Setting Checks	✓ Wee	kly						
V	/isual Cl	neck of Flow Rate Rotor	neter 🗹 Wee	kly						
Ι	n-line Fi	lter Inspection/Replace	ment 🗌 Unki	nown						
S	Sample L	ine Check for Dirt/Wat	er 🗹 Wee	kly						

PED108

### F-02058-1500-S10-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 12/03/2015

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000291
DAS	Campbell	CR3000	2511	000406
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	1088003022	00564
Flow Rate	Apex	AXMC105LPMDPC	54763	000666
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 V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
BFT	142-Sandy	Grenville-12/04/2015				
1	12/4/2015	Computer	Dell	07007	Inspiron 15	Unknown
2	12/4/2015	DAS	Campbell	000498	CR3000	3815
3	12/4/2015	Elevation	Elevation	None	1	None
4	12/4/2015	Filter pack flow pump	Thomas	00808	107CA18	00002460587
5	12/4/2015	Flow Rate	Арех	000463	AXMC105LPMDPCV	42230
6	12/4/2015	Infrastructure	Infrastructure	none	none	none
7	12/4/2015	Modem	Raven	06465	V4221-V	0808337771
8	12/4/2015	Ozone	ThermoElectron Inc	000738	49i A1NAA	1045347307
9	12/4/2015	Ozone Standard	ThermoElectron Inc	000453	49i A3NAA	CM08200027
10	12/4/2015	Sample Tower	Aluma Tower	000632	В	unknown
11	12/4/2015	Shelter Temperature	Campbell	none	107-L	none
12	12/4/2015	Siting Criteria	Siting Criteria	None	1	None
13	12/4/2015	Temperature	RM Young	04444	41342VO	4542
14	12/4/2015	Zero air pump	Werther International	06897	C 70/4	000821893

# **DAS Data Form**

DAS Time Max Error:

0

Mfg	Afg Serial Nu		]	<b>Fechnician</b>	Site Visit Date	Parameter	Use Desc.
Campbell	3815	BFT	142	Sandy Grenville	12/04/2015	DAS	Primary
Das Date:	<b>Date:</b> 12/4 /2015 Audit		12/4 /2015	Mfg	Datel	Parameter	DAS
Das Time: Das Day:	338	Audit Time	338	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Channel	:	High Channe	l:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:				
0.0001	0.000	1 0.0001	0.0001				
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0.00000	
				Cert Date	1/22/201	5 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.0001	0.0000	) V	V	0.0001	
7	0.1000	0.0998	0.0999	V	V	0.0001	
7	0.3000	0.2996	0.2997	' V	V	0.0001	
7	0.5000	0.4995	0.4996	6 V	V	0.0001	
7	0.7000	0.6994	0.6995	5 V	V	0.0001	
7	0.9000	0.8993	0.8994	V	V	0.0001	
7	1.0000	0.9992	0.9993	V	V	0.0001	

# Flow Data Form

Mfg	Serial Nun	iber Tag	Site	Те	chnician	Site Visit D	ate Paran	neter	Owner ID	
Арех	42230		BFT142	Sa	ndy Grenville	12/04/2015	Flow F	Rate	000463	
					Mfg	BIOS	F	Parameter FI	ow Rate	
					Serial Number	103471	1	Tfer Desc. nexus		
					Tfer ID	01420				
					Slope	0.9	96664 Int	ercept	0.03078	
					Cert Date	2/5	6/2015 <b>Co</b>	rrCoff	0.99996	
					Mfg	BIOS	F	Parameter FI	ow Rate	
					Serial Number	103424	1	fer Desc. B	OS cell	
					Tfer ID	01410				
					Slope	0.9	96664 Int	ercept	0.03078	
					Cert Date	Cert Date 2/5/20		rrCoff	0.99996	
DAS 1: DAS 2:					Cal Factor Z	lero		0		
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale		1		
1.53%	1.96%				<b>Rotometer</b> R	leading:	1	.5		
Desc.	Test type	Input l/n	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSigna	ll PctDifference	
primary	pump off	0.000	0.000	0.01	0.010	0.01	l/m	l/m		
primary	leak check	0.000	0.000	0.00	-0.010	-0.01	l/m	l/m		
primary	test pt 1	1.504	1.520	1.51	1.510	1.50	l/m	l/m	-1.32%	
primary	test pt 2	1.505	1.530	1.51	1.510	1.50	l/m	l/m	-1.96%	
primary	test pt 3	1.506	1.530	1.51	1.510	1.51	l/m	l/m	-1.31%	
Sensor Comp	onent Leak Tes	t		Conditio	n		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 Conditio	n	Conditio	Clean and dry		Statu	s pass		
Sensor Comp	onent Moisture	Present		Conditio	No moisture p	resent	Statu	s pass		
Sensor Comp	onent Filter Dist	tance		Conditio	<b>an</b> 4.0 cm		Statu	s pass		
Sensor Comp	onent Filter Dep	oth		Conditio	2.0 cm		Statu	s pass		
Sensor Comp	onent Filter Azir	muth		Conditio	<b>n</b> 160 deg		Statu	s pass		
Sensor Comp	onent System M	lemo		Conditio	n	Statu	s pass			

# **Ozone Data Form**

Mfg Serial Number Tag Site			Site	Technician		Site Visit Date	Parame	ter Owner ID		
ThermoElectron	Inc 104	5347307	BFT142	S	andy Grer	ville	12/04/2015	Ozone	000738	
Slope:         1.01401         Slope:         0.           Intercept         -0.63216         Intercept         0.           CorrCoff         0.99998         CorrCoff         0.			0.0000	0 Mfg 0 Serial Number 0 0 Tfer ID		ThermoElectron IncPar0419606966Tfe01112		rameter ozone er Desc. Ozone primary stan		
DAS 1: A Avg % Diff: 0.9%	A Max 9	DAS 2: <b>6 Di</b> 1.9%	bDif A Max	% Di	% Di Slope (Cert Date 6/2			0.99384         Intercept         -0.4094           25/2015         CorrCoff         1.0000		
UseDescript primary primary	ion	ConcGroup 1 2	Tfer Raw 0.00 30.01	Tfer 0. 30	Corr 41 .60	Si 0.0 30.	te Si 02 ppb 01 ppb	te Unit	PctDifference -1.93%	
primary primary primary		3 4 5	50.24 80.07 110.08	50 80 11	.96 .97 1.17	50. 81. 112	96 ppb 80 ppb .00 ppb		0.00% 1.03% 0.75%	
Sensor Comp Sensor Comp	onent Sa onent In	ample Train let Filter Conditio	n	Conditi Conditi	ion Good ion Clean			Status [ Status [	pass	
Sensor Component     Battery Backup       Sensor Component     Offset				Conditi	ion 0.000			Status Status	pass	
Sensor Comp	onent S	ero Voltage		Condition N/A				Status Status	pass	
Sensor Comp Sensor Comp	onent Fi	ullscale Voltage ell A Freq.		Condition N/A Condition 101.4 kHz				Status Status	pass	
Sensor Comp Sensor Comp	onent C	ell A Noise ell A Flow		Conditi Conditi	ion 0.7 pp ion 0.71 l	b om		Status Status	pass	
Sensor Comp Sensor Comp	onent C	ell A Pressure ell A Tmp.		Conditi Conditi	ion 756.1	mmHg C		Status Status	pass	
Sensor Comp Sensor Comp	onent C	ell B Freq.		Conditi Conditi	ion 96.5 k	Hz		Status Status	pass	
Sensor Component Cell B Flow			Conditi	ion 0.08 l	om		Status [	Fail		
Sensor Comp	onent C	ell B Tmp.		Conditi	ion			Status Status	pass	
Sensor Comp Sensor Comp	onent Li onent Sy	ne Loss ystem Memo		Conditi Conditi	ion Not te	sted omments		Status Status	pass	

# **Temperature Data Form**

Mfg	Serial Number	Tag Site	1	[echni	ician	Site V	Site Visit Date Paramet		eter	<b>Owner ID</b>	
RM Young	ng 4542 BFT142			Sandy Grenville		12/04	4/2015	Temper	ature	04444	
				Mf	g	Extec	h	Pa	rameter Temperature		
				Ser	rial Number	H2327	H232734 Tf		fer Desc. R	D	
				Tfer ID		01227	,				
DAS 1:		Slo	pe		1.00343 Inte		rcept	-0.06409	Э		
Abs Avg Err Abs Max Er Abs Avg Err Abs Max				ax Er Cert Date			1/30/201	5 Cor	rCoff	1.00000	כ
0.16	0.21										
UseDesc.	Test type	InputTmpRaw	InputTmp	InputTmpCorr. OutputTmpS		Signal	Signal OutputSignalEng		OSE Unit	Difference	
primary Tem	p Low Range	0.39	0.45	0.45 0.000			0.2		С	-0.21	
primary Terr	p Mid Range	25.32	25.30	)	0.000		25.1		С	-0.19	
primary Tem	ip High Range	48.10	48.00	)	0.000		47.	9	С	-0.09	
Sensor Compon	ent Shield		Condi	tion N	loderately cle	an		Status	pass		
Sensor Compon	Sensor Component Blower				I/A			Status	pass		
Sensor Compon	Sensor Component Blower Status Switch					Condition N/A			s pass		
Sensor Compon	ent System Memo	)	Condi	Condition				Status	pass		

# Shelter Temperature Data For

Mfg	Serial Number Tag Site		te	Technician	Site Visit Date Parameter		Owner ID
Campbell	none		FT142	Sandy Grenville	12/04/2015	Shelter Temperature	none
DAS 1:	I	DAS 2:		Mfg	Extech	Parameter She	lter Temperatur
Abs Avg Err Abs	0.47	0.47 Abs Avg Er	r Abs Max Er	Serial Number	H232734	Tfer Desc. RTD	)
	i			Tfer ID	01227		
				Slope	1.0034	3 Intercept	-0.06409
				Cert Date	1/30/201	5 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	21.94	21.93	0.000	22.1	С	0.17
primary	Temp Mid Range	21.75	21.74	0.000	22.2	С	0.47
primary	Temp Mid Range	22.01	22.00	0.000	22.3	С	0.33

#### Infrastructure Data For

Site ID BFT	42 Technicia	Sandy Grenville Site Visit Date 12/04/2015	
Shelter Make	Shelter Model	Shelter Size	
Ekto	8810	640 cuft	

Sensor Component Sample Tow	ver 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 Tr	ap Condition	Installed	Status	pass
Sensor Component Power Cabl	es Condition	Good	Status	pass
Sensor Component Shelter Ten	np Control Condition	Functioning	Status	pass
Sensor Component Rotometer	Condition	Installed	Status	pass
Sensor Component Sample Tow	ver Condition	Good	Status	pass
Sensor Component Shelter Con	dition Condition	Fair	Status	pass
Sensor Component Shelter Doc	r Condition	Good	Status	pass
Sensor Component Shelter Roc	f Condition	Good	Status	pass
Sensor Component Shelter Floo	or Condition	Good	Status	pass
Sensor Component Signal Cabl	e Condition	Good	Status	pass
Sensor Component Tubing Type	e Condition	3/8 teflon	Status	pass
Sensor Component Sample Tra	in Condition	Good	Status	pass

# **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	BFT142	Sandy Grenville	12/04/2015	Cell B Flow	ThermoElectron	3889		
This analyzer diagnostic	check is outside	the manufacturer's	recommended v	alue.				

# **Field Systems Comments**

#### 1 Parameter: DasComments

The sample tower has been attached to the shelter. The sample tower is not grounded.

#### 2 Parameter: SitingCriteriaCom

The site is surrounded by a corn/soy bean field, within a large-scale commercial agriculture operation.

#### 3 Parameter: ShelterCleanNotes

The shelter floor has been replaced since the previous audit.

#### 4 Parameter: MetOpMaintCom

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

Field Systems Da	ata Form		F-02058-1500-S1-rev002			
Site ID BFT142	Technician Sandy Gre	nville Site Visit Date 12/	04/2015			
Site Sponsor (agency)	EPA	USGS Map	Williston			
<b>Operating Group</b>	UNC-IMS	Map Scale				
AQS #	37-031-9991	Map Date				
Meteorological Type	R.M. Young					
Air Pollutant Analyzer	Ozone	QAPP Latitude				
<b>Deposition Measurement</b>	dry, wet	QAPP Longitude				
Land Use	agriculture	QAPP Elevation Meters				
Terrain	flat	QAPP Declination				
Conforms to MLM	Yes	QAPP Declination Date				
Site Telephone		Audit Latitude	34.884668			
Site Address 1	Open Grounds Farm	Audit Longitude	-76.620666			
Site Address 2	100 Nelson Bay Rd.	Audit Elevation	5.3			
County	Carteret	Audit Declination	-9.9			
City, State	Beaufort, NC	Present				
Zip Code	28516	Fire Extinguisher ✓	Inspected July 2000			
Time Zone	Eastern	First Aid Kit				
Primary Operator		Safety Glasses				
Primary Op. Phone #		Safety Hard Hat 🗹				
Primary Op. E-mail		Climbing Belt				
<b>Backup Operator</b>		Security Fence				
Backup Op. Phone #		Secure Shelter				
Backup Op. E-mail		Stable Entry Step 🗹				
Shelter Working Room ✓	Make Ekto	<b>Model</b> 8810	Shelter Size 640 cuft			
Shelter Clean	Notes The shelter floor has been	n replaced since the previous audi	t			
Site OK	Notes					
Driving Directions From I-95 take highway 70 east through Morehead City and over the bridge. Continue through Beaufort staying on route 70 east. At East Carteret High School, route 70 turns to the right at a traffic light. Continue straight through the light on Merrimon Rd. (SR 1300), do not follow 70 to the right. Open Grounds Farm will be on the right approximately 6 miles on Merrimon Rd. Sign in at the guard house. Continue on the dirt road into the farm. Turn left at the first dirt road. The site will be visible in the corner of the field. Follow the dirt road around the field to the site.						

**BFT142** 

### F-02058-1500-S2-rev002

Site ID

Technician Sandy Grenville

Site Visit Date 12/04/2015

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	20 m	
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** 

The site is surrounded by a corn/soy bean field, within a large-scale commercial agriculture operation.

Fi	eld Systems Data Form	F-02058-1500-S3-rev002	
Site	BFT142 Technician Sandy Grenville		Site Visit Date 12/04/2015
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
D			

### F-02058-1500-S4-rev002

Site	e ID	BFT142	Technician	Sandy Grenville		Site Visit Date	12/04/2015	
1 Do all the meterological sensors appear to be intact, in good condition, and well maintained?								
2	2 Are all the meteorological sensors operational online, and reporting data?			✓				
3	Are the	shields for the temper	ature and RH s	ensors clean?	✓			
4	Are the	aspirated motors wor	king?		✓	N/A		
5	Is the so scratche	lar radiation sensor's s?	lens clean and f	free of	✓	N/A		
6	Is the su	rface wetness sensor	grid clean and u	indamaged?	✓	N/A		
7	Are the condition	sensor signal and pow n, and well maintaine	ver cables intact d?	, in good		N/A		
8	Are the s from the	sensor signal and pow e elements and well m	ver cable connec aintained?	ctions protected	✓	N/A		

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

The meteorological tower has been removed and the temperature sensor is installed in a naturally aspirated shield on the sample tower.
Fi	eld Systems Data Form	F-02058-1500-S5-rev002					
Site	BFT142 Technician Sandy Grenville		Site Visit Date 12/04/2015				
	Siting Criteria: Are the pollutant analyzers and deposition ec	uip	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	ma	intenance				
1	Do the analyzers and equipment appear to be in good condition and well maintained?						
2	Are the analyzers and monitors operational, on-line, and reporting data?						
3	Describe ozone sample tube.		1/4 teflon by 10 meters				
4	Describe dry dep sample tube.		3/8 teflon by 10 meters				
5	Are in-line filters used in the ozone sample line? (if yes indicate location)		At inlet only				
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓					
7	Is the zero air supply desiccant unsaturated?	✓					
8	Are there moisture traps in the sample lines?	✓	Flow line only				
9	Is there a rotometer in the dry deposition filter line, and is it clean?	✓	Clean and dry				

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

Fi	eld Sy		F-02058-1500-S6-rev002							
Site	e ID	BFT142	Technician	Sandy Grenville	;	Site Vis	it Date	12/04/201	5	
	DAS, se	nsor translators, and p	eripheral equi	pment operatio	ns a	nd maintena	nce			
1	Do the I well mai	DAS instruments appea intained?	ar to be in good	l condition and	✓					
2 Are all the components of the DAS operational? (printers, modem, backup, etc) ☑										
<b>3</b> Do the analyzer and sensor signal leads pass through lightning protection circuitry?					✓	Met sensors	only			
4	Are the well mai	signal connections pro intained?	tected from the	e weather and	✓					
5	5 Are the signal leads connected to the correct DAS channel?				✓					
6	Are the grounde	DAS, sensor translator d?	rs, and shelter	properly	✓					
7	Does the	e instrument shelter ha	ive a stable pov	ver source?	✓					
8	Is the in	strument shelter temp	erature contro	lled?	✓					
9	Is the m	et tower stable and gro	ounded?			Stable			Grounded	
10	Is the sa	mple tower stable and	grounded?							
11	Tower c	omments?				Met tower re	emoved.			

Provide any additional 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 has been attached to the shelter. The sample tower is not grounded.

Field Sy	ystems Data Fo	orm			<b>F-02</b>	058-15	500-S7-rev002
Site ID	BFT142	Technician	Sandy Grenville	Site Visit Date	2/04/2015		]
<u>Documen</u>	itation						
<b>Does the</b>	site have the required i	instrument and	equipment manuals?				
Wind speed Wind direct Temperatur Relative hun Solar radiat Surface weth Wind senson Temperatur Humidity se Solar radiat	Yes         sensor         ion sensor         re sensor         nidity sensor         ion sensor         ion sensor         ness sensor         r translator         re translator         ion translator		A Data logg Data logg Strip char Computer Modem Printer Zero air p Filter flow Surge pro UPS	er er t recorder ump 7 pump tector	Yes	No N V V V V V V V V	
Tipping buc Ozone analy Filter pack f	in translator        ket rain gauge     zer     flow controller     MFC power supply		Lightning Shelter he Shelter air	protection device ater r conditioner			
Does the	e site have the required	and most rece	nt QC documents and	<u>l report forms?</u>	G		
Station Log SSRF Site Ops Ma HASP Field Ops M Calibration Ozone z/s/p Preventive r	Pr Inual Ianual Reports Control Charts naintenance schedule	esent  ✓  ✓  ✓  Oct 200  ✓  Oct 200  ✓  Oct 200  ✓      ✓	01			.t	
1 Is the s	tation log properly con	ipleted during	every site visit? 🔽				
2 Are the current	e Site Status Report For t?	rms being com	pleted and 🔽				
3 Are the sample	e chain-of-custody form transfer to and from la	is properly use ab?	d to document 🔽				
4 Are ozo current	one z/s/p control charts t?	properly comp	oleted and	Control charts not use	ed		
Provide any natural or n	additional explanation nan-made, that may aff	(photograph of fect the monitor	or sketch if necessary) ring parameters:	regarding condition	ons listed a	bove, or a	any other features,

### **Field Systems Data Form**

#### **BFT142** Technician Sandy Grenville Site Visit Date 12/04/2015 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? ✓ Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 🗹 5 the required site activities? (including documentation)

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

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

complete sample train including all filters?

reported? If yes, how?

3

Are the automatic and manual z/s/p checks monitored and

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	$\checkmark$	Semiannually	
Automatic Zero/Span Tests		Daily	
Manual Zero/Span Tests	$\checkmark$	As needed	
Automatic Precision Level Tests		Daily	
Manual Precision Level Test	$\checkmark$	As needed	
Analyzer Diagnostics Tests	$\checkmark$	Weekly	
In-line Filter Replacement (at inlet)	$\checkmark$	Every 2 weeks	
In-line Filter Replacement (at analyze		N/A	
Sample Line Check for Dirt/Water	$\checkmark$	Weekly	
Zero Air Desiccant Check	$\checkmark$	As needed	
1 Do multi-point calibration gases go the sample train including all filters?	rough the	e complete	
2 Do automatic and manual z/s/p gasses	go throu	gh the	

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

✓

SSRF, logbook, call-in

### F-02058-1500-S8-rev002

Field S	Systems Data Fo	orm			F-02058-15	500-89-rev002
Site ID	BFT142	Technician	Sandy Grenville	Site Visit Date	12/04/2015	]
Site o	peration procedures					
1 Is the	filter pack being change	ed every Tuesda	y as scheduled? 🗹 🛛	-ilter changed mori	nings	

2	Are the Site Status Report Forms be correctly?	ing	completed and filed	✓	
3	Are data downloads and backups be scheduled?	ing	performed as		No longer required
4	Are general observations being made	e an	d recorded? How?	✓	SSRF
5	Are site supplies on-hand and replen fashion?	ishe	ed in a timely	✓	
6	Are sample flow rates recorded? How	w?		✓	SSRF, logbook, call-in
7	Are samples sent to the lab on a regu fashion?	ılar	schedule in a timely		
8	Are filters protected from contamina and shipping? How?	atio	n during handling	✓	Clean gloves on and off
9	Are the site conditions reported regu operations manager or staff?	ılarl	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

Sample Line Check for Dirt/Water

✓

### **Field Systems Data Form**

BFT142

### F-02058-1500-S10-rev002

Site ID

Tecl

Technician Sandy Grenville

Site Visit Date 12/04/2015

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07007
DAS	Campbell	CR3000	3815	000498
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	00002460587	00808
Flow Rate	Apex	AXMC105LPMDPC	42230	000463
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0808337771	06465
Ozone	ThermoElectron Inc	49i A1NAA	1045347307	000738
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200027	000453
Sample Tower	Aluma Tower	В	unknown	000632
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VO	4542	04444
Zero air pump	Werther International	C 70/4	000821893	06897

### **APPENDIX B**

**CASTNET Site Spot Report Forms** 

Data Compiled: 11/15/2015 2:18:18 PM

SiteV	isitDate	Site	Techr	nician					
10/28/2	2015	ABT147	Sandy (	Grenville	2				
Line	Audited	d Parameter		DAS	Ch. #	Criteria +/-	Counts	QaResult	Units
1	Ozone Sl	ope		Р	0	1.1	4	0.99294	unitless
2	Ozone In	tercept		Р	0	5	4	-0.37282	ppb
3	Ozone co	orrelation		Р	0	0.995	4	0.99999	unitless
4	Ozone %	difference avg		Р	7	10	4	1.1	%
5	Ozone %	difference max		Р	7	10	4	1.2	%

## **Field Performance Comments**

CommentCode: 99 Parameter: Ozone SensorComponent: Cell A Flow 1

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

Pass/Fail

Р

Р

Р

Р

Р

**Data Compiled:** 11/15/2015 2:39:15 PM

SiteVisitDate	Site	Technician
11/02/2015	ARE128	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.00896	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.80592	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99993	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.2	%	Р
5	Ozone % difference max	Р	7	10	4	1.7	%	Р

**Data Compiled:** 10/30/2015 1:24:34 PM

SiteV	isitDate	Site	Technician					
10/07/2	2015	ASH135	Eric Hebert					
Line	Audited	l Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units
1	Ozone Sl	ope	Р	0	1.1	4	0.95816	unitless
2	Ozone In	tercept	Р	0	5	4	-0.31783	ppb
3	Ozone co	rrelation	Р	0	0.995	4	1.00000	unitless
4	Ozone %	difference avg	Р	7	10	4	4.7	%
5	Ozone %	difference max	Р	7	10	4	5.1	%

## **Field Performance Comments**

1	Parameter:	Ozone	SensorComponent:	Cell A Pressure	CommentCode: 99				
	This analyzer	diagnostic check is outsic	le the manufacturer's recor	mmended value.					
2	Parameter: Ozone SensorComponent: System Memo Commer								
	The analyzer output is erratic and varying. The analyzer is in need of maintenance.								

Page 1 of 1

Pass/Fail

P P

Р

Р

Р

Data Compiled:

12/5/2015 3:21:30 PM

SiteVisitDate	Site	Technician
11/19/2015	BEL116	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.98851	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.90721	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	3.2	%	Р
5	Ozone % difference max	Р	7	10	4	4.9	%	Р

Data Compiled:

d: 12/7/2015 9:56:14 PM

### SiteVisitDate Site Technician

12/04/2015BFT142Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	6	0.16	c	Р
2	Temperature max error	Р	4	0.5	6	0.21	c	Р
3	Ozone Slope	Р	0	1.1	4	1.01401	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.63216	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.9	%	Р
7	Ozone % difference max	Р	7	10	4	1.9	%	Р
8	Flow Rate average % difference	Р	10	5	4	1.53	%	Р
9	Flow Rate max % difference	Р	10	5	4	1.96	%	Р
10	DAS Time maximum error	Р	0	5	1	0.00	min	Р
11	DAS Voltage average error	Р	7	0.003	42	0.0001	V	Р
12	Shelter Temperature average error	Р	5	1	12	0.32	с	Р
13	Shelter Temperature max error	Р	5	1	12	0.47	с	Р

Technician

12/04/2015 BFT142

Sandy Grenville

## **Field Performance Comments**

 1
 Parameter:
 Ozone
 SensorComponent:
 Cell B Flow
 C

CommentCode: 99

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

## **Field Systems Comments**

1 Parameter: DasComments

The sample tower has been attached to the shelter. The sample tower is not grounded.

2 Parameter: SitingCriteriaCom

The site is surrounded by a corn/soy bean field, within a large-scale commercial agriculture operation.

**3 Parameter:** ShelterCleanNotes

The shelter floor has been replaced since the previous audit.

4 Parameter: MetOpMaintCom

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

Data Compiled:

ed: 12/5/2015 3:54:17 PM

# SiteVisitDateSiteTechnician11/24/2015BWR139Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	9	0.09	с	Р
2	Temperature max error	Р	4	0.5	9	0.12	с	Р
3	Ozone Slope	Р	0	1.1	4	1.01015	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.50418	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.5	0⁄0	Р
7	Ozone % difference max	Р	7	10	4	0.7	%	Р
8	Flow Rate average % difference	Р	10	5	3	4.17	0⁄0	Р
9	Flow Rate max % difference	Р	10	5	3	4.17	%	Р
10	DAS Time maximum error	Р	0	5	1	0.02	min	Р
11	DAS Voltage average error	Р	7	0.003	42	0.0001	V	Р
12	Shelter Temperature average error	Р	5	1	12	0.11	с	Р
13	Shelter Temperature max error	Р	5	1	12	0.31	с	Р

## **Field Systems Comments**

### **1 Parameter:** DasComments

The meteorological tower is no longer in service. The temperature sensor has been moved to the sample tower and is installed in a naturally aspirated shield.

#### 2 Parameter: SiteOpsProcedures

The ozone sample train is leak checked every two weeks following the inlet filter change.

### 3 Parameter: SitingCriteriaCom

Very light agriculture activities near site, not harvested, just to provide food for wildlife.

### 4 **Parameter:** ShelterCleanNotes

The shelter is showing signs of deterioration with leaks and rot at bottom of walls.

Data Compiled:

piled: 12/29/2015 5:44:54 PM

## SiteVisitDateSiteTechnician11/22/2015CDR119Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	15	0.19	c	Р
2	Temperature max error	Р	4	0.5	15	0.22	c	Р
3	Ozone Slope	Р	0	1.1	4	0.98679	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.73121	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99994	unitless	Р
6	Ozone % difference avg	Р	7	10	4	2.9	%	Р
7	Ozone % difference max	Р	7	10	4	4.3	%	Р
8	Flow Rate average % difference	Р	10	5	3	2.6	%	Р
9	Flow Rate max % difference	Р	10	5	3	2.6	%	Р
10	DAS Time maximum error	Р	0	5	1	0.13	min	Р
11	DAS Voltage average error	Р	7	0.003	28	0.0002	V	Р
12	Shelter Temperature average error	Р	5	1	12	0.26	с	Р
13	Shelter Temperature max error	Р	5	1	12	0.41	с	Р

## **Field Systems Comments**

### 1 Parameter: SiteOpsProcComm

The filter handling procedures have improved since the previous site audit visit.

### 2 Parameter: SitingCriteriaCom

Site is in a wooded valley, within 30 meters of a lightly traveled road. Large diesel trucks use the road.

### 3 Parameter: ShelterCleanNotes

The shelter has been refurbished since the previous site audit visit.

### 4 Parameter: MetOpMaintCom

The temperature sensor has been moved to a naturally aspirated shield on the sample tower. The meteorological tower has been removed.

Data Compiled:

d: 12/7/2015 8:32:58 PM

## SiteVisitDateSiteTechnician12/01/2015CND125Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	6	0.16	с	Р
2	Temperature max error	Р	4	0.5	6	0.30	с	Р
3	Ozone Slope	Р	0	1.1	4	0.97118	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.05317	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	2.9	%	Р
7	Ozone % difference max	Р	7	10	4	3.4	%	Р
8	Flow Rate average % difference	Р	10	5	3	1.96	%	Р
9	Flow Rate max % difference	Р	10	5	3	1.96	%	Р
10	DAS Time maximum error	Р	0	5	1	0.28	min	Р
11	DAS Voltage average error	Р	7	0.003	42	0.0001	V	Р
12	Shelter Temperature average error	Р	5	1	12	0.04	с	Р
13	Shelter Temperature max error	Р	5	1	12	0.05	с	Р

## **Field Systems Comments**

### 1 Parameter: SitingCriteriaCom

The land owner maintains a pine tree forest on the property within 50 meters of the site. The trees were planted just before the site was installed in 1990 and will be harvested in the near future.

### 2 Parameter: ShelterCleanNotes

The shelter is well maintained, clean and well organized. However the shelter roof is leaking and several wall panels and parts of the floor are showing signs of rot.

### 3 Parameter: MetOpMaintCom

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

Data Compiled: 10/30/2015 1:42:21 PM

SiteVisitDate	Site	Technician
10/23/2015	CTH110	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97207	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.54651	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	3.5	%	Р
5	Ozone % difference max	Р	7	10	4	3.7	%	Р

Data Compiled:

led: 11/2/2015 11:59:36 AM

# SiteVisitDateSiteTechnician10/26/2015GRS420Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	6	0.15	c	Р
2	Temperature max error	Р	4	0.5	6	0.23	с	Р
3	Ozone Slope	Р	0	1.1	4	0.97926	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.35728	ppb	Р
5	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
6	Ozone % difference avg	Р	7	10	4	2.8	%	Р
7	Ozone % difference max	Р	7	10	4	3.6	%	Р
8	Flow Rate average % difference	Р	10	5	4	1.04	%	Р
9	Flow Rate max % difference	Р	10	5	4	1.48	%	Р
10	DAS Time maximum error	Р	0	5	1	0.05	min	Р
11	DAS Voltage average error	Р	2	0.003	21	0.0000	V	Р
12	Shelter Temperature average error	Р	5	1	10	0.25	с	Р
13	Shelter Temperature max error	Р	5	1	10	0.47	c	Р

10/26/2015 GRS420

Technician

Eric Hebert

## **Field Performance Comments**

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

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

## **Field Systems Comments**

1 Parameter: SiteOpsProcComm

Site operation and filter handling has improved since the previous audit visit.

2 Parameter: SiteOpsProcedures

The ozone sample train is leak-tested each week after the inlet filter is changed.

3 Parameter: SitingCriteriaCom

The site is located on a ridge top with the sampling height at the tops of the trees on the ridge. The site is within 40 km of Knoxville and other major sources.

4 Parameter: ShelterCleanNotes

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

5 Parameter: MetSensorComme

The temperature sensor has been relocated from 10 meters to approximately 3.9 meters above the ground. Previously recorded temperature data are not comparable to current data labeled as temperature.

SiteVisitDate	Site	Technician	Technician					
10/06/2015	HOW191	Eric Hebert						
Line Audited	d Parameter	DAS	Ch. #	Criter				

.ine	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.96286	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.40667	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	4.2	%	Р
5	Ozone % difference max	Р	7	10	4	4.3	%	Р

SiteVisitDate	Site	Technician
10/03/2015	HWF187	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.98118	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.16523	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 % difference max	Р	7	10	4	2.5	%	Р

Data Compiled: 10/30/2015 1:53:35 PM

SiteVisitDate	Site	Technician
10/24/2015	KEF112	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97256	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.13647	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99993	unitless	Р
4	Ozone % difference avg	Р	7	10	4	2.6	⁰∕₀	Р
5	Ozone % difference max	Р	7	10	4	3.2	%	Р

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11/10/2010 1.5/.2011

## SiteVisitDateSiteTechnician11/01/2015LRL117Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	9	0.21	с	Р
2	Temperature max error	Р	4	0.5	9	0.30	с	Р
3	Ozone Slope	Р	0	1.1	4	0.99066	unitless	Р
4	Ozone Intercept	Р	0	5	4	-1.30958	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99994	unitless	Р
6	Ozone % difference avg	Р	7	10	4	3.5	%	Р
7	Ozone % difference max	Р	7	10	4	4.9	%	Р
8	Flow Rate average % difference	Р	10	5	4	6.05	%	Fail
9	Flow Rate max % difference	Р	10	5	4	6.25	%	Fail
10	DAS Time maximum error	Р	0	5	1	0.02	min	Р
11	DAS Voltage average error	Р	7	0.003	42	0.0000	V	Р
12	Shelter Temperature average error	Р	5	1	12	0.47	с	Р
13	Shelter Temperature max error	Р	5	1	12	0.68	c	Р

## **Field Systems Comments**

### 1 Parameter: DasComments

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

#### 2 Parameter: SiteOpsProcedures

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

### 3 Parameter: ShelterCleanNotes

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

Data Compiled: 11/15/2015 1:57:27 PM

SiteVisitDate	Site	Technician
10/25/2015	MKG113	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.00862	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.36949	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99994	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.9	%	Р
5	Ozone % difference max	Р	7	10	4	1.7	%	Р

**Data Compiled:** 10/7/2015 9:55:53 PM

SiteV	isitDate	Site	Technician		
10/02/2	2015	NIC001	Eric Hebert		
Line	Audite	d Parameter	DAS C	h. #	Criteria +/-
1	T		P		0.5

ine	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	6	0.18	с	Р
2	Temperature max error	Р	4	0.5	6	0.26	с	Р
3	Flow Rate average % difference	Р	10	5	3	0.99	%	Р
4	Flow Rate max % difference	Р	10	5	3	1.32	%	Р

## **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: 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.

Data Compiled:

biled: 12/29/2015 5:04:04 PM

## SiteVisitDateSiteTechnician11/21/2015PAR107Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	12	0.05	с	Р
2	Temperature max error	Р	4	0.5	12	0.10	с	Р
3	Ozone Slope	Р	0	1.1	4	1.00098	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.89739	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.6	%	Р
7	Ozone % difference max	Р	7	10	4	2.7	%	Р
8	Flow Rate average % difference	Р	10	5	3	3.02	%	Р
9	Flow Rate max % difference	Р	10	5	3	3.23	%	Р
10	DAS Time maximum error	Р	0	5	1	0.00	min	Р
11	DAS Voltage average error	Р	7	0.003	42	0.0000	V	Р
12	Shelter Temperature average error	Р	5	1	12	0.20	с	Р
13	Shelter Temperature max error	Р	5	1	12	0.29	с	Р

## **Field Systems Comments**

### 1 Parameter: DasComments

The meteorological tower has been removed and the temperature sensor has been mounted on the sample tower.

### 2 Parameter: SitingCriteriaCom

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

### 3 **Parameter:** ShelterCleanNotes

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

Data Compiled:

ed: 12/7/2015 9:23:50 PM

## SiteVisitDateSiteTechnician12/03/2015PED108Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	3	0.10	с	Р
2	Temperature max error	Р	4	0.5	3	0.18	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98554	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.67255	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99983	unitless	Р
6	Ozone % difference avg	Р	7	10	4	3.4	%	Р
7	Ozone % difference max	Р	7	10	4	5.9	%	Р
8	Flow Rate average % difference	Р	10	5	3	4.65	%	Р
9	Flow Rate max % difference	Р	10	5	3	5.06	%	Fail
10	DAS Time maximum error	Р	0	5	1	0.00	min	Р
11	DAS Voltage average error	Р	7	0.003	42	0.0001	V	Р
12	Shelter Temperature average error	Р	5	1	12	0.22	с	Р
13	Shelter Temperature max error	Р	5	1	12	0.24	с	Р

## **Field Systems Comments**

### 1 Parameter: DasComments

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

### 2 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 nine years to increase the size of the clearing. The tree line is encroaching again and is between 25 and 35 meters from the site.

### 3 Parameter: ShelterCleanNotes

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

Data Compiled: 11/15/2015 1:40:17 PM

SiteVisitDate	Site	Technician
11/04/2015	PNF126	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.00789	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.19347	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 % difference max	Р	7	10	4	1.7	%	Р

Data Compiled: 11/15/2015 2:08:23 PM

SiteVisitDate		Site	Technicia	an					
10/27/2	2015	PSU106	Sandy Gren	ville					
Line	Audited	d Parameter	DA	S Ch.	#	Criteria +/-	Counts	QaResult	Units
1	Ozone Sl	ope	F	•	0	1.1	4	1.01677	unitless
2	Ozone In	tercept	F	,	0	5	4	-0.47066	ppb
3	Ozone co	orrelation	F	,	0	0.995	4	0.99998	unitless
4	Ozone %	difference avg	F	•	7	10	4	0.8	%
5	Ozone %	difference max	F	•	7	10	4	1.6	%

## **Field Performance Comments**

CommentCode: 99 SensorComponent: Cell B Flow Parameter: Ozone 1

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

Pass/Fail

Р

Р

Р

Р

Р

Data Compiled:

piled: 11/15/2015 3:49:17 PM

# SiteVisitDateSiteTechnician11/06/2015SHN418Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	9	0.14	с	Р
2	Temperature max error	Р	4	0.5	9	0.22	с	Р
3	Ozone Slope	Р	0	1.1	4	0.96564	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.36003	ppb	Р
5	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
6	Ozone % difference avg	Р	7	10	4	4.1	%	Р
7	Ozone % difference max	Р	7	10	4	4.6	%	Р
8	Flow Rate average % difference	Р	10	5	9	1.81	%	Р
9	Flow Rate max % difference	Р	10	5	9	2.04	%	Р
10	DAS Time maximum error	Р	0	5	1	0.57	min	Р
11	DAS Voltage average error	Р	2	0.003	21	0.0001	V	Р
12	Shelter Temperature average error	Р	5	1	15	0.59	с	Р
13	Shelter Temperature max error	Р	5	1	15	0.76	c	Р

11/06/2015 SHN418

Technician

Eric Hebert

## **Field Performance Comments**

1	Parameter:	Flow Rate	SensorComponent:	Moisture Present	CommentCode: 72
	The filter samp	ole tubing has drops of m	noisture in low sections our	tside the shelter.	

2 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: SiteOpsProcedures

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

2 Parameter: ShelterCleanNotes

The shelter is in good condition, clean and well organized

3 Parameter: MetSensorComme

The temperature sensor has been moved from 10 meters to approximately 2 meters above ground. Currently recorded temperature data are not comparable to previously measured temperature data.

Data Compiled: 10/7/2015 10:16:10 PM

SiteVisitDate		Site	Technicia	an		
		UND002	Eric Hebert			
Line	Audited	l Parameter	DA	S Ch.#	Criteria +/-	Counts
1	Temperat	ure average error	F	• 4	0.5	6
2	Temperat	ure max error	F	<b>y</b> 4	0.5	6
3	Flow Rat	e average % difference	F	<b>P</b> 10	5	3
4	Flow Rat	e max % difference	F	<b>)</b> 10	5	3

## **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.

QaResult

0.35

0.44

0.09

0.23

Units

с

с

%

%

Pass/Fail

Р

Р

Р

Р

#### 3 Parameter: ShelterCleanNotes

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

Data Compiled: 12/29/2015 3:17:57 PM

SiteVisitDate Site Technician

11/19/2015 VPI120 Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	3	0.03	с	Р
2	Temperature max error	Р	4	0.5	3	0.05	с	Р
3	Ozone Slope	Р	0	1.1	4	0.99265	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.28599	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.1	%	Р
7	Ozone % difference max	Р	7	10	4	1.5	%	Р
8	Flow Rate average % difference	Р	10	5	2	3.02	%	Р
9	Flow Rate max % difference	Р	10	5	2	3.23	%	Р
10	DAS Time maximum error	Р	0	5	1	0.00	min	Р
11	DAS Voltage average error	Р	7	0.003	42	0.0000	V	Р
12	Shelter Temperature average error	Р	5	1	12	0.26	с	Р
13	Shelter Temperature max error	Р	5	1	12	0.40	с	Р

## **Field Systems Comments**

### 1 Parameter: SitingCriteriaCom

The site is on a wooded hillside. The met gear and sample inlet are at the tree tops of the downhill trees. The uphill tree line is 30 meters away.

### 2 Parameter: ShelterCleanNotes

The shelter roof has been recently repaired due to additional leaks. The shelter is clean, neat, and well organized.

**Data Compiled:** 10/7/2015 9:37:37 PM

SiteV	'isitDate	Site	Technician				
10/01/2	2015	WFM105	Eric Hebert				
Line	Audited	d Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult
1	Temperat	ture average error	Р	4	0.5	6	0.35
2	Temperat	ture max error	Р	4	0.5	6	0.44
3	Flow Rat	e average % difference	Р	10	5	2	0.44
4	Flow Rat	e max % difference	Р	10	5	2	0.67

## **Field Performance Comments**

1 Parameter: Flow Rate SensorComponent: Filter Position

CommentCode 71

Units

с

с

%

%

Pass/Fail

Р

Р

Р

Р

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: DasComments

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

2 Parameter: DocumentationCo

There is no logbook present to record the status of the site equipment or filter information.

3 Parameter: SitingCriteriaCom

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

4 Parameter: ShelterCleanNotes

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

Data Compiled:

d: 12/5/2015 3:08:35 PM

# SiteVisitDateSiteTechnician11/09/2015WSP144Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	6	0.22	c	Р
2	Temperature max error	Р	4	0.5	6	0.38	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98867	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.62015	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р
6	Ozone % difference avg	Р	7	10	4	2.2	%	Р
7	Ozone % difference max	Р	7	10	4	3.4	%	Р
8	Flow Rate average % difference	Р	10	5	3	2.17	%	Р
9	Flow Rate max % difference	Р	10	5	3	2.6	%	Р
10	DAS Time maximum error	Р	0	5	1	0.02	min	Р
11	DAS Voltage average error	Р	7	0.003	42	0.0000	V	Р
12	Shelter Temperature average error	Р	5	1	12	0.65	с	Р
13	Shelter Temperature max error	Р	5	1	12	0.89	с	Р

## **Field Systems Comments**

#### 1 Parameter: SiteOpsProcedures

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

### 2 Parameter: SitingCriteriaCom

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

### 3 Parameter: ShelterCleanNotes

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

**Data Compiled:** 11/15/2015 2:27:07 PM

SiteVisitDate	Site	Technician
10/29/2015	WST109	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99514	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.25764	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99994	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.8	%	Р
5	Ozone % difference max	Р	7	10	4	1.8	%	Р
#### **APPENDIX C**

**CASTNET Ozone Performance Evaluation Forms** 

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
HWF	187-Eric I	Hebert-10/03/2015				
1	10/3/2015	DAS	Campbell	000356	CR3000	2134
2	10/3/2015	Ozone	ThermoElectron Inc	000700	49i A1NAA	1030244793
3	10/3/2015	Ozone Standard	ThermoElectron Inc	000445	49i A3NAA	CM08200021
4	10/3/2015	Zero air pump	Werther International	06916	C 70/4	000829158

Mfg	Serial Number Tag	g Site	Tec	hnician		Site Visit Date	Parame	ter Owner ID
ThermoElectron Ir	nc 1030244793	HWF187	Eric	c Hebert		10/03/2015	Ozone	000700
Slope:         0.98118         Slope:         0           Intercept         -0.16523         Intercept         0           CorrCoff         1.00000         CorrCoff         0		0.0000 0.0000 0.0000	D0     Mfg       D0     Serial Number       D0     Tfer ID		ThermoElectron IncPar49CPS-70008-364Tfe01110		rameter ozone er Desc. Ozone primary stan	
DAS 1: A Avg % Diff: A 2.2%	DAS 2: A Max % Di 2.5%	%Dif A Max	% Di	Slope Cert Da	te	1.011: 9/21/20	30 Inter 15 Corr	cept         -0.21263           Coff         1.00000
UseDescription primary primary	on ConcGroup 1 2 2	Tfer Raw           0.11           30.76	Tfer 0 0.3 30.6	Corr 1 52	Si 0.1 29.	te Si 17 ppb 88 ppb	te Unit	PctDifference
primary primary primary	3 4 5	47.57 74.59 108.92	47.2 73.9 107.	24 96 91	46. 72. 105	08 ppb 49 ppb .70 ppb	Status	-2.46% -1.99% -2.05%
Sensor Compo Sensor Compo Sensor Compo	nent Inlet Filter Conditi nent Battery Backup	on	Condition Condition Condition	n Clean n N/A			Status   Status   Status	pass
Sensor Compo	nent Offset		<b>Conditio</b>	n 0.10			Status [	pass
Sensor Compo	nent Span nent Zero Voltage		Conditio	n 1.011 n N/A			Status Status	pass
Sensor Compo Sensor Compo	nent Fullscale Voltage		Conditio	n N/A n 93.6 k	Hz		Status Status	pass
Sensor Compo	nent Cell A Noise		Conditio	n 0.6 pp	b		Status	pass
Sensor Compo Sensor Compo	nent Cell A Flow nent Cell A Pressure		Condition	n 0.50 lp n 713.6	om mmHg		Status Status	pass
Sensor Compo	nent Cell A Tmp.		Conditio	n 32.0 C	;		Status	pass
Sensor Compo Sensor Compo	nent Cell B Freq. nent Cell B Noise		Conditio Conditio	n 90.8 k n 0.8 pp	Hz b		Status Status	pass
Sensor Compo	nent Cell B Flow		Conditio	n 0.72 lp	om		Status	pass
Sensor Compo Sensor Compo	nent Cell B Pressure		Conditio	n n			Status Status	pass
Sensor Compo	nent Line Loss		Conditio	n Not te	sted		Status	pass
Sensor Compo	nent System Memo		Conditio	n			Status	pass

Site V	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
НОЙ	V191-Eric I	Hebert-10/06/2015				
1	10/6/2015	DAS	Campbell	000419	CR3000	2527
2	10/6/2015	Ozone	ThermoElectron Inc	000616	49i A1NAA	1009241781
3	10/6/2015	Ozone Standard	ThermoElectron Inc	000435	49i A3NAA	CM08200011
4	10/6/2015	Zero air pump	Werther International	06908	C 70/4	000821900

Mfg Serial Number Tag Site			Те	chnician		Site Visit Dat	e Parame	ter Owner ID	
ThermoElectro	n Inc 10	009241781	HOW191	E	ric Hebert		10/06/2015	Ozone	000616
Slope: Intercept CorrCoff	Slope:0.96286Slope:Intercept-0.40667InterceptCorrCoff0.99998CorrCoff		0.00000 0.00000 0.00000		Mfg Serial Number Tfer ID		ThermoElectron IncPar49CPS-70008-364Tfe01110		rameter ozone er Desc. Ozone primary stan
DAS 1: A Avg % Diff 4.2%	: A Max	DAS 2:           * % Di         A Avg %           4.4%	6Dif A Max	% Di	% Di Slope Cert Date9/		1.01 <sup>2</sup> 9/21/20	1.01130         Intercept         -0.1           21/2015         CorrCoff         1.0	
UseDescri	ption	ConcGroup	Tfer Raw	Tfer	Corr	Si	te S	Site Unit	PctDifference
primar	у	1	0.30	0.	50	-0.	23 ppb		
primar	у	2	32.83	32	.67	31.	25 ppb		-4.35%
primar	y v	4	75 20	74	.72	49.	53 ppb		-4.08%
primar	у У	5	111.30	110	).26	105	.50 ppb		-4.32%
Sensor Com	ponent	Sample Train		Conditi	on Good			Status	pass
Sensor Com	ponent	Inlet Filter Conditio	n	Conditi	on Clean			Status	pass
Sensor Com	ponent	Battery Backup		Conditi	on N/A			Status	pass
Sensor Com	ponent	Offset		Conditi	on 0.20			Status	pass
Sensor Com	ponent	Span		Conditi	on 1.007			Status	pass
Sensor Com	ponent	Zero Voltage		Conditi	on N/A			Status	pass
Sensor Com	ponent	Fullscale Voltage		Conditi	on N/A			Status	pass
Sensor Com	ponent	Cell A Freq.		Conditi	<mark>on</mark> 86.9 k	κHz		Status	pass
Sensor Com	ponent	Cell A Noise		Conditi	<mark>on</mark> 0.8 pp	b		Status	pass
Sensor Com	ponent	Cell A Flow		Conditi	<mark>on</mark> 0.67 l	pm		Status	pass
Sensor Com	ponent	Cell A Pressure		Conditi	<mark>on</mark> 699.6	mmHg		Status	pass
Sensor Com	ponent	Cell A Tmp.		Conditi	<mark>on</mark> 37.9 (	)		Status	pass
Sensor Com	ponent	Cell B Freq.		Conditi	on 101.6	kHz		Status	pass
Sensor Com	ponent	Cell B Noise		Conditi	on 0.6 pp	b		Status	pass
Sensor Com	ponent	Cell B Flow		Conditi	on 0.67 l	pm		Status	pass
Sensor Com	ponent	Cell B Pressure		Conditi	on			Status	pass
Sensor Com	Sensor Component Cell B Tmp.		Conditi	ndition			Status	pass	
Sensor Com	ponent	Line Loss		Conditi	on Not te	sted		Status	pass
Sensor Com	ponent	System Memo		Conditi	on			Status	pass

Site V	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ASH	135-Eric H	lebert-10/07/2015				
1	10/7/2015	DAS	Campbell	000634	CR3000	4933
2	10/7/2015	Ozone	ThermoElectron Inc	000620	49i A1NAA	1009241793
3	10/7/2015	Ozone Standard	ThermoElectron Inc	000442	49i A3NAA	CM08200018
4	10/7/2015	UPS	APC	06797	RS900	unknown
5	10/7/2015	Zero air pump	Werther International	06923	C 70/4	000836208

Mfg Serial Number Tag Site			Тес	chnician		Site Visit Date	Parame	ter Owner ID
ThermoElectron In	c 1009241793	ASH135	Eri	ic Hebert		10/07/2015	Ozone	000620
Slope: Intercept CorrCoff	Slope:0.95816Slope:Intercept-0.31783InterceptCorrCoff1.00000CorrCoff			Mfg Serial Number Tfer ID		ThermoElectron IncPar49CPS-70008-364Tfe01110		rameter ozone er Desc. Ozone primary stan
DAS 1: A Avg % Diff: A 4.8%	DAS 2: Max % Di 5.1%	6Dif A Max	% Di	Slope Cert Da	ite	9/21/20	30 Inter 15 Corr	cept         -0.21263           Coff         1.00000
UseDescriptio primary primary primary	n ConcGroup 1 2 3	Tfer Raw           0.28           32.18           50.62	Tfer 0.4 0.4 32. 50.	Corr 18 03 26	Si 0.1 30. 47.	te Si 11 ppb 39 ppb 81 ppb	te Unit	PctDifference -5.12% -4.87%
primary primary	4 5	77.18	76. 108	52 .43	73. 103	12 ppb .50 ppb		-4.44%
Sensor Compon	ent Sample Train	on	Conditio Conditio	n Good			Status Status	pass
Sensor Compon Sensor Compon	nent Offset		Conditio	n Funct n -0.20	ioning		Status Status	pass
Sensor Compon	ent Span		Conditio	<b>n</b> 1.011			Status	pass
Sensor Compon	ent Zero Voltage		Conditio	n N/A			Status	pass
Sensor Compor	ent Fullscale Voltage		Conditio	n N/A			Status	pass
Sensor Compor	tent Cell A Freq.		Conditio	<b>)n</b> 93.8 k	Hz		Status	pass
Sensor Compon	ent Cell A Noise		Conditio	<b>)n</b> 1.1 pp	b		Status	pass
Sensor Compon	ent Cell A Flow		Conditio	on 0.73 l	om		Status	pass
Sensor Compon	ent Cell A Pressure		Conditio	<b>n</b> 709.5	mmHg		Status	Fail
Sensor Compon	tent Cell A Tmp.		Conditio	<b>n</b> 32.2 (	)		Status	pass
Sensor Compor	ent Cell B Freq.		Conditio	on 98.8 k	Hz		Status	pass
Sensor Compor	ent Cell B Noise		Conditio	on 1.0 pp	b		Status	pass
Sensor Compor	ent Cell B Flow		Conditio	on 0.72 l	om		Status	pass
Sensor Compor	tent Cell B Pressure		Conditio	on			Status	pass
Sensor Compon	ent Cell B Tmp.		Conditio	on [			Status	pass
Sensor Component Line Loss		Conditio	lition Not tested			Status	pass	
Sensor Compor	ent System Memo		Conditio	on See c	omments		Status	pass

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CTH	II10-Eric H	lebert-10/23/2015				
1	10/23/2015	DAS	Campbell	000415	CR3000	2510
2	10/23/2015	Ozone	ThermoElectron Inc	000735	49i A1NAA	1105347308
3	10/23/2015	Ozone Standard	ThermoElectron Inc	000447	49i A3NAA	CM08200023
4	10/23/2015	Zero air pump	Werther International	06864	PC70/4	000815261

Mfg	Serial Number Tag Site			Те	Technician		Site Visit Date	e Parame	ter Owner ID	
ThermoElectr	on Inc 1	105347308	CTH110	Er	ric Hebert		10/23/2015	Ozone	000735	
Slope: Intercept CorrCoff	Slope:0.97207Slope:Intercept-0.54651InterceptCorrCoff0.99998CorrCoff		0.0000	0.00000         Mfg           0.00000         Serial Number           0.00000         Tfer ID		ThermoElectron Inc       Parameter       ozone         49CPS-70008-364       Tfer Desc.       Ozone primar         01110       01110       01110				
DAS 1: A Avg % Dif 3.5%	ff: A Max	DAS 2:           % Di         A Avg %           3.7%	6Dif A Max	% Di	6 Di Cert Date 9/2			D1130         Intercept         -0.2126           //2015         CorrCoff         1.0000		
UseDescr prima prima prima	ription nry nry nry	ConcGroup 1 2 3	Tfer Raw 0.40 34.38 52.52	Tfer 0.0 34. 52.	Corr 60 .20 .14	Si -0. 32. 50.	te S 28 ppb 92 ppb 39 ppb	ite Unit	PctDifference -3.74% -3.36%	
prima prima	ury ury	4 5	74.34 108.83	73. 107	.71 7.82	71. 104	21 ppb .00 ppb		-3.39%	
Sensor Cor Sensor Cor Sensor Cor Sensor Cor Sensor Cor	mponent [ mponent [ mponent [ mponent [ mponent ]	Sample Train Inlet Filter Conditic Battery Backup Offset Span	n	Condition Condition Condition Condition	on Good on Clean on N/A on 0.40 on 1.014			Status Status Status Status Status	pass pass pass pass pass	
Sensor Co Sensor Co	nponent	Zero Voltage Fullscale Voltage		Condition N/A Condition N/A				Status Status	pass pass	
Sensor Co Sensor Co	mponent mponent	Cell A Freq. Cell A Noise		Condition Condition	on 81.8 k on 2.1 pp	:Hz )b		Status Status	pass pass	
Sensor Co Sensor Co	mponent mponent	Cell A Flow Cell A Pressure		Condition Condition	on 0.74   on 702.5	om mmHg		Status Status	pass pass	
Sensor Con Sensor Con	mponent mponent	Cell A Tmp. Cell B Freq.		Condition Condition	on 31.6 ( on 92.8 k	C (Hz		Status Status	pass	
Sensor Col Sensor Col	mponent [ mponent [	Cell B Noise Cell B Flow		Condition Condition	on 1.5 pp on 0.73 l	om		Status Status	pass pass	
Sensor Component       Cell B Pressure         Sensor Component       Cell B Tmp.		Condition Condition	Condition			Status Status	pass			
Sensor Col Sensor Col	mponent mponent	Line Loss System Memo		Condition Condition	on Not te	sted		Status Status	pass	

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
KEF	T112-Eric H	lebert-10/24/2015				
1	10/24/2015	DAS	Campbell	000414	CR3000	2537
2	10/24/2015	Ozone	ThermoElectron Inc	000728	49i A1NAA	1105347306
3	10/24/2015	Ozone Standard	ThermoElectron Inc	000545	49i A3NAA	0929938241
4	10/24/2015	Zero air pump	Werther International	06922	C 70/4	000836217

Mfg Serial Number Tag Site			Те	echnician		Site Visit Date	Parame	ter Owner ID	
ThermoElectro	on Inc 11	105347306	KEF112	E	ric Heberl		10/24/2015	Ozone	000728
Slope:0.97256Slope:Intercept-0.13647InterceptCorrCoff0.99993CorrCoff		0.0000 0.0000 0.0000	Mfg           00000         Serial Number           00000         Tfer ID		ThermoElectron IncPar49CPS-70008-364Tfer01110		rameter ozone er Desc. Ozone primary stan		
DAS 1: A Avg % Dif 2.6%	f: A Max	DAS 2:	6Dif A Max	% Di	Slope Cert Da	ıte	1.011 9/21/20	30 Inter 15 Corr	-0.21263           Coff         1.00000
UseDescr prima prima prima	iption ry ry ry	ConcGroup 1 2 3	Tfer Raw 0.32 32.24 55.25	Tfer 0. 32 54	Corr .52 2.09 1.84	Si -0. 31. 53.	te Si 15 ppb 27 ppb 89 ppb	te Unit	PctDifference -2.56% -1.73%
prima prima	ry ry	5	114.76	113	3.68	/5.	01 ppb		-2.85%
Sensor Con Sensor Con Sensor Con	nponent [ nponent [ nponent ]	Sample Train Inlet Filter Conditio Battery Backup	n	Conditi Conditi Conditi	ion Good ion Clean			Status Status Status	pass pass
Sensor Con	nponent	Offset		Conditi	ion 0.000			Status	pass
Sensor Con	nponent	Span		Conditi	ion 1.011			Status	pass
Sensor Con	nponent	Zero Voltage		Conditi	ion N/A			Status	pass
Sensor Con	nponent	Fullscale Voltage		Conditi	ion N/A			Status	pass
Sensor Con	nponent	Cell A Freq.		Conditi	ion 87.6 I	κHz		Status	pass
Sensor Con	nponent	Cell A Noise		Conditi	ion Not te	sted		Status	pass
Sensor Con	nponent	Cell A Flow		Conditi	ion 0.73 l	pm		Status	pass
Sensor Con	nponent	Cell A Pressure		Conditi	ion 685.7	mmHg		Status	pass
Sensor Con	nponent	Cell A Tmp.		Conditi	ion 30.8 (	C		Status	pass
Sensor Con	nponent	Cell B Freq.		Conditi	ion 89.9 l	κHz		Status	pass
Sensor Con	nponent	Cell B Noise		Conditi	ion Not te	sted		Status	pass
Sensor Con	nponent	Cell B Flow		Conditi	ion 0.74 I	pm		Status	pass
Sensor Con	nponent	Cell B Pressure		Conditi	ion			Status	pass
Sensor Con	nponent	Cell B Tmp.		Conditi	ion			Status	pass
Sensor Component Line Loss		Conditi	idition Not tested			Status	pass		
Sensor Con	nponent	System Memo		Conditi	ion			Status	pass

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
MK	G113-Sandy	Grenville-10/25/2015				
1	10/25/2015	DAS	Campbell	000404	CR3000	2521
2	10/25/2015	Ozone	ThermoElectron Inc	000703	49i A1NAA	1030244805
3	10/25/2015	Ozone Standard	ThermoElectron Inc	000374	49i A3NAA	0726124694
4	10/25/2015	Zero air pump	Werther International	06937	C 70/4	000821896

Mfg Serial Number Tag Site			Tech	Technician		Site Visit Date	Parame	eter Owner ID
ThermoElectron Inc	1030244805	MKG113	San	dy Grenvill	е	10/25/2015	Ozone	000703
Slope:1.00862Slope:Intercept-0.36949InterceptCorrCoff0.99994CorrCoff		0.0000	00     Mfg       00     Serial Number       00     Tfer ID		ThermoElectron IncPar0419606966Tfe01112		rameter ozone er Desc. Ozone primary stan	
DAS 1: A Avg % Diff: A M 0.9%	DAS 2: Iax % Di A Avg % 1.7%	6Dif A Max	% Di	Slope Cert Date		0.993 6/25/20	84 Inter 15 Corr	-0.40946 Coff 1.00000
UseDescription primary	ConcGroup 1	Tfer Raw 0.11	Tfer Co 0.52	orr	Si 0.1	te Si 14 ppb	ite Unit	PctDifference
primary primary	2 3	29.99 50.01	30.58	8 3	30. 51.	07 ppb 04 ppb		-1.67% 0.61%
primary	5	109.99	80.73	3 18	81.	.20 ppb		0.11%
Sensor Componer	nt Sample Train		Condition	Good			Status	pass
Sensor Componen	nt Inlet Filter Condition	n	Condition	Clean			Status	pass
Sensor Componen	nt Battery Backup		Condition	N/A			Status	pass
Sensor Componen	nt Offset		Condition	0.10			Status	pass
Sensor Componen	nt Span		Condition	1.010			Status	pass
Sensor Componen	nt Zero Voltage		Condition	N/A			Status	pass
Sensor Componen	nt Fullscale Voltage		Condition	N/A			Status	pass
Sensor Componen	nt Cell A Freq.		Condition	93.6 kHz			Status	pass
Sensor Componen	nt Cell A Noise		Condition	1.3 ppb			Status	pass
Sensor Componen	nt Cell A Flow		Condition	0.69 lpm			Status	pass
Sensor Componen	nt Cell A Pressure		Condition	712.5 mr	nHg		Status	pass
Sensor Componen	nt Cell A Tmp.		Condition	34.7 C			Status	pass
Sensor Componen	nt Cell B Freq.		Condition	90.5 kHz			Status	pass
Sensor Componen	nt Cell B Noise		Condition	1.3 ppb			Status	pass
Sensor Componer	nt Cell B Flow		Condition	0.67 lpm			Status	pass
Sensor Componen	nt Cell B Pressure		Condition				Status	pass
Sensor Componen	nt Cell B Tmp.		Condition				Status	pass
Sensor Component Line Loss		Condition	ndition Not tested			Status	pass	
Sensor Componer	nt System Memo		Condition				Status	pass

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
PSU	106-Sandy	Grenville-10/27/2015				
1	10/27/2015	DAS	Campbell	000407	CR3000	2512
2	10/27/2015	Ozone	ThermoElectron Inc	000678	49i A1NAA	1030244791
3	10/27/2015	Ozone Standard	ThermoElectron Inc	000434	49i A3NAA	CM08200010
4	10/27/2015	Zero air pump	Werther International	06921	C 70/4	000836216

Mfg	Se	rial Number Tag	Site	Tee	chnician		Site Visit	Date	Parame	ter	Owner II	)
ThermoElec	ctron Inc 10	030244791	PSU106	Sa	andy Gre	nville	10/27/20	15	Ozone		000678	
Slope: Intercept CorrCoff	1.01 -0.47 0.99	677Slope:7066Intercept9998CorrCoff	0.0000	Mfg       Serial Number       Tfer ID		ThermoElectron Inc     Parameter     ozone       0419606966     Tfer Desc.     Ozone primary       01112			ozone Ozone primary	stan		
DAS 1:		<b>DAS 2:</b>			Slope			0.99384	.99384 Intercept -0.40946			946
A Avg % E	Diff: A Max	% Di         A Avg %           1.6%	6Dif A Max	% Di	Cert Da	nte	6/	25/2015	5 Corr	Coff	1.000	000
U-D-				Tform	<b>C</b>	0.	4.	0:4	II	D.(D	:	
UseDes	mary	1 ConcGroup	-0.03		Corr	-0	$\frac{10}{100}$	onh	Unit	PetD	Interence	
prir	nary	2	29.98	30.	57	30.	.62 p	opb			0.16%	
prir	nary	3	51.00	51.	72	51.	.87 p	pb			0.29%	
prir	nary	4	79.10	80.	00	81.	.30 p	opb			1.62%	
prir	nary	5	110.80	111	.89	113	.10 p	opb			1.08%	
Sensor C	omponent	Sample Train		Conditio	on Good				Status	pass		
Sensor C	omponent	nlet Filter Conditio	n	Conditio	n Clean	1			Status	pass		
Sensor C	omponent	Battery Backup		Conditio	n N/A				Status	pass		]
Sensor C	omponent	Offset		Conditio	<b>n</b> -0.10				Status	pass		
Sensor C	omponent	Span		Conditio	<b>n</b> 1.029				Status	pass		
Sensor C	omponent	Zero Voltage		Conditio	n N/A				Status	pass		]
Sensor C	omponent	Fullscale Voltage		Conditio	n N/A				Status	pass		
Sensor C	omponent	Cell A Freq.		Conditio	on 91.3 k	κHz			Status	pass		
Sensor C	omponent	Cell A Noise		Conditio	<b>)n</b> 1.1 pp	ob			Status	pass		
Sensor C	omponent	Cell A Flow		Conditio	<b>n</b> 0.71 l	pm			Status	pass		
Sensor C	omponent	Cell A Pressure		Conditio	<b>n</b> 714.4	mmHg			Status	pass		
Sensor C	omponent	Cell A Tmp.		Conditio	on 29.7 (	2			Status	pass		
Sensor C	omponent	Cell B Freq.		Conditio	<b>n</b> 90.6 k	κHz			Status	pass		]
Sensor C	omponent	Cell B Noise		Conditio	<b>n</b> 1.0 pp	b			Status	pass		
Sensor C	omponent	Cell B Flow		Conditio	<b>n</b> 0.000				Status	Fail		
Sensor C	omponent	Cell B Pressure		Conditio	on				Status	pass		
Sensor C	Sensor Component Cell B Tmp.		Conditio	on				Status	pass		]	
Sensor C	Sensor Component Line Loss		Conditio	ition Not tested				Status	pass			
Sensor Component System Memo				Conditio	dition See comments				Status	pass		

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ABT	147-Sandy	Grenville-10/28/2015				
1	10/28/2015	DAS	Campbell	000413	CR3000	2519
2	10/28/2015	Ozone	ThermoElectron Inc	000627	49i A1NAA	1009241772
3	10/28/2015	Ozone Standard	ThermoElectron Inc	000440	49i A3NAA	CM08200025
4	10/28/2015	Zero air pump	Werther International	06930	P 70/4	000829168

Mfg	Serial Number Tag	Site	Тес	chnician		Site Visit Date	Paramet	er Owner ID
ThermoElectron Inc	1009241772	ABT147	Sa	andy Grer	nville	10/28/2015	Ozone	000627
Slope: () Intercept -() CorrCoff ()	D.99294         Slope:           D.37282         Intercept           D.999999         CorrCoff	0.0000	0 Mfg 0 Serial Number 0 Tfer ID		ThermoElectron IncPar0419606966Tfe01112		rameter ozone r Desc. Ozone primary stan	
DAS 1: A Avg % Diff: A M 1.1%	DAS 2: 1.2% 1.2% DAS 2: A Avg %	6Dif A Max	% Di	Slope Cert Da	te	0.9938 6/25/20	34 Intero 15 Corr(	cept         -0.40946           Coff         1.00000
UseDescription primary primary primary	ConcGroup 1 2 3	Tfer Raw 0.03 29.87 50.03	Tfer 0 0.4 30.4 50.7	Corr 14 46 75	Si -0. 30. 50.	te Si 22 ppb 12 ppb 19 ppb	te Unit	PctDifference -1.12% -1.10%
primary primary	4 5	80.40 110.24	81. 111	31 .33	80. 110	40 ppb .00 ppb		-1.12% -1.19%
Sensor Compone Sensor Compone Sensor Compone	nt Sample Train nt Inlet Filter Condition nt Battery Backup	n	Condition Condition Condition	on Good On Clean On N/A			Status Status Status	bass bass bass
Sensor Compone Sensor Compone Sensor Compone	nt Offset nt Span nt Zero Voltage		Condition Condition	on 0.20 on 0.997 on N/A			Status F Status F Status F	bass bass
Sensor Compone Sensor Compone	nt Fullscale Voltage nt Cell A Freq.		Condition	on N/A on 89.8 k	Hz		Status A	Dass
Sensor Compone Sensor Compone Sensor Compone	nt Cell A Flow		Condition Condition	on 0.00 lp 720.4	om mmHg		Status F Status F Status F	Fail
Sensor Compone Sensor Compone	nt Cell A Tmp.		Conditio	on 36.5 ( on 94.7 k	) Hz		Status	Dass
Sensor Compone Sensor Compone	nt Cell B Noise		Conditio Conditio	)n 1.1 pp )n 0.67 lj	b om		Status F Status F	Dass
Sensor Compone Sensor Compone	nt Cell B Pressure nt Cell B Tmp.		Conditio Conditio	on			Status F Status F	Dass
Sensor Compone Sensor Compone	nt Line Loss nt System Memo		Conditio Conditio	n Not te Sn See c	sted omments		Status A	bass bass

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
WS7	109-Sandy	Grenville-10/29/2015				
1	10/29/2015	DAS	Campbell	000427	CR3000	2526
2	10/29/2015	Ozone	ThermoElectron Inc	000611	49i A1NAA	1009241795
3	10/29/2015	Ozone Standard	ThermoElectron Inc	000696	49i A3NAA	1030244812
4	10/29/2015	Zero air pump	Werther International	06934	P 70/4	000821881

Mfg	Se	rial Number Tag	Site	Те	echnician		Site Visit Date	Paramet	ter Owner ID
ThermoElectro	on Inc 10	009241795	WST109	S	andy Grer	nville	10/29/2015	Ozone	000611
Slope: Intercept CorrCoff	0.99 -0.29 0.99	2514Slope:5764Intercept2994CorrCoff	0.0000	0000Mfg0000Serial Number0000Tfer ID		ThermoElectron IncPar0419606966Tfe01112		rameter ozone er Desc. Ozone primary stan	
DAS 1: A Avg % Dif 0.8%	f: A Max	DAS 2:           * % Di         A Avg %           1.8%	6Dif A Max	% Di	Slope Cert Da	ıte	0.9938 6/25/20	34 Inter 15 Corr	cept         -0.40946           Coff         1.00000
UseDescr prima prima	iption ry ry	ConcGroup 1 2	Tfer Raw 0.00 29.95	Tfer 0. 30	Corr 41 .54	Si 0.0 30.	te Si 05 ppb 43 ppb	te Unit	PctDifference -0.36%
prima prima prima	ry ry ry	3 4 5	50.03 80.28 110.00	50 81	0.75 .18 1.09	50. 79. 110	42 ppb 75 ppb .70 ppb		-0.65% -1.76% -0.35%
Sensor Cor Sensor Cor	nponent [ nponent [	Sample Train Inlet Filter Conditic	n	Conditi Conditi	ion Good			Status	pass
Sensor Cor Sensor Cor	nponent [ nponent [	Offset		Conditi Conditi	ion N/A			Status	pass
Sensor Cor Sensor Cor	nponent	Zero Voltage		Conditi	on 1.005			Status	pass
Sensor Cor Sensor Cor	nponent [ nponent [	Cell A Freq.		Conditi	on 96.1 k	(Hz		Status	pass
Sensor Cor Sensor Cor	nponent [ nponent [	Cell A Flow		Conditi Conditi	ion 1.0 pp ion 0.71 l	pm		Status   Status	pass
Sensor Cor Sensor Cor	nponent [ nponent [	Cell A Pressure Cell A Tmp.		Conditi Conditi	ion 700.4	mmHg C		Status Status	pass
Sensor Cor Sensor Cor	nponent	Cell B Freq. Cell B Noise		Conditi Conditi	on 97.1 k	kHz ob		Status Status	pass
Sensor Cor Sensor Cor	nponent [ nponent [	Cell B Flow Cell B Pressure		Conditi Conditi	ion 0.71   ion	pm		Status Status	pass pass
Sensor Cor Sensor Cor	nponent [ nponent [	Cell B Tmp. Line Loss		Conditi Conditi	ion	sted		Status Status	pass
Sensor Cor	nponent	System Memo		Conditi	on			Status	pass

Site V	∕isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
AREI	28-Sandy	Grenville-11/02/2015				
1	11/2/2015	DAS	Campbell	000400	CR3000	2524
2	11/2/2015	Ozone	ThermoElectron Inc	000621	49i A1NAA	1009241798
3	11/2/2015	Ozone Standard	ThermoElectron Inc	000199	49i A3NAA	0607315737
4	11/2/2015	Zero air pump	Werther International	06866	PC70/4	000815262

Mfg	Serial Number Tag	Site	Tee	chnician		Site Visit Date	Paramet	ter Owner ID
ThermoElectron Ir	1009241798	ARE128	Sa	andy Grer	nville	11/02/2015	Ozone	000621
Slope: Intercept CorrCoff	1.00896         Slope:           -0.80592         Intercept           0.99993         CorrCoff	0.00000	0     Mfg       0     Serial Number       0     Tfer ID		ThermoElectron IncPar0419606966Tfe01112		rameter ozone r Desc. Ozone primary stan	
DAS 1: A Avg % Diff: A 1.2%	DAS 2: Max % Di A Avg % 1.7%	6Dif A Max 6	% Di	Slope Cert Da	ite	0.9938 6/25/20	34Interd15Corr(	cept         -0.40946           Coff         1.00000
UseDescriptio primary primary primary	n ConcGroup 1 2 3	Tfer Raw -0.02 30.00 50.02	Tfer 0.3 0.3 30. 50.	Corr 39 59 74	Si -0. 30. 49.	te Si 04 ppb 11 ppb 90 ppb	te Unit	PctDifference -1.57% -1.66%
primary primary	4 5	80.22 109.52	81. 110	12 .61	80. 111	50 ppb .40 ppb		-0.76% 0.71%
Sensor Compo Sensor Compo Sensor Compo Sensor Compo Sensor Compo	nent       Sample Train         nent       Inlet Filter Condition         nent       Battery Backup         nent       Offset         nent       Span	on	Condition Condition Condition Condition	Good           on         Clean           on         N/A           on         0.10           on         1.011			Status Status Status Status Status	Dass Dass Dass Dass Dass
Sensor Compo Sensor Compo Sensor Compo Sensor Compo	nent Zelo Voltage nent Fullscale Voltage nent Cell A Freq. nent Cell A Noise		Condition Condition Condition	on N/A on 97.7 k	:Hz ob		Status Status Status Status	Dass Dass Dass Dass
Sensor Compo Sensor Compo Sensor Compo	nent Cell A Flow nent Cell A Pressure nent Cell A Tmp.		Condition Condition	on 0.72 l on 716.1	om mmHg C		Status Status Status	Dass
Sensor Compo	nent Cell B Freq.		<b>Conditio</b>	on 89.6 k	íHz		Status	pass
Sensor Compo Sensor Compo	nent Cell B Flow		Conditio	on 0.71	om		Status Status	Pass
Sensor Compo Sensor Compo	nent Cell B Tmp.		Conditio	on Not te	sted		Status   Status   Status	pass
Sensor Compo	nent System Memo		Conditio	on			Status [	pass

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
PNF	126-Eric H	lebert-11/04/2015				
1	11/4/2015	DAS	Campbell	000346	CR3000	2125
2	11/4/2015	Ozone	ThermoElectron Inc	000695	49i A1NAA	1030244801
3	11/4/2015	Ozone Standard	ThermoElectron Inc	000437	49i A3NAA	CM08200013
4	11/4/2015	Zero air pump	Werther International	06885	C 70/4	000814270

Mfg	Seria	al Number Tag	Site	Те	echnician		Site Visit Date	Parame	eter Owner ID
ThermoElectron I	nc 1030	0244801	PNF126	E	ric Hebert		11/04/2015	Ozone	000695
Slope: Intercept CorrCoff	1.0078 0.1934 0.9999	<ul><li>89 Slope:</li><li>47 Intercept</li><li>99 CorrCoff</li></ul>	0.0000	00     Mfg       00     Serial Number       00     Tfer ID		ThermoElectron IncPar49CPS-70008-364Tfe01110		rameter ozone er Desc. Ozone primary stan	
DAS 1: A Avg % Diff: A 1.2%	A Max %	DAS 2: 6 Di 1.7%	6Dif A Max	% Di	Slope Cert Da	te	1.011 9/21/20	30 Inter 15 Corr	-0.21263           Coff         1.00000
UseDescripti primary primary primary primary	on	ConcGroup 1 2 3 4	Tfer Raw 0.45 31.29 52.62 74.15	Tfer 0. 31 52 73	Corr .65 .15 2.24	Si 0.7 31. 53. 74.	te Si 74 ppb 59 ppb 14 ppb 18 ppb	ite Unit	PctDifference
primary		5	99.80	98	.89 .89	99.	80 ppb	<u> </u>	0.92%
Sensor Compo Sensor Compo Sensor Compo	onent Sa onent Inlo	et Filter Conditio	n	Conditi Conditi Conditi	ion Good ion Clean ion N/A			Status Status Status	pass pass pass
Sensor Compo	onent Of	fset		Conditi	ion -0.10			Status	pass
Sensor Compo	onent Sp	an		Conditi	ion 1.029			Status	pass
Sensor Compo	onent Ze	ro Voltage		Conditi	ion N/A			Status	pass
Sensor Compo	onent Fu	Ilscale Voltage		Conditi	ion N/A			Status	pass
Sensor Compo	onent Ce	ell A Freq.		Conditi	ion 98.5 k	Hz		Status	pass
Sensor Compo	onent Ce	ell A Noise		Conditi	ion 0.9 pp	b		Status	pass
Sensor Compo	onent Ce	ell A Flow		Conditi	ion 0.63 l	om		Status	pass
Sensor Compo	onent Ce	ell A Pressure		Conditi	ion 619.7	mmHg		Status	pass
Sensor Compo	onent Ce	ell A Tmp.		Conditi	ion 35.9 (	>		Status	pass
Sensor Compo	onent Ce	ell B Freq.		Conditi	ion 82.6 k	Hz		Status	pass
Sensor Compo	onent Ce	ell B Noise		Conditi	ion 0.7 pp	b		Status	pass
Sensor Compo	onent Ce	ell B Flow		Conditi	ion 0.82 l	om		Status	pass
Sensor Compo	onent Ce	ell B Pressure		Conditi	ion			Status	pass
Sensor Compo	onent Ce	ell B Tmp.		Conditi	ion			Status	pass
Sensor Compo	onent Lir	ne Loss		Conditi	ion Not te	sted		Status	pass
Sensor Compo	onent Sy	stem Memo		Conditi	ion			Status	pass

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
BEL	116-Eric H	ebert-11/19/2015				
1	11/19/2015	DAS	Campbell	000341	CR3000	2120
2	11/19/2015	Ozone	ThermoElectron Inc	000684	49i A1NAA	1030244795
3	11/19/2015	Ozone Standard	ThermoElectron Inc	000373	49i A3NAA	0726124685
4	11/19/2015	Sample Tower	Aluma Tower	000127	В	none
5	11/19/2015	Zero air pump	Werther International	06913	C 70/4	000829178

Mfg	Serial Number Tag	Site	Тес	hnician		Site Visit Dat	e Parame	eter Owner ID
ThermoElectron Inc	1030244795	BEL116	Eri	c Hebert		11/19/2015	Ozone	000684
Slope: Intercept CorrCoff	0.98851         Slope:           0.90721         Intercept           0.99998         CorrCoff	0.00000 0.00000 0.00000		Mfg Serial Number Tfer ID		ThermoElectron IncPar49CPS-70008-364Tfe01110		rameter ozone er Desc. Ozone primary stan
DAS 1: A Avg % Diff: A M 3.2%	DAS 2: <u>Max % Di</u> <u>4.9%</u>	6Dif A Max	% Di	Slope Cert Da	ite	1.01 <sup>-</sup> 9/21/20	130Inter015Corr	-0.21263           •Coff         1.00000
UseDescription primary primary primary	ConcGroup 1 2 3 4	Tfer Raw 0.38 27.88 49.83	Tfer ( 0.5 27.7 49.4	Corr 8 77 48	Si -0. 26. 47.	te S 08 ppb 41 ppb 80 ppb	Site Unit	PctDifference -4.90% -3.40%
primary	5	105.73	104.	.75	102	25 ppb .90 ppb		-2.35%
Sensor Compone Sensor Compone Sensor Compone	nt Sample Train nt Inlet Filter Condition nt Battery Backup	on	Conditio Conditio Conditio	n Good n Clean n N/A			StatusStatusStatus	pass pass pass
Sensor Compone	nt Offset		Conditio	<b>n</b> -0.1			Status	pass
Sensor Compone	nt Span		Conditio	<b>n</b> 0.997			Status	pass
Sensor Compone	nt Zero Voltage		Conditio	n N/A			Status	pass
Sensor Compone	nt Fullscale Voltage		Conditio	N/A			Status	pass
Sensor Compone	nt Cell A Freq.		Conditio	<b>n</b> 94.5 k	Hz		Status	pass
Sensor Compone	nt Cell A Noise		Conditio	<b>n</b> 0.8 pp	b		Status	pass
Sensor Compone	nt Cell A Flow		Conditio	n 0.67 l	om		Status	pass
Sensor Compone	nt Cell A Pressure		Conditio	<b>n</b> 729.6	mmHg		Status	pass
Sensor Compone	nt Cell A Tmp.		Conditio	<b>n</b> 33.1 C	)		Status	pass
Sensor Compone	nt Cell B Freq.		Conditio	<b>n</b> 88.4 k	Hz		Status	pass
Sensor Compone	nt Cell B Noise		Conditio	<b>n</b> 0.9 pp	b		Status	pass
Sensor Compone	nt Cell B Flow		Conditio	n 1.3 lpr	n		Status	pass
Sensor Compone	nt Cell B Pressure		Conditio	n			Status	pass
Sensor Compone	nt Cell B Tmp.		Conditio	n			Status	pass
Sensor Compone	Sensor Component Line Loss		Conditio	ndition Not tested			Status	pass
Sensor Compone	nt System Memo		Conditio	n			Status	pass