2022 – 1st Quarter Report

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

EPA Contract No. EP-W-18-005

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List of Acronyms and Abbreviations

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

USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USNO	United States Naval Observatory
VDC	volts direct current
WDEQ	Wyoming Department of Environmental Quality
WDNR	Wisconsin Department of Natural Resources
WRR	World Radiation Reference
WSLH	Wisconsin State Laboratory of Hygiene

1.0 CASTNET Quarterly Report

1.1 Introduction

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

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

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

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

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

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

As of December 2021, the network is comprised of 97 active rural sampling sites across the United States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Bureau of Land Management – Wyoming State Office (BLM-WSO) and several independent partners. Wood Environment and Infrastructure Solutions (Wood) is responsible for operating the EPA sponsored sites, and Air Resource Specialists, Inc. (ARS) is responsible for operating the NPS and BLM-WSO sponsored sites

1.2 Project Objectives

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

Performance audits verify that all reported variables are consistent with the accuracy goals as defined in the CASTNET Quality Assurance Project Plan (QAPP). The parameter specific accuracy goals are presented in Table 1.

Table 1. Performance Audit Challenge and Acceptance Criteria

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

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Shelter Temperature	Accuracy	Comparison to station temperature sensor	≤ ± 2.0° C
Wind Direction	Orientation Accuracy	Parallel to alignment rod/crossarm, or sighted to distant point	≤ ±5° from degrees true
Wind Direction	Linearity	Eight cardinal points on test fixture	≤ ±5° mean absolute error
Wind Direction	Response Threshold	Starting torque tested with torque gauge	< 10 g-cm Climatronics; < 20 g-cm R.M. Young
Wind Speed	Accuracy	Shaft rotational speed generated and measured with certified synchronous motor	≤ ±0.5 mps below 5.0 mps input; ≤ ±5.0% of input at or above 5.0 mps
Wind Speed	Starting Threshold	Starting torque tested with torque gauge	< 0.5 g-cm
Mass Flow Controller	Flow Rate	Comparison with Primary Standard	≤ ± 5.0% of designated rate
Ozone	Slope	Linear regression of multi-point test gas concentration as measured with a certified transfer standard	0.9000 ≤ m ≤ 1.1000
Ozone	Intercept		-5.0 ppb ≤ b ≤ 5.0 ppb
Ozone	Correlation Coefficient		0.9950 ≤ r
Ozone	Percent Difference	Comparison with Level 2 standard concentration	≤ ±15.1% of test gas concentration and ≤ ± 0.0015 ppm actual difference
DAS	Accuracy	Comparison with certified standard	≤ ± 0.003 VDC

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

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

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

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

1.3 CASTNET Sites Visited First Quarter 2022

This report consists of the systems and performance, and other audit results from the CASTNET sites visited during the first quarter (January through March) of 2022. The site locations, sponsor, visit dates, and parameters audited, are included in Table 2.

Table 2. CASTNET Site Audit Visits

Site ID	Sponsor	Date	MET	FSA	O3 PE	SO2	CO	NOy	FLOW
CVL151	EPA	2/28/2022			**1**				
ALC188	EPA	3/1/2022			**1**				
BBE401	NPS	3/3/2022			**1**				
CAV436	NPS	3/5/2022		**1**	**1**				
PAL190	EPA	3/6/2022			**1**				

1.4 Audit Results

The observations and results of the systems, performance, and Ozone PE audits are included in Appendix A, *CASTNET Audit Report Forms* by site, arranged by audit date. Photographs of site conditions are included within each system report where necessary. Copies of the spot reports that were sent following the audit of each site are included as Appendix B, *CASTNET Site Spot Report Forms*.

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

2.0 NADP Quarterly Report

2.1 Introduction

The National Atmospheric Deposition Program (NADP) operates two precipitation chemistry networks and two atmospheric concentration networks. The National Trends Network (NTN) has been measuring acidic precipitation since 1978. The network currently has more than 250 sites. The precipitation event-based Atmospheric Integrated Research Monitoring Network (AIRMoN) began operation in 1992, and as of July 2019 is no longer in operation. The Mercury Deposition Network (MDN) measures total mercury in precipitation samples from approximately 90 stations. The MDN began operation in 1996 and includes sites throughout the US and Canada. The Atmospheric Mercury Network (AMNet) and the Ammonia Monitoring Network (AMoN) measure ambient concentrations of mercury and ammonia, respectively.

The NADP and other long-term monitoring networks provide critical information to the EPA regarding evaluating the effectiveness of emission reduction control programs from the power industry. The networks of the NADP are sponsored by several federal, state, and local agencies as well as private organizations.

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

2.2 Project Objectives

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

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

2.3 NADP Sites Visited First Quarter 2022

This report presents the NADP sites surveyed during the first quarter (January through March) of 2022. The station locations, sponsors, network. and dates of the surveys are presented in Table 3.

Table 3. NADP Site Survey Visits

Site ID	Sponsor	Date	NTN	MDN	AMoN
PR20	USDA / USGS / USDA	2/14/2022	**1**	**1**	**1**
VI01	NPS	2/14/2022	**1**		
MS30	EPA	2/28/2022			**1**
TX41	EPA	3/1/2022			**1**
TX22	USGS	3/4/2022	**1**		
TX43	EPA	3/6/2022			**1**
CO81	New site – info unavailable	3/8/2022	**1**		
CO82	New site – info unavailable	3/8/2022	**1**		
AL10	USGS	3/22/2022	**1**		
UT98	USGS	3/24/2022	**1**		
CO22	CO Department of Public Health and Environment	3/29/2022	**1**		
CO94	EPA	3/30/2022	**1**		

2.4 Survey Results

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

Other items gathered during the surveys (i.e., photographs, Belfort charts, etc.) are uploaded to the EPA OneDrive account where the NADP PO and the U.S. EPA POs can access them and download them as needed.

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

APPENDIX A

CASTNET Audit Report Forms

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CVL151-Martin Valvur-02/28/2022						
1	2/28/2022	DAS	Campbell	000417	CR3000	2515
2	2/28/2022	Ozone	ThermoElectron Inc	000733	49i A1NAA	1105347322
3	2/28/2022	Ozone Standard	ThermoElectron Inc	000696	49i A3NAA	1030244812
4	2/28/2022	Zero air pump	Werther International	07100	C 70/4	000966270

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347322	CVL151	Martin Valvur	02/28/2022	Ozone	000733

Slope:	0.99168	**Slope:**	0.00000
Intercept	0.37366	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00520	**Intercept**	-0.00890
Cert Date	1/26/2022	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.10	0.10	0.62	ppb		0.52
primary	2	16.17	16.11	16.16	ppb		0.05
primary	3	37.49	37.34	37.44	ppb	0.27	
primary	4	66.30	66.03	65.83	ppb	-0.3	
primary	5	109.14	108.70	108.20	ppb	-0.46	

Sensor Component	Condition	Status
Audit Pressure	760.0 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	9 m	Fail
ADT 1000-10000 vehicles further t	True	pass
ADT <1000 vehicles further than 5	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Moderately clean	pass
Offset	-0.5	pass
Span	1.025	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	89.6 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	717.1 mmHg	pass
Cell A Tmp.	34.7 C	pass
Cell B Freq.	97.5 kHz	pass
Cell B Noise	0.4 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	716.5 mmHg	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ALC188-Martin Valvur-03/01/2022						
1	3/1/2022	DAS	Campbell	000422	CR3000	2523
2	3/1/2022	Ozone	ThermoElectron Inc	000629	49i A1NAA	1009241784
3	3/1/2022	Ozone Standard	ThermoElectron Inc	000449	49i A3NAA	CM08200025
4	3/1/2022	Zero air pump	Werther International	06886	C 70/4	000815259

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241784	ALC188	Martin Valvur	03/01/2022	Ozone	000629

Slope:	1.00032	**Slope:**	0.00000
Intercept	0.17709	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00520	**Intercept**	-0.00890
Cert Date	1/26/2022	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.09	0.09	0.42	ppb		0.33
primary	2	17.27	17.20	17.21	ppb		0.01
primary	3	35.53	35.39	35.51	ppb	0.34	
primary	4	67.67	67.45	67.75	ppb	0.44	
primary	5	111.95	111.50	111.70	ppb	0.18	

Sensor Component	Condition	Status
Audit Pressure	761 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT 1000-10000 vehicles further t	True	pass
ADT <1000 vehicles further than 5	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Moderately clean	pass
Offset	0.2	pass
Span	1.076	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	85.2 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.74 lpm	pass
Cell A Pressure	719.9 mmHg	pass
Cell A Tmp.	27.0 C	pass
Cell B Freq.	90.2 kHz	pass
Cell B Noise	0.7 ppb	pass
Cell B Flow	0.73 lpm	pass
Cell B Pressure	719.6 mmHg	pass
System Memo		pass

Site Inventory by Site Visit

Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
BBE401-Martin Valvur-03/03/2022					
1 3/3/2022	DAS	Environmental Sys Corp	90767	8816	4592
2 3/3/2022	Ozone	ThermoElectron Inc	none	49i A3NCA	1201477660
3 3/3/2022	Ozone Standard	ThermoElectron Inc	90831	49C	0520012325
4 3/3/2022	Zero air pump	Twin Tower Engineering	none	TT70/4E	526293

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1201477660	BBE401	Martin Valvur	03/03/2022	Ozone	none

Slope:	0.99273	**Slope:**	0.00000
Intercept	-0.17461	**Intercept**	0.00000
CorrCoff:	0.99999	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00520	**Intercept**	-0.00890
Cert Date	1/26/2022	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.07	0.07	0.16	ppb		0.09
primary	2	15.48	15.42	15.08	ppb		-0.34
primary	3	35.38	35.24	34.64	ppb	-1.72	
primary	4	63.58	63.32	62.45	ppb	-1.38	
primary	5	112.96	112.50	111.70	ppb	-0.71	

Sensor Component	Audit Pressure	**Condition**	677.7 mmHg	**Status**	pass
Sensor Component	26.6 degree unobstructed rule	**Condition**	True	**Status**	pass
Sensor Component	Tree dewline >10m or below inlet	**Condition**	True	**Status**	pass
Sensor Component	ADT 1000-10000 vehicles further t	**Condition**	True	**Status**	pass
Sensor Component	ADT <1000 vehicles further than 5	**Condition**	True	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Offset	**Condition**	0.3	**Status**	pass
Sensor Component	Span	**Condition**	1.002	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	-0.0001	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	1.0007	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	69.8 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.66 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	663.1 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	31.4 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	93.9 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.4 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.67 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	662.8 mmHg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CAV436-Martin Valvur-03/05/2022						
1	3/5/2022	Computer	Hewlett Packard	none	ProBook	5CD01715DB
2	3/5/2022	DAS	Environmental Sys Corp	None	8864	C2602
3	3/5/2022	Modem	Sierra wireless	none	GX450	Unknown
4	3/5/2022	Ozone	ThermoElectron Inc	none	49i A3NAA	1231755663
5	3/5/2022	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460009
6	3/5/2022	Shelter Temperature	ARS	none	none	none
7	3/5/2022	Temperature2meter	RM Young	none	41342VC	032188
8	3/5/2022	Zero air pump	Werther International	none	C 70/4	000915011

DAS Data Form

DAS Time Max Error: 0.72

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	C2602	CAV436	Martin Valvur	03/05/2022	DAS	Primary

Das Date: 3 /5 /2022
Das Time: 09:19:17
Das Day: 64

Audit Date 3 /5 /2022
Audit Time 09:20:00
Audit Day 64

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0003	0.0006	0.0003	0.0006

Mfg	HY	**Parameter**	DAS
Serial Number	12010039329	**Tfer Desc.**	Source generator (D
Tfer ID	01322		
Slope	1.00000	**Intercept**	0.00000
Cert Date	6/15/2014	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/12/2022	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
16	0.0000	0.0001	0.0004	V	V	0.0003
16	0.1000	0.0992	0.0997	V	V	0.0005
16	0.3000	0.3003	0.3003	V	V	0.0000
16	0.5000	0.5001	0.5007	V	V	0.0006
16	0.7000	0.7000	0.7001	V	V	0.0001
16	0.9000	0.8993	0.8995	V	V	0.0002
16	1.0000	1.0009	1.0008	V	V	-0.0001

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1231755663	CAV436	Martin Valvur	03/05/2022	Ozone	none

Slope:	0.97876	**Slope:**	0.00000
Intercept	0.15011	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00520	**Intercept**	-0.00890
Cert Date	1/26/2022	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.08	0.08	0.30	ppb		0.22
primary	2	14.41	14.36	14.16	ppb		-0.2
primary	3	37.68	37.53	36.84	ppb	-1.86	
primary	4	66.25	65.98	64.72	ppb	-1.93	
primary	5	112.30	111.85	109.65	ppb	-1.99	

Sensor Component	Condition	Status
Audit Pressure	650.3 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT 1000-10000 vehicles further t	True	pass
ADT <1000 vehicles further than 5	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Moderately clean	pass
Offset	-0.1	pass
Span	0.992	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	88.7 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.62 lpm	pass
Cell A Pressure	630.6 mmHg	pass
Cell A Tmp.	39.2 C	pass
Cell B Freq.	95.9 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.61 lpm	pass
Cell B Pressure	630.0 mmHg	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	032188	CAV436	Martin Valvur	03/05/2022	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99980	Intercept	-0.01168
Cert Date	1/12/2022	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.6	0.87		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.42	0.43	0.000	0.72	C	0.29
primary	Temp Mid Range	20.87	20.89	0.000	21.52	C	0.63
primary	Temp High Rang	46.20	46.22	0.000	47.09	C	0.87

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	CAV436	Martin Valvur	03/05/2022	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
1.17	1.79		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99980	Intercept	-0.01168
Cert Date	1/12/2022	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.33	24.35	0.000	26.1	C	1.79
primary	Temp Mid Range	24.46	24.48	0.000	26.1	C	1.6
primary	Temp Mid Range	24.91	24.93	0.000	25.1	C	0.13

Sensor Component	System Memo	Condition		Status	pass

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CAV436	**Technician**	Martin Valvur	**Site Visit Date**	03/05/2022

Site Sponsor (agency)	NPS	**USGS Map**	
Operating Group	NPS	**Map Scale**	
AQS #	35-151-0745	**Map Date**	
Meteorological Type			
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement		**QAPP Longitude**	
Land Use		**QAPP Elevation Meters**	
Terrain		**QAPP Declination**	
Conforms to MLM		**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	32.178141
Site Address 1		**Audit Longitude**	-104.443206
Site Address 2		**Audit Elevation**	1358
County		**Audit Declination**	7
City, State	Carlsbad, NM		
Zip Code	88220	**Fire Extinguisher** ☐	
Time Zone	Mountain	**First Aid Kit** ☐	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☐	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Steps** ☑	

Shelter Working Room ☐	**Make**		**Model**		**Shelter Size**		
Shelter Clean ☐	**Notes**	New shelter has been installed					
Site OK ☐	**Notes**						

Driving Directions

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CAV436	Technician	Martin Valvur	Site Visit Date	03/05/2022

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

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

The 2-meter temperature sensor is mounted one meter above the building roof and facing south. The building is likely to impact the accuracy of the measurements.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	CAV436	Technician	Martin Valvur	Site Visit Date	03/05/2022

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	CAV436	Technician	Martin Valvur	Site Visit Date	03/05/2022

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

The zero-air desiccant is saturated.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CAV436 **Technician** Martin Valvur **Site Visit Date** 03/05/2022

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	CAV436	Technician	Martin Valvur	Site Visit Date	03/05/2022

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

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

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

The site is visited every other Tuesday.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	CAV436	Technician	Martin Valvur	Site Visit Date	03/05/2022

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	CAV436	Technician	Martin Valvur	Site Visit Date	03/05/2022

Site operation procedures

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

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

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

Dry deposition samples are not collected at this site.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID CAV436 **Technician** Martin Valvur **Site Visit Date** 03/05/2022

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	ProBook	5CD01715DB	none
DAS	Environmental Sys Corp	8864	C2602	None
Modem	Sierra wireless	GX450	Unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	1231755663	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	CM08460009	none
Shelter Temperature	ARS	none	none	none
Temperature2meter	RM Young	41342VC	032188	none
Zero air pump	Werther International	C 70/4	000915011	none

Site Inventory by Site Visit

Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
PAL190-Martin Valvur-03/06/2022					
1 3/6/2022	DAS	Campbell	000343	CR3000	2122
2 3/6/2022	Ozone	ThermoElectron Inc	000726	49i A1NAA	1105347314
3 3/6/2022	Ozone Standard	ThermoElectron Inc	000735	49i A3NAA	0726124696
4 3/6/2022	Zero air pump	Werther International	06922	C 70/4	000836217

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347314	PAL190	Martin Valvur	03/06/2022	Ozone	000726

Slope:	1.01632	**Slope:**	0.00000
Intercept	-0.24793	**Intercept**	0.00000
CorrCoff:	0.99998	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00520	**Intercept**	-0.00890
Cert Date	1/26/2022	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.07	0.07	0.22	ppb		0.15
primary	2	15.54	15.48	15.26	ppb		-0.22
primary	3	35.27	35.13	35.15	ppb	0.06	
primary	4	65.87	65.61	66.45	ppb	1.27	
primary	5	112.66	112.20	113.90	ppb	1.5	

Sensor Component	Condition	Status
Audit Pressure	673 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT 1000-10000 vehicles further t	True	pass
ADT <1000 vehicles further than 5	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	-1.1	pass
Span	1.066	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	73.9 kHz	pass
Cell A Noise	0.4 ppb	pass
Cell A Flow	0.67 lpm	pass
Cell A Pressure	649.8 mmHg	pass
Cell A Tmp.	31.3 C	pass
Cell B Freq.	81.8 kHz	pass
Cell B Noise	0.2 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	649.2 mmHg	pass
System Memo		pass

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: 4/15/2022 13:14:28

SiteVisitDate	Site	Technician
03/01/2022	ALC188	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00032	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.17709	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.3	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.33	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.01	ppb	**P**

EEMS Spot Report

Data Compiled: 4/15/2022 13:23:34

SiteVisitDate	Site	Technician
03/03/2022	BBE401	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99273	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.17461	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.5	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.09	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.34	ppb	**P**

EEMS Spot Report

Data Compiled: 4/15/2022 14:41:20

SiteVisitDate	Site	Technician
03/05/2022	CAV436	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.60	c	**Fail**
2	Temperature2meter max error	P	5	0.5	3	0.87	c	**Fail**
3	Ozone Slope	P	0	1.1	4	0.97876	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.15011	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.8	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.22	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.2	ppb	**P**
9	DAS Voltage average error	P	16	0.003	14	0.0003	V	**P**
10	Shelter Temperature average error	P	5	2	6	1.17	c	**P**
11	Shelter Temperature max error	P	5	2	6	1.79	c	**P**

SiteVisitDate	Site	Technician
03/05/2022	CAV436	Martin Valvur

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Dry deposition samples are not collected at this site.

2 **Parameter:** DocumentationCo

The site is visited every other Tuesday.

3 **Parameter:** ShelterCleanNotes

New shelter has been installed

4 **Parameter:** PollAnalyzerCom

The zero-air desiccant is saturated.

5 **Parameter:** MetSensorComme

The 2-meter temperature sensor is mounted one meter above the building roof and facing south. The building is likely to impact the accuracy of the measurements.

EEMS Spot Report

Data Compiled: 4/15/2022 12:54:47

SiteVisitDate	Site	Technician
02/28/2022	CVL151	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99168	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.37366	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.3	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.52	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.05	ppb	**P**

EEMS Spot Report

Data Compiled: 4/15/2022 13:37:18

SiteVisitDate	Site	Technician
03/06/2022	PAL190	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01632	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.24793	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.1	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.15	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.22	ppb	**P**