2015 – 1st Quarter Report Support for Conducting Systems & Performance Audits of CASTNET Sites and NADP Monitoring Stations

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Prepared for:

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List of Acronyms and Abbreviations

| % diff | percent difference |
|---------|---|
| A/D | analog to digital converter |
| ARS | Air Resource Specialist, Inc. |
| ASTM | American Society for Testing and Materials |
| CASTNET | Clean Air Status and Trends Network |
| DAS | data acquisition system |
| DC | direct current |
| deg | degree |
| DVM | digital voltmeter |
| EEMS | Environmental, Engineering & Measurement Services, Inc. |
| EPA | U.S. Environmental Protection Agency |
| ESC | Environmental Systems Corporation |
| FSAD | Field Site Audit Database |
| GPS | geographical positioning system |
| lpm | liters per minute |
| MLM | Multilayer Model |
| m/s | meters per second |
| mv | milivolt |
| NIST | National Institute of Standards and Technology |
| NOAA | National Oceanic and Atmospheric Administration |
| NPS | National Park Service |
| QAPP | Quality Assurance Project Plan |
| SOP | standard operating procedure |
| TEI | Thermo Environmental Instruments |
| USNO | United States Naval Observatory |
| V | volts |
| WRR | World Radiation Reference |
| | |

1.0 CASTNET Quarterly Report

1.1 Introduction

The Clean Air Status and Trends Network (CASTNET) is a national air monitoring program developed under mandate of the 1990 Clean Air Act Amendments. Each site in the network measures acidic gases and particles 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 June 2015, the network is comprised of 93 active rural sampling sites across the Untied States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), the Bureau of Land Management (BLM), Environment Canada, 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, SHE604, and FOR605.

Some or all of the additional monitored variables, NOy, CO, and SO_2 have been added to the EPA sponsored sites BVL130, HWF187, PND165, PNF126, and BEL116. No sites that measure these variables were audited in first quarter 2015.

| Sensor | Parameter | Audit Challenge | Acceptance Criteria | | |
|---------------------------|-------------------------|--|--|--|--|
| Precipitation | Response | 10 manual tips | 1 DAS count per tip | | |
| Precipitation | Accuracy | 2 introductions of known amounts of water | $\leq \pm 10.0\%$ of input amount | | |
| Relative Humidity | Accuracy | Compared to reference instrument or standard solution | $\leq \pm 10.0\%$ 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 | Accuracy | Comparison to 3 NIST measured baths (~ 0° C, ambient, ~ full-scale) | \leq ± 0.5° C | | |
| Temperature Difference | Accuracy | Comparison to station temperature sensor | $\leq \pm 0.50^{\circ} \mathrm{C}$ | | |
| Wind Direction | Orientation Accuracy | Parallel to alignment rod/crossarm, or sighted to distant point | $\leq \pm 5^{\circ}$ from degrees true | | |
| Wind Direction | Linearity | Eight cardinal points on test fixture | $\leq \pm 5^{\circ}$ mean absolute error | | |
| Wind Direction | Response Threshold | Starting torque tested with torque gauge | < 10 g-cm Climatronics; < 20 g-cm R.M. Young | | |
| Wind Speed | Accuracy | Shaft rotational speed generated and measured with certified synchronous motor | $\leq \pm 0.5$ mps below 5.0 mps input; $\leq \pm 5.0\%$ of input at or above 5.0 mps | | |
| Wind Speed | Starting Threshold | Starting torque tested with torque gauge | < 0.5 g-cm | | |
| Mass Flow Controller | Flow Rate | Comparison with Primary Standard | $\leq \pm 5.0\%$ of designated rate | | |
| Ozone | Slope | Linear regression of multi- | $0.9000 \le m \le 1.1000$ | | |
| Ozone | Intercept | point test gas concentration as measured with a certified | -5.0 ppb ≤ b ≤ 5.0 ppb | | |

 Table 1. Performance Audit Challenge and Acceptance Criteria

| Sensor | Parameter | Audit Challenge | Acceptance Criteria |
|--------|----------------------------|------------------------------------|------------------------------|
| 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 First Quarter 2015

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 2015. The locations and dates of the audits are presented in Table 2.

| Site ID | Audit Type | Sponsor Site Location | | Visit dates |
|---------|---------------|-----------------------|----------------------------|-------------|
| EVE419 | Audit w/o met | NPS | Everglades NP | 2/10/2015 |
| CAD150 | Audit w/o met | EPA | EPA Caddo Valley | |
| CVL151 | Audit w/o met | EPA | EPA Coffeeville | |
| CDZ171 | Audit w/o met | EPA | Cadiz | 3/13/2015 |
| MCK131 | Audit w/o met | EPA | Mackville | 3/15/2015 |
| MCK231 | Audit w/o met | EPA | Mackville (precision site) | 3/15/2015 |
| MAC426 | Audit w/o met | NPS | Mammoth Cave NP | 3/17/2015 |
| CKT136 | Audit w/o met | EPA | Crockett | 3/18/2015 |

 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) ozone Performance Evaluations (PE).

| Site ID | EID Sponsor Agency Site Location | | |
|---------|----------------------------------|----------------------|-----------|
| SUM156 | EPA | Sumatra | 2/10/2015 |
| IRL141 | EPA | Indian River Lagoon | 2/11/2015 |
| GAS153 | EPA | Georgia Station | 2/25/2015 |
| SND152 | EPA | Sand Mountain | 3/1/2015 |
| SPD111 | EPA | Speedwell | 3/19/2015 |
| COW137 | EPA | Coweeta | 3/20/2015 |
| ESP127 | EPA | Edgar Evins St. Park | 3/26/2015 |

 Table 3.
 Site Ozone 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 100 stations. The MDN began operation in 1996 and includes sites throughout the US and Canada. The Atmospheric Mercury Network (AMNet) and the Ammonia Monitoring Network (AMoN) measure ambient concentrations of mercury and ammonia, respectively.

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

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

2.2 **Project Objectives**

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

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

2.3 NADP Sites Visited First Quarter 2015

This report covers the results from the NADP sites surveyed during the first quarter (January through March) of 2015. The station names and dates of the surveys are presented in Table 4.

| Side ID | Network | Survey Date | Station Name | |
|---------|-----------|-------------|--------------|--|
| AL19 | MDN /NTN | 2/24/2015 | Birmingham | |
| FL32 | NTN | 2/17/2015 | Orlando | |
| FL96 | MDN / NTN | 2/9/2015 | Pensacola | |
| NC25 | NTN | 3/20/2015 | Coweeta | |

Table 4.Sites Surveyed

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 NADP site 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 |
|------|------------|-----------------------|------------------------|----------|--------------|---------------|
| EVE | 419-Eric H | lebert-02/10/2015 | | | | |
| 1 | 2/10/2015 | DAS | Environmental Sys Corp | 90642 | 8816 | 2527 |
| 2 | 2/10/2015 | Elevation | Elevation | None | 1 | None |
| 3 | 2/10/2015 | Filter pack flow pump | Thomas | none | 107CAB18B | 071100039615 |
| 4 | 2/10/2015 | Flow Rate | Porter | none | MPC05-88NSP1 | 4667040001001 |
| 5 | 2/10/2015 | Infrastructure | Infrastructure | none | none | none |
| 6 | 2/10/2015 | Modem | US Robotics | none | 56k | unknown |
| 7 | 2/10/2015 | Sample Tower | Aluma Tower | none | В | AT-71102-71-2 |
| 8 | 2/10/2015 | Siting Criteria | Siting Criteria | None | 1 | None |

DAS Data Form

DAS Time Max Error: 3.57

| Mfg | Serial | Number Site | Т | echnician | Site Visit Date F | Parameter | Use Desc. |
|--------------|------------------------|--------------------------|------------------------|---------------|-------------------|------------|----------------------------|
| Environmenta | l Sys 2527 | EVI | E419 E | Eric Hebert | 02/10/2015 | DAS | Primary |
| Das Date: | 2 /11/2015 11:02:26 | Audit Date Audit Time | 2 /11/2015 11:06:00 | Mfg | HY 12010039329 | Parameter | DAS Source generator (D |
| Das Day: | 42 | Audit Day | 42 | Serial Number | | Tier Desc. | Source generator (D |
| Low Channe | l: | High Channe | el: | Tfer ID | 01322 | | |
| Avg Diff: | Max Diff: | Avg Diff: | Max Diff: | Slope | 1.00000 | Intercept | 0.00000 |
| 0.000 | 1 0.00 | 0.0001 | 0.0002 | Cert Date | 6/15/2014 | CorrCoff | 1.00000 |
| | | | | Mfg | Fluke | Parameter | DAS |
| | | | | Serial Number | 86590148 | Tfer Desc. | DVM |
| | | | | Tfer ID | 01310 | | |
| | | | | Slope | 1.00000 | Intercept | 0.00000 |
| | | | | Cert Date | 1/22/2014 | CorrCoff | 1.00000 |
| Channel | Input | DVM Output | DAS Output | InputUnit | OutputUnit | Difference | |
| 8 | 0.0000 | 0.0003 | 0.0003 | V | V | 0.0000 | |
| 8 | 0.1000 | 0.1000 | 0.1000 | V | V | 0.0000 | |
| 8 | 0.3000 | 0.3000 | 0.2999 | V | V | -0.0001 | |
| 8 | 0.5000 | 0.4998 | 0.4999 | V | V | 0.0001 | |
| 8 | 0.7000 | 0.7000 | 0.7000 | V | V | 0.0000 | |
| 8 | 0.9000 | 0.9003 | 0.9003 | V | V | 0.0000 | |
| 8 | 1.0000 | 1.0005 | 1.0002 | V | V | -0.0003 | |
| 16 | 0.0000 | 0.0000 | 0.0000 | V | V | 0.0000 | |
| 16 | 0.1000 | 0.1000 | 0.1000 | V | V | 0.0000 | |
| 16 | 0.3000 | 0.3001 | 0.3001 | V | V | 0.0000 | |
| 16 | 0.5000 | 0.5000 | 0.4999 | V | V | -0.0001 | |
| 16 | 0.7000 | 0.7002 | 0.7003 | V | V | 0.0001 | |
| 16 | 0.9000 | 0.9000 | 0.9000 | V | V | 0.0000 | |
| 16 | 1.0000 | 1.0008 | 1.0006 | V | V | -0.0002 | |

Flow Data Form

| Mfg | Serial Nur | nber Ta 🖇 | Site | Тес | hnician | Site Visit | Date Paran | neter | Owner ID |
|--------------------------------------|-----------------|---------------|------------------|---------------|--------------------------|------------|-------------|-------------|-------------------|
| Porter | 46670400 | 01001 | EVE419 | Eri | c Hebert | 02/10/201 | 5 Flow F | Rate | none |
| | | | | Mfg | BIOS | F | Parameter F | low Rate | |
| | | | | Serial Number | 131818 | 1 | fer Desc. B | IOS 220-H | |
| | | | | Tfer ID | 01417 | | | | |
| | | | | | Slope | 1 | .00316 Int | ercept | -0.00540 |
| | | | | | Cert Date | 1, | 7/2015 Co | rrCoff | 1.00000 |
| DAS 1: | | DAS 2: | | L | Cal Factor Z | ero | 0.0 | 27 | |
| A Avg % Diff: | A Max % Di | A Avg %I | Dif A Max | x % Di | Cal Factor F | ull Scale | 5.0 | 03 | |
| 0.42% | 0.52% | | | | Rotometer R | eading: | 3. | 05 | |
| UseDescription: | Test type: | Input l/m: | Input STP: | MfcDisp.: | OutputSignal: | Output S E | InputUnit: | OutputSigna | allPctDifference: |
| primary | pump off | 0.000 | 0.000 | 0.00 | 0.0160 | 0.04 | 1/m | l/m | |
| primary | leak check | 0.000 | 0.000 | 0.02 | 0.0350 | 0.06 | l/m | l/m | |
| primary | test pt 1 | 0.000 | 2.985 | 2.98 | 2.9840 | 3.00 | l/m | l/m | 0.35% |
| primary | test pt 2 | 0.000 | 2.986 | 2.98 | 2.9840 | 3.00 | l/m | l/m | 0.32% |
| primary | test pt 3 | 0.000 | 2.980 | 2.98 | 2.9840 | 3.00 | l/m | l/m | 0.52% |
| primary | test pt 4 | 0.000 | 2.981 | 2.98 | 2.9840 | 3.00 | l/m | l/m | 0.49% |
| Sensor Compo | ment Leak Te | st | | Conditio | n | | Status | s pass | |
| Sensor Compo | nent Filter Az | imuth | | Conditio | ndition 270 | | Statu | pass | |
| Sensor Compo | ment Filter De | pth | | Conditio | n -0.5 cm | | Status | s Fail | |
| Sensor Compo | nent Filter Po | sition | | Conditio | n Poor | | Status | s Fail | |
| Sensor Compo | ment Moisture | Present | | Conditio | tion No moisture present | | Statu | s pass | |
| Sensor Component Rotometer Condition | | Conditio | on Clean and dry | | Statu | s pass | | | |
| Sensor Compo | onent System | Memo | | Conditio | See comments | | Status | s pass | |
| Sensor Compo | ment Tubing C | Condition | | Conditio | n Good | | Status | s pass | |
| Sensor Compo | nent Filter Dis | stance | | Conditio | n 4.5 cm | | Status | s pass | |

| Infrastructure Data I | For | | | |
|-----------------------|------------------------|-----------------|-------------------------|-------------|
| Site ID EVE419 | Technician Eric | Hebert | Site Visit Date 02/10/2 | 015 |
| Shelter Make | Shelter Model | | Shelter Size | |
| Ekto | 8810 | | 640 cuft | |
| | | A second second | | |
| Sensor Component | Shelter Roof | Condition | Fair | Status pass |
| | Sample Tower Type | Condition | | Status pass |
| Sensor Component | | Condition | N/A | Status pass |
| Sensor Component | Moisture Trap | Condition | Not installed | Status Fail |
| Sensor Component | Power Cables | Condition | Good | Status pass |
| Sensor Component | Rotometer | Condition | Installed | Status pass |
| Sensor Component | Conduit | Condition | N/A | Status pass |
| Sensor Component | Sample Tower | Condition | Fair | Status pass |
| Sensor Component | Shelter Condition | Condition | Good | Status pass |
| Sensor Component | Shelter Floor | Condition | Good | Status pass |
| Sensor Component | Shelter Temp Control | Condition | Functioning | Status pass |
| Sensor Component | Signal Cable | Condition | Fair | Status pass |
| Sensor Component | Tubing Type | Condition | 3/8 teflon | Status pass |
| Sensor Component | Shelter Door | Condition | Good | Status pass |
| Sensor Component | Sample Train | Condition | Good | Status pass |

Site Visit Comments

| Parameter | Site | Technician | S.V. Date | Component | Mfg | Serial No. | Hazard Proble | em |
|-----------|--------|-------------|------------|-----------------|--------|------------|---------------|----|
| Flow Rate | EVE419 | Eric Hebert | 02/10/2015 | Filter Position | Porter | 4004 | | |
| | | | | | | | | |

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

Field Systems Comments

1 Parameter: SiteOpsProcComm

Assistance was provided to the site operators regarding questions relating to the new SSRF. Corrections were made to the previous week's form to account for the non-routine sample duration.

2 Parameter: DasComments

A winch has been added to assist with lowering the sample tower.

3 Parameter: SitingCriteriaCom

Small parking lot for park employees and fire fighting equipment is within 100 meters of the site.

4 Parameter: ShelterCleanNotes

The shelter is very clean, neat and well organized. ARS is repairing the leak in the roof.

5 Parameter: MetSensorComme

The 10 meter temperature sensor has been removed and temperature is now being measured using a combination RH/temperature sensor mounted in a naturally aspirated shield at approximately 2 meters above the ground. This is a change from the previous temperature measurements which were made with an RTD in a forced-air aspirated shield at approximately 9 meters from the ground.

| Site ID EVE419 | Technician Eric Hebert | Site Visit Date 02/10/2015 |
|------------------------|---|---|
| | | Sile visit Date 02/10/2013 |
| Site Sponsor (agency) | NPS/EPA | USGS Map Long Pine Key |
| Operating Group | NPS | Map Scale |
| AQS# | | Map Date |
| Meteorological Type | R.M. Young | |
| Air Pollutant Analyzer | | QAPP Latitude |
| Deposition Measurement | dry, wet, Hg, IMPROVE | QAPP Longitude |
| Land Use | wetlands | QAPP Elevation Meters |
| Terrain | flat | QAPP Declination |
| Conforms to MLM | Yes | QAPP Declination Date |
| Site Telephone | (305) 242-7838 | Audit Latitude 25.39122 |
| Site Address 1 | Everglades National Park | Audit Longitude -80.68081 |
| Site Address 2 | 40001 State Road 9336 | Audit Elevation |
| County | Dade | Audit Declination -5.1 |
| City, State | Homestead, FL | Present |
| Zip Code | 33034 | 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 Ekto N | Iodel 8810 Shelter Size 640 cuft |
| | | t and well organized. ARS is repairing the leak in the roof. |
| | Notes | |
| mile t Chec | o the intersection of East Palm Drive (Ra | he end and junction with Rat 1. Continue south on Rat 1 about 1/4 t 9336). Turn right (west) on 9336 and continue to the park entrance. Park Road to Long Pine Key Road. Turn left on Long Pine Key Rd. is on the right at the fire station. |

A States

Field Systems Data Form

EVE419

F-02058-1500-S2-rev001

Site ID

Technician Eric Hebert

Site Visit Date 02/10/2015

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

Siting Distances OK

Siting Criteria Comment

Small parking lot for park employees and fire fighting equipment is within 100 meters of the site.

| Fi | eld Sy | stems Data | Form | | F-02058-1500-S3-rev001 |
|------|---|--|---|---------------|----------------------------|
| Site | D | EVE419 | Technician | Eric Hebert | Site Visit Date 02/10/2015 |
| 1 | | nd speed and direc afluenced by obstr | tion sensors sited so uctions? | 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 | | to the prevaiing tower and sensors | | | N/A |
| 4 | | | ds pointed north or es such as buildings | positioned to | |
| 5 | condition surface | ons? (i.e. ground b | sensors sited to avo elow sensors should oped. Ridges, hollow avoided) | be natural | |
| 6 | Is the so | olar radiation sens | or plumb? | | N/A |
| 7 | Is it site light? | ed to avoid shading | g, or any artificial of | • reflected | N/A |
| 8 | Is the ra | ain gauge plumb? | | | N/A |
| 9 | Is it site towers, | | ng effects from buil | dings, trees, | N/A |
| 10 | Is the su facing n | | sor sited with the gr | id surface | N/A |
| 11 | Is it inc | clined approximat | ely 30 degrees? | | N/A |
| | | | | | |

The 10 meter temperature sensor has been removed and temperature is now being measured using a combination RH/temperature sensor mounted in a naturally aspirated shield at approximately 2 meters above the ground. This is a change from the previous temperature measurements which were made with an RTD in a forced-air aspirated shield at approximately 9 meters from the ground.

| Fi | eld Sy | stems Data Fo | orm | | | F-02058 | -1500-S4- | rev001 |
|------|--|---|------------------|-----------------|-------------------------|------------|-----------|--------|
| Site | e ID | EVE419 | Technician | Eric Hebert | Site Visit Date | 02/10/2015 | | |
| | | | | | | | | |
| 1 | | ne meterological sensor n, and well maintained | | intact, in good | | | | |
| 2 | Are all t reportin | he meteorological sens 1g data? | sors operationa | l online, and | | | | |
| 3 | Are the | shields for the temper | ature and RH s | ensors clean? | | | | |
| 4 | Are the | aspirated motors worl | king? | | N/A | | | |
| 5 | Is the so scratche | lar radiation sensor's | lens clean and f | ree of | N/A | | | |
| 6 | Is the su | irface wetness sensor g | rid clean and u | indamaged? | N/A | | | |
| 7 | Are the sensor signal and power cables intact, in good condition, and well maintained? | | | | N/A | | | |
| 8 | | sensor signal and pow e elements and well ma | | tions protected | N/A | | | |
| | | | | | New York Control of the | | | |

| Fie | d Systems | Data Form | | F-02058-1500-S5-rev001 | | | | |
|------|---|---|----------------|------------------------------|--------------------------|--|--|--|
| Site | ID EVE419 | Technician Eric He | bert | Site Visit Date 02/10/201 | 15 | | | |
| | Siting Criteria: An | e the pollutant analyzers and depo | osition equipr | nent sited in accordance wit | th 40 CFR 58, Appendix E | | | |
| 1 | Do the sample inle unrestricted airflo | ts have at least a 270 degree arc of w? | · 🗸 | | | | | |
| 2 | Are the sample inl | ets 3 - 15 meters above the ground | !? ✓ | | | | | |
| 3 | Are the sample inl and 20 meters from | ets > 1 meter from any major obst n trees? | ruction, 🔽 | | | | | |
| | Pollutant analyzer | s and deposition equipment opera | tions and mai | ntenance | | | | |
| 1 | Do the analyzers a condition and well | nd equipment appear to be in goo maintained? | d 🔽 | | | | | |
| 2 | Are the analyzers reporting data? | and monitors operational, on-line, | and 🗹 | | | | | |
| 3 | Describe ozone sar | nple tube. | | N/A | | | | |
| 4 | Describe dry dep s | ample tube. | | 3/8 teflon by 9 meters | | | | |
| 5 | Are in-line filters (indicate location) | used in the ozone sample line? (if y | es 🗌 | N/A | | | | |
| 6 | Are sample lines c obstructions? | lean, free of kinks, moisture, and | | | | | | |
| 7 | Is the zero air sup | ply desiccant unsaturated? | | N/A | | | | |
| 8 | Are there moisture | e traps in the sample lines? | | No moisture trap installed | | | | |
| 9 | Is there a rotomete clean? | er in the dry deposition filter line, | and is it 🔽 | Clean and dry | | | | |
| Par | ameter | Manufacturer M | Iodel | S/N | Client ID | | | |
| Sam | ple Tower | Aluma Tower | | AT-71102-71-2 | none | | | |

071100039615

none

107CAB18B

Filter pack flow pump

Thomas

| Fie | eld Sy | ystems D | oata Fo | rm | | F-02 |)58-15 | 00-S6-rev001 | | |
|------|--|-------------------------------|--------------|-----------------------|-------------|-------------|--------------------|---------------|----------|--------|
| Site | D | EVE419 | | Technician Eric | Hebert | | Site Visit Dat | te 02/10/2015 | | |
| | DAS, se | ensor transla | tors, and p | eripheral equipmen | t operation | ns and i | <u>naintenance</u> | | | |
| 1 | Do the well ma | DAS instrum aintained? | ients appea | ar to be in good con | dition and | | | | | |
| 2 | | the compone , backup, etc | | DAS operational? (p | orinters, | | | | | |
| 3 | | analyzer and 1g protection | | nal leads pass throu | gh | Me | et sensors only | | | |
| 4 | | e signal conne aintained? | ections pro | tected from the wea | ther and | | | | | |
| 5 | Are the signal leads connected to the correct DAS channel? | | | | | | | | | |
| 6 | Are the ground | | r translator | rs, and shelter prope | erly | | | | | |
| 7 | Does th | e instrument | t shelter ha | ve a stable power so | ource? | | | | | |
| 8 | Is the i | nstrument sh | elter temp | erature controlled? | | | | | | |
| 9 | | net tower stal | | | | | Stable | G | Frounded | |
| 10 | Is the s | ample tower | stable and | grounded? | | | | | ✓ | |
| 11 | Tower | comments? | | | | | | | | |
| Par | ameter | | Ma | nufacturer | Model | | S/N | | Clie | ent ID |
| DAS | S | | Env | vironmental Sys Corp | 8816 | | 2527 | | 906 | 642 |
| Mod | dem | | US | Robotics | 56k | | unknown | | non | ie |
| | | | | | | | | | | |

A winch has been added to assist with lowering the sample tower.

| Field Systems Data | Fo | rm | | | | F-02 | .058- | 1500-S7-rev001 |
|---|--------|--------------------|-----------------------|-----------------------|--|-------------|--|------------------------|
| Site ID EVE419 | | Tech | nnician | Eric Hebert | Site Visit Date | 02/10/2015 | 5 | |
| | | | | | | | | |
| Documentation | | | | | | | | |
| Does the site have the requir | 253630 | Constanting of the | 114223 | | uals? | | | |
| Wind speed sensor | Yes | No | N/2 | | logger | Yes | No | N/A |
| Wind direction sensor | | | ✓ | | logger | | | |
| Temperature sensor | | | | | o chart recorder | | | |
| Relative humidity sensor | | | | ELECTRON DEVICES STOL | puter | | | |
| Solar radiation sensor | | | | | The Deal Street Control and the Street Street Street | | | |
| Surface wetness sensor | | | | | | | | |
| Wind sensor translator | | | | | air pump | | | |
| Temperature translator | | | | | r flow pump | | | |
| Humidity sensor translator | | | | | e protector | | | |
| Solar radiation translator | | | | | | | | |
| Tipping bucket rain gauge | | | | | tning protection device | | | |
| Ozone analyzer | | | | Shel | ter heater | | | |
| Filter pack flow controller | | | | Shel | ter air conditioner | | | |
| Filter pack MFC power supply | | | | | | | | |
| Does the site have the requ | ired a | and m | ost rece | nt QC documen | ts and report forms? | | | |
| | Pre | sent | | | | Curre | ent | |
| Station Log | | | Datavie | ew. | line and the second | | | |
| SSRF | | < | | | | | | |
| Site Ops Manual | | | | | | | | |
| HASP | | | | | | | | |
| Field Ops Manual | | | | | | | | |
| Calibration Reports | | ✓ | | | | | | |
| Ozone z/s/p Control Charts | | | N/A | | | | | |
| Preventive maintenance schedu | d i | | | | | | | |
| 1 Is the station log properly | comj | pleted | during | every site visit? | Dataview | | | |
| 2 Are the Site Status Report current? | For | ms bei | ng comp | pleted and | | | | |
| 3 Are the chain-of-custody f sample transfer to and fro | | | erly used | d to document | | | | |
| 4 Are ozone z/s/p control cha current? | arts p | oroper | ly comp | oleted and | □ N/A | | | |
| Provide any additional explana natural or man-made, that may | | | | | | ons listed | above, | or any other features, |
| | 1998 | 0.964.955 | | | | | an a | |
| | | | | | | | | |

| Fiel | d Systems Data | Form | | | F-02058- | 1500-S8-rev001 |
|---------|--|----------------------|--|---------------------|------------|----------------|
| Site II | D EVE419 | Technician E | ric Hebert | Site Visit Date | 02/10/2015 | |
| 1 I | Site operation procedures Has the site operator atten course? If yes, when and w | | NET training 🔲 🗍 | Frained by previous | operator | |
| | Has the backup operator a training course? If yes, wh | | A STATE AND A STAT | | | |
| | s the site visited regularly chedule? | on the required Tues | sday 🔽 | | | |
| | are the standard CASTNE collowed by the site operate | | dures being | | | |
| 5 Is | s the site operator(s) know | ledgeable of, and ab | le to perform 🗹 🛛 | | | |

oliant

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

the required site activities? (including documentation)

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

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

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

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

N/A

N/A

□ N/A

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

| Fiel | d Systems Data Forn | 1 | | | F-02058-1500-S9-rev001 | | | | |
|----------|--|------------------|----------------------|--|-------------------------|-----------------------------|-----------------|--|--|
| Site I | D EVE419 T | echnic | ian Eric Hebert | | Site Visit Da | te 02/10/2015 | | | |
| <u>S</u> | Site operation procedures | | | | | | | | |
| 1 Is | s the filter pack being changed ev | ery Tu | esday as scheduled | | Filter changed mo | prinings | | | |
| | Are the Site Status Report Forms Forms Forms Forms Formetly? | being c | ompleted and filed | | | | | | |
| | Are data downloads and backups cheduled? | oeing p | performed as | | No longer required | | | | |
| 4 A | Are general observations being ma | l recorded? How? | | SSRF | | | | | |
| | Are site supplies on-hand and repl ashion? | d in a timely | | | | | | | |
| 6 A | Are sample flow rates recorded? E | | | SSRF | | | | | |
| | Are samples sent to the lab on a re ashion? | gular s | schedule in a timely | | | | | | |
| | Are filters protected from contami and shipping? How? | nation | during handling | | Clean gloves on and off | | | | |
| | Are the site conditions reported re operations manager or staff? | gularly | v to the field | | | | | | |
| QC C | heck Performed |] | Frequency | | | Compliant | | | |
| Mu | Ilti-point MFC Calibrations | | Semiannually | | | | | | |
| | w System Leak Checks | | Weekly | 1. | | | | | |
| | ter Pack Inspection | | | | | | | | |
| | w Rate Setting Checks | | Weekly | 10100112 | | | | | |
| | Visual Check of Flow Rate Rotometer Veekly | | | | | | | | |
| In- | line Filter Inspection/Replacemen | t 🗆 | | | | | | | |
| Sar | mple Line Check for Dirt/Water | | | 2116.327 | | | | | |
| | e any additional explanation (pho l or man-made, that may affect th | | | | y) regarding cond | itions listed above, or any | other features, | | |

Assistance was provided to the site operators regarding questions relating to the new SSRF. Corrections were made to the previous week's form to account for the non-routine sample duration.

Site Inventory by Site Visit

| Site | Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|------|------------|-----------------------|-----------------------|----------|----------------|---------------|
| CA | D150-Sandy | Grenville-02/27/2015 | | | | |
| 1 | 2/27/2015 | Computer | Dell | 000306 | D520 | unknown |
| 2 | 2/27/2015 | DAS | Campbell | 000421 | CR3000 | 2530 |
| 3 | 2/27/2015 | Elevation | Elevation | None | 1 | None |
| 4 | 2/27/2015 | Filter pack flow pump | Thomas | 00462 | 107CA110 | 09883403-01-4 |
| 5 | 2/27/2015 | Flow Rate | Apex | 000602 | AXMC105LPMDPCV | illegible |
| 6 | 2/27/2015 | Infrastructure | Infrastructure | none | none | none |
| 7 | 2/27/2015 | Modem | Raven | 06469 | H4222-C | 0808310608 |
| 8 | 2/27/2015 | Ozone | ThermoElectron Inc | 000624 | 49i A1NAA | 1009241792 |
| 9 | 2/27/2015 | Ozone Standard | ThermoElectron Inc | 000495 | 49i A3NAA | 0622717849 |
| 10 | 2/27/2015 | Sample Tower | Aluma Tower | 03538 | А | none |
| 11 | 2/27/2015 | Shelter Temperature | Campbell | none | 107-L | none |
| 12 | 2/27/2015 | Siting Criteria | Siting Criteria | None | 1 | None |
| 13 | 2/27/2015 | Temperature | Climatronics | 06777 | 100093 | none |
| 14 | 2/27/2015 | Zero air pump | Werther International | 06882 | C 70/4 | 000815255 |

| DAS Dat | ta Form | l | | DAS Ti | me Max Error: | 0.05 | |
|-----------------------|----------------|--------------------------|----------------|-----------------|-----------------|-------------|---------------------|
| Mfg | Serial | Number Site | Т | echnician | Site Visit Date | Parameter | Use Desc. |
| Campbell | 2530 | CAI | D150 S | Sandy Grenville | 02/27/2015 | DAS | Primary |
| Das Date: | 2 /27/2015 | Audit Date | 2 /27/2015 | Mfg | Datel | Parameter | DAS |
| Das Time: Das Day: | 14:22:10 57 | Audit Time_ Audit Day | 14:22:13 57 | Serial Number | 15510194 | Tfer Desc. | Source generator (D |
| Low Channel | | High Channe | | Tfer ID | 01320 | | |
| Avg Diff: | Max Diff: | | Max Diff: | Slope | 1.0000 | 0 Intercept | 0.00000 |
| 0.0001 | 0.0 | 005 0.0001 | 0.0005 | Cert Date | 2/2/201 | 0 CorrCoff | 1.00000 |
| | | | | | 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 | 0.0005 | V | V | 0.0005 | |
| 7 | 0.1000 | 0.0999 | 0.1000 | V | V | 0.0001 | |
| 7 | 0.3000 | 0.2997 | 0.2998 | V | V | 0.0001 | |
| 7 | 0.5000 | 0.4997 | 0.4997 | V | V | 0.0000 | |
| 7 | 0.7000 | 0.6995 | 0.6996 | V | V | 0.0001 | |
| 7 | 0.9000 | 0.8994 | 0.8995 | V | V | 0.0001 | |
| 7 | 1.0000 | 0.9993 | 0.9994 | V | V | 0.0001 | |

Flow Data Form

| Mfg | Serial Nu | nber Ta | Site | Te | chnician | Site Visit I | Date Param | neter | Owner ID |
|-----------------|-----------------|------------|------------|-----------|-----------------|--------------|------------------|------------|-------------------|
| Арех | illegible | | CAD150 | Sa | indy Grenville | 02/27/201 | 5 Flow R | ate | 000602 |
| | | | | [| Mfg | BIOS | P | arameter | Flow Rate |
| | | | | | Serial Number | 103471 | | fer Desc. | nexus |
| | | | | | Tfer ID | 01420 | | | |
| | | | | | Tier ID | 01420 | | | |
| | | | | | Slope | 0. | 96664 Inte | ercept | 0.03078 |
| | | | | | Cert Date | 2/: | 5/2015 Col | rrCoff | 0.99996 |
| | | | | | Mfg | BIOS | Р | arameter | Flow Rate |
| | | | | | Serial Number | 103424 | Т | fer Desc. | BIOS cell |
| | | | | | Tfer ID | 01410 | | | |
| | | | | | Slope | 0. | 96664 Inte | ercept | 0.03078 |
| | | | | | Cert Date | 2/ | 5/2015 Co | rrCoff | 0.99996 |
| DAS 1: | | DAS 2: | | L | Cal Factor Z | ero | -0.0 |)3 | |
| A Avg % Diff: | A Max % Di | A Avg % | Dif A Max | : % Di | Cal Factor F | ull Scale | 0.9 | 98 | |
| 0.18% | 0.20% | | | | Rotometer R | eading: | 1 | .5 | |
| UseDescription: | Test type: | Input l/m: | Input STP: | MfcDisp.: | × | Output S E: | InputUnit: | OutputSign | allPctDifference: |
| primary | pump off | 0.000 | 0.000 | 0.00 | 0.000 | -0.03 | l/m | l/m | |
| primary | leak check | 0.000 | 0.000 | 0.00 | 0.090 | -0.06 | l/m | l/m | |
| primary | test pt 1 | 1.451 | 1.503 | 1.52 | 1.520 | 1.50 | l/m | l/m | -0.20% |
| primary | test pt 2 | 1.449 | 1.502 | 1.52 | 1.520 | 1.50 | l/m | l/m | -0.13% |
| primary | test pt 3 | 1.450 | 1.503 | 1.52 | 1.520 | 1.50 | l/m | l/m | -0.20% |
| Sensor Compo | onent Leak Te | st | | Conditio | on | | Status | pass | |
| Sensor Compo | onent Filter Az | imuth | | Conditio | n 270 deg | | Status | pass | |
| Sensor Compo | onent Filter De | pth | | Conditio | 2.0 cm | | Status | pass | |
| Sensor Compo | onent Filter Po | sition | | Conditio | n Good | | Status | pass | |
| Sensor Compo | onent Moisture | Present | | Conditio | No moisture p | resent | Status | pass | |
| Sensor Compo | | | <u>ו</u> | Conditio | n Clean and dry | | Status | pass | |
| Sensor Compo | <u>.</u> | | | Conditio | | | Status | | |
| Sensor Comp | | | | | ndition Good | | | pass | |
| | | | | | 1 4.0 cm | | | | |
| Sensor Compo | | | | | 4.0 011 | | Status | pass | |

Ozone Data Form

| Mfg | Serial Number Tag | Site | Te | echnician | | Site Visi | it Date | Paramet | ter | Owner I | D |
|--------------------|-----------------------------------|--------------|---------|-----------------|--------|--------------------|------------|-------------|-----------------------|----------------------|--------|
| ThermoElectron Inc | 1009241792 | CAD150 | S | andy Grei | nville | 02/27/2 | 015 | Ozone | | 000624 | |
| Intercept 0 | .01673 Slope: .00908 Intercept | 0.00000 | D | Mfg Serial N | umber | Thermol 0419606 | Electron I | | ameter 0 r Desc. 0 | zone zone primary | y stan |
| CorrCoff 0 | .99992 CorrCoff | 0.0000 | 0 | Tfer ID | | 01112 | |] | | | |
| DAS 1: | DAS 2: | | | Slope | | | 0.99909 | Intero | oont | -0.15 | 598 |
| A Avg % Diff: A M | | 6Dif A Max 9 | % Di | | | | | | - I | | |
| 2.0% | 2.6% | | | Cert Da | ite | | 1/27/2015 | Corr | Coff | 1.00 | 0000 |
| UseDescription: | ConcGroup: | Tfer Raw: | Tfer | Corr: | Si | te: | Site | Unit: | PctDi | fference: | |
| primary | 1 | 0.18 | | 33 | -0. | | ppb | | | | |
| primary | 2 | 29.92 | | .10 | 30. | | ppb | | | 1.99% | |
| primary | 3 | 49.94 | | .14 | 51. | | ppb | | | 2.21% | |
| primary | 4 | 79.91 | | .13 | 82. | | ppb | | | 2.58% | |
| primary | 5 | 110.06 | 110 | 0.31 | 111 | .50 | ppb | | | 1.08% | |
| Sensor Componen | t Cell B Noise | | Conditi | on 1.4 pp | b | | | Status | pass | | |
| Sensor Componen | t Cell B Tmp. | | Conditi | on | | | | Status | pass | | |
| Sensor Componen | t Fullscale Voltage | | Conditi | on N/A | | | | Status | pass | | |
| Sensor Componen | t Inlet Filter Condition | วท | Conditi | on Dirty | | | | Status | Fail | | |
| Sensor Componen | t Line Loss | | Conditi | on Not te | sted | | | Status | pass | | |
| Sensor Componen | t Offset | | Conditi | on 0.2 | | | | Status | pass | | |
| Sensor Componen | t Span | | Conditi | on 1.037 | | | | Status | pass | | |
| Sensor Componen | t Cell B Freq. | | Conditi | on 108.9 | kHz | | | Status | pass | | |
| Sensor Componen | t System Memo | | Conditi | on | | | | Status | pass | | |
| Sensor Componen | t Sample Train | | Conditi | on Good | | | | Status | pass | | |
| Sensor Componen | t Cell B Pressure | | Conditi | on | | | | Status | pass | | |
| Sensor Componen | t Cell B Flow | | Conditi | on 0.78 l | pm | | | Status | pass | | |
| Sensor Componen | t Cell A Tmp. | | Conditi | on 29.6 (|) | | | Status | pass | | |
| Sensor Componen | t Cell A Pressure | | Conditi | on 744.5 | mmHg | | | Status | pass | | |
| Sensor Componen | t Cell A Noise | | Conditi | on 1.0 pp | b | | | Status | pass | | |
| Sensor Componen | t Cell A Freq. | | Conditi | on 118.9 | kHz | | | Status | pass | | |
| Sensor Componen | t Cell A Flow | | Conditi | on 0.78 l | pm | | | Status | pass | | |
| Sensor Componen | t Battery Backup | | Conditi | on N/A | | | | Status | pass | | |
| Sensor Componen | t Zero Voltage | | Conditi | on N/A | | | | Status [| pass | | |

Temperature Data Form

| Mfg | | Serial Nun | ıber Ta | Site | | Tec | hni | cian | Site V | isit Date | Param | eter | Owner II |) |
|--------------|-------|-------------|---------------|-----------|----------|--------|------|------------|--------|-----------|---------|------------|-------------|-----|
| Climatronics | | none | | CAD150 | | Sar | ndy | Grenville | 02/27 | /2015 | Temper | ature | 06777 | |
| | | | | | |] | Mfg | g | Extect | า | Pa | rameter Te | mperature | |
| | | | | | | | Seri | ial Number | H2327 | /34 | Tf | er Desc. R | D | |
| | | | | | | | Tfe | r ID | 01227 | , | | | | |
| DAS 1: | | | DAS 2: | | | 5 | Sloj | ре | | 1.0034 | 3 Inte | rcept | -0.064 | 409 |
| Abs Avg Err | Abs | Max Er | Abs Avg | g Err Abs | Max Er | (| Cer | t Date | | 1/30/201 | 5 Cor | rCoff | 1.000 | 000 |
| 0.03 | | 0.05 | | | |] | | | | | | | | |
| UseDesc.: | | Test type: | Inp | utTmpRaw | InputTmp | Cor | r.: | OutputTmpS | ignal: | OutputSig | nalEng: | OSE Unit: | Difference: | |
| primary | Temp | Low Range | | -0.10 | -0.0 | 4 | | 0.000 | | 0.0 |) | С | 0.05 | |
| primary | Temp | Mid Range | | 25.49 | 25.4 | 7 | | 0.000 | | 25. | 5 | С | 0.04 | |
| primary | Temp | High Rang | e | 47.34 | 47.2 | 4 | | 0.000 | | 47. | 2 | С | -0.01 | |
| Sensor Com | ponen | t Shield | | | Cond | litior | n C | lean | | | Status | pass | |] |
| Sensor Com | ponen | t Blower St | atus Swit | tch | Cond | litior | n N | //A | | | Status | pass | |] |
| Sensor Com | ponen | t Blower | | | Cond | litior | n Fi | unctioning | | | Status | pass | |] |
| Sensor Com | ponen | t System M | 1emo | | Cond | litior | n 🗌 | | | | Status | pass | |] |

| Infrastructure Data F | or | | | |
|-----------------------|----------------------|------------------------|---------------|----------------|
| Site ID CAD150 | Tech | nician Sandy Grenville | Site Visit Da | ate 02/27/2015 |
| Shelter Make | Shelter | Model | Shelter Size | |
| Ekto | 8810 | | 640 cuft | |
| | | | | |
| Sensor Component | Shelter Roof | Condition | Fair | Status pass |
| Sensor Component | Sample Tower Type | Condition | Туре А | 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 | Rotometer | Condition | Installed | Status pass |
| Sensor Component | Conduit | Condition | N/A | Status pass |
| Sensor Component | Sample Tower | Condition | Fair | Status pass |
| Sensor Component | Shelter Condition | Condition | Poor | Status Fail |
| Sensor Component | Shelter Floor | Condition | Fair | Status pass |
| Sensor Component | Shelter Temp Control | Condition | Functioning | Status pass |
| Sensor Component | Signal Cable | Condition | Good | Status pass |
| Sensor Component | Tubing Type | Condition | 3/8 teflon | Status pass |
| Sensor Component | Shelter Door | Condition | Fair | Status pass |
| Sensor Component | Sample Train | Condition | Good | Status pass |

Shelter Temperature Data For

| Mfg | Serial Number Ta | Site | Technician | Site Visit Date | Parameter | Owner ID |
|-------------------|---------------------------|----------------|-----------------|-----------------|---------------------|------------------|
| Campbell | none | CAD150 | Sandy Grenville | 02/27/2015 | Shelter Temperature | none |
| DAS 1: | DAS 2: | - | Mfg | Extech | Parameter She | elter Temperatur |
| Abs Avg ErrAb0.42 | os Max Er Abs Avg 0.52 | Err Abs Max Er | Serial Number | H232734 | Tfer Desc. RT | D |
| | | | 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 | 18.44 | 18.44 | 0.000 | 17.9 | С | -0.52 |
| primary | Temp Mid Range | 20.14 | 20.14 | 0.000 | 19.7 | С | -0.45 |
| primary | Temp Mid Range | 20.20 | 20.19 | 0.000 | 19.9 | С | -0.29 |

Field Systems Comments

1 Parameter: SiteOpsProcedures

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

2 Parameter: ShelterCleanNotes

The bottom of the shelter walls are very badly deteriorated. The floor and ceiling have been repaired.

3 Parameter: MetOpMaintCom

The shelter is in poor condition. The bottom of the walls have rot damage. The front wall and the section below the heater are severely damaged by ants.

| Site ID CAD150 | Technician Sandy Grenville | Site Visit Date 02/2 | 27/2015 |
|------------------------|---------------------------------------|------------------------------|--|
| Site Sponsor (agency) | EPA | USGS Map | Caddo Valley |
| Operating Group | Ouachita Baptist University | Map Scale | |
| AQS# | | Map Date | |
| Meteorological Type | Climatronics | | |
| Air Pollutant Analyzer | Ozone | QAPP Latitude | 34.1792 |
| Deposition Measurement | dry, wet | QAPP Longitude | -93.0989 |
| Land Use | woodland - mixed | QAPP Elevation Meters | 71 |
| Terrain | gently rolling | QAPP Declination | 2.3 |
| Conforms to MLM | Marginally | QAPP Declination Date | 12/28/2004 |
| Site Telephone | (870) 246-0030 | Audit Latitude | 34.17927 |
| Site Address 1 | DeGray Regulating Dam | Audit Longitude | -93.09875 |
| Site Address 2 | Route 390 | Audit Elevation | 7 |
| County | Clark | Audit Declination | 1.3 |
| City, State | Arkadelphia, AR | Present | |
| Zip Code | 71923 | Fire Extinguisher | No inspection date |
| - Fime Zone | Central | First Aid Kit | |
| Primary Operator | | Safety Glasses | |
| Primary Op. Phone # | | Safety Hard Hat | |
| Primary Op. E-mail | | Climbing Belt | |
| Backup Operator | | Security Fence | |
| Backup Op. Phone # | | Secure Shelter | |
| Backup Op. E-mail | | Stable Entry Step 🗹 | |
| Shelter Working Room | Make Ekto Me | odel 8810 | Shelter Size 640 cuft |
| Shelter Clean | Notes The bottom of the shelter walls | are very badly deteriorated. | The floor and ceiling have been repaired |
| Site OK | Notes | | |

west. Continue for approximately 1 mile, the site will be on the left just before the dam.

Field Systems Data Form

CAD150

F-02058-1500-S2-rev001

Site ID

Technician Sandy Grenville

Site Visit Date 02/27/2015

| 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 | 2 | |
| City 10,000 to 50,000 population | 10 km | | |
| City 1,000 to 10,000 population | 5 km | | |
| Major highway, airport or rail yard | 2 km | | |
| Secondary road, heavily traveled | 500 m | | |
| Secondary road, lightly traveled | 200 m | | |
| Feedlot operations | 500 m | | |
| Intensive agricultural ops (including aerial spraying) | 500 m | | |
| Limited agricultural operations | 200 m | | |
| Large parking lot | 200 m | | |
| Small parking lot | 100 m | | |
| Tree line | 50 m | 6 | |
| Obstacles to wind | 10 times obstacle height | | |

Siting Distances OK

Siting Criteria Comment

| Fi | eld Systems Data Fo | rm | | F-02058-1500-S3-rev001 | | | | |
|---|---|--|----------------------------|--|--|--|--|--|
| Site | e ID CAD150 | Technician Sandy Grenville | Site Visit Date 02/27/2015 | | | | | |
| 1 | Are wind speed and direction s being influenced by obstructio | | | 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 plus | nb? | | N/A | | | | |
| 4 | Are the temperature shields pe avoid radiated heat sources su | | | | | | | |
| 5 | Are temperature and RH sens conditions? (i.e. ground below surface and not steeply sloped standing water should be avoid | sensors should be natural Ridges, hollows, and areas of | | | | | | |
| 6 | Is the solar radiation sensor pl | umb? | | N/A | | | | |
| 7 | Is it sited to avoid shading, or light? | any artificial or reflected | | N/A | | | | |
| 8 | Is the rain gauge plumb? | | | N/A | | | | |
| 9 | Is it sited to avoid sheltering el towers, etc? | fects from buildings, trees, | | N/A | | | | |
| 10 | Is the surface wetness sensor s facing north? | ited with the grid surface | | N/A | | | | |
| 11 | Is it inclined approximately 30 |) degrees? | | N/A | | | | |
| Dw | wide one additional evaluation | (nhataananh an skatah if naaa | | x) regarding conditions listed above or any other features | | | | |

| Fie | ld Sy | ystems Data | a Form | | F-02058-1500-S4-rev00 | | | | |
|---------------------------------|---------------------|---|---|-----------------|-----------------------|--------|--------|--|--|
| Site | ID | CAD150 | Technician | Sandy Grenville | Site Visit Date 02/27 | 7/2015 | | | |
| | | | | | | | | | |
| | | the meterological s ion, and well main | sensors appear to be i tained? | ntact, in good | Temperature only | | | | |
| | | the meteorologica | al sensors operational | online, and | Temperature only | | | | |
| 3 | Are the | e shields for the te | emperature and RH se | ensors clean? | | | | | |
| 4 | Are the | e aspirated motors | s working? | | | | | | |
| | Is the s scratch | | isor's lens clean and fi | ree of | N/A | | | | |
| 5 | Is the s | surface wetness se | nsor grid clean and u | ndamaged? | N/A | | | | |
| | | e sensor signal and on, and well main | d power cables intact, tained? | in good | N/A | | | | |
| 0 | | e sensor signal and he elements and w | d power cable connect rell maintained? | tions protected | N/A | | | | |
| Parameter Manufacturer Model | | | | | S/N | Clie | ent ID | | |
| Temperature Climatronics 100093 | | | 100093 | none | 067 | 77 | | | |

The shelter is in poor condition. The bottom of the walls have rot damage. The front wall and the section below the heater are severely damaged by ants.

| Fie | ld Systems Data Form | | F-02058-1500-S5-rev001 | | | | |
|------|--|------|---|--|--|--|--|
| Site | ID CAD150 Technician Sandy Grenville | | Site Visit Date 02/27/2015 | | | | |
| | 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 | 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 | | | | |
| Par | ameter Manufacturer Model | | S/N Client ID | | | | |

| Parameter | Manufacturer | Model | S/IN | Client ID | |
|-----------------------|-----------------------|-----------|---------------|-----------|--|
| Sample Tower | Aluma Tower | A | none | 03538 | |
| Ozone | ThermoElectron Inc | 49i A1NAA | 1009241792 | 000624 | |
| Filter pack flow pump | Thomas | 107CA110 | 09883403-01-4 | 00462 | |
| Zero air pump | Werther International | C 70/4 | 000815255 | 06882 | |

| Fie | eld Sy | ystems Data | Form | | | F-02058-1500-S6-rev001 | | | | |
|------|----------------|--|-----------------------------|-----------------|----------------|------------------------|---------------------|-----------|--|--|
| Site | e ID | CAD150 | Technician | Sandy Grenville | | Site Visit Date | 02/27/2015 | | | |
| | DAS, se | ensor translators, an | d peripheral equij | oment operation | <u>is ar</u> | id maintenance | | | | |
| 1 | | DAS instruments ap aintained? | pear to be in good | condition and | | | | | | |
| 2 | | the components of t , backup, etc) | he DAS operation: | al? (printers, | | | | | | |
| 3 | | analyzer and sensor 1g protection circuit | | hrough | | Met sensors only | | | | |
| 4 | | e signal connections paintained? | protected from the | weather and | | | | | | |
| 5 | Are the | e signal leads connec | ted to the correct l | DAS channel? | | | | | | |
| 6 | Are the ground | e DAS, sensor transla led? | ators, and shelter j | oroperly | | | | | | |
| 7 | Does th | e instrument shelter | • have a stable pow | er source? | | | | | | |
| 8 | Is the in | nstrument shelter te | mperature control | led? | | | | | | |
| 9 | Is the n | net tower stable and | grounded? | | | Stable | Grou | inded | | |
| 10 | Is the s | ample tower stable a | and grounded? | | | | | 2 | | |
| 11 | Tower | comments? | | | | Sample tower is sta | able but not ground | ded | | |
| Pai | rameter | | Manufacturer | Model | | S/N | | Client ID | | |
| Cor | nputer | | Dell | D520 | and the second | unknown | | 000306 | | |

2530

0808310608

000421

06469

CR3000

H4222-C

Campbell

Raven

DAS

Modem

| Field Systems Data | Form | n | | | F-0 2 | 2058-2 | 1500-S7-rev001 | | | |
|--|---|-------------------------|------------------|-------------------------------------|---|----------|-----------------------|--|--|--|
| Site ID CAD150 | | Fechnician | Sandy Grenville | Site Visit Da | te 02/27/201 | 5 | | | | |
| | | | | | | | | | | |
| Documentation | | | | | | | | | | |
| Does the site have the requir | SPACE AND A DESCRIPTION OF | STREET, NAME OF ALL AND | | <u>als?</u> | | | | | | |
| Wind speed sensor | Yes | No N/. | | oggor | Yes | No ✓ | N/A | | | |
| Wind direction sensor | | | Data I Data I | And the second second second second | | | | | | |
| Temperature sensor | | | | chart recorder | | | | | | |
| Relative humidity sensor | | | Comp | | | | | | | |
| Solar radiation sensor | | | Mode | | | | | | | |
| Surface wetness sensor | | | Printe | | | | | | | |
| Wind sensor translator | | | | ur pump | | | | | | |
| Temperature translator | | | | flow pump | | | | | | |
| Humidity sensor translator | | | | protector | | | | | | |
| Solar radiation translator | | | UPS | | | | | | | |
| Tipping bucket rain gauge | | | Lighti | ning protection devi | ice 🗌 | | | | | |
| Ozone analyzer | | | Shelte | r heater | | | | | | |
| Filter pack flow controller | | | Shelte | r air conditioner | | | | | | |
| Filter pack MFC power supply | | | | | | | | | | |
| Does the site have the requ | ired and | l most rece | nt QC documents | and report forms? | | | | | | |
| | Presen | ıt | | | Curr | ent | | | | |
| Station Log | | | | | Image: A set of the set of the | | | | | |
| SSRF | ✓ | | | | | | | | | |
| Site Ops Manual | | | | | | | | | | |
| HASP | ✓ | Nov 20 | 09 | | ✓ | | | | | |
| Field Ops Manual | | July 19 | 90 | | | | | | | |
| Calibration Reports | | 101 | | | | | | | | |
| Ozone z/s/p Control Charts | | | | | | | Street and the state | | | |
| Preventive maintenance schedu | ıl 🗌 | | | | | | | | | |
| 1 Is the station log properly completed during every site visit? ☑ Minimal information | | | | | | | | | | |
| 2 Are the Site Status Report current? | t Forms | being com | oleted and | | | | | | | |
| 3 Are the chain-of-custody f sample transfer to and from | | operly used | d to document | | | _ | | | | |
| 4 Are ozone z/s/p control ch current? | arts pro | perly comp | leted and [| Control charts no | t used | | | | | |
| Provide any additional explana natural or man-made, that may | | | | ary) regarding cone | ditions listed | above, o | r any other features, | | | |

| Fi | eld S | ystems Data | a Form | | F-02058-1500-S8-rev001 | | | | |
|-----|--|--|--|--------------------------------------|------------------------|------------|--|--|--|
| Sit | e ID | CAD150 | Technician | Sandy Grenville | Site Visit Date | 02/27/2015 | | | |
| 1 | Has th | peration procedur ne site operator att e? If yes, when and | ended a formal CA | STNET training | | | | | |
| 2 | | | r attended a formal when and who instru | Select rectaints states rectains and | | | | | |
| 3 | Is the s schedu | | ly on the required T | uesday 🗸 | | | | | |
| 4 | | e standard CAST ed by the site oper | NET operational pro rator? | cedures being | | | | | |
| 5 | Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation) | | | | | | | | |
| | | | OA/OC shashs roof | | -1 | | | | |

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

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

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

| 0 | C | Ch | ecl | s P | erf | orm | ed |
|------|---|----|--------|-----|-----|-----|----|
| s ne | | | 100.00 | | | | |

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

| Frequency | Compliant |
|--------------|-----------|
| Semiannually | |
| Daily | |
| | |
| Daily | |
| | |
| Weekly | |
| Monthly | |
| N/A | |
| Weekly | |
| Weekly | |

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

| 3 | Are the automatic and manua | l z/s/p | checks | monitored | and |
|---|-----------------------------|---------|--------|-----------|-----|
| | reported? If yes, how? | | | | |

SSRF, call-in

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

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

| Fie | eld Sy | stems Data Fo | rm | | | | | F-02058- | 1500-S9-rev001 |
|---------------------------------------|---|--|------------|---------------------------|------------------|-----------|-------------------------|-----------------------|-----------------------|
| Site | ID | CAD150 | Techn | ician | Sandy Grenville | | Site Visit Date | e 02/27/2015 | |
| | Site ope | ration procedures | | | | | | | |
| 1 | Is the fi | lter pack being change | d every 🛛 | fuesda | y as scheduled: | | Filter changed mo | rinings | |
| 2 | 2 Are the Site Status Report Forms being completed and filed correctly? | | | | | | | | |
| 3 | 3 Are data downloads and backups being performed as scheduled? | | | | | | No longer required | | |
| 4 | Are gen | eral observations being | g made a | nd reo | corded? How? | | SSRF | | |
| 5 | 5 Are site supplies on-hand and replenished in a timely fashion? | | | | | | | | |
| 6 | Are san | ple flow rates recorded | l? How? | | | | SSRF, logbook, ca | all-in | |
| 7 | Are san fashion | nples sent to the lab on ? | a regula | r sche | dule in a timely | | | | |
| 8 | | ers protected from cont oping? How? | aminatio | on dui | ing handling | | One set of gloves only | | |
| 9 | | site conditions reporte ons manager or staff? | d regula | rly to | the field | | | | |
| QC | Check P | erformed | | Free | luency | | | Compliant | 1 |
| N | Iulti-poi | nt MFC Calibrations | V | Sem | iannually | | | | |
| F | low Syst | em Leak Checks | | Wee | kly | | | | |
| F | Filter Pack Inspection | | | | | | | | |
| F | Flow Rate Setting Checks | | | | | | | | |
| V | Visual Check of Flow Rate Rotometer Weekly | | | 202300 | | | A Standard Street Brand | | |
| In-line Filter Inspection/Replacement | | | 2042,777.3 | | | | | | |
| S | ample Li | ine Check for Dirt/Wat | er 🔽 | Wee | kly | Gene | | | |
| | Contraction of the second s | dditional explanation (n-made, that may affe | | Contraction of the second | | 10.010.01 |) regarding condi | tions listed above, o | r any other features, |

Site Inventory by Site Visit

| Site | Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|------|------------|-----------------------|-----------------------|----------|----------------|---------------|
| CVI | L151-Sandy | Grenville-02/28/2015 | | | | |
| 1 | 2/28/2015 | Computer | Dell | 000477 | D630 | unknown |
| 2 | 2/28/2015 | DAS | Campbell | 000410 | CR3000 | 2508 |
| 3 | 2/28/2015 | Elevation | Elevation | None | 1 | None |
| 4 | 2/28/2015 | Filter pack flow pump | Thomas | 04282 | 107CAB18B | 129800010140 |
| 5 | 2/28/2015 | Flow Rate | Apex | 000461 | AXMC105LPMDPCV | illegible |
| 6 | 2/28/2015 | Infrastructure | Infrastructure | none | none | none |
| 7 | 2/28/2015 | Modem | Raven | 06462 | V42221 | 0808338333 |
| 8 | 2/28/2015 | Ozone | ThermoElectron Inc | 000698 | 49i A1NAA | 1030244797 |
| 9 | 2/28/2015 | Ozone Standard | ThermoElectron Inc | 000464 | 49i A3NAA | 0622717858 |
| 10 | 2/28/2015 | Sample Tower | Aluma Tower | 03540 | А | none |
| 11 | 2/28/2015 | Shelter Temperature | Campbell | none | 107-L | none |
| 12 | 2/28/2015 | Siting Criteria | Siting Criteria | None | 1 | None |
| 13 | 2/28/2015 | Temperature | Climatronics | 06770 | 100093 | none |
| 14 | 2/28/2015 | Zero air pump | Werther International | 06884 | PC70/4 | 000815263 |

DAS Data Form DAS Time Max Error: 0 Serial Number Site Technician Site Visit Date Parameter Use Desc. Mfg Campbell 2508 CVL151 Sandy Grenville 02/28/2015 DAS Primary **Das Date:** 2 /28/2015 **Audit Date** 2 /28/2015 Datel **Parameter** DAS Mfg **Das Time:** 15:38:27 Audit Time 15:38:27 15510194 Tfer Desc. Source generator (D **Serial Number** Das Day: 58 Audit Day 58 **Tfer ID** 01320 **High Channel:** Low Channel: Max Diff: Avg Diff: **Max Diff:** Avg Diff: 1.00000 0.00000 Slope Intercept 0.0001 0.0001 0.0001 0.0001 1.00000 **Cert Date** 2/2/2010 **CorrCoff** Parameter DAS Fluke Mfg Serial Number 95740135 Tfer Desc. DVM 01311 Tfer ID 1.00000 0.00000 Slope Intercept 1/22/2015 1.00000 **Cert Date CorrCoff** Channel Input DVM Output DAS Output InputUnit OutputUnit Difference V 7 0.0000 -0.0001 0.0000 V 0.0001 V V 7 0.1000 0.0998 0.0999 0.0001 7 0.3000 0.2997 0.2998 V V 0.0001 7 0.5000 0.4996 V V 0.0001 0.4995 7 0.7000 V V 0.0001 0.6995 0.6996 7 V V 0.9000 0.8994 0.8994 0.0000 7 0.9992 0.9993 V V 0.0001 1.0000

Flow Data Form

| Mfg | Serial Nur | nber Ta | Site | Te | chnician | Site Visit I | Date Param | ieter | Owner ID |
|-----------------|-----------------------|--------------|--------------|-----------------|------------------|--------------|-------------------|------------------|-------------------|
| Арех | illegible | | CVL151 | Sa | ndy Grenville | 02/28/2015 | 5 Flow R | ate | 000461 |
| | | | | | Mfg | BIOS | P | arameter | Flow Rate |
| | | | | | Serial Number | 103471 | | Tfer Desc. nexus | |
| | | | | | | 01420 | | | |
| | | | | | Tfer ID | 01420 | | | |
| | | | | | Slope | 0. | 96664 Inte | ercept | 0.03078 |
| | | | | | Cert Date | 2/ | 5/2015 Cor | rCoff | 0.99996 |
| | | | | | Mfg | BIOS | Р | arameter | Flow Rate |
| | | | | | Serial Number | 103424 | Т | fer Desc. | BIOS cell |
| | | | | | Tfer ID | 01410 | | | |
| | | | | | Slope | 0. | 96664 Inte | ercept | 0.03078 |
| | | | | | Cert Date | 2/ | 5/2015 Cor | rCoff | 0.99996 |
| DAS 1: DAS 2: | | L | Cal Factor Z | ero | -0.0 |)2 | | | |
| A Avg % Diff: | A Max % Di | A Avg % | Dif A Max | x % Di | Cal Factor F | ull Scale | 0.9 | 97 | |
| 1.06% | 1.32% | | | | Rotometer R | eading: | 1 | .4 | |
| UseDescription: | Test type: | | Input STP: | MfcDisp.: | | | | ¥ | allPctDifference: |
| primary | pump off | 0.000 | 0.000 | -0.02 | 0.000 | -0.02 | 1/m | l/m | |
| primary | leak check | 0.000 | 0.000 | 0.03 | 0.020 | 0.00 | l/m | l/m | |
| primary | test pt 1 | 1.457 | 1.513 | 1.54 | 1.540 | 1.50 | l/m | l/m | -0.86% |
| primary | test pt 2 | 1.464 | 1.520 | 1.54 | 1.540 | 1.50 | l/m | l/m | -1.32% |
| primary | test pt 3 | 1.460 | 1.515 | 1.54 | 1.530 | 1.50 | l/m | l/m | -0.99% |
| Sensor Compo | onent Leak Te | st | | Conditio | on | Statu | | IS pass | |
| Sensor Compo | Dent Filter Az | imuth | | Conditio | n 360 deg | | Status | pass | |
| Sensor Compo | onent Filter De | pth | | Conditio | 2.0 cm | | Status | pass | |
| Sensor Compo | ment Filter Po | sition | | Conditio | n Good | | Status | pass | |
| Sensor Compo | onent Moisture | Present | | Conditio | n No moisture p | resent | Status | pass | |
| Sensor Compo | nent Rotomet | er Conditior | 1 | Conditio | Clean and dry | | Status | pass | |
| Sensor Compo | | | | Conditio | n | Status | pass | | |
| Sensor Compo | | | | Conditio | n Good | Status | | | |
| | | | | n 5.0 cm | Status | | | | |
| | | | | | | | | | |

Ozone Data Form

| Mfg | Serial Number Tag | Site | Te | echnician | | Site Visit Date | | Parameter | | Owner I | D |
|--------------------|--|--------------------------------|-------------------|------------------|----------------|-----------------------------|--------------------|-----------|--|-----------|--------|
| ThermoElectron Inc | 1030244797 | CVL151 | S | andy Grei | nville | 02/28/2015 | | Ozone | | 000698 | |
| Intercept -0 | .00543 Slope: .58714 Intercept .00000 CorrCoff | 0.00000 | 0 | Serial Number | | Thermol 0419606 01112 | Electron 6966 | | rameter ozone er Desc. Ozone primary stan | | y stan |
| DAS 1: | DAS 2: | | | | | | 0.0000 | | | 0.45 | 500 |
| A Avg % Diff: A M | | 6Dif A Max ⁶ | % Di | Slope | | | 0.99909 | | cept | -0.15 | |
| 0.7% | 1.9% | | Cert Date | | 1/27/2015 Corr | | rCoff 1.00000 | | 1000 | | |
| UseDescription: | ConcGroup: | Tfer Raw: | Tfer | Corr: | Si | e: | Site | Unit: | PctDi | fference: | |
| primary | 1 | 0.14 | 0. | 29 | -0. | 17 | ppb | | | | |
| primary | 2 | 29.77 | 29 | .95 | 29. | 37 | ppb | | | -1.94% | |
| primary | 3 | 49.71 | 49 | .91 | 49. | 56 | ppb | | | -0.70% | |
| primary | 4 | 79.57 | 79 | .79 | 79. | 66 | ppb | | | -0.16% | |
| primary | 5 | 109.60 | 109 | 9.85 | 109 | .90 | ppb | | | 0.05% | |
| Sensor Componen | t Cell B Noise | | Conditi | on 0.9 pp | b | | | Status [| pass | | |
| Sensor Componen | t Cell B Tmp. | | Conditi | on | | | | Status | pass | | |
| Sensor Componen | t Fullscale Voltage | | Conditi | on N/A | | | | Status | pass | | |
| Sensor Componen | t Inlet Filter Condition | n | Conditi | on Clean | | | | Status | pass | | |
| Sensor Componen | t Line Loss | | Conditi | on Not te | sted | | | Status | pass | | |
| Sensor Componen | t Offset | | Conditi | on 0.3 | | | | Status | pass | | |
| Sensor Componen | t Span | | Condition 1.02 | | | | Status | pass | | | |
| Sensor Componen | t Cell B Freq. | | Condition 101 kHz | | | | Status | pass | | | |
| Sensor Componen | t System Memo | | Conditi | Condition | | | | Status | pass | | |
| Sensor Componen | t Sample Train | | Conditi | Condition Good | | | | Status | pass | | |
| Sensor Componen | t Cell B Pressure | | Conditi | on | | | | Status | pass | | |
| Sensor Componen | t Cell B Flow | | Conditi | on 0.70 l | pm | | | Status | pass | | |
| Sensor Componen | t Cell A Tmp. | | Conditi | on 29.8 (|) | | | Status | pass | | |
| Sensor Componen | t Cell A Pressure | | Conditi | on 736 m | mHg | | | Status | pass | | |
| Sensor Componen | t Cell A Noise | | Conditi | on 0.9 pp | b | | | Status | pass | | |
| Sensor Componen | t Cell A Freq. | | Conditi | on 96.5 k | Hz | | | Status | pass | | |
| Sensor Componen | t Cell A Flow | | Conditi | on 0.70 l | pm | | | Status | pass | | |
| Sensor Componen | t Battery Backup | | Conditi | on N/A | | | | Status | pass | | |
| Sensor Componen | t Zero Voltage | Zero Voltage | | | | | | Status | pass | | |

Temperature Data Form

| Mfg | | Serial Nun | ıber Ta | Site | | Tecł | Technician | | Site V | isit Date | Param | eter | Owner II |) |
|--------------|-------|-------------|---------------|----------|----------|-------|------------|------------|----------------|-----------|---------------|--------------|-------------|-----|
| Climatronics | | none | | CVL151 | | San | ndy G | renville | 02/28 | /2015 | Temper | rature | 06770 | |
| | | | | | | N | Mfg | | Extech | 1 | Pa | arameter Te | mperature | |
| | | | | | | S | Seria | l Number | H2327 | 34 | Tf | fer Desc. RT | D | |
| | | | | | | ſ | Tfer] | ID | 01227 | | | | | |
| DAS 1: | | | DAS 2: | | | S | Slope | • | | 1.00343 | 3 Inte | rcept | -0.06 | 409 |
| Abs Avg Err | Abs | Max Er | Abs Avg | gErr Abs | Max Er | | Cert Date | | 1/30/2015 Corr | | rCoff 1.00000 | | 000 | |
| 0.13 | | 0.26 | | | | | | | | | | | | |
| UseDesc.: | | Test type: | Inp | utTmpRaw | InputTmp | Corr | r.: 0 | OutputTmpS | ignal: | OutputSig | nalEng: | OSE Unit: | Difference: | |
| primary | Temp | Low Range | | 0.12 | 0.18 | 3 | | 0.000 | | 0.2 | | С | 0 | |
| primary | Temp | Mid Range | | 24.36 | 24.3 | 4 | | 0.000 | | 24.: | 5 | С | 0.12 | |
| primary | Temp | High Rang | e | 48.22 | 48.1 | 2 | | 0.000 | | 48.4 | 4 | С | 0.26 | |
| Sensor Com | ponen | t Shield | | | Cond | ition | n Cle | an | | | Status | pass | | |
| Sensor Com | ponen | t Blower St | atus Swit | ch | Cond | ition | n N/A | N | | | Status | pass | | |
| Sensor Com | ponen | t Blower | | | Cond | ition | n Fur | nctioning | | | Status | pass | | |
| Sensor Com | ponen | t System M | lemo | | Cond | ition | n | | | | Status | pass | | |

| Infrastructure Data F | Infrastructure Data For | | | | | | | | |
|-----------------------|-------------------------|---|--------------|-------------|--|--|--|--|--|
| Site ID CVL151 | Tecl | Technician Sandy Grenville Site Visit Date 02/28/2015 | | | | | | | |
| Shelter Make | Shelter | ·Model | Shelter Size | | | | | | |
| Ekto | 8810 | | 640 cuft | | | | | | |
| | | | | | | | | | |
| Sensor Component | Shelter Roof | Condition | Poor | Status Fail | | | | | |
| Sensor Component | Sample Tower Type | Condition | Туре А | 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 | Rotometer | Condition | Installed | Status pass | | | | | |
| Sensor Component | Conduit | Condition | N/A | Status pass | | | | | |
| Sensor Component | Sample Tower | Condition | Fair | Status pass | | | | | |
| Sensor Component | Shelter Condition | Condition | Fair | Status pass | | | | | |
| Sensor Component | Shelter Floor | Condition | Good | Status pass | | | | | |
| Sensor Component | Shelter Temp Contro | Condition | Functioning | Status pass | | | | | |
| Sensor Component | Signal Cable | Condition | Good | Status pass | | | | | |
| Sensor Component | Tubing Type | Condition | 3/8 teflon | Status pass | | | | | |
| Sensor Component | Shelter Door | Condition | Good | Status pass | | | | | |
| Sensor Component | Sample Train | Condition | Good | Status pass | | | | | |

Shelter Temperature Data For

| Mfg | Serial Number Ta | Site | Technician | Site Visit Date | Parameter | Owner ID |
|-------------------|------------------|--------|-----------------|-----------------|---------------------|-----------------|
| Campbell | none | CVL151 | Sandy Grenville | 02/28/2015 | Shelter Temperature | none |
| DAS 1: | DAS 2: | | Mfg | Extech | Parameter She | lter Temperatur |
| Abs Avg ErrAb0.37 | | | Serial Number | H232734 | Tfer Desc. RTD | D |
| | | | 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 | 18.89 | 18.89 | 0.000 | 18.7 | С | -0.21 |
| primary | Temp Mid Range | 19.90 | 19.90 | 0.000 | 19.4 | С | -0.5 |
| primary | Temp Mid Range | 19.45 | 19.45 | 0.000 | 19.1 | С | -0.4 |

Field Systems Comments

1 Parameter: DocumentationCo

The site operations manual does not apply to the currently installed instrumentation. The current HASP is not available onsite.

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

The shelter is somewhat cluttered. The floor has been repaired since the previous audit visit, however the roof is still leaking.

| Site ID CVL151 | Technician Sandy Grenville | Site Visit Date 02/2 | 28/2015 |
|------------------------|---|---|--|
| Site Sponsor (agency) | EPA | USGS Map | Coker Lake |
| Operating Group | Private - USFS | Map Scale | |
| AQS# | 28-161-9991 | Map Date | |
| Meteorological Type | Climatronics | | |
| Air Pollutant Analyzer | Ozone | QAPP Latitude | 34.0028 |
| Deposition Measurement | dry, wet | QAPP Longitude | -89.7989 |
| Land Use | woodland - evergreen | QAPP Elevation Meters | 134 |
| Terrain | rolling | QAPP Declination | 0.2 |
| Conforms to MLM | Marginally | QAPP Declination Date | 2/22/2006 |
| Site Telephone | (662) 623-7334 | Audit Latitude | 34.00274 |
| Site Address 1 | Forest Road 809 | Audit Longitude | -89.79918 |
| Site Address 2 | Tombigbee National Forest | Audit Elevation | 13 |
| County | Yalobusha | Audit Declination | -0.95 |
| City, State | Tillatoba, MS | Present | |
| Zip Code | 38961 | Fire Extinguisher 🔽 | No inspection date |
| Time Zone | Central | First Aid Kit | |
| Primary Operator | | Safety Glasses | |
| Primary Op. Phone # | | Safety Hard Hat | |
| Primary Op. E-mail | | Climbing Belt | |
| Backup Operator | | Security Fence | |
| Backup Op. Phone # | | Secure Shelter | |
| Backup Op. E-mail | | Stable Entry Step 🗹 | |
| Shelter Working Room♥ | | odel 8810 | Shelter Size 640 cuft |
| Shelter Clean | Notes The shelter is somewhat clutte however the roof is still leaking | | red since the previous audit visit, |
| Site OK | Notes | | |
| Fores | interstate 55 take exit 220 east on highwast st Service sign for the Yalobusha County V the facility turn left on forest service road 8 809. Continue approximately 0.3 miles to | Nork Center and Jamie L. Whi 302. Continue approximately | tter Plant Materials Center. Immediately |

Field Systems Data Form

CVL151

F-02058-1500-S2-rev001

Site ID

Technician Sandy Grenville

Site Visit Date 02/28/2015

| 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 | | |
| 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 | 19 | |
| Intensive agricultural ops (including aerial spraying) | 500 m | | |
| Limited agricultural operations | 200 m | | |
| Large parking lot | 200 m | | |
| Small parking lot | 100 m | | |
| Tree line | 50 m | 17 m | |
| Obstacles to wind | 10 times obstacle height | | |

Siting Distances OK

Siting Criteria Comment

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

| Fi | eld Systems Data F | orm | F-02058-1500-S3-rev001 | | | | | |
|------|--|---|------------------------|--|--|--|--|--|
| Site | e ID CVL151 | Technician Sandy Grenville | | Site Visit Date 02/28/2015 | | | | |
| 1 | Are wind speed and direction being influenced by obstructi | | | N/A | | | | |
| 2 | | | | N/A | | | | |
| 3 | Are the tower and sensors plu | | | N/A | | | | |
| 4 | Are the temperature shields J avoid radiated heat sources s | pointed north or positioned to uch as buildings, walls, etc? | | | | | | |
| 5 | Are temperature and RH sen conditions? (i.e. ground below surface and not steeply sloped standing water should be avo | v sensors should be natural d. Ridges, hollows, and areas of | | | | | | |
| 6 | Is the solar radiation sensor J | olumb? | | N/A | | | | |
| 7 | Is it sited to avoid shading, or light? | any artificial or reflected | | N/A | | | | |
| 8 | Is the rain gauge plumb? | | | N/A | | | | |
| 9 | Is it sited to avoid sheltering o towers, etc? | effects from buildings, trees, | | N/A | | | | |
| 10 | Is the surface wetness sensor facing north? | sited with the grid surface | | N/A | | | | |
| 11 | Is it inclined approximately. | 30 degrees? | | N/A | | | | |
| Dro | ovide onv additional ovnlanetic | on (nhatagranh ar skatsh if nasa | ccar | v) regarding conditions listed above or any other features | | | | |

| Fie | ld Systems Da | ita Form | | | F-02058-1500-S4-rev001 | | | | |
|------|--|---|-----------------|-----|---------------------------------|-----------|--|--|--|
| Site | D CVL151 | Technician | Sandy Grenville | | Site Visit Date 02/28/2015 | | | | |
| | Do all the meterologic condition, and well ma | al sensors appear to be i aintained? | intact, in good | | Temperature only | | | | |
| 2 | | gical sensors operational | l online, and | | Temperature only | | | | |
| | | e temperature and RH so | ensors clean? | | | | | | |
| 4 | Are the aspirated mot | ors working? | | | | | | | |
| | Is the solar radiation s scratches? | sensor's lens clean and f | ree of | | N/A | | | | |
| 6 | Is the surface wetness | sensor grid clean and u | ndamaged? | | N/A | | | | |
| | Are the sensor signal a condition, and well ma | and power cables intact, aintained? | , in good | | | | | | |
| | Are the sensor signal a from the elements and | and power cable connect I well maintained? | tions protected | | | | | | |
| Para | meter | Manufacturer | Model | | S/N | Client ID | | | |
| | | may affect the monitorin | | y) | regarding conditions listed abo | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

| Fie | eld Systems Dat | ta Form | | F-02058-1500-S5-rev001 |
|------|--|---|----------------|---|
| Site | ID CVL151 | Technician Sandy Grenvil | le | Site Visit Date 02/28/2015 |
| | Siting Criteria: Are the | pollutant analyzers and deposition | <u>equip</u> i | nent sited in accordance with 40 CFR 58, Appendix E |
| 1 | Do the sample inlets ha unrestricted airflow? | ve at least a 270 degree arc of | | |
| 2 | Are the sample inlets 3 | - 15 meters above the ground? | | |
| 3 | Are the sample inlets > and 20 meters from tre | 1 meter from any major obstruction es? | n, 🗆 | 17 meters |
| | Pollutant analyzers and | l deposition equipment operations a | nd ma | intenance |
| 1 | Do the analyzers and ec condition and well main | quipment appear to be in good ntained? | | |
| 2 | Are the analyzers and a reporting data? | nonitors operational, on-line, and | | |
| 3 | Describe ozone sample | tube. | | 1/4 teflon by 12 meters |
| 4 | Describe dry dep samp | le tube. | | 3/8 teflon by 12 meters |
| 5 | Are in-line filters used indicate location) | in the ozone sample line? (if yes | | At inlet only |
| 6 | Are sample lines clean, obstructions? | free of kinks, moisture, and | | |
| 7 | Is the zero air supply d | esiccant unsaturated? | | |
| 8 | Are there moisture traj | os in the sample lines? | | |
| 9 | Is there a rotometer in clean? | the dry deposition filter line, and is | it 🗹 | Clean and dry |
| Par | ameter | Manufacturer Model | | S/N Client ID |

| Parameter | Manufacturer | Model | S/N | Client ID | |
|-----------------------|-----------------------|-----------|--------------|-----------|--|
| Sample Tower | Aluma Tower | A | none | 03540 | |
| Ozone | ThermoElectron Inc | 49i A1NAA | 1030244797 | 000698 | |
| Filter pack flow pump | Thomas | 107CAB18B | 129800010140 | 04282 | |
| Zero air pump | Werther International | PC70/4 | 000815263 | 06884 | |

| Fie | eld Sy | stems Data Fo | orm | | F-02058-1500-S6-rev001 | | | | |
|------|----------------|---|------------------------------|-----------------|------------------------|-----------------------|------------|--------|---|
| Site | D | CVL151 | Technician | Sandy Grenville | | Site Visit Date | 02/28/2015 | | |
| | DAS, se | nsor translators, and j | <mark>peripheral equi</mark> | pment operation | <u>15 a1</u> | <u>nd maintenance</u> | | | |
| 1 | | DAS instruments appe intained? | ar to be in good | l condition and | | | | | |
| 2 | | the components of the , backup, etc) | DAS operation | al? (printers, | | | | | |
| 3 | | analyzer and sensor sig g protection circuitry | | through | | Met sensors only | | | |
| 4 | | signal connections pro intained? | otected from the | e weather and | | | | | |
| 5 | Are the | signal leads connected | to the correct | DAS channel? | | | | | |
| 6 | Are the ground | DAS, sensor translato ed? | rs, and shelter | properly | | | | | |
| 7 | Does the | e instrument shelter h | ave a stable pov | ver source? | | | | | |
| 8 | Is the in | strument shelter temp | erature control | lled? | | | | | |
| 9 | Is the m | et tower stable and gr | ounded? | | | Stable | Gr | ounded | I |
| 10 | Is the sa | mple tower stable and | l grounded? | | | | | | |
| 11 | | comments? | | | | | | | |
| | | | | | | | | | |

| Parameter | Manufacturer | Model | S/N | Client ID |
|-----------|--------------|--------|------------|-----------|
| Computer | Dell | D630 | unknown | 000477 |
| DAS | Campbell | CR3000 | 2508 | 000410 |
| Modem | Raven | V42221 | 0808338333 | 06462 |

| Field Systems Data | Forn | 1 | | | F-02 | 058- | 1500-S7-rev001 |
|---|--|-------------|--|--|-------------|--|------------------------|
| Site ID CVL151 | Т | echniciar | Sandy Grenville | Site Visit Date | 2/28/2015 | | |
| States States | | | | | | | |
| Documentation | | | | | | | |
| Does the site have the requir | <u>ed instru</u> | 2223 982302 | NY DESCRIPTION OF THE OWNER OF THE | <u>wals?</u> | | | |
| | | | I/A Dete | | Yes | No ✓ | N/A |
| Wind speed sensor Wind direction sensor | | | | ı logger ı logger | | | |
| Temperature sensor | | | | o chart recorder | | | |
| Relative humidity sensor | <u> 1997 - 1997 - 1997</u> 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1 1997 - 199 | | | iputer | | | |
| Solar radiation sensor | | | | The second s | | | |
| Surface wetness sensor | | | | | | | |
| Wind sensor translator | A CONTRACTOR OF STREET, STREET | | | air pump | | | |
| Temperature translator | | | | r flow pump | | | |
| Humidity sensor translator | | | | e protector | | | |
| Solar radiation translator | | | | | | | |
| Tipping bucket rain gauge | | | | tning protection device | | | |
| Ozone analyzer | | | | ter heater | | | |
| Filter pack flow controller | | | Shel | ter air conditioner | | | |
| Filter pack MFC power supply | | | | | | | |
| Does the site have the requi | ired and | most rec | ent OC documen | ts and report forms? | | | |
| | Present | | | | Curre | nf | |
| Station Log | | | | | | in the second se | |
| SSRF | | | | | | | |
| Site Ops Manual | | June 2 | 2007 | | | | |
| HASP | | Nov 2 | | | | | |
| Field Ops Manual | | July 1 | | | | | |
| Calibration Reports | | | | | | | |
| Ozone z/s/p Control Charts | | | | | | | |
| Preventive maintenance schedu | d 🗌 | | | | | | |
| | | | | | | | |
| 1 Is the station log properly | complet | ed durinş | g every site visit? | | | | |
| | | | | | | | |
| 2 Are the Site Status Report current? | Forms l | being con | pleted and | | | | |
| 3 Are the chain-of-custody for sample transfer to and from | | operly us | ed to document | | | | |
| 4 Are ozone z/s/p control cha current? | irts prop | perly com | pleted and | Control charts not use | ed | | |
| Provide any additional explana natural or man-made, that may | | | | | ns listed a | ibove, c | or any other features, |
| The site operations manual does | not apply | to the cu | rrently installed ins | trumentation. The current | HASP is r | ot avail | able onsite. |
| | | | | | | | |

| Field Systems Data Form | | | | | | F-02058-1500-S8-rev001 | | |
|-------------------------|-----------------------|---|----------------------------------|--|------------|------------------------|------------------------|-----|
| Site | ID | CVL151 | Technician | Sandy Grenville | | Site Visit Date | 02/28/2015 | |
| 1 | Has the | eration procedures site operator attended If yes, when and who | | TNET training | _ T | rained by J.B. And | erson during site upgr | ade |
| 2 | Has the | backup operator atte g course? If yes, when | nded a formal (| SHOLDSTORD ADDITIONS AND ADDITION AND ADDITION AND ADDITION ADDITIONAL ADDITICADOTICAL ADDITICAL ADDITICAL ADD | | | | |
| 3 | Is the si schedule | te visited regularly on the second | the required T | iesday | | | | |
| 4 | | standard CASTNET o d by the site operator? | CONTRACTOR CONTRACTOR CONTRACTOR | cedures being | | | | |
| 5 | | te operator(s) knowled lired site activities? (in | | | | | | |
| | <u>Are reg</u> | ular operational QA/Q | C checks perfo | rmed on meteor | ologi | cal instruments? | | |

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

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

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

| 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 analy |
| Sample Line Check for Dirt/Water |
| Zero Air Desiccant Check |

| Frequency | Compliant |
|---------------|-----------|
| Semiannually | |
| Daily | |
| | |
| Daily |] |
| | |
| Weekly | |
| Every 2 weeks | |
| N/A | |
| Weekly | |
| Weekly | |

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

| | | Contraction and Contraction Contractions and States |
|---|------------------------------|---|
| 3 | Are the automatic and manual | z/s/n checks monitored and |
| - | Are the automatic and manual | L'sp checks montoreu anu |
| | reported? If yes how? | |

ze

Unknown

✓

SSRF, logbook, call-in

| Field Systems Data Form | | | | | | F-02058-1500-S9-rev001 | | | |
|--|--|-------------------|--------|------------------|-----|-------------------------|--------------------------|--------------------|--|
| Site | D CVL151 Te | chnio | cian | Sandy Grenville | | Site Visit Date | e 02/28/2015 |];="\``\`` | |
| | Site operation procedures | | | | | | | | |
| 1 | Is the filter pack being changed eve | ry Tı | iesda | y as scheduled | ? 🔽 | Filter changed afte | rnoons | | |
| | 2 Are the Site Status Report Forms being completed and filed correctly? | | | | | | | | |
| 3 | Are data downloads and backups b scheduled? | eing _l | perfo | ormed as | | No longer required | I | | |
| 4 | Are general observations being mad | le an | d rec | corded? How? | | SSRF, logbook | | | |
| 5 | Are site supplies on-hand and reple fashion? | nishe | d in | a timely | | | | | |
| 6 | Are sample flow rates recorded? He | ow? | | | | SSRF, call-in | | | |
| 7 | Are samples sent to the lab on a reg fashion? | ular | scheo | dule in a timely | | | | | |
| | Are filters protected from contamin and shipping? How? | atior | ı dur | ing handling | | Clean gloves on and off | | | |
| | Are the site conditions reported reg operations manager or staff? | ularl | y to t | the field | | | | | |
| QC | Check Performed | | Freq | luency | | | Compliant | | |
| M | Iulti-point MFC Calibrations | ✓ | Sem | iannually | | | | | |
| F | low System Leak Checks | | Wee | kly | | | | | |
| Fi | Filter Pack Inspection | | | | | | | | |
| F | Flow Rate Setting Checks | | | | | | | | |
| V | Visual Check of Flow Rate Rotometer 🗹 Weekly | | | | | | | | |
| In-line Filter Inspection/Replacement Semiannually | | | | | | | | | |
| S | ample Line Check for Dirt/Water | | Wee | kly | | | | | |
| | ide any additional explanation (phot ral or man-made, that may affect the | | | | | y) regarding condit | tions listed above, or a | ny other features, | |

Site Inventory by Site Visit

| Site | Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number | | | | |
|------|-----------------------------------|-----------------------|-----------------------|----------|----------------|---------------|--|--|--|--|
| CD. | CDZ171-Sandy Grenville-03/13/2015 | | | | | | | | | |
| 1 | 3/13/2015 | Computer | Dell | 000281 | D520 | unknown | | | | |
| 2 | 3/13/2015 | DAS | Campbell | 000352 | CR3000 | 2130 | | | | |
| 3 | 3/13/2015 | Elevation | Elevation | None | 1 | None | | | | |
| 4 | 3/13/2015 | Filter pack flow pump | Thomas | 06020 | 107CAB18D | 060400022646 | | | | |
| 5 | 3/13/2015 | Flow Rate | Арех | 000650 | AXMC105LPMDPCV | 54767 | | | | |
| 6 | 3/13/2015 | Infrastructure | Infrastructure | none | none | none | | | | |
| 7 | 3/13/2015 | Modem | Raven | 06457 | V42221 | 0808338189 | | | | |
| 8 | 3/13/2015 | Ozone | ThermoElectron Inc | 000727 | 49i A1NAA | 1105347320 | | | | |
| 9 | 3/13/2015 | Ozone Standard | ThermoElectron Inc | 000544 | 49i A3NAA | 0929938242 | | | | |
| 10 | 3/13/2015 | Sample Tower | Aluma Tower | 000125 | В | none | | | | |
| 11 | 3/13/2015 | Shelter Temperature | Campbell | none | 107-L | none | | | | |
| 12 | 3/13/2015 | Siting Criteria | Siting Criteria | None | 1 | None | | | | |
| 13 | 3/13/2015 | Temperature | RM Young | 06403 | 41342VC | 14036 | | | | |
| 14 | 3/13/2015 | Zero air pump | Werther International | 06899 | PC70/4 | 000821902 | | | | |

| DAS Dat | a Form | | | DAS Ti | me Max Error: [| 0.02 | |
|-----------------------|----------------|--------------------------|------------------|-----------------|-----------------|---------------|---------------------|
| Mfg | Serial | Number Site | Т | echnician | Site Visit Date | Parameter | Use Desc. |
| Campbell | 2130 | CD | Z171 S | Sandy Grenville | 03/13/2015 | DAS | Primary |
| Das Date: | 3 /13/2015 | Audit Date | 3 /13/2015 | Mfg | Datel | Parameter | DAS |
| Das Time: Das Day: | 16:43:53 72 | Audit Time_ Audit Day | 16:43:54 72 | Serial Number | 15510194 | Tfer Desc. | Source generator (D |
| Low Channel: | | High Channe | | Tfer ID | 01320 | | |
| Avg Diff: | Max Diff: | Avg Diff: | Max Diff: | Slope | 1.0000 | 0 Intercept | 0.00000 |
| 0.0001 | 0.00 | 0.0001 | 0.0002 | Cert Date | 2/2/201 | 0 CorrCoff | 1.00000 |
| | | | | 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 | -0.0001 | 0.0001 | V | V | 0.0002 | |
| 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 | 0.4996 | 0.4996 | V | V | 0.0000 | |
| 7 | 0.7000 | 0.6995 | 0.6995 | V | V | 0.0000 | |
| 7 | 0.9000 1.0000 | 0.8994 0.9993 | 0.8994 0.9993 | V V | V V | 0.0000 0.0000 | |

Flow Data Form

| Mfg | Serial Nu | mber Ta | Site | Тес | chnician | Site Visit Da | te Param | eter | Owner ID |
|----------------|-----------------|---------------|------------|-----------|------------------|---------------|-----------------|------------|-------------------|
| Apex | 54767 | | CDZ171 | Sa | ndy Grenville | 03/13/2015 | Flow R | ate | 000650 |
| | | | | [| Mfg | BIOS | P | arameter | Flow Rate |
| | | | | | Serial Number | 103471 | T | fer Desc. | nexus |
| | | | | | Tfer ID | 01420 | | | |
| | | | | | Slope | 0.96 | 664 Inte | ercept | 0.03078 |
| | | | | | Cert Date | | | rCoff | 0.99996 |
| | | | | | | | | | |
| | | | | | Mfg | BIOS | | arameter | |
| | | | | | Serial Number | 103424 | Т | fer Desc. | BIOS cell |
| | | | | | Tfer ID | 01410 | | | |
| | | | | | Slope | 0.96 | 664 Inte | ercept | 0.03078 |
| | | | | | Cert Date | 2/5/2 | 2015 Cor | rCoff | 0.99996 |
| DAS 1: | | DAS 2: | | Ĺ | Cal Factor Z | oro | | 0 | |
| A Avg % Diff: | A Max % Di | A Avg %l | Dif A Max | x % Di | Cal Factor E | | 1.0 | | |
| 0.35% | 0.53% | | | | Rotometer R | | 1. | _ | |
| UseDescription | : Test type: | Input l/m: | Input STP: | MfcDisp.: | OutputSignal: | Output S E: I | nputUnit: | OutputSigr | allPctDifference: |
| primary | pump off | 0.000 | 0.000 | 0.00 | 0.010 | 0.00 | l/m | l/m | |
| primary | leak check | 0.000 | 0.000 | 0.01 | 0.010 | 0.01 | l/m | l/m | 0.52% |
| primary | test pt 1 | 1.504 | 1.518 | 1.50 | 1.500 | 1.51 | l/m | l/m | -0.53% |
| primary | test pt 2 | 1.502 | 1.514 | 1.50 | 1.500 | 1.51 | l/m | 1/m | -0.26% |
| primary | test pt 3 | 1.507 | 1.516 | 1.50 | 1.500 | 1.52 | l/m | l/m | 0.26% |
| Sensor Comp | onent Leak Te | st | | Conditio | n | | Status | pass | |
| Sensor Comp | onent Filter Az | imuth | | Conditio | n 140 deg | | Status | pass | |
| Sensor Comp | onent Filter De | epth | | Conditio | n 1.0 cm | | Status | pass | |
| Sensor Comp | onent Filter Po | sition | | Conditio | n Good | | Status | pass | |
| | onent Moisture | | | | n No moisture pr | resent | Status | pass | |
| | onent Rotome | | | _ | n Clean and dry | | | | |
| | | | 1 | _ | | | Status | | |
| Sensor Comp | onent System | Memo | | Conditio | n | | Status | pass | |
| Sensor Comp | onent Tubing | Condition | | Conditio | n Good | | Status | pass | |
| Sensor Comp | onent Filter Di | stance | | Conditio | n 3.0 cm | | Status | pass | |
| | | | | | | | | | |

Ozone Data Form

| Mfg | Serial Number Tag | Site | Te | echnician | | Site Visi | t Date | Paramet | ter | Owner I | D |
|---------------------------|-----------------------------------|--------------|---------|-----------------|--------|--------------------|------------|---------------|-----------|-----------------------|---------|
| ThermoElectron Inc | 1105347320 | CDZ171 | S | andy Grei | nville | 03/13/20 | 015 | Ozone | | 000727 | |
| | .01264 Slope: .64212 Intercept | 0.0000 | _ | Mfg Serial N | lumbor | ThermoE 0419606 | | | ameter o | zone Dzone primary | / stan |
| | .999999 CorrCoff | 0.0000 | | | | | 300 | | r Desc. 🗠 | | / Starr |
| | | | | Tfer ID | | 01112 | | | | | |
| DAS 1: | DAS 2: | | | Slope | | | 0.99405 | Intere | cept | -0.42 | 803 |
| A Avg % Diff: A M 0.5% | ax % Di A Avg % 0.7% | 6Dif A Max 9 | % Di | Cert Da | ite | | 3/9/2015 | 5 Corre | Coff | 1.00 | 000 |
| | | | | | | | | | | | |
| UseDescription: | ConcGroup: | Tfer Raw: | | Corr: | Si | | | Unit: | PctDi | fference: | |
| primary primary | 1 2 | 0.09 29.91 | | 52 .51 | -0. | | ppb ppb | | | 0.29% | |
| primary | 3 | 50.08 | | .81 | 50. | | ppb ppb | | | -0.45% | |
| primary | 4 | 79.93 | | .83 | 81. | | ppb ppb | | | 0.46% | |
| primary | 5 | 110.04 | | 1.12 | 111 | | ppb | | | 0.70% | |
| Sensor Componen | | 110.01 | 1 | on 0.9 pp | | .>0 | | Status | 0255 | 0.7070 | |
| | | | | | | | | | 5455 | | |
| Sensor Componen | t Cell B Tmp. | | Conditi | on | | | | Status | pass | | |
| Sensor Componen | t Fullscale Voltage | | Conditi | on N/A | | | | Status | pass | | |
| Sensor Componen | t Inlet Filter Condition | n | Conditi | on Clean | | | | Status | pass | | |
| Sensor Componen | t Line Loss | | Conditi | on Not te | sted | | | Status | pass | | |
| Sensor Componen | t Offset | | Conditi | on 0.000 | | | | Status | pass | | |
| Sensor Componen | t Span | | Conditi | on 1.007 | | | | Status | pass | | |
| Sensor Componen | t Cell B Freq. | | Conditi | on 93.1 k | Hz | | | Status | pass | | |
| Sensor Componen | t System Memo | | Conditi | on | | | | Status | pass | | |
| Sensor Componen | t Sample Train | | Conditi | on Good | | | | Status | pass | | |
| Sensor Componen | t Cell B Pressure | | Conditi | on | | | | Status | pass | | |
| Sensor Componen | t Cell B Flow | | Conditi | on 0.71 l | pm | | | Status | pass | | |
| Sensor Componen | t Cell A Tmp. | | Conditi | on 31.5 (|) | | | Status | pass | | |
| Sensor Componen | t Cell A Pressure | | Conditi | on 719.1 | mmHg | | | Status | pass | | |
| Sensor Componen | t Cell A Noise | | Conditi | on 1.0 pp | b | | | Status | pass | | |
| Sensor Componen | t Cell A Freq. | | Conditi | on 96.9 k | Hz | | | Status | pass | | |
| Sensor Componen | t Cell A Flow | | Conditi | on 0.71 l | pm | | | Status | pass | | |
| Sensor Componen | t Battery Backup | | Conditi | on N/A | | | | Status | pass | | |
| Sensor Componen | t Zero Voltage | | Conditi | on N/A | | | | Status | pass | | |

Temperature Data Form

| Mfg | i | Serial Nun | nber Ta | Site | | Tec | hni | cian | Site V | isit Date | Param | eter | Owner II |) |
|-------------|-------|------------|---------------|----------|---------|-------|--------------|------------|--------|-----------|---------|-------------|-------------|-----|
| RM Young | | 14036 | | CDZ171 | | Sar | ndy | Grenville | 03/13 | /2015 | Temper | ature | 06403 | |
| | | | | | | | Mf | g | Extect | ۱ | Ра | rameter Te | mperature | |
| | | | | | | | Ser | ial Number | H2327 | '34 | Tf | er Desc. RT | D | |
| | | | | | | | Tfe | r ID | 01227 | |] | | | |
| DAS 1: | | | DAS 2: | | | | Slo j | ре | | 1.0034 | 3 Inte | rcept | -0.064 | 409 |
| Abs Avg Err | Abs | Max Er | Abs Avg | gErr Abs | Max Er | | Cer | rt Date | | 1/30/201 | 5 Cor | rCoff | 1.000 | 000 |
| 0.27 | | 0.48 | | | |] | | | | | | | | |
| UseDesc.: | | Test type: | Inp | utTmpRaw | InputTm | pCor | r.: | OutputTmpS | ignal: | OutputSig | nalEng: | OSE Unit: | Difference: | |
| primary | Temp | Low Range | e | 0.10 | 0.1 | 6 | | 0.000 | | 0.1 | - | С | -0.06 | |
| primary | Temp | Mid Range | ; | 24.95 | 24.9 | 93 | | 0.000 | | 24. | 7 | С | -0.28 | |
| primary | Temp | High Rang | e | 48.32 | 48.2 | 22 | | 0.000 | | 47. | 7 | С | -0.48 | |
| Sensor Com | ponen | t Shield | | | Cond | litio | n C | lean | | | Status | pass | |] |
| Sensor Com | ponen | t Blower S | tatus Swit | ch | Cond | litio | n N | I/A | | | Status | pass | |] |
| Sensor Com | ponen | t Blower | | | Cond | litio | n N | I/A | | | Status | pass | |] |
| Sensor Com | ponen | t System N | /lemo | | Cond | litio | n 🗌 | | | | Status | pass | |] |

| Infrastructure Data F | or | | | | | |
|-------------------------------------|---------------|----------------|---|---------------|----------------|------|
| Site ID CDZ171 | | Technician Sar | dy Grenville | Site Visit Da | ate 03/13/2015 | |
| Shelter Make | | Shelter Model | | Shelter Size | | |
| Ekto | | 8810 | | 640 cuft | | |
| <u> 1997 - Andrew Andrew Andrew</u> | | | 100.00000000000000000000000000000000000 | | | |
| Sensor Component | Shelter Roof | | Condition | Good | Status | pass |
| Sensor Component | Sample Towe | er Type | Condition | Туре В | Status | pass |
| Sensor Component | Met Tower | | Condition | N/A | Status | pass |
| Sensor Component | Moisture Tra | p | Condition | Installed | Status | pass |
| Sensor Component | Power Cable | S | Condition | Good | Status | pass |
| Sensor Component | Rotometer | | Condition | Installed | Status | pass |
| Sensor Component | Conduit | | Condition | N/A | Status | pass |
| Sensor Component | Sample Towe | er | Condition | Good | Status | pass |
| Sensor Component | Shelter Cond | lition | Condition | Fair | Status | pass |
| Sensor Component | Shelter Floor | | Condition | Poor | Status | Fail |
| Sensor Component | Shelter Temp | Control | Condition | Functioning | Status | pass |
| Sensor Component | Signal Cable | | Condition | Good | Status | pass |
| Sensor Component | Tubing Type | | Condition | 3/8 teflon | Status | pass |
| Sensor Component | Shelter Door | | Condition | Fair | Status | pass |
| Sensor Component | Sample Trair |) | Condition | Good | Status | pass |

Shelter Temperature Data For

| Mfg | Serial Number Ta | Site | Technician | Site Visit Date | Parameter | Owner ID |
|-------------------|---------------------------|----------------|-----------------|-----------------|---------------------|-----------------|
| Campbell | none | CDZ171 | Sandy Grenville | 03/13/2015 | Shelter Temperature | none |
| DAS 1: | DAS 2: | | Mfg | Extech | Parameter She | Iter Temperatur |
| Abs Avg ErrAb0.62 | os Max Er Abs Avg 0.67 | 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 | 25.50 | 25.48 | 0.000 | 24.8 | С | -0.67 |
| primary | Temp Mid Range | 25.15 | 25.13 | 0.000 | 24.6 | С | -0.53 |
| primary | Temp Mid Range | 24.40 | 24.38 | 0.000 | 23.7 | С | -0.67 |

Field Systems Comments

1 Parameter: SiteOpsProcComm

Tower is still being lowered and the deposition filter changed without downing ozone channel. This is a new site operator who has been partially trained by the previous backup site operator. He would benefit from additional training. It was observed that he did not complete the SSRF correctly and was unsure of some of the required instrument checks.

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

The shelter floor is beginning to rot again by the door. The shelter is still cluttered and dirty.

4 Parameter: PollAnalyzerCom

The zero air desiccant is saturated and should be replaced.

5 Parameter: MetSensorComme

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

| Site ID CDZ171 | Technician Sandy Grenville | e Site Visit Date 03/ | 13/2015 |
|------------------------|--|--------------------------------|--------------------------------------|
| | | LIGGE M. | Cadiz |
| Site Sponsor (agency) | EPA | USGS Map | |
| Operating Group | private, TVA | Map Scale | |
| AQS # | 21-221-9991 | Map Date | |
| Meteorological Type | R.M. Young | | |
| Air Pollutant Analyzer | Ozone, SO2, NOy, PM2.5, IMPROVE | QAPP Latitude | 36.7841 |
| Deposition Measurement | dry | QAPP Longitude | -87.8500 |
| Land Use | agriculture, woodland - mixed | QAPP Elevation Meters | 189 |
| Terrain | gently rolling | QAPP Declination | -2.01 |
| Conforms to MLM | Yes | QAPP Declination Date | 2/23/2006 |
| Site Telephone | (270) 522-9373 | Audit Latitude | 36.78405 |
| Site Address 1 | 4560 Old Dover Road | Audit Longitude | -87.8501 |
| Site Address 2 | route 1175 | Audit Elevation | 19 |
| County | Trigg | Audit Declination | -2.7 |
| City, State | Cadiz, KY | Present | |
| Zip Code | 42211 | Fire Extinguisher 🔽 | Inspected July 2014 |
| Time Zone | Central | First Aid Kit | |
| Primary Operator | | Safety Glasses | |
| Primary Op. Phone # | | Safety Hard Hat | |
| Primary Op. E-mail | | Climbing Belt | |
| Backup Operator | | Security Fence | |
| Backup Op. Phone # | | Secure Shelter | |
| Backup Op. E-mail | | Stable Entry Step 🔽 | |
| Shelter Working Room | Make Ekto M | odel 8810 | Shelter Size 640 cuft |
| Shelter Clean | Notes The shelter floor is beginning t | o rot again by the door. The s | helter is still cluttered and dirty. |
| Site OK | Notes | | |

Field Systems Data Form

CDZ171

F-02058-1500-S2-rev001

Site ID

Technician Sandy Grenville

Site Visit Date 03/13/2015

| 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 | | |
| City 10,000 to 50,000 population | 10 km | | |
| City 1,000 to 10,000 population | 5 km | | |
| Major highway, airport or rail yard | 2 km | | |
| Secondary road, heavily traveled | 500 m | | |
| Secondary road, lightly traveled | 200 m | | |
| Feedlot operations | 500 m | | |
| Intensive agricultural ops (including aerial spraying) | 500 m | | |
| Limited agricultural operations | 200 m | 15 m | |
| Large parking lot | 200 m | | |
| Small parking lot | 100 m | | |
| Tree line | 50 m | | |
| Obstacles to wind | 10 times obstacle height | | |

Siting Distances OK

Siting Criteria Comment

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

| Fi | eld Systems Data Fo | orm | | F-02058-1500-S3-rev001 |
|------|---|--|-------|--|
| Site | CDZ171 | Technician Sandy Grenville | | Site Visit Date 03/13/2015 |
| 1 | Are wind speed and direction being influenced by obstruction | | | N/A |
| 2 | Are wind sensors mounted so (i.e. wind sensors should be m horizontally extended boom > tower into the prevailing wind | ounted atop the tower or on a 2x the max diameter of the | | N/A |
| 3 | Are the tower and sensors plu | | | N/A |
| 4 | Are the temperature shields p avoid radiated heat sources su | | | |
| 5 | Are temperature and RH sense conditions? (i.e. ground below surface and not steeply sloped standing water should be avoi | sensors should be natural . Ridges, hollows, and areas of | | |
| 6 | Is the solar radiation sensor p | umb? | | N/A |
| 7 | Is it sited to avoid shading, or light? | any artificial or reflected | | N/A |
| 8 | Is the rain gauge plumb? | | | N/A |
| 9 | Is it sited to avoid sheltering e towers, etc? | ffects from buildings, trees, | | N/A |
| 10 | Is the surface wetness sensor s facing north? | ited with the grid surface | | N/A |
| 11 | Is it inclined approximately 3 | 0 degrees? | | N/A |
| Pro | vide any additional explanatio | n (photograph or sketch if neco | essar | y) regarding conditions listed above, or any other features, |

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

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

| reporting data? Are the shields for the temperature and RH sensors clean? Are the aspirated motors working? N/A Is the solar radiation sensor's lens clean and free of scratches? Is the surface wetness sensor grid clean and undamaged? N/A Are the sensor signal and power cables intact, in good condition, and well maintained? | | d Systems Data | a Form | | F-02058-1500-S4-rev001 | | | | |
|---|---------|--------------------------|--------------------------|-----------------|------------------------|----------------------------|--|--|--|
| condition, and well maintained? 2 Are all the meteorological sensors operational online, and reporting data? 3 3 Are the shields for the temperature and RH sensors clean? 4 Are the aspirated motors working? 5 15 15 15 15 16 15 16 17 Are the sensor signal and power cables intact, in good condition, and well maintained? 8 Are the sensor signal and power cables connections protected from the elements and well maintained? 17 Parameter Manufacturer Model S/N Client ID Temperature RM Young 41342VC 14036 06403 | Site II | CDZ171 | Technician | Sandy Grenville | | Site Visit Date 03/13/2015 | | | |
| 2 Are all the meteorological sensors operational online, and reporting data? Image: meteorological sensors operational online, and reporting data? 3 Are the shields for the temperature and RH sensors clean? Image: meteorological sensors operational online, and reporting data? 4 Are the aspirated motors working? Image: meteorological sensor operational online, and reporting data? 5 Is the solar radiation sensor 's lens clean and free of scratches? Image: meteorological sensor grid clean and undamaged? 6 Is the surface wetness sensor grid clean and undamaged? Image: meteorological 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? Image: meteorological and power cable connections protected from the elements and well maintained? Parameter Manufacturer Model 5 S/N Client ID | | | | ntact, in good | | Temperature only | | | |
| Are the shields for the temperature and RH sensors clean? Are the aspirated motors working? N/A Is the solar radiation sensor's lens clean and free of scratches? Is the surface wetness sensor grid clean and undamaged? N/A Are the sensor signal and power cables intact, in good condition, and well maintained? Are the sensor signal and power cable connections protected from the elements and well maintained? Parameter Manufacturer Model S/N Client ID Temperature RM Young 41342VC 14036 06403 | 2 A | re all the meteorologica | | online, and | | Temperature only | | | |
| 5 Is the solar radiation sensor's lens clean and free of scratches? 6 Is the surface wetness sensor grid clean and undamaged? 7 Are the sensor signal and power cables intact, in good condition, and well maintained? 8 Are the sensor signal and power cable connections protected from the elements and well maintained? Parameter Manufacturer Model S/N Client ID Temperature RM Young 41342VC 14036 06403 Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, | | | emperature and RH se | ensors clean? | | | | | |
| scratches? 6 Is the surface wetness sensor grid clean and undamaged? 7 Are the sensor signal and power cables intact, in good condition, and well maintained? 8 Are the sensor signal and power cable connections protected from the elements and well maintained? Parameter Manufacturer Model S/N Client ID Temperature RM Young 41342VC 14036 06403 | 4 A | re the aspirated motors | s working? | | | 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? Parameter Manufacturer Model S/N Client ID Temperature RM Young 41342VC 14036 06403 'rovide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, | | | isor's lens clean and fi | ree of | | N/A | | | |
| Into the sensor signal and power cable connections protected Image: Condition, and well maintained? 8 Are the sensor signal and power cable connections protected Image: Condition and connections and connecting connecting connecting connections and connections and connect | 6 Is | the surface wetness se | nsor grid clean and u | ndamaged? | | N/A | | | |
| from the elements and well maintained? Parameter Manufacturer Model S/N Client ID Temperature RM Young 41342VC 14036 06403 'rovide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, | | | | in good | | | | | |
| Temperature RM Young 41342VC 14036 06403 Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, | | | | ions protected | | | | | |
| rovide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, | Paran | neter | Manufacturer | Model | | S/N | Client ID | | |
| rovide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, | Temp | aratura | RM Young | /13/2\/C | | 14036 | 06403 | | |
| | | or man-made, that ma | y affect the monitorin | ig parameters: | 9066 (| | IN A DESCRIPTION OF THE READ OF THE READ | | |
| | | or man-made, that ma | y affect the monitorin | ng parameters: | | | | | |
| | | or man-made, that ma | y affect the monitorin | ig parameters: | | | | | |
| | | or man-made, that ma | y affect the monitorin | ig parameters: | | | | | |
| | | or man-made, that ma | y affect the monitorin | ig parameters: | | | | | |
| | | or man-made, that ma | y affect the monitorin | ig parameters: | | | | | |
| | | or man-made, that ma | y affect the monitorin | ig parameters: | | | | | |
| | | or man-made, that ma | ay affect the monitorin | ig parameters: | | | | | |
| | | or man-made, that ma | ay affect the monitorin | ig parameters: | | | | | |
| | | or man-made, that ma | ay affect the monitorin | ig parameters: | | | | | |
| | | or man-made, that ma | are a free the monitorin | ig parameters: | | | | | |

| Fie | eld Syste | ems Data F | 'orm | | | F-02058-1 | 500-S5-rev001 |
|------|--------------------------------|---------------------------------------|---------------------------|------------------------|-------------|--------------------------------------|----------------|
| Site | | Z171 | Technician S | andy Grenville | | Site Visit Date 03/13/2015 | |
| | Siting Crite | ria: Are the pollu | itant analyzers and | <u>l deposition eq</u> | <u>uipr</u> | nent sited in accordance with 40 CFR | 58, Appendix E |
| 1 | Do the samp unrestricted | | least a 270 degree | arc of | | | |
| 2 | Are the sam | ple inlets 3 - 15 r | neters above the g | round? | | | |
| 3 | | ple inlets > 1 me ers from trees? | ter from any majo | r obstruction, | | | |
| | Pollutant ar | alyzers and depo | osition equipment | operations and | mai | intenance | |
| | | yzers and equipn nd well maintaine | ent appear to be i ed? | n good | | | |
| | Are the ana reporting da | | ors operational, or | ı-line, and | | | |
| 3 | Describe oz | one sample tube. | | | | 1/4 teflon by 18 meters | |
| 4 | Describe dr | y dep sample tub | e. | | | 3/8 teflon by 15 meters | |
| | Are in-line f indicate loca | | ozone sample line | ? (if yes | | At inlet only | |
| | Are sample obstructions | | of kinks, moisture, | and | | | |
| 7 | Is the zero a | ir supply desicca | int unsaturated? | | | | |
| 8 | Are there m | oisture traps in t | he sample lines? | | | Flow line only | |
| | Is there a ro clean? | otometer in the d | ry deposition filter | line, and is it | | Clean and dry | |
| Par | ameter | N | Ianufacturer | Model | | S/N C | lient ID |

| Parameter | Manufacturer | Model | S/N | Client ID |
|-----------------------|-----------------------|-----------|--------------|-----------|
| Sample Tower | Aluma Tower | В | none | 000125 |
| Ozone | ThermoElectron Inc | 49i A1NAA | 1105347320 | 000727 |
| Filter pack flow pump | Thomas | 107CAB18D | 060400022646 | 06020 |
| Zero air pump | Werther International | PC70/4 | 000821902 | 06899 |

The zero air desiccant is saturated and should be replaced.

| Fie | eld Sy | ystems D | ata Form | | | | F-02058- | 1500-S6-rev | v001 | | |
|------|-------------------|--|---|-----------------|----------------|-------------------|------------|-------------|------|--|--|
| Site | ID | CDZ171 | Technician | Sandy Grenville | | Site Visit Date | 03/13/2015 | | | | |
| | DAS, s | ensor translat | ors, and peripheral equip | ment operation | <u>15 ai</u> | nd maintenance | | | | | |
| 1 | Do the well ma | DAS instrume aintained? | ents appear to be in good | condition and | | | | | | | |
| 2 | | the componer , backup, etc) | its of the DAS operationa | l? (printers, | | | | | | | |
| 3 | | analyzer and analyzer and analyzer and a | sensor signal leads pass th zircuitry? | nrough | | Met sensors only | | | | | |
| 4 | | e signal connec aintained? | tions protected from the | weather and | | | | | | | |
| 5 | Are the | e signal leads o | connected to the correct D | AS channel? | | | | | | | |
| 6 | Are the ground | | translators, and shelter p | roperly | | | | | | | |
| 7 | Does th | ie instrument | shelter have a stable powe | er source? | | | | | | | |
| 8 | Is the i | nstrument she | lter temperature controll | ed? | | | | | | | |
| 9 | Is the r | net tower stab | le and grounded? | | | Stable | Ground | led | | | |
| 10 | Is the s | ample tower s | table and grounded? | | | | | | | | |
| 11 | Tower | comments? | | | | Met tower removed | | | | | |
| Par | ameter | | Manufacturer | Model | | S/N | | Client ID | | | |
| Cor | nputer | | Dell | D520 | unknown 000281 | | | 000281 | | | |
| DAS | S | | Campbell | CR3000 | 100060 | 2130 | | 000352 | | | |
| Mod | dem | | Raven | V42221 | 144-02(201) | 0808338189 06457 | | | | | |

| Field Systems Data | Fo | rn | 1 | | | | | | | F-02 | 058 | -150 | 0-S7-rev001 |
|---|-------|----------|---------|---------|-----------------------|---------------|-----------|-----------------|-----------|---|----------|---|-------------------|
| Site ID CDZ171 | | Т | echi | nician | Sandy G | renville | | Site Visit D | ate 0 | 3/13/2015 | | | |
| | | | | | | | | | | | | | |
| Documentation | | | | | | | | | | | | | |
| Does the site have the requir | ed in | No. OF C | 1223.43 | | Charles and Contracts | ent manu | als? | | | | | | |
| W/ 1 | Yes | | No | N/. | A | Data | | | | Yes | No ✓ | N/A | |
| Wind speed sensor | | | | | | Data l | | | | | | Image: Construction Image: Construction< | |
| Wind direction sensor | | | | | | Data l | | | | | | v v | |
| Temperature sensor | | | 200 | | | 10,000,007,00 | | t recorder | | | | (1997) (1997) (1997) | |
| Relative humidity sensor | | | | | | Comp | | | | | | | |
| Solar radiation sensor | | | | | | Mode | | | | | <u> </u> | 10000000 | |
| Surface wetness sensor | | | | | | Printe | 179.93 | | | | | ✓ | |
| Wind sensor translator | | | | | | Zero a | 100 E F | | | | | | |
| Temperature translator | | | | | | | | pump | | | | | |
| Humidity sensor translator | 11 C. | | <u></u> | | | Surge | prot | tector | | ✓ | | | |
| Solar radiation translator | Ц | | | | | UPS | | | | | | | |
| Tipping bucket rain gauge | | | | | | | | protection de | vice | | | ✓ | |
| Ozone analyzer | | | | | | Shelte | | | | Image: A start of the start of | | | |
| Filter pack flow controller | | | | | | Shelte | r air | conditioner | | | | | |
| Filter pack MFC power supply | | | | | | | | | | | | | |
| Does the site have the requ | ired | and | mo | st rece | nt QC do | cuments | and | report forms | <u>s?</u> | | | | |
| | Pre | esen | t | | | | | | | Curren | nt 👘 | | |
| Station Log | | | | | | | 22.074-04 | | 1422 | | | | |
| SSRF | | | | | | | | | | | | | |
| Site Ops Manual | | | (| Oct 200 |)1 | | | | | | | | |
| HASP | | | 1 | Nov 20 | 09 | | | | | | | | |
| Field Ops Manual | | | | | | | | | | | | | |
| Calibration Reports | | | | | | | | | | | | | |
| Ozone z/s/p Control Charts | | | | | | | | | | | | | |
| Preventive maintenance schedu | d | | | | | | | | | | | | |
| 1 Is the station log properly | com | plet | ed d | uring | every site | e visit? | | linimal informa | ation | | | | |
| 2 Are the Site Status Report current? | For | ms | bein | g comj | pleted and | d 💽 | | | | | | | |
| 3 Are the chain-of-custody f sample transfer to and fro | | | oper | ly use | d to docu | ment 🛛 | | | | | | | |
| 4 Are ozone z/s/p control cha current? | arts | proj | perly | y comp | oleted and | | | ontrol charts r | not use | d | | | |
| Provide any additional explana natural or man-made, that may | | | | | | | ary) | regarding co | nditio | ns listed a | bove, | or any | v other features, |
| | | | | | | | | | | | | 1 | |

| Fie | eld S | ystems Dat | a Form | | F-02058-1500-S8-rev00 | 1 |
|--------|----------------------------|--|---|-------------|----------------------------|---|
| Site | e ID | CDZ171 | Technician Sandy Grenville | | Site Visit Date 03/13/2015 | |
| 1 2 | Has th course Has th | e? If yes, when an he backup operate | res Itended a formal CASTNET training [d who instructed? or attended a formal CASTNET when and who instructed? | - - - | | |
| 3 | Is the s schedu | and the second | rly on the required Tuesday | | | |
| 4 | | e standard CAST ed by the site ope | The operational procedures being | | | |
| 5 | | | nowledgeable of, and able to perform es? (including documentation) | | | |

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

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

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

| C | C | Che | ck P | erfo | rm | er |
|----|---|------|------|------|----|----|
| N. | | CIIC | UNI | UIIU | | u |

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

| Frequency | Compliant |
|---------------|-----------|
| Semiannually | |
| Daily | |
| | |
| Daily | |
| | |
| Weekly | |
| Every 2 weeks | |
| N/A | |
| | |
| Weekly | |

oliant

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

Call-in only

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

~

 \checkmark

| Fie | eld Sy | vstems Data Fo | orm | | | | | F -0 | 0 2058- 1 | 1500-8 | 9-rev001 |
|------|--|--|----------------|---------|---|---------|--------------------|-------------|------------------|----------|-------------|
| Site | e ID | CDZ171 | Techni | cian | Sandy Grenville |) | Site Visit Dat | e 03/13/2 | 015 | | |
| | Site ope | eration procedures | | | | | | | | | |
| 1 | Is the fi | lter pack being change | y as scheduled | ?⊻ | Filter changed afternoons (90% of the time) | | | | | | |
| 2 | Are the correctl | Site Status Report Fo | rms being | comp | bleted and filed | | | | | | |
| 3 | Are dat schedul | a downloads and back ed? | ormed as | | No longer required | | | | | | |
| 4 | Are gen | eral observations bein | g made ar | id rec | orded? How? | | SSRF | | | | |
| 5 | Are site fashion | supplies on-hand and ? | replenish | ed in | a timely | | | | | | |
| 6 | Are san | nple flow rates recorde | ed? How? | | | | SSRF, call-in | | | | |
| 7 | Are san fashion | nples sent to the lab on ? | a regular | sche | dule in a timely | | | | | | |
| 8 | Are filte and ship | ers protected from con pping? How? | taminatio | n dur | ing handling | | Clean gloves on a | nd off | | | |
| 9 | | site conditions reporte ons manager or staff? | ed regular | ly to 1 | the field | | | | | | |
| QC | Check P | erformed | | Free | luency | | | Compli | ant | | |
| N | Aulti-poi | nt MFC Calibrations | | Sem | iannually | 236.273 | | | | | |
| | Contraction of the second | em Leak Checks | | Wee | kly | | | | | | |
| | Filter Pack Inspection | | | | | | | | | | |
| | Flow Rate Setting Checks | | | | | | | | | | |
| | Visual Check of Flow Rate Rotometer 🗹 Weekly | | | | | | | | | | |
| I | In-line Filter Inspection/Replacement Semiannually | | | | | | | | | | |
| S | ample L | ine Check for Dirt/Wa | ter 🗌 | | | | | | | | |
| Prov | ride any a | additional explanation | (photogra | ph or | r sketch if nece | ssary | 7) regarding condi | tions liste | d above, or | any othe | r features, |

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

Tower is still being lowered and the deposition filter changed without downing ozone channel. This is a new site operator who has been partially trained by the previous backup site operator. He would benefit from additional training. It was observed that he did not complete the SSRF correctly and was unsure of some of the required instrument checks.

Site Inventory by Site Visit

| Site | Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|------|------------|-----------------------|-----------------------|----------|----------------|---------------|
| МС | K131-Sandy | Grenville-03/15/2015 | | | | |
| 1 | 3/15/2015 | Computer | Dell | 000457 | D520 | unknown |
| 2 | 3/15/2015 | DAS | Campbell | 000429 | CR3000 | 2535 |
| 3 | 3/15/2015 | Elevation | Elevation | None | 1 | None |
| 4 | 3/15/2015 | Filter pack flow pump | Thomas | 00497 | 107CA18 | 118700000596 |
| 5 | 3/15/2015 | Flow Rate | Арех | 000528 | AXMC105LPMDPCV | 48097 |
| 6 | 3/15/2015 | Infrastructure | Infrastructure | none | none | none |
| 7 | 3/15/2015 | Modem | Raven | 06477 | H4222-C | 0808311292 |
| 8 | 3/15/2015 | Ozone | ThermoElectron Inc | 000723 | 49i A1NAA | 1105347327 |
| 9 | 3/15/2015 | Ozone Standard | ThermoElectron Inc | 000366 | 49i A3NAA | 0726124695 |
| 10 | 3/15/2015 | Sample Tower | Aluma Tower | 03514 | A | none |
| 11 | 3/15/2015 | Shelter Temperature | Campbell | none | 107-L | none |
| 12 | 3/15/2015 | Siting Criteria | Siting Criteria | None | 1 | None |
| 13 | 3/15/2015 | Temperature | RM Young | 04318 | 41342 | 4037 |
| 14 | 3/15/2015 | Zero air pump | Werther International | 06912 | PC70/4 | 000829177 |

DAS Data Form DAS Time Max Error: 0 Serial Number Site Technician Site Visit Date Parameter Use Desc. Mfg Campbell 2535 MCK131 Sandy Grenville 03/15/2015 DAS Primary **Das Date:** 3 /15/2015 **Audit Date** 3 /15/2015 Datel **Parameter** DAS Mfg **Das Time:** 16:43:00 Audit Time 16:43:00 15510194 Tfer Desc. Source generator (D **Serial Number** 74 Das Day: 74 Audit Day Tfer ID 01320 **High Channel:** Low Channel: Max Diff: Avg Diff: Max Diff: Avg Diff: 1.00000 0.00000 Slope Intercept 0.0001 0.0002 0.0001 0.0002 1.00000 **Cert Date** 2/2/2010 CorrCoff Parameter DAS Fluke Mfg Serial Number 95740135 Tfer Desc. DVM 01311 Tfer ID 1.00000 0.00000 Slope Intercept 1/22/2015 1.00000 **Cert Date CorrCoff** Channel Input DVM Output DAS Output InputUnit OutputUnit Difference V 7 0.0000 -0.0001 0.0000 V 0.0001 V V 7 0.1000 0.0998 0.0999 0.0001 7 0.3000 0.2997 0.2998 V V 0.0001 7 0.5000 0.4997 V V 0.0002 0.4995 7 0.7000 V V 0.0001 0.6995 0.6996 7 V V 0.9000 0.8994 0.8994 0.0000

0.9993

V

V

0.0001

7

1.0000

0.9992

Flow Data Form

| Mfg | Se | erial Num | ıber Ta | Site | Тес | chnician | Site Visit I | Date Paran | neter | Owner ID |
|--------------------------------------|---------|-------------|-----------------|-----------------|-----------|-----------------|--------------|------------|------------|-------------------|
| Арех | 4 | 8097 | | MCK131 | Sa | ndy Grenville | 03/15/201 | 5 Flow R | Rate | 000528 |
| | | | | | | Mfg | BIOS | Р | arameter | Flow Rate |
| | | | | | | Serial Number | 103471 | Т | fer Desc. | nexus |
| | | | | | | Tfer ID | 01420 | | _ | |
| | | | | | | | | | | |
| | | | | | | Slope | | | ercept | 0.03078 |
| | | | | | | Cert Date | 2/ | 5/2015 Col | rrCoff | 0.99996 |
| | | | | | | Mfg | BIOS | P | arameter | Flow Rate |
| | | | | | | Serial Number | 103424 | Т | fer Desc. | BIOS cell |
| | | | | | | Tfer ID | 01410 | | | |
| | | | | | | | | 00004 | | 0.02070 |
| | | | | | | Slope | | | ercept | 0.03078 |
| | | | | | | Cert Date | 2/ | 5/2015 Col | rrCoff | 0.99996 |
| DAS 1: | | | DAS 2: | | | Cal Factor Z | ero | 0.00 | 05 | |
| A Avg % Diff: | A May | x % Di | A Avg %I | Dif A Max | : % Di | Cal Factor F | ull Scale | 1.01 | 16 | |
| 0.29% | | 0.46% | | | | Rotometer R | eading: | 1 | .5 | |
| UseDescription | : Tes | st type: | Input l/m: | Input STP: | MfcDisp.: | OutputSignal: | Output S E: | InputUnit: | OutputSign | allPctDifference: |
| primary | pump | | 0.000 | 0.000 | -0.01 | -0.001 | 0.00 | l/m | l/m | |
| primary | leak c | | 0.000 | 0.000 | 0.00 | -0.002 | 0.00 | l/m | l/m | |
| primary | test pt | | 1.549 | 1.504 | 1.48 | 1.479 | 1.50 l/m | | l/m | -0.27% |
| primary | test pt | | 1.551 | 1.507 | 1.48 | 1.484 | 1.51 | l/m | l/m | -0.13% |
| primary | test pt | t 3 | 1.550 | 1.506 | 1.48 | 1.478 | 1.50 | l/m | l/m | -0.46% |
| Sensor Comp | onent | Leak Tes | t | | Conditio | n | | Status | pass | |
| Sensor Comp | onent | Filter Azir | muth | | Conditio | n 200 deg | | Status | pass | |
| Sensor Comp | onent | Filter Dep | oth | | Conditio | n 1.0 cm | | Status | pass | |
| Sensor Comp | onent | Filter Pos | ition | | Conditio | n Good | | Status | pass | |
| Sensor Component Moisture Present | | | Conditio | n No moisture p | resent | Status | pass | | | |
| Sensor Component Rotometer Condition | | Conditio | n Clean and dry | | Status | pass | | | | |
| Sensor Component System Memo | | Conditio | n | | Status | pass | | | | |
| Sensor Component Tubing Condition | | | Conditio | n Good | | Status | pass | | | |
| Sensor Component Filter Distance | | | Conditio | n 4.5 cm | | Status | pass | | | |
| | | | | | | | | | | |

Ozone Data Form

| Mfg | fg Serial Number Tag S | | | echnician | | Site Visit Date | | | Parameter | | D |
|--------------------|---|----------------|---------------------|----------------------|------------|-----------------|-------------|--------|------------|----------------------|--------|
| ThermoElectron Inc | MCK131 | S | andy Grei | nville | 03/15/2015 | | Ozone | | 000723 | | |
| Intercept -0. | 99746 Slope: 87322 Intercept 99995 CorrCoff | 0.0000 | D | Mfg Serial N | umber | | | | rameter of | zone zone primary | / stan |
| | Correon | 0.00000 | 0 | Tfer ID 01112 | | | | | | | |
| DAS 1: | DAS 2: | | | Slope | | | 0.99405 | Intero | cept | -0.42 | 803 |
| A Avg % Diff: A Ma | 6Dif A Max 9 | Dif A Max % Di | | | | 3/9/2015 | _ | - L | 1.00 | 000 | |
| 2.3% | 4.5% | | | Cert Da | | | 0/0/2010 | | | | |
| UseDescription: | ConcGroup: | Tfer Raw: | | Corr: | Si | | | Unit: | PctDi | fference: | |
| primary | 1 | -0.02 | | 41 | 0.0 | | ppb | | | | |
| primary | 2 | 30.02 | | .63 | 29. | | ppb | | | -4.54% | |
| primary | 3 | 49.99 | - | .71 | 49. | | ppb | | | -2.80% | |
| primary | 4 | 79.84 | | .74 | 79. | | ppb | | | -1.19% | |
| primary | 5 | 109.75 | 1 |).83 | 109 | .90 | ppb | | | -0.84% | |
| Sensor Componen | t Cell B Noise | | Conditi | on 0.9 pp | b | | | Status | pass | | |
| Sensor Componen | t Cell B Tmp. | | Conditi | on | | | | Status | pass | | |
| Sensor Componen | t Fullscale Voltage | | Condition N/A | | | | | Status | pass | | |
| Sensor Componen | t Inlet Filter Condition | on | Conditi | on Clean | | | | Status | pass | | |
| Sensor Componen | t Line Loss | | Conditi | on Not te | sted | | | Status | pass | | |
| Sensor Componen | t Offset | | Conditi | on 0.30 | | | | Status | pass | | |
| Sensor Componen | t Span | | Condition 1.031 | | | | Status | pass | | | |
| Sensor Componen | t Cell B Freq. | | Condition 100.2 kHz | | | | Status pass | | | | |
| Sensor Componen | t System Memo | | Conditi | on | | Status | | | pass | | |
| Sensor Componen | t Sample Train | | Conditi | on Good | | | | Status | pass | | |
| Sensor Componen | t Cell B Pressure | | Conditi | on | | | | Status | pass | | |
| Sensor Componen | t Cell B Flow | | Conditi | on 0.72 l | pm | | | Status | pass | | |
| Sensor Componen | t Cell A Tmp. | | Conditi | on 34.2 (| 2 | | | Status | pass | | |
| Sensor Componen | t Cell A Pressure | | Conditi | on 725.9 | mmHg | | | Status | pass | | |
| Sensor Componen | t Cell A Noise | | Conditi | on 1.4 pp | b | | | Status | pass | | |
| Sensor Componen | t Cell A Freq. | | Conditi | on 91.5 k | Hz | | | Status | pass | | |
| Sensor Componen | Sensor Component Cell A Flow | | | Condition 0.67 lpm | | | | Status | pass | | |
| Sensor Componen | t Battery Backup | | Conditi | on N/A | | | | Status | pass | | |
| Sensor Componen | t Zero Voltage | | Conditi | on N/A | | | | Status | pass | | |

Temperature Data Form

| Mfg | | Serial Nun | ıber Ta | Site | | Tech | hnic | ian | Site V | isit Date | Param | eter | Owner II |) |
|---------------|-------|-------------|---------------|----------|----------|-------|-------|------------|--------|-----------|---------|--------------|-------------|-----|
| RM Young | | 4037 | | MCK131 | | San | ndy G | Grenville | 03/15/ | /2015 | Temper | rature | 04318 | |
| | | | | | | N | Mfg | | Extech | | Pa | arameter Te | mperature | |
| | | | | | | S | Seria | al Number | H2327 | 34 | Tf | fer Desc. RT | D | |
| | | | | | | ſ | Tfer | · ID | 01227 | | | | | |
| DAS 1: | | | DAS 2: | | | S | Slop | e | | 1.0034 | 3 Inte | rcept | -0.064 | 409 |
| Abs Avg Err | Abs | Max Er | Abs Avg | Err Abs | Max Er | 0 | Cert | t Date | | 1/30/201 | 5 Cor | rCoff | 1.000 | 000 |
| 0.17 | | 0.36 | | | | | | | | | | | | |
| UseDesc.: | | Test type: | Inp | utTmpRaw | InputTmp | Corr | r.: (| OutputTmpS | ignal: | OutputSig | nalEng: | OSE Unit: | Difference: | |
| primary | Temp | Low Range | ; | 0.07 | 0.13 | 3 | | 0.000 | | 0.1 | | С | -0.04 | |
| primary | Temp | Mid Range | | 25.10 | 25.0 | 8 | | 0.000 | | 25. | 0 | С | -0.12 | |
| primary | Temp | High Rang | e | 48.80 | 48.7 | 0 | | 0.000 | | 48. | 3 | С | -0.36 | |
| Sensor Com | ponen | t Shield | | | Cond | ition | | ean | | | Status | pass | | |
| Sensor Com | ponen | t Blower St | atus Swit | ch | Cond | ition | 1 N// | A | | | Status | pass | |] |
| Sensor Com | ponen | t Blower | | | Cond | ition | ı Fu | Inctioning | | | Status | pass | | |
| Sensor Com | ponen | t System M | lemo | | Cond | ition | 1 | | | | Status | pass | | |

Shelter Temperature Data For

| Mfg | Serial Number Ta | Site | Technician | Site Visit Date | Parameter | Owner ID |
|-------------------|---------------------------|----------------|-----------------|-----------------|---------------------|------------------|
| Campbell | none MCK131 | | Sandy Grenville | 03/15/2015 | Shelter Temperature | none |
| DAS 1: | DAS 2: | | Mfg | Extech | Parameter She | elter Temperatur |
| Abs Avg ErrAb0.20 | os Max Er Abs Avg 0.42 | Err Abs Max Er | Serial Number | H232734 | Tfer Desc. RT | D |
| | | | 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 | 24.97 | 24.95 | 0.000 | 25.0 | С | 0.07 |
| primary | Temp Mid Range | 25.03 | 25.01 | 0.000 | 25.1 | С | 0.1 |
| primary | Temp Mid Range | 27.34 | 27.31 | 0.000 | 26.9 | С | -0.42 |

| Infrastructure Data F | or | | | | | |
|-----------------------|--------------|----------------------|---------------|-----------------|------------|------|
| Site ID MCK131 | | Technician Sa | ndy Grenville | Site Visit Date | 03/15/2015 | |
| Shelter Make | | Shelter Model | | Shelter Size | | |
| Ekto | | 8810 | | 640 cuft | | |
| | | | | | | |
| Sensor Component | Shelter Roof | | Condition | Good | Status | pass |
| Sensor Component | Sample Tow | er Type | Condition | Туре А | Status | pass |
| Sensor Component | Met Tower | | Condition | Fair | Status | pass |
| Sensor Component | Moisture Tra | p | Condition | Installed | Status | pass |
| Sensor Component | Power Cable | s | Condition | Good | Status | pass |
| Sensor Component | Rotometer | | Condition | Installed | Status | pass |
| Sensor Component | Conduit | | Condition | N/A | Status | pass |
| Sensor Component | Sample Tow | er | Condition | Fair | Status | pass |
| Sensor Component | | | Condition | Good | Status | pass |
| Sensor Component | | | Condition | Fair | Status | pass |
| Sensor Component | | | Condition | Functioning | Status | pass |
| Sensor Component | | | Condition | Good | Status | pass |
| Sensor Component | | | Condition | | Status | |
| Sensor Component | | | Condition | | Status | |
| Sensor Component | | | Condition | | Status | |

Field Systems Comments

1 Parameter: ShelterCleanNotes

The shelter is neat, clean, and well organized.

Site Inventory by Site Visit

| Site | Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|------|------------|-----------------------|-----------------------|----------|----------------|---------------|
| МС | K231-Sandy | Grenville-03/15/2015 | | | | |
| 1 | 3/15/2015 | Computer | Dell | 000458 | D530 | unknown |
| 2 | 3/15/2015 | DAS | Campbell | 000359 | CR3000 | 2137 |
| 3 | 3/15/2015 | Elevation | Elevation | None | 1 | None |
| 4 | 3/15/2015 | Filter pack flow pump | Thomas | 04513 | 107CAB18B | 110000014171 |
| 5 | 3/15/2015 | Flow Rate | Арех | 000529 | AXMC105LPMDPCV | illegible |
| 6 | 3/15/2015 | Infrastructure | Infrastructure | none | none | none |
| 7 | 3/15/2015 | Modem | Raven | 06476 | H4222-C | 0808311140 |
| 8 | 3/15/2015 | Ozone | ThermoElectron Inc | 000682 | 49i A1NAA | 1030244796 |
| 9 | 3/15/2015 | Ozone Standard | ThermoElectron Inc | 000369 | 49i A3NAA | 0726124690 |
| 10 | 3/15/2015 | Shelter Temperature | Campbell | none | 107-L | none |
| 11 | 3/15/2015 | Siting Criteria | Siting Criteria | None | 1 | None |
| 12 | 3/15/2015 | Temperature | RM Young | 06542 | 41342VC | 14803 |
| 13 | 3/15/2015 | Zero air pump | Werther International | 06924 | C 70/4 | 000836205 |

DAS Data Form DAS Time Max Error: 0 Serial Number Site Technician Site Visit Date Parameter Use Desc. Mfg Campbell 2137 MCK231 Sandy Grenville 03/15/2015 DAS Primary **Das Date:** 3 /15/2015 Audit Date 3 /15/2015 Datel **Parameter** DAS Mfg 16:51:10 Das Time: 16:51:10 **Audit Time** 15510194 Tfer Desc. Source generator (D **Serial Number** 74 Das Day: 74 Audit Day **Tfer ID** 01320 Low Channel: **High Channel:** Avg Diff: **Max Diff:** Avg Diff: Max Diff: 1.00000 0.00000 Slope Intercept 0.0002 0.0005 0.0002 0.0005 1.00000 **Cert Date** 2/2/2010 CorrCoff Fluke **Parameter** DAS Mfg **Serial Number** 95740135 Tfer Desc. DVM 01311 Tfer ID 1.00000 0.00000 Slope Intercept

Cert Date

1/22/2015

CorrCoff

1.00000

| Channel | Input | DVM Output | DAS Output | InputUnit | OutputUnit | Difference | |
|---------|--------|------------|------------|-----------|------------|------------|--|
| 7 | 0.0000 | -0.0001 | 0.0001 | V | V | 0.0002 | |
| 7 | 0.1000 | 0.0998 | 0.1000 | V | V | 0.0002 | |
| 7 | 0.3000 | 0.2997 | 0.3000 | V | V | 0.0003 | |
| 7 | 0.5000 | 0.4996 | 0.5000 | V | V | 0.0004 | |
| 7 | 0.7000 | 0.6995 | 0.7000 | V | V | 0.0005 | |
| 7 | 0.9000 | 0.8994 | 0.8994 | V | V | 0.0000 | |
| 7 | 1.0000 | 0.9992 | 0.9993 | V | V | 0.0001 | |

Flow Data Form

| Mfg | S | erial Nun | ıber Ta | Site | Тес | hnician | Site Visit I | Date Param | leter | Owner ID |
|----------------|--------|-------------|---------------|------------|-----------|------------------|--------------|-------------------|------------|-------------------|
| Арех | il | legible | | MCK231 | Sa | ndy Grenville | 03/15/2015 | 5 Flow R | ate | 000529 |
| | | | | | [| Mfg | BIOS | P | arameter | Flow Rate |
| | | | | | | Serial Number | 103471 | | fer Desc. | |
| | | | | | | Tfer ID | 01420 | | | |
| | | | | | | Tier ID | 01420 | | | |
| | | | | | | Slope | 0. | 96664 Inte | ercept | 0.03078 |
| | | | | | | Cert Date | 2/ | 5/2015 Cor | rCoff | 0.99996 |
| | | | | | | Mfg | BIOS | P | arameter | Flow Rate |
| | | | | | | Serial Number | 103424 | Т | fer Desc. | BIOS cell |
| | | | | | | Tfer ID | 01410 | | | |
| | | | | | | Slope | 0. | 96664 Inte | ercept | 0.03078 |
| | | | | | | Cert Date | 2/ | 5/2015 Cor | rCoff | 0.99996 |
| DAS 1: | | | DAS 2: | | L | Cal Factor Z | ero | 0.01 | 4 | |
| A Avg % Diff: | A Ma | x % Di | A Avg % | Dif A Max | : % Di | Cal Factor F | ull Scale | 1.0 |)1 | |
| 1.28% | | 1.75% | | | | Rotometer R | eading: | 1. | .5 | |
| UseDescription | Te | st type: | Input l/m: | Input STP: | MfcDisp.: | OutputSignal: | Output S E: | InputUnit: | OutputSign | allPctDifference: |
| primary | pump | | 0.000 | 0.000 | 0.03 | 0.030 | 0.04 | l/m | l/m | |
| primary | - | check | 0.000 | 0.000 | 0.01 | 0.003 | 0.04 | l/m | l/m | |
| primary | test p | | 1.527 | 1.482 | 1.49 | 1.497 | 1.51 | l/m | l/m | 1.75% |
| primary | test p | | 1.528 | 1.483 | 1.49 | 1.490 | 1.50 | l/m | l/m | 1.01% |
| primary | test p | t 3 | 1.522 | 1.478 | 1.49 | 1.486 | 1.49 | l/m | l/m | 1.08% |
| Sensor Comp | onent | Leak Tes | t | | Conditio | n | | Status | pass | |
| Sensor Comp | onent | Filter Azir | muth | | Conditio | n 160 deg | | Status | pass | |
| Sensor Comp | onent | Filter Dep | oth | | Conditio | n 1.5 cm | | Status | pass | |
| Sensor Comp | onent | Filter Pos | ition | | Conditio | n Good | | Status | pass | |
| Sensor Comp | onent | Moisture | Present | | Conditio | n No moisture pr | resent | Status | pass | |
| Sensor Comp | | | | 1 | Conditio | n Clean and dry | | Status | pass | |
| Sensor Comp | | | | | Conditio | | | Status | | |
| | | | | Conditio | | | Status | | | |
| Sensor Comp | | | | | Conditio | | | _ | | |
| Sensor Comp | onent | | | | | | | Status | Pass | |

Ozone Data Form

| Mfg | Serial Number Tag | Site | Te | echnician | | Site Visi | t Date | Paramet | ter | Owner I | D |
|---------------------------------------|--|-----------------|---------|-----------------|--------|--------------------|------------|----------|------------|----------------------|--------|
| ThermoElectron Inc | 1030244796 | MCK231 | S | andy Gre | nville | 03/15/20 | 015 | Ozone | | 000682 | |
| Intercept -0 | 00750 Slope: 0.0000 57296 Intercept 0.0000 99996 CorrCoff 0.0000 | | 0 | Mfg Serial N | lumber | ThermoE 0419606 | | | rameter of | zone zone primary | / stan |
| | | | | Tfer ID | | 01112 | | | | | |
| DAS 1: | DAS 2: | | | Slope | | | 0.99405 | Inter | cept | -0.42 | 803 |
| A Avg % Diff: A M | | 6Dif A Max 9 | % Di | Cert Da | ıte | | 3/9/2015 | 5 Corr(| Coff | 1.00 | 000 |
| 1.0% | 2.3% | | | | | | | | | | |
| UseDescription: | ConcGroup: | Tfer Raw: | | Corr: | Si | | | Unit: | PctDi | fference: | |
| primary | 1 | 0.04 | | .47 | 0.4 | | ppb | | | 2 200/ | |
| primary | 2 | 30.00 | | 0.61 | 29. | | ppb | | | -2.29% | |
| primary | 3 | 50.18 | | .91 | 50. | | ppb | | | -1.10% | |
| primary | 4 5 | 79.91 109.99 | | 0.81 1.07 | 80. | | ppb nnh | | | -0.14% 0.57% | |
| primary | | 109.99 | 1 | | | .70 | ppb | | | 0.37% | |
| Sensor Componen | t Cell B Noise | | Conditi | ion 1.4 pp | b | | | Status | pass | | |
| Sensor Componen | t Cell B Tmp. | | Conditi | ion | | | | Status | pass | | |
| Sensor Componen | t Fullscale Voltage | | Conditi | ion N/A | | | | Status [| pass | | |
| Sensor Componen | t Inlet Filter Condition | on | Conditi | ion Clean | 1 | | | Status | pass | | |
| Sensor Componen | t Line Loss | | Conditi | on Not te | ested | | | Status | pass | | |
| Sensor Componen | t Offset | | Conditi | on 0.3 | | | | Status | pass | | 1 |
| Sensor Componen | t Span | | Conditi | on 1.017 | | | | Status | pass | | |
| Sensor Componen | t Cell B Freq. | | Conditi | on 79.7 k | κHz | | | Status | pass | | |
| Sensor Componen | | | Conditi | ion | | | | Status | pass | | |
| Sensor Componen | | | Conditi | on Good | | | | Status | pass | | |
| Sensor Componen | | | Conditi | | | | | Status | | | |
| Sensor Componen | | | | on 0.73 l | pm | | | Status | | | |
| Sensor Componen | | | | on 35.7 (| | | | Status | | | |
| Sensor Componen | <u> </u> | | | on 712.5 | | | | Status | | | |
| Sensor Componen | | | | ion 1.6 pr | | | | Status | | | |
| Sensor Componen | <u></u> | | | on 96.4 k | | | | Status | | | |
| Sensor Componen | | | | on 0.74 l | | | | Status | | | |
| Sensor Componen | | | Conditi | | | | | Status | | | |
| Sensor Componen | | | Conditi | | | | | Status | | | |
| • • • • • • • • • • • • • • • • • • • | | | | | | | | Ľ | | | |

Temperature Data Form

| Mfg | | Serial Nun | nber Ta | Site | | Tec | hni | cian | Site V | isit Date | Param | eter | Owner I | D |
|-------------|-------|------------|---------------|-----------|---------|--------|------|------------|--------|-----------|---------|-------------|-------------|-----|
| RM Young | | 14803 | | MCK231 | | Sar | ndy | Grenville | 03/15 | /2015 | Temper | rature | 06542 | |
| | | | | | |] | Mfg | g | Extect | ı | Pa | arameter Te | emperature | |
| | | | | | | | Seri | ial Number | H2327 | /34 | Tí | fer Desc. R | ſD | |
| | | | | | | , | Tfe | r ID | 01227 | | | | | |
| DAS 1: | | | DAS 2: | | | 5 | Sloj | ре | | 1.0034 | 3 Inte | rcept | -0.06 | 409 |
| Abs Avg Err | Abs | Max Er | Abs Avg | g Err Abs | Max Er | • | Cer | rt Date | | 1/30/201 | 5 Cor | rCoff | 1.00 | 000 |
| 0.21 | | 0.41 | | | |] | | | | | | | | |
| UseDesc.: | | Test type: | Inp | outTmpRaw | InputTm | pCor | r.: | OutputTmpS | ignal: | OutputSig | nalEng: | OSE Unit: | Difference: | |
| primary | Temp | Low Range | e | 0.07 | 0.13 | 3 | | 0.000 | | 0.1 | | С | -0.08 | |
| primary | Temp | Mid Range | ; | 25.10 | 25.0 |)8 | | 0.000 | | 24. | 9 | С | -0.14 | |
| primary | Temp | High Rang | e | 48.80 | 48.7 | 0'0 | | 0.000 | | 48. | 3 | C | -0.41 | |
| Sensor Com | ponen | t Shield | | | Cond | litior | n C | lean | | | Status | pass | | |
| Sensor Com | ponen | t Blower S | tatus Swi | tch | Cond | litior | n N | I/A | | | Status | pass | | |
| Sensor Com | ponen | t Blower | | | Cond | litior | n F | unctioning | | | Status | pass | | |
| Sensor Com | ponen | t System N | /lemo | | Cond | litior | n 🗌 | | | | Status | pass | | |

Shelter Temperature Data For

| Mfg | Serial Number Ta | Site | Technician | Site Visit Date | Parameter | Owner ID |
|-------------------|---------------------------|----------------|-----------------|-----------------|---------------------|------------------|
| Campbell | none MCK231 | | Sandy Grenville | 03/15/2015 | Shelter Temperature | none |
| DAS 1: | DAS 2: | | Mfg | Extech | Parameter She | elter Temperatur |
| Abs Avg ErrAb0.45 | os Max Er Abs Avg 0.76 | Err Abs Max Er | Serial Number | H232734 | Tfer Desc. RTI | D |
| | | | 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 | 29.60 | 29.56 | 0.000 | 30.3 | С | 0.76 |
| primary | Temp Mid Range | 25.20 | 25.18 | 0.000 | 25.3 | С | 0.13 |
| primary | Temp Mid Range | 23.40 | 23.38 | 0.000 | 23.8 | С | 0.46 |

| Infrastructure Data F | `or | | | | |
|-----------------------|----------------------|---|-------------------------|--------|------|
| Site ID MCK231 | 1 Technician San | dy Grenville | Site Visit Date 03/15/2 | 015 | |
| Shelter Make | Shelter Model | | Shelter Size | | |
| Ekto | 8810 | | 640 cuft | | |
| | | 1000-000-000-000-000-000-000-000-000-00 | | | |
| Sensor Component | Shelter Roof | Condition | Fair | Status | nass |
| | | <u>-</u> | | | |
| Sensor Component | Sample Tower Type | Condition | Туре А | 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 | Rotometer | Condition | Installed | Status | pass |
| Sensor Component | Conduit | Condition | N/A | Status | pass |
| Sensor Component | Sample Tower | Condition | Fair | Status | pass |
| Sensor Component | Shelter Condition | Condition | Good | Status | pass |
| Sensor Component | Shelter Floor | Condition | Fair | Status | pass |
| Sensor Component | Shelter Temp Control | Condition | Functioning | Status | pass |
| Sensor Component | Signal Cable | Condition | Good | Status | pass |
| Sensor Component | Tubing Type | Condition | 3/8 teflon | Status | pass |
| Sensor Component | Shelter Door | Condition | Good | Status | pass |
| Sensor Component | Sample Train | Condition | Good | Status | pass |

Field Systems Comments

1 Parameter: ShelterCleanNotes

The site instruments are located in the MCK131 shelter. The same site operator is servicing both sites.

| Site ID MCK131 | Technician Sandy Gree | nville Site Visit Date 03/ | 15/2015 |
|------------------------|-----------------------------------|----------------------------|-----------------------|
| Site Sponsor (agency) | EPA | USGS Map | Mackville |
| Operating Group | Private | Map Scale | |
| AQS# | 21-229-9991 | Map Date | |
| Meteorological Type | R.M. Young | | |
| Air Pollutant Analyzer | Ozone | QAPP Latitude | 37.7044 |
| Deposition Measurement | dry, wet | QAPP Longitude | -85.0483 |
| Land Use | agriculture, woodland - mixed | QAPP Elevation Meters | 353 |
| Terrain | rolling | QAPP Declination | 4.25 |
| Conforms to MLM | Marginally | QAPP Declination Date | 12/28/2004 |
| Site Telephone | (859) 262-5181 | Audit Latitude | 37.70467 |
| Site Address 1 | Westley Miller Road | Audit Longitude | -85.04870 |
| Site Address 2 | | Audit Elevation | 29 |
| County | Washington | Audit Declination | -4.5 |
| City, State | Harrodsburg, KY | | |
| Zip Code | 40330 | Fire Extinguisher ☑ | Inspected Nov 1992 |
| Time Zone | Eastern | First Aid Kit | |
| Primary Operator | | Safety Glasses | |
| Primary Op. Phone # | | Safety Hard Hat | |
| Primary Op. E-mail | | Climbing Belt | |
| Backup Operator | | Security Fence | |
| Backup Op. Phone # | | Secure Shelter | |
| Backup Op. E-mail | | Stable Entry Step | |
| Shelter Working Room ☑ | Make Ekto | Model 8810 | Shelter Size 640 cuft |
| Shelter Clean | Notes The shelter is neat, clean, | and well organized. | |
| Site OK | Notes | | |

Field Systems Data Form

MCK131

F-02058-1500-S2-rev001

Site ID

Technician Sandy Grenville

Site Visit Date 03/15/2015

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

Siting Distances OK

Siting Criteria Comment

| Fi | eld Systems Data Form | | F-02058-1500-S3-rev00 | | | | |
|------|--|---------|--|--|--|--|--|
| Site | MCK131 Technician Sandy Grenv | ville | Site Visit Date 03/15/2015 | | | | |
| 1 | Are wind speed and direction sensors sited so as to avoid being influenced by obstructions? | | Ν/Α | | | | |
| 2 | Are wind sensors mounted so as to minimize tower effects (i.e. wind sensors should be mounted atop the tower or on 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 t avoid radiated heat sources such as buildings, walls, etc? | 0 | | | | | |
| 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 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? | | Ν/Α | | | | |
| Pro | wide any additional avalanation (photograph or skotch if a | ACACCAT | w) regarding conditions listed above or any other features | | | | |

| Field Systems Data Form | | | | | F-02058-1500-S4-rev001 | | | |
|-------------------------|--|------------------------|------------------|-------|----------------------------|-----------|--|--|
| Site | ID MCK131 | Technician | Sandy Grenville | | Site Visit Date 03/15/2015 | | | |
| | | | | | F. | | | |
| | Do all the meterological s condition, and well main | | intact, in good | | Temperature only | | | |
| | Are all the meteorologica reporting data? | ll sensors operationa | l online, and | | Temperature only | | | |
| 3 | Are the shields for the ter | mperature and RH s | ensors clean? | | | | | |
| 4 | Are the aspirated motors | working? | | | | | | |
| | Is the solar radiation sen scratches? | sor's lens clean and t | free of | | N/A | | | |
| 6 | Is the surface wetness ser | nsor grid clean and u | indamaged? | | N/A | | | |
| | Are the sensor signal and condition, and well main | | , in good | | | | | |
| 8 | Are the sensor signal and from the elements and w | l power cable connec | ctions protected | | | | | |
| Para | ameter | Manufacturer | Model | | S/N | Client ID | | |
| Tem | perature | RM Young | 41342 | 582.9 | 4037 | 04318 | | |
| | al or man-made, that ma | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

| Fie | ld Systems Data Form | F-02058-1500-S5-rev001 | |
|------|---|------------------------|---|
| Site | ID MCK131 Technician Sandy Grenvill | e | Site Visit Date 03/15/2015 |
| | Siting Criteria: Are the pollutant analyzers and deposition | equip | 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 a | <mark>ıd ma</mark> | 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? | | Flow line only |
| 9 | Is there a rotometer in the dry deposition filter line, and is i clean? | t 🗹 | Clean and dry |
| Par | ameter Manufacturer Model | | S/N Client ID |

| Parameter | Manufacturer | Model | S/N | Client ID | |
|-----------------------|-----------------------|-----------|--------------|-----------|--|
| Sample Tower | Aluma Tower | A | none | 03514 | |
| Ozone | ThermoElectron Inc | 49i A1NAA | 1105347327 | 000723 | |
| Filter pack flow pump | Thomas | 107CA18 | 118700000596 | 00497 | |
| Zero air pump | Werther International | PC70/4 | 000829177 | 06912 | |

| Field Systems Data Form | | | | | | | F-02 |)58-15 | 00-S6-rev001 |
|-------------------------|---------------------|---|------------------|-----------------|--------------|-----------------------|-------------|----------------------|--------------|
| Site | ID | MCK131 | Technician | Sandy Grenville | | Site Visit Date | 03/15/2015 | | |
| | DAS, se | nsor translators, and j | peripheral equi | pment operation | <u>is ai</u> | <u>nd maintenance</u> | | | |
| 1 | Do the l well ma | DAS instruments appe intained? | ar to be in good | l condition and | | | | | |
| 2 | | the components of the , backup, etc) | DAS operation | al? (printers, | | | | | |
| 3 | | analyzer and sensor sig g protection circuitry | | through | | Met sensors only | | | |
| 4 | | signal connections pro intained? | otected from the | e weather and | | | | | |
| 5 | Are the | signal leads connected | to the correct | DAS channel? | | | | | |
| 6 | Are the ground | DAS, sensor translato ed? | rs, and shelter | properly | | | | | |
| 7 | Does th | e instrument shelter h | ave a stable pov | ver source? | | | | | |
| 8 | Is the in | strument shelter temp | erature contro | lled? | | | | | |
| 9 | Is the m | et tower stable and gr | ounded? | | | Stable | (| Frounded | |
| 10 | Is the sa | mple tower stable and | grounded? | | | | | | |
| 11 | Tower o | comments? | | | | | | | |
| | | | | | | | | 440000.00000.000 000 | |

| Parameter | Manufacturer | Model | S/N | Client ID |
|-----------|--------------|---------|------------|-----------|
| Computer | Dell | D520 | unknown | 000457 |
| DAS | Campbell | CR3000 | 2535 | 000429 |
| Modem | Raven | H4222-C | 0808311292 | 06477 |

| Field Systems Data | For | m | | | | F- (| 02058- | 1500-S7-rev001 |
|--|-------------|----------|---|---------------------|---------------------|---------------|-----------|------------------------|
| Site ID MCK131 | | Tecl | nnician [| Sandy Grenville | Site Visit Dat | e 03/15/20 | 015 | - A Star |
| Documentation | | | | | | | | |
| Does the site have the require | ed ins | trum | ent and | equipment manus | als? | | | |
| | Yes | No | N. 7. 8 | | <u></u> | Yes | No | N/A |
| Wind speed sensor | | | | - Data lo | ogger | | | |
| Wind direction sensor | | | | Data lo | ogger | | | |
| Temperature sensor | | | | Strip c | hart recorder | | | |
| Relative humidity sensor | | | | Сотри | ıter | | | |
| Solar radiation sensor | | | | Moden | n | | | |
| Surface wetness sensor | | | | Printer | r | | | |
| Wind sensor translator | | | | Zero a | ir pump | | | |
| Temperature translator | | | | Filter f | flow pump | | | |
| Humidity sensor translator | | | | Surge | protector | | | |
| Solar radiation translator | | | | UPS | | | | |
| Tipping bucket rain gauge | | | | Lightn | ing protection devi | ce 🗌 | | |
| Ozone analyzer | | | | Shelter | r heater | | | |
| Filter pack flow controller | | | | Shelter | r air conditioner | | | |
| Filter pack MFC power supply | | | | | | | | |
| Does the site have the requi | red a | nd m | ost recen | nt QC documents | and report forms? | | | |
| | Pres | 8. Y. S. | | | A. S. A. | Cu | rrent | |
| Station Log | | - | | | | | ✓ | |
| SSRF | | Z | | | | | | |
| Site Ops Manual | | | Oct 2007 | 1 | | | | |
| HASP | • | | 2014 | | | | | |
| Field Ops Manual | Ę | | | | | [| | |
| Calibration Reports | • | | Electron | іс сору | | | | |
| Ozone z/s/p Control Charts | Ľ | | | | | | | |
| Preventive maintenance schedu | I [| | | | | | | |
| 1 Is the station log properly of | comp | leted | during e | every site visit? 🔽 | | 1. 11 | | |
| 2 Are the Site Status Report current? | Form | ıs bei | ng comp | leted and | | | | |
| 3 Are the chain-of-custody for sample transfer to and from | | | erly used | l to document 🖳 | | | | |
| 4 Are ozone z/s/p control cha current? | irts p | roper | ly compl | leted and | Control charts not | used | | |
| Provide any additional explanat natural or man-made, that may | | | | | nry) regarding cond | litions liste | ed above, | or any other features, |
| | ann ann ann | | 2.2.5. 1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1. | | | | | |

| Fie | Field Systems Data Form | | | | | F-02058-1500-S8-rev001 | | |
|------|--|---|--|-----------------|--------------|---|-------------------|-----|
| Site | e ID | MCK131 | Technician | Sandy Grenville | | Site Visit Date | 03/15/2015 | |
| 1 | Has the | eration procedures e site operator attende ? If yes, when and who | | STNET training | | Frained on-site by M | IACTEC techniciar | ı |
| 2 | 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? | | | | | | | |
| 3 | Is the si schedul | te visited regularly on e? | the required T | uesday | | | | |
| 4 | | standard CASTNET d by the site operator | Contract and the second second second second | cedures being | | | | |
| 5 | is the site operator(s) knowledgeable of, and able to perform ✓ the required site activities? (including documentation) | | | | | | | |
| | Are reg | ular operational QA/(| OC checks perfo | ormed on meteo | <u>rolog</u> | ical instruments? | | |
| QC | Check I | Performed | | Frequency | | | Complia | int |
| Mu | ltipoint | Calibrations | | Semiannual | lv | and a first statement of the statement of the factors | | |

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

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

QC Check Performed

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

| Frequency | Compliant |
|---------------|-----------|
| Semiannually | |
| Daily | |
| | |
| Daily | |
| | |
| Weekly | |
| Every 2 weeks | |
| N/A | |
| Weekly | |
| Weekly | |

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

Unknown

 \checkmark

SSRF, logbook, call-in

| Field Systems Data Form | | | | | | | F-02058-1 | 500-S9-rev001 |
|-------------------------|---|-------|---------|------------------|--------------------------|-------------------------|-------------------------|---------------------|
| Site | ID MCK131 Tec | hnio | cian [| Sandy Grenville | 2 | Site Visit Date | 03/15/2015 | |
| | Site operation procedures | | | | | | | |
| 1 | Is the filter pack being changed every Tuesday as scheduled? | | | ? 🔽 | Filter changed morinings | | | |
| | Are the Site Status Report Forms being completed and filed correctly? | | | | | | | |
| | Are data downloads and backups being performed as scheduled? | | | | No longer required | | | |
| 4 | Are general observations being made and recorded? How? | | | | SSRF, logbook | | | |
| | Are site supplies on-hand and replenished in a timely fashion? | | | | | | | |
| 6 | Are sample flow rates recorded? How? | | | | SSRF, logbook, call-in | | | |
| | Are samples sent to the lab on a regu fashion? | ılar | sched | lule in a timely | | | | |
| | Are filters protected from contamina and shipping? How? | ntior | 1 duri | ing handling | | Clean gloves on and off | | |
| | Are the site conditions reported regu operations manager or staff? | larl | y to tl | he field | | | | |
| QCO | Check Performed | | Freq | uency | | | Compliant | |
| M | ulti-point MFC Calibrations | | Semia | annually | | | | |
| Fl | ow System Leak Checks | | Week | kly | | | | |
| Fi | Iter Pack Inspection | | | | | | | |
| Fl | Flow Rate Setting Checks | | | | | | | |
| Vi | Visual Check of Flow Rate Rotometer Veekly | | | | | | | |
| In | -line Filter Inspection/Replacement | ✓ | As ne | eded | | | | |
| Sa | mple Line Check for Dirt/Water | | Week | kly | | | | |
| | de any additional explanation (photo al or man-made, that may affect the | | | | | y) regarding condit | ions listed above, or a | any other features, |

| Site ID MCK231 | Technician Sandy Grenville | Site Visit Date 03/ | 15/2015 |
|------------------------|--|-------------------------------|--|
| Site Sponsor (agency) | EPA | USGS Map | Mackville |
| Operating Group | Private | Map Scale | |
| AQS# | 21-229-9991 | Map Date | |
| Meteorological Type | R.M. Young | | |
| Air Pollutant Analyzer | Ozone | QAPP Latitude | 37.7044 |
| Deposition Measurement | dry, wet | QAPP Longitude | -85.0483 |
| Land Use | agriculture, woodland - mixed | QAPP Elevation Meters | 353 |
| Terrain | rolling | QAPP Declination | 4.25 |
| Conforms to MLM | Marginally | QAPP Declination Date | 12/28/2004 |
| Site Telephone | (859) 262-5181 | Audit Latitude | 37.70467 |
| Site Address 1 | Wesley Miller Road | Audit Longitude | -85.04870 |
| Site Address 2 | | Audit Elevation | 29 |
| County | Washington | Audit Declination | -4.5 |
| City, State | Harrodsburg, KY | Present | |
| Zip Code | 40330 | Fire Extinguisher 🗹 | Inspected Nov 1992 |
| 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 | | odel 8810 | Shelter Size 640 cuft |
| Shelter Clean | Notes The site instruments are locate sites. | ed in the MCK131 shelter. The | e same site operator is servicing both |
| Site OK | Notes | | |

ALC: NOT STREET

Field Systems Data Form

MCK231

F-02058-1500-S2-rev001

Site ID

Technician Sandy Grenville

Site Visit Date 03/15/2015

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

Siting Distances OK

Siting Criteria Comment

| Fi | eld Systems Data Form | | F-02058-1500-S3-rev001 |
|------|--|-------------------------|--|
| Site | MCK231 Tech | nician Sandy Grenville | Site Visit Date 03/15/2015 |
| 1 | Are wind speed and direction sensors being influenced by obstructions? | sited so as to avoid | N/A |
| 2 | Are wind sensors mounted so as to m (i.e. wind sensors should be mounted horizontally extended boom >2x the r tower into the prevailing wind) | atop the tower or on a | N/A |
| 3 | Are the tower and sensors plumb? | | N/A |
| 4 | Are the temperature shields pointed a avoid radiated heat sources such as b | | |
| 5 | Are temperature and RH sensors site conditions? (i.e. ground below sensors surface and not steeply sloped. Ridges standing water should be avoided) | s should be natural | |
| 6 | Is the solar radiation sensor plumb? | | N/A |
| 7 | Is it sited to avoid shading, or any art light? | ificial or reflected | N/A |
| 8 | Is the rain gauge plumb? | | N/A |
| 9 | Is it sited to avoid sheltering effects fr towers, etc? | rom buildings, trees, | N/A |
| 10 | Is the surface wetness sensor sited with facing north? | h the grid surface | N/A |
| 11 | Is it inclined approximately 30 degre | es? | N/A |
| Dre | wide any additional evaluation (abot | aronh ar skotch if nass | x) regarding conditions licted above or any other features |

| Fie | ld Systems D | ata Form | | F-02058-1500-S4-rev001 | | | |
|--------------|---|--|-----------------|------------------------|--------------------------|----|-----------|
| Site | ID MCK231 | Technician S | Sandy Grenville | | Site Visit Date 03/15/20 | 15 | |
| | Do all the meterolog condition, and well 1 | ical sensors appear to be in | ntact, in good | Г | emperature only | | |
| 2 | | ogical sensors operational | online, and | ₽Т | emperature only | | |
| | | | | | | | |
| 4 | Are the aspirated m | otors working? | | | | | |
| | Is the solar radiation scratches? | ı sensor's lens clean and fr | ee of | | I/A | | |
| 6 | Is the surface wetne | ss sensor grid clean and un | ndamaged? | | I/A | | |
| | Are the sensor signa condition, and well 1 | l and power cables intact, i naintained? | in good | | | | |
| | Are the sensor signa from the elements a | l and power cable connecti nd well maintained? | ions protected | | | | |
| D | | Martin | Model | | CUNT | | Client ID |
| Рага | meter | Manufacturer | wiouei | | S/N | | |
| Tem Provi | perature de any additional ex | RM Young planation (photograph or s t may affect the monitorin | 41342VC | ary) r | 14803 | 0 | 6542 |
| Tem Provi | perature de any additional ex | RM Young | 41342VC | ary) r | 14803 | 0 | 6542 |
| Tem Provi | perature de any additional ex | RM Young | 41342VC | ary) r | 14803 | 0 | 6542 |
| Tem Provi | perature de any additional ex | RM Young | 41342VC | ary) r | 14803 | 0 | 6542 |
| Tem Provi | perature de any additional ex | RM Young | 41342VC | ary) r | 14803 | 0 | 6542 |
| Tem Provi | perature de any additional ex | RM Young | 41342VC | ary) r | 14803 | 0 | 6542 |
| Tem Provi | perature de any additional ex | RM Young | 41342VC | ary) r | 14803 | 0 | 6542 |
| Tem Provi | perature de any additional ex | RM Young | 41342VC | ary) r | 14803 | 0 | 6542 |
| Tem Provi | perature de any additional ex | RM Young | 41342VC | ary) r | 14803 | 0 | 6542 |
| Tem Provi | perature de any additional ex | RM Young | 41342VC | ary) r | 14803 | 0 | 6542 |

| Fie | ld Sy | stems Data | Form | F-02058-1500-S5-rev00 | | | |
|------|--|---|------------------------------------|-----------------------|---------------------------|--------------------------|-------------------|
| Site | ID | MCK231 | Technician Sandy | Grenville | Site Visit Date 03/15 | j/2015 | |
| | Siting (| Criteria: Are the po | llutant analyzers and dep | osition equi | oment sited in accordance | <u>e with 40 CFR 58,</u> | <u>Appendix E</u> |
| 1 | | sample inlets have icted airflow? | at least a 270 degree arc o | of 🔽 | | | |
| 2 | Are the | sample inlets 3 - 1 | 5 meters above the groun | d? | | | |
| | | sample inlets > 1 meters from trees? | neter from any major obs | struction, 🗹 | 1 | | |
| | Polluta | nt analyzers and de | eposition equipment operation | ations and m | aintenance | | |
| | | analyzers and equi on and well mainta | pment appear to be in goo ined? | od 🔽 |] | | |
| 2 | | analyzers and monopole ng data? | nitors operational, on-line | e, and 🔽 |] | | |
| 3 | Describ | e ozone sample tuł |)e. | | 1/4 teflon by 15 meters | | |
| 4 | Describ | e dry dep sample t | ube. | | 3/8 teflon by 13 meters | | |
| | | line filters used in t e location) | he ozone sample line? (if | yes 🔽 | At inlet only | | |
| 6 | Are san obstruc | A PART OF A | e of kinks, moisture, and | L V |] | | |
| 7 | Is the z | ero air supply desi | ccant unsaturated? | |] | | |
| 8 | Are the | re moisture traps i | n the sample lines? | | Flow line only | | |
| 9 | 9 Is there a rotometer in the dry deposition filter line, and is it clean? | | | | Clean and dry | | |
| Para | ameter | - | Manufacturer | Model | S/N | Clien | t ID |
| Ozo | ne | | ThermoElectron Inc | 49i A1NAA | 1030244796 | 00068 | 32 |

| Ozone | ThermoElectron Inc | 491 A INAA | 1030244790 | 00062 | |
|-----------------------|-----------------------|------------|--------------|-------|--|
| Filter pack flow pump | Thomas | 107CAB18B | 110000014171 | 04513 | |
| Zero air pump | Werther International | C 70/4 | 000836205 | 06924 | |

| eld Sy | stems Data Fo | | F-020 | 58-15 | 500-S6-rev001 | | | |
|----------------|--|---|---|--|--|--|---|--|
| ID | MCK231 | Technician | Sandy Grenville | 29122 | Site Visit Date | 03/15/2015 | | |
| <u>DAS, se</u> | nsor translators, and J | peripheral equi | pment operation | <u>ıs aı</u> | <u>nd maintenance</u> | | | |
| | | ar to be in good | condition and | | | | | |
| | | DAS operation | al? (printers, | | | | | |
| | | | hrough | | Met sensors only | | | |
| | | otected from the | e weather and | | | | | |
| Are the | signal leads connected | to the correct | DAS channel? | | | | | |
| | | rs, and shelter | properly | | | | | |
| Does the | e instrument shelter ha | ave a stable pov | ver source? | | | | | |
| Is the in | strument shelter temp | erature control | led? | | | | | |
| Is the m | et tower stable and or | ounded? | | | Stable | Gr | ounded | |
| | | | | | | | | |
| is the sa | imple tower stable and | i grounded? | | | | | | |
| Tower c | omments? | | | | | | | |
| | ID <u>DAS</u> , see Do the I well maid Are all the modem, Do the a lightning Are the well maid Are the grounder Does the Is the im Is the main State and the State and the Stat | ID MCK231 DAS, sensor translators, and I Do the DAS instruments apperent well maintained? Are all the components of the modem, backup, etc) Do the analyzer and sensor siglightning protection circuitry? Are the signal connections provell maintained? Are the signal leads connected Are the bAS, sensor translator grounded? Does the instrument shelter has Is the instrument shelter temp | DAS, sensor translators, and peripheral equip Do the DAS instruments appear to be in good well maintained? Are all the components of the DAS operations modem, backup, etc) Do the analyzer and sensor signal leads pass the lightning protection circuitry? Are the signal connections protected from the well maintained? Are the signal leads connected to the correct of Are the signal leads connected to the correct of Are the DAS, sensor translators, and shelter p grounded? Does the instrument shelter have a stable pow Is the instrument shelter temperature control Is the met tower stable and grounded? Is the sample tower stable and grounded? | ID MCK231 Technician Sandy Grenville DAS, sensor translators, and peripheral equipment operation Do the DAS instruments appear to be in good condition and well maintained? Are all the components of the DAS operational? (printers, modem, backup, etc) Do the analyzer and sensor signal leads pass through lightning protection circuitry? Are the signal connections protected from the weather and well maintained? Are the signal leads connected to the correct DAS channel? Are the signal leads connected to the correct DAS channel? Are the DAS, sensor translators, and shelter properly grounded? Does the instrument shelter have a stable power source? Is the instrument shelter temperature controlled? Is the sample tower stable and grounded? | ID MCK231 Technician Sandy Grenville DAS, sensor translators, and peripheral equipment operations and well maintained? Image: Components of the DAS operational? (printers, modem, backup, etc) Image: Components of the DAS operational? (printers, modem, backup, etc) Do the analyzer and sensor signal leads pass through lightning protection circuitry? Image: Components of the Component of the correct DAS channel? Image: Component of the correct DAS channel? Are the signal connected to the correct DAS channel? Image: Component of the correct | ID MCK231 Technician Sandy Grenville Site Visit Date DAS, sensor translators, and peripheral equipment operations and maintenance Do the DAS instruments appear to be in good condition and well maintained? Image: Condition and well maintained? Are all the components of the DAS operational? (printers, modem, backup, etc) Image: Condition and well maintained? Do the analyzer and sensor signal leads pass through lightning protection circuitry? Image: Condition and well maintained? Are the signal connections protected from the weather and well maintained? Image: Condition and well maintained? Are the signal leads connected to the correct DAS channel? Image: Condition and well maintained? Are the DAS, sensor translators, and shelter properly grounded? Image: Condition and well maintained? Is the instrument shelter temperature controlled? Image: Condition and well maintained? Is the met tower stable and grounded? Image: Condition and well maintained? Is the sample tower stable and grounded? Image: Condition and well maintained? | ID MCK231 Technician Sandy Grenville Site Visit Date 03/15/2015 DAS, sensor translators, and peripheral equipment operations and maintenance Do the DAS instruments appear to be in good condition and well maintained? Are all the components of the DAS operational? (printers, modem, backup, etc) Met sensors only Do the analyzer and sensor signal leads pass through lightning protection circuitry? Met sensors only Are the signal connections protected from the weather and well maintained? Are the signal leads connected to the correct DAS channel? Are the DAS, sensor translators, and shelter properly grounded? Does the instrument shelter have a stable power source? Is the instrument shelter temperature controlled? Is the net tower stable and grounded? Is the sample tower stable and grounded? | ID MCK231 Technician Sandy Grenville Site Visit Date 03/15/2015 DAS, sensor translators, and peripheral equipment operations and maintenance Do the DAS instruments appear to be in good condition and well maintained? Image: Construct on the translators of the DAS operational? (printers, modem, backup, etc) Do the analyzer and sensor signal leads pass through lightning protection circuitry? Image: Construct on the translators of the translators on the translator of the translators on the translator of the t |

| Parameter | Manufacturer | Model | S/N | Client ID |
|-----------|--------------|---------|------------|-----------|
| Computer | Dell | D530 | unknown | 000458 |
| DAS | Campbell | CR3000 | 2137 | 000359 |
| Modem | Raven | H4222-C | 0808311140 | 06476 |

| Field Systems Data F | F-02 | F-02058-1500-S7-rev001 | | | | |
|--|--|--|---|-------------|---------|-----------------------|
| Site ID MCK231 | Те | chnician | Sandy Grenville Site Visit Date 0 | 3/15/2015 | | |
| Documentation | | | | | | |
| Does the site have the required | linstru | ment and | equipment manuals? | | | |
| Does the site have the required | | 28, 38, 23, 24, 24, 25, 25, 25, 25, 25, 25, 25, 25, 25, 25 | | Yes | No | N/A |
| Wind speed sensor | the second s | | Data logger | | | |
| Wind direction sensor | | | Data logger | | | |
| Temperature sensor | | | Strip chart recorder | | | |
| Relative humidity sensor | | | Computer | | | |
| Solar radiation sensor | | | Modem | | | |
| Surface wetness sensor | | | Printer | | | |
| | | | 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 | 2 [| | Shelter heater | | | |
| Filter pack flow controller |] . | | Shelter air conditioner | | | |
| Filter pack MFC power supply |] . | | | | | |
| Does the site have the require | ed and 1 | nost rece | nt QC documents and report forms? | | | |
| | resent | | | Curren | It | |
| Station Log | | | | | | |
| SSRF | | <u> </u> | | | | |
| Site Ops Manual | | | | | | |
| HASP | | 2014 | | | | |
| Field Ops Manual | | | | | | |
| Calibration Reports | | Electror | | | | |
| Ozone z/s/p Control Charts | | | | | | A CALLS |
| Preventive maintenance schedul | | | | | | |
| | | | | | | |
| 1 Is the station log properly co | mplete | d during o | every site visit? 🔽 | | | |
| | | | | | | |
| 2 Are the Site Status Report F current? | orms bo | eing comp | leted and 🔽 | | | |
| 3 Are the chain-of-custody for sample transfer to and from | | perly used | l to document | | | |
| 4 Are ozone z/s/p control chart current? | | erly comp | leted and Control charts not use | ed | | |
| | | | | | 1000 | |
| Provide any additional explanation natural or man-made, that may a | | | r sketch if necessary) regarding conditio | ns listed a | bove, o | r any other features, |
| natural or man-made, that may a | nett th | e monitor | ing parameters. | | | |
| | NOTION OF | - | | | | |

| Fie | eld Sy | ystems Data | Form | | | F-02058-1500-S8-rev001 |
|------|---|---|---|--|---------------|--------------------------------------|
| Site | e ID | MCK231 | Technician S | andy Grenville | 21223 2214 | Site Visit Date 03/15/2015 |
| 1 | Has th | peration procedures the site operator atte ? If yes, when and | nded a formal CAST | NET training [| > | Trained on-site by MACTEC technician |
| 2 | | CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR | attended a formal CA hen and who instruct | TO REPORT AND REAL PROPERTY OF THE REAL PROPERTY OF | | |
| 3 | Is the site visited regularly on the required Tuesday schedule? | | | | | |
| 4 | | e standard CASTNI ed by the site opera | ET operational proce tor? | dures being | < | |
| 5 | | | wledgeable of, and ab ? (including documen | | ✓ | |
| | Are reg | <u>gular operational Q</u> | A/QC checks perform | <u>ned on meteor</u> | olog | gical instruments? |
| QC | QC Check Performed Freque | | | | | Compliant |
| Mu | Multipoint Calibrations | | | | a next as | |

| Multipoint Calibrations | Sen |
|---|-----|
| Visual Inspections | Wee |
| Translator Zero/Span Tests (climatronics) | N/A |
| Manual Rain Gauge Test | N/A |
| Confirm Reasonableness of Current Values | N/A |
| Test Surface Wetness Response | N/A |

| 1 | Semiannually | |
|---|--------------|--|
| | Weekly | |
|] | N/A | |

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

| QC Check Performed |
|---------------------------------|
| Multi-point Calibrations |
| Automatic Zero/Span Tests |
| Manual Zero/Span Tests |
| Automatic Precision Level Tests |
| Manual Precision Level Test |

In-line Filter Replacement (at inlet) In-line Filter Replacement (at analyze Sample Line Check for Dirt/Water

Analyzer Diagnostics Tests

Zero Air Desiccant Check

| | Semiannually | |
|--------------|---------------|--|
| ✓ | Daily | |
| | | |
| | Daily | |
| | | |
| | Weekly | |
| | Every 2 weeks | |
| | N/A | |
| | Weekly | |
| \checkmark | Weekly | |

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

Call-in

~

 \checkmark

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

Frequency

- Compliant

| Fie | ld Systems Data Fo | rm | | | | F-02058-1500-S9-rev0 | | | | | |
|------|---|---|--------------|------------------|-------------------|--------------------------|--------------|--|--|--|--|
| Site | MCK231 | Techni | ician | Sandy Grenville | | Site Visit Dat | e 03/15/2015 | | | | |
| | Site operation procedures | | | | | | | | | | |
| 1 | Is the filter pack being changed | every T | uesda | y as scheduled | 2 | Filter changed morinings | | | | | |
| | Are the Site Status Report For correctly? | ns being | comp | pleted and filed | | | | | | | |
| | Are data downloads and backu scheduled? | ps being | perfo | ormed as | | No longer required | ł | | | | |
| 4 | Are general observations being | nd rec | corded? How? | | SSRF, logbook | | | | | | |
| | Are site supplies on-hand and r fashion? | ed in | a timely | | | | | | | | |
| 6 | Are sample flow rates recorded | | | | SSRF, logbook, ca | all-in | | | | | |
| | Are samples sent to the lab on a fashion? | ı regular | sche | dule in a timely | | | | | | | |
| | Are filters protected from conta and shipping? How? | aminatio | n dur | ing handling | | Clean gloves on and off | | | | | |
| | Are the site conditions reported operations manager or staff? | l regular | ly to 1 | the field | | | | | | | |
| QC (| Check Performed | | Free | luency | | | Compliant | | | | |
| Μ | ulti-point MFC Calibrations | | Sem | iannually | 2017276/06 | | | | | | |
| Fl | ow System Leak Checks | Image: A start of the start of | Wee | kly | | | | | | | |
| Fi | Iter Pack Inspection | | | | | | | | | | |
| Fl | ow Rate Setting Checks | Image: A start of the start of | Wee | kly | | | | | | | |
| Vi | sual Check of Flow Rate Roton | neter 🔽 | Wee | kly | | | | | | | |
| In | -line Filter Inspection/Replacer | nent 🔽 | As n | eeded | | | | | | | |
| Sa | mple Line Check for Dirt/Wate | er 🔽 | Wee | kly | 216.27/3 | | | | | | |

Site Inventory by Site Visit

| Site | Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|------|------------|-----------------------|------------------------|----------|--------------|---------------|
| MA | C426-Sandy | Grenville-03/17/2015 | | | | |
| 1 | 3/17/2015 | Computer | Hewlett Packard | none | 6730b | CNV0094B73 |
| 2 | 3/17/2015 | DAS | Environmental Sys Corp | 3027 | 8832 | A3027 |
| 3 | 3/17/2015 | Elevation | Elevation | None | 1 | None |
| 4 | 3/17/2015 | Filter pack flow pump | Thomas | none | 107CAB11A | 10950000033 |
| 5 | 3/17/2015 | Flow Rate | Tylan | 02023 | FC280SAV | AW710253 |
| 6 | 3/17/2015 | Infrastructure | Infrastructure | none | none | none |
| 7 | 3/17/2015 | Met tower | Climatronics | none | illegible | illegible |
| 8 | 3/17/2015 | MFC power supply | Tylan | 03645 | RO-32 | FP9605011 |
| 9 | 3/17/2015 | Ozone | ThermoElectron Inc | none | 49i A3NAA | CM08460049 |
| 10 | 3/17/2015 | Ozone Standard | ThermoElectron Inc | none | 49i A1NAA | 0733726104 |
| 11 | 3/17/2015 | Printer | Hewlett Packard | none | 842C | unknown |
| 12 | 3/17/2015 | Sample Tower | Aluma Tower | none | В | none |
| 13 | 3/17/2015 | Shelter Temperature | ARS | 60 | none | none |
| 14 | 3/17/2015 | Siting Criteria | Siting Criteria | None | 1 | None |
| 15 | 3/17/2015 | Temperature | RM Young | none | 41342 | 15105 |
| 16 | 3/17/2015 | Zero air pump | Werther International | none | PC70/4 | 000665778 |

DAS Data Form

DAS Time Max Error: 0.42

| Mfg | Serial Number Site Te | | echnician | Site Visit Date | Parameter | Use Desc. | |
|-------------------------------------|------------------------------|---------------------------------------|--------------------------------------|--------------------------|-------------------|-------------------------|---------|
| Environmenta | ental Sys A3027 MAC426 Sa | | Sandy Grenville | 03/17/2015 | DAS | Primary | |
| Das Date: Das Time: Das Day: | 3 /17/2015 14:12:27 76 | Audit Date Audit Time Audit Day | 3 /17/2015 14:12:52 76 | Mfg Serial Number | Datel 15510194 | Parameter Tfer Desc. | DAS |
| Low Channe | l: | High Chann | el: | Tfer ID | 01320 | | |
| Avg Diff: 0.000 ⁴ | Max Diff: 1 0.00 | Avg Diff: 004 0.000 | Max Diff: 1 0.0004 | Slope Cert Date | 2/2/2010 | F. | 0.00000 |
| | | | | Mfg | Fluke | Parameter | |
| | | | | Serial Number Tfer ID | 95740135 01311 | Tfer Desc. | . DVM |
| | | | | Slope | 1.0000 | Intercept | 0.00000 |
| | | | | Cert Date | 1/22/201 | 5 CorrCoff | 1.00000 |
| Channel | Input | DVM Output | DAS Output | InputUnit | OutputUnit | Difference | |
| 2 | 0.0000 | 0.0000 | 0.0000 | V | V | 0.0000 | |
| 2 | 0.1000 | 0.0999 | 0.0999 | V | V | 0.0000 | |
| 2 | 0.3000 | 0.2998 | 0.2995 | V | V | -0.0003 | |
| 2 | 0.5000 | 0.4996 | 0.4995 | V | V | -0.0001 | |
| 2 | 0.7000 | 0.6995 | 0.6994 | | V | -0.0001 | |
| 2 | 0.9000 | 0.8993 | 0.8993 | | V | 0.0000 | |
| 2 | 1.0000 | 0.9994 | 0.9990 | V | V | -0.0004 | |

Flow Data Form

| Mfg | Serial Nun | nber Ta S | ite | Те | chnician | Site Visit Da | te Param | ieter | Owner ID |
|---|-----------------|--------------|------------|----------|---------------------------|----------------|--------------------------|--------------|------------------|
| Tylan | AW710253 | 3 | MAC426 | Sa | andy Grenville | 03/17/2015 | Flow R | ate | 02023 |
| Mfg | Tylan | | | | Mfg | BIOS | P | arameter FI | ow Rate |
| | FP9605011 | 03645 | | | Serial Number | 103471 | | fer Desc. ne | |
| | | | | | | | | | |
| Parameter | MFC power su | oply | | | Tfer ID | 01420 | | | |
| L | | | | | Slope | 0.96 | 6664 Inte | ercept | 0.03078 |
| | | | | | Cert Date | 2/5/2 | 2015 Cor | rCoff | 0.99996 |
| | | | | | Mfg | BIOS | P | arameter FI | ow Rate |
| | | | | | Serial Number | 103424 | Т | fer Desc. B | IOS cell |
| | | | | | Tfer ID | 01410 | | | |
| | | | | | Slope | 0.96 | 664 Inte | ercept | 0.03078 |
| | | | | | Cert Date | 2/5/2 | 2/5/2015 CorrCoff | | |
| DAS 1: | | DAS 2: | | l | Cal Factor Z | ero | | 0 | |
| A Avg % Diff: A Max % Di A Avg %Dif A Max % | | | | | Cal Factor F | ull Scale | | 0 | |
| 0.67% | 0.74% | | | | Rotometer R | eading: | 1. | .5 | |
| UseDescription: | Test type: | | Input STP: | MfcDisp. | : OutputSignal: | Output S E: In | nputUnit: | OutputSigna | llPctDifference: |
| 1 7 | pump off | 0.000 | 0.000 | -0.03 | 0.0000 | 0.04 | l/m | l/m | |
| 1 7 | leak check | 0.000 | 0.000 | -0.02 | 0.0000 | 0.03 | l/m | l/m | |
| | test pt 1 | 1.503 | 1.487 | 1.36 | 0.0000 | 1.50 | l/m | l/m | 0.54% |
| | test pt 2 | 1.500 | 1.484 | 1.36 | 0.0000 | 1.50 | l/m | l/m | 0.74% |
| primary | test pt 3 | 1.501 | 1.485 | 1.36 | 0.0000 | 1.50 | l/m | l/m | 0.74% |
| Sensor Compo | nent Leak Tes | st | | Conditio | on | | Status | pass | |
| Sensor Compo | nent Filter Azi | muth | | Conditio | on | | Status | pass | |
| Sensor Compo | nent Filter De | oth | | Conditio | -2.5 cm | | Status | Fail | |
| Sensor Compo | nent Filter Pos | sition | | Conditio | Poor | | Status | Fail | |
| Sensor Compo | ment Moisture | Present | | Conditio | No moisture pr | esent | Status | pass | |
| Sensor Compo | nent Rotomete | er Condition | | Conditio | Clean and dry | | Status | pass | |
| | | | | Conditio | on | Status | pass | | |
| | | | | Conditio | ition Good Status pass | | | | |
| Sensor Compo | | | | _ | lition 5.5 cm Status pass | | | | |
| | | | | | | | | | |

Ozone Data Form

| Mfg | Serial Number Tag | Site | Те | Technician | | Site Visit Date | | Parameter | | Owner I | D |
|--------------------|------------------------------|----------------|----------|--------------------|--------|-----------------|------------------------------------|-----------|-------------|------------------|--------|
| ThermoElectron Inc | CM08460049 | MAC426 | S | andy Gre | nville | 03/17/20 | 015 | Ozone | | none | |
| Slope: 0 | .99762 Slope: | 0.0000 | 0 | Mfg Ther | | | ThermoElectron Inc Parameter ozone | | | | |
| • <u>-</u> | .33402 Intercept | 0.0000 | | Serial N | lumber | 0419606966 Tfe | | | er Desc. Oz | one primary | y stan |
| CorrCoff 1 | off 1.00000 CorrCoff 0.0000 | | | Tfer ID | | 01112 | | | | | |
| DAS 1: | DAS 2: | | | Slope | | 0.99405 Interd | | | cept | -0.42 | 2803 |
| | ax % Di A Avg % | 6Dif A Max | % Di | Cert Da | ıte | 3/9/2015 Corr | | | Coff | 1.00 | 0000 |
| 1.0% | 1.6% | | | | | | | | | | |
| UseDescription: | ConcGroup: | Tfer Raw: | | Corr: | Si | | | Unit: | PctDiffe | erence: | |
| primary | 1 | 0.07 | | 50 | 0. | | ppb | | | 1 (10/ | |
| primary | 2 | 29.90 | | .50 | 30. | | ppb nnh | | | -1.61% | |
| primary primary | 3 4 | 49.82 79.99 | | .54 .89 | 49. | | ppb ppb | | | -1.19% -0.72% | |
| primary | 5 | 109.89 | | .89).97 | 110 | | ppb ppb | | | -0.72% | |
| | | 109.89 | 1 | | | | ppo | ~ | | -0.4270 | |
| Sensor Componer | t Cell B Noise | | Conditi | on 0.8 pp | ac | | | Status | pass | | |
| Sensor Componer | t Cell B Tmp. | | Conditi | on | | | | Status | pass | |] |
| Sensor Componer | t Fullscale Voltage | | Conditi | Condition N/A | | | | | pass | | |
| Sensor Componer | t Inlet Filter Condition | Conditi | on Clean | 1 | | | Status | pass | | | |
| Sensor Componer | t Line Loss | | Conditi | on Not te | sted | | | Status | pass | | |
| Sensor Componer | nt Offset | | Conditi | on 0.2 | | | | Status | pass | | |
| Sensor Componer | nt Span | | Conditi | Condition 1.004 | | | | | pass | | |
| Sensor Componer | t Cell B Freq. | | Conditi | Condition 98.9 kHz | | | | | pass | | |
| Sensor Componer | t System Memo | | Conditi | Condition | | | | | pass | | |
| Sensor Componer | t Sample Train | | Conditi | Condition Good | | | | | pass | | |
| Sensor Componer | t Cell B Pressure | | Conditi | on | | | | Status | pass | | |
| Sensor Componer | t Cell B Flow | | Conditi | on 0.71 l | pm | | | Status | pass | | |
| Sensor Componer | t Cell A Tmp. | | Conditi | on 36.5 (| 2 | | | Status | pass | | |
| Sensor Componer | t Cell A Pressure | | Conditi | on 733.5 | mmHg | | | Status | pass | | |
| Sensor Componer | t Cell A Noise | | Conditi | on 0.4 pp | b | | | Status | pass | | |
| Sensor Componer | ensor Component Cell A Freq. | | | on 81.4 k | κHz | | | Status | pass | | |
| Sensor Componer | t Cell A Flow | | Conditi | dition 0.71 lpm | | | | Status | pass | | |
| Sensor Componer | t Battery Backup | | Conditi | ion N/A | | | | Status | pass | | |
| Sensor Componer | Component Zero Voltage | | | | | | | Status | pass | | |

Temperature Data Form

| Mfg | | Serial Nun | ıber Ta | Site | | Tecl | echnician | | Site V | isit Date | Param | eter | Owner I | D |
|-------------------------|-------|------------|------------|----------|---------------------|---------------|----------------------------------|--------------|-------------|----------------------|---------------|---------------------|---------|-----|
| RM Young | | 15105 | | MAC426 | | Sar | ndy (| Grenville | 03/17 | 7/2015 Temper | | ature | none | |
| | | | | | | Mfg | | | Extech Pa | | rameter Te | rameter Temperature | | |
| | | | | | | Serial Number | | H232734 Tf | | fer Desc. RTD | | | | |
| | | | | | | 1 | Tfer | r ID | 01227 | | | | | |
| DAS 1: DAS 2: | | | | | 5 | Slop | pe | 1.00343 Inte | | 3 Inte | ercept -0.064 | | 409 | |
| Abs Avg Err | Abs | Max Er | Abs Avg | Err Abs | Err Abs Max Er | | Cert Date | | | 1/30/2015 Cor | | rCoff 1.00000 | | 000 |
| 0.27 | | 0.40 | | | |] | | | | | | | | |
| UseDesc.: | | Test type: | Inp | utTmpRaw | InputTm | pCor | Corr.: OutputTmpSignal: OutputSi | | OutputSig | gnalEng: OSE Unit | | Difference: | | |
| primary | Temp | Low Range | e | 0.04 | 0.10 | 0.10 0.0000 | | 0.5 | | С | 0.4 | | | |
| primary | Temp | Mid Range | ; | 25.64 | 25.6 | 62 0.0000 | | 0.0000 | 25.7 | | С | 0.08 | | |
| primary | Temp | High Rang | e | 49.36 | 49.2 | 26 | | 0.0000 | | 48. | 9 | С | -0.32 | |
| Sensor Com | ponen | t Shield | | | Cond | lition | | lean | | | Status | pass | | |
| Sensor Com | ponen | t Blower S | tatus Swit | ch | Cond | lition | n N/ | /A | | | Status pass | | | |
| Sensor Component Blower | | | | Cond | ndition Functioning | | | | Status pass | | | | | |
| Sensor Com | ponen | t System N | lemo | | Cond | lition | 1 🗌 | | | | Status | pass | | |

Shelter Temperature Data For

| Mfg | Serial Number Ta | Site | Technician | Site Visit Date | Parameter | Owner ID |
|-------------------|--------------------------|----------------|-----------------|-----------------|---------------------|-----------------|
| ARS | none | MAC426 | Sandy Grenville | 03/17/2015 | Shelter Temperature | 60 |
| DAS 1: | DAS 2: | | Mfg | Extech | Parameter She | Iter Temperatur |
| Abs Avg ErrAb0.46 | s Max Er Abs Avg 0.85 | 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 | 26.38 | 26.35 | 0.000 | 25.5 | С | -0.85 |
| primary | Temp Mid Range | 25.70 | 25.68 | 0.000 | 25.2 | С | -0.48 |
| primary | Temp Mid Range | 26.01 | 25.99 | 0.000 | 25.9 | С | -0.05 |

| Infrastructur | e Data F | or | | | | | |
|---------------|----------|---------------|----------------|--------------|----------------|--------------|------|
| Site ID | MAC426 | 6 | Technician San | dy Grenville | Site Visit Dat | e 03/17/2015 | |
| Shelter M | ake | | Shelter Model | | Shelter Size | | |
| custom | | | N/A | | 1536 cuft | | |
| | | | | | | | |
| Sensor Con | nponent | Shelter Roof | 1 | Condition | Good | Status | pass |
| Sensor Con | nponent | Sample Tow | ver Type | Condition | Туре В | Status | pass |
| Sensor Con | nponent | Met Tower | | Condition | Good | Status | pass |
| Sensor Con | nponent | Moisture Trap | | Condition | Installed | Status | pass |
| Sensor Con | nponent | Power Cable | es | Condition | Good | Status | pass |
| Sensor Con | nponent | Rotometer | | Condition | Installed | Status | pass |
| Sensor Con | nponent | Conduit | | Condition | N/A | Status | pass |
| Sensor Con | nponent | Sample Tow | ver | Condition | Good | Status | pass |
| Sensor Con | nponent | Shelter Con | dition | Condition | Good | Status | pass |
| Sensor Con | nponent | Shelter Floo | r | Condition | Good | Status | pass |
| Sensor Con | nponent | Shelter Tem | p Control | Condition | Functioning | Status | pass |
| Sensor Con | nponent | Signal Cable |) | Condition | Good | Status | pass |
| Sensor Con | nponent | Tubing Type | • | Condition | 3/8 teflon | Status | pass |
| | | Shelter Door | | Condition | | Status | pass |
| Sensor Con | nponent | Sample Trai | n | Condition | | Status | |

Field Systems Comments

1 Parameter: SiteOpsProcComm

The site operators are very knowledgeable with air quality monitoring. They are doing a very good job with site activities and filter handling.

2 Parameter: SitingCriteriaCom

Bowling Green is within 40 km of the site. The site is in a hay field which is harvested twice per year. The area to the west and south is comprised of livestock farms including cattle and poultry. The coordinates provided in the QAPP are incorrect.

3 Parameter: ShelterCleanNotes

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

| Meteorological Type Clin Air Pollutant Analyzer Ozc Deposition Measurement dry, Land Use agri Terrain rollin | | USGS Map Map Scale Map Date QAPP Latitude QAPP Longitude | Rhoda |
|--|--|--|------------------------|
| AQS #21-0Meteorological TypeClinAir Pollutant AnalyzerOzcDeposition Measurementdry,Land UseagriTerrainrollin | 061-0501 natronics one, SO2, NOy, Hg, IMPROVE, PM , wet, Hg | Map Date QAPP Latitude | 37.2806 |
| Meteorological Type Clin Air Pollutant Analyzer Ozc Deposition Measurement dry, Land Use agri Terrain rollin | natronics one, SO2, NOy, Hg, IMPROVE, PM , wet, Hg | QAPP Latitude | 37.2806 |
| Air Pollutant Analyzer Ozc Deposition Measurement dry, Land Use agri Terrain rolling | one, SO2, NOy, Hg, IMPROVE, PM , wet, Hg | | 37.2806 |
| Deposition Measurementdry,Land UseagriTerrainrolling | , wet, Hg | | 37.2806 |
| Land Use agri Terrain rollin | | QAPP Longitude | |
| Terrain | iculture, woodland - mixed | | -86.2639 |
| CARLES STREET | | QAPP Elevation Meters | 236 |
| Conforms to MLM Mar | ng | QAPP Declination | 3 |
| | rginally | QAPP Declination Date | 12/27/2004 |
| Site Telephone (270 | 0) 758-2136 | Audit Latitude | 37.13179 |
| Site Address 1 Alfre | ed Cook Road | Audit Longitude | -86.14295 |
| Site Address 2 | | Audit Elevation | 23 |
| County Edn | nonson | Audit Declination | -4.0 |
| City, State Smi | iths Grove, KY | Present | |
| Zip Code 421 | 71 | Fire Extinguisher 🔽 | inspected March 2011 |
| Time Zone Eas | stern | 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 🗹 Ma | ke custom M | odel N/A | Shelter Size 1536 cuft |
| Shelter Clean 🔽 Not | tes The shelter is well maintained, | clean, neat, and well organize | d. |
| Site OK 🔽 Not | ies | | |

Field Systems Data Form

MAC426

F-02058-1500-S2-rev001

Site ID

Technician Sandy Grenville

Site Visit Date 03/17/2015

| 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 | 35 km | |
| City 10,000 to 50,000 population | 10 km | |] |
| City 1,000 to 10,000 population | 5 km | | |
| Major highway, airport or rail yard | 2 km | | |
| Secondary road, heavily traveled | 500 m | | |
| Secondary road, lightly traveled | 200 m | | |
| Feedlot operations | 500 m | | |
| Intensive agricultural ops (including aerial spraying) | 500 m | | |
| Limited agricultural operations | 200 m | 10 m |] |
| Large parking lot | 200 m | | |
| Small parking lot | 100 m | | |
| Tree line | 50 m | | |
| Obstacles to wind | 10 times obstacle height | | |

Siting Distances OK

Siting Criteria Comment

Bowling Green is within 40 km of the site. The site is in a hay field which is harvested twice per year. The area to the west and south is comprised of livestock farms including cattle and poultry. The coordinates provided in the QAPP are incorrect.

| Fie | eld Systems Data F | orm | | F-02058-1500-S3-rev001 |
|---|--|---|-----|---|
| Site | MAC426 | Technician Sandy Grenville | | Site Visit Date 03/17/2015 |
| 1 | Are wind speed and direction being influenced by obstructi | | | 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 ph | | | N/A |
| 4 | Are the temperature shields p avoid radiated heat sources s | | | |
| 5 | Are temperature and RH sen conditions? (i.e. ground below surface and not steeply sloped standing water should be avo | y sensors should be natural I. Ridges, hollows, and areas of | | |
| 6 | Is the solar radiation sensor p | lumb? | | N/A |
| 7 | Is it sited to avoid shading, or light? | any artificial or reflected | | N/A |
| 8 | Is the rain gauge plumb? | | | N/A |
| 9 | Is it sited to avoid sheltering o towers, etc? | effects from buildings, trees, | | N/A |
| 10 | Is the surface wetness sensor facing north? | sited with the grid surface | | N/A |
| 11 | Is it inclined approximately 3 | 30 degrees? | | N/A |
| Dre | wide onv additional evaluatio | n (nhatagranh ar skatah if nagas | cor | x) regarding conditions listed above, or any 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:

| Field Syst | tems Data Fo | orm | | F-02058-1500-S4-rev00 | | | | |
|---|---|-------------------|-----------------|-----------------------|------------------------|-----------|--|--|
| Site ID | 1AC426 | Technician | Sandy Grenville | | Site Visit Date 03/17/ | 2015 | | |
| | meterological senso and well maintaine | | ntact, in good | | Temperature only | | | |
| Are all the reporting | e meteorological sen data? | sors operational | | Temperature only | | | | |
| Are the shields for the temperature and RH sensors clean? | | | | | | | | |
| Are the aspirated motors working? | | | | | | | | |
| 5 Is the solar radiation sensor's lens clean and free of scratches? | | | | | N/A | | | |
| 5 Is the surface wetness sensor grid clean and undamaged? | | | | | N/A | | | |
| | nsor signal and pow and well maintaine | | in good | | | | | |
| | nsor signal and pow lements and well m | | ions protected | | | | | |
| arameter | М | anufacturer | Model | | S/N | Client ID | | |
| let tower | CI | imatronics | illegible | USERS | illegible | none | | |
| emperature | RI | M Young | 41342 | | 15105 | none | | |

| Fie | eld Systems Data | Form | | F-02058-1500-S5-rev001 | | | |
|------|--|---------------------------------------|-------------|---|--|--|--|
| Site | MAC426 | Technician Sandy Grenville | | Site Visit Date 03/17/2015 | | | |
| | Siting Criteria: Are the pol | lutant analyzers and deposition eq | <u>uipı</u> | nent sited in accordance with 40 CFR 58, Appendix E | | | |
| 1 | Do the sample inlets have a unrestricted airflow? | t least a 270 degree arc of | | | | | |
| 2 | Are the sample inlets 3 - 15 | meters above the ground? | | | | | |
| 3 | Are the sample inlets > 1 m and 20 meters from trees? | eter from any major obstruction, | | | | | |
| | Pollutant analyzers and dep | position equipment operations and | ma | intenance | | | |
| 1 | Do the analyzers and equip condition and well maintain | | | | | | |
| 2 | Are the analyzers and mon reporting data? | itors operational, on-line, and | | | | | |
| 3 | Describe ozone sample tubo | | | 1/4 teflon by 10 meters | | | |
| 4 | Describe dry dep sample tu | be. | | 3/8 teflon by 12 meters | | | |
| 5 | Are in-line filters used in th indicate location) | e ozone sample line? (if yes | | At inlet only | | | |
| 6 | Are sample lines clean, free obstructions? | of kinks, moisture, and | | | | | |
| 7 | Is the zero air supply desice | cant unsaturated? | | | | | |
| 8 | Are there moisture traps in | the sample lines? | | | | | |
| 9 | Is there a rotometer in the clean? | dry deposition filter line, and is it | | Clean and dry | | | |
| Par | ameter | Manufacturer Model | | S/N Client ID | | | |

| Parameter | Manufacturer | Model | S/N | Client ID | |
|--------------------------|-----------------------|-----------|-------------|-----------|--|
| Sample Tower | Aluma Tower | В | none | none | |
| Ozone ThermoElectron Inc | | 49i A3NAA | CM08460049 | none | |
| Filter pack flow pump | Thomas | 107CAB11A | 10950000033 | none | |
| MFC power supply Tylan | | RO-32 | FP9605011 | 03645 | |
| Zero air pump | Werther International | PC70/4 | 000665778 | none | |

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

| Fie | eld Systems Data | Form | F-02058-1500-S6-rev001 | | | |
|------|---|--|------------------------|-----------------------|------------|-------|
| Site | MAC426 | Technician Sandy Gre | enville | Site Visit Date | 03/17/2015 | |
| | DAS, sensor translators, | and peripheral equipment ope | erations ar | <u>ad maintenance</u> | | |
| 1 | Do the DAS instruments well maintained? | appear to be in good condition | and 🗹 | | | |
| 2 | Are all the components of modem, backup, etc) | f the DAS operational? (printe | ers, 🔽 | | | |
| 3 | Do the analyzer and sense lightning protection circu | or signal leads pass through hitry? | | Met sensors only | | |
| 4 | Are the signal connection well maintained? | s protected from the weather | and 🔽 | | | |
| 5 | Are the signal leads conn | ected to the correct DAS chan | nel? 🗹 | | | |
| 6 | Are the DAS, sensor tran grounded? | slators, and shelter properly | | | | |
| 7 | Does the instrument shelf | er have a stable power source | ? 🗹 | | | |
| 8 | Is the instrument shelter | temperature controlled? | | | | |
| 9 | Is the met tower stable ar | nd grounded? | | Stable | Grounded | |
| 10 | Is the sample tower stable | e and grounded? | | | | |
| 11 | Tower comments? | | | | | |
| Par | ameter | Manufacturer Moo | lel | S/N | Clien | it ID |
| Con | nputer | Hewlett Packard 6730 |) Db | CNV0094B73 | 3 none | |

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

842C

A3027

unknown

3027

none

Environmental Sys Corp 8832

Hewlett Packard

DAS

Printer

| Field Systems Data | For | m | | | F-02 | 058-1 | 500-S7-rev001 |
|---|-----------------|---|------------------|--|---------------|----------|---------------------|
| Site ID MAC426 | iteration (i | Tech | nician | Sandy Grenville Site Visit Date | 03/17/2015 | | |
| | | | | | | | |
| Documentation | | | | | | | |
| Does the site have the requir | 250000 | STATES. | 14.7.1 (0.2.1.2) | | | | |
| Wind speed sensor | Yes 🗸 | No | N/A | Data logger | Yes | No | N/A |
| 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 | <u> </u> | | | | | | |
| | | nd me | st rocon | t QC documents and report forms? | | | |
| Does the site have the requ | SARAN. | A 1665 | <u>st recen</u> | to the documents and report forms. | C | | |
| Station Lan | Pres | | | - | Currei | n | |
| Station Log SSRF | | | DataViev | N2 | | | |
| Site Ops Manual | | Image: A state of the state of | | | V | | |
| HASP | | | | | | | |
| Field Ops Manual | | | | | | | |
| Calibration Reports | 10.5316.0 | | | | | | |
| Ozone z/s/p Control Charts | | 483 | | | | | |
| Preventive maintenance schedu | i I | 4 | | | | | |
| Treventive maintenance senear | | | (ASBN 8 | | | | |
| 1 Is the station log properly | сотр | leted o | luring e | very site visit? DataView | | | |
| 2 Are the Site Status Report current? | Forn | ıs beir | ig compl | leted and | | | |
| 3 Are the chain-of-custody f sample transfer to and fro | | | rly used | to document | | | |
| 4 Are ozone z/s/p control cha current? | arts p | roperl | y compl | eted and Control charts not u | sed | | |
| Provide any additional explana natural or man-made, that may | | | | sketch if necessary) regarding conditing parameters: | ions listed a | bove, oi | any other features, |
| | | | ing the set | | | | |
| | | | | | | | |

| Fie | eld Sy | stems Data Fo | rm | | F-02058-1500-S8-rev00 | | | | |
|------|--|--|----------------|-----------------|-----------------------|----------------------|---------------------|--------------------|--|
| Site | ID | MAC426 | Technician | Sandy Grenville | | Site Visit Date | 03/17/2015 | | |
| 1 | Contraction of the local distance of the loc | <u>ration procedures</u> site operator attended | a formal CAS | STNET training | | Receives training ev | ery 6 months during | calibration visits | |
| | course? | If yes, when and who i | instructed? | | | | | | |
| 2 | Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? | | | | | Receives training ev | ery 6 months during | calibration visits | |
| | Is the sit schedule | e visited regularly on t ? | he required T | uesday | | | | | |
| | | standard CASTNET op I by the site operator? | perational pro | cedures being | | | | | |
| | | e operator(s) knowledg ired site activities? (inc | | | | | | | |
| | <u>Are reg</u> | ilar operational QA/QO | C checks perfo | ormed on meteor | rolo | gical instruments? | | | |
| QC | Check P | erformed | | Frequency | | | Compliant | | |

| QC Check Performed | Frequ | iency | Co |
|---|---------|----------|----|
| Multipoint Calibrations | Semia | innually | |
| Visual Inspections | ✓ Weekl | y . | |
| Translator Zero/Span Tests (climatronics) | N/A | | |
| Manual Rain Gauge Test | Month | ly | |
| Confirm Reasonableness of Current Values | ✓ Weekl | У | |
| Test Surface Wetness Response | ✓ N/A | | |

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

QC Check Performed Multi-point Calibrations Automatic Zero/Span Tests Manual Zero/Span Tests **Automatic Precision Level Tests Manual Precision Level Test Analyzer Diagnostics Tests**

In-line Filter Replacement (at inlet)

In-line Filter Replacement (at analyze

Sample Line Check for Dirt/Water

Zero Air Desiccant Check

- 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?

Frequency ~ \checkmark Monthly, quarterly, semiannually ~ Daily ~ ~ Every 2 weeks \checkmark \checkmark Daily \square ✓ ~ Alarm values only \checkmark ~ Every 2 weeks V N/A \checkmark \checkmark Weekly

~

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

DataView

Compliant

| Fie | eld Sy | stems Data Fo | rm | | | | |)2058-15 | 500-S9-rev001 | |
|------|----------------------|---|-----------------------|---------|------------------|--------------------|---------------------|-------------|---------------|--------------------|
| Site | D | MAC426 | Techn | ician | Sandy Grenvill | e | Site Visit Date | e 03/17/20 |)15 |] |
| | Site ope | ration procedures | | | | | | | | |
| 1 | Is the fil | ter pack being changed | l every T | 'uesda | y as scheduled | l? ☑ | Filter changed vari | ious times | | |
| 2 | Are the correctly | Site Status Report For y? | ms being | comp | oleted and filed | | | | | |
| 3 | Are data schedule | a downloads and backu ed? | ıps being | perfo | ormed as | | No longer required | l | | |
| 4 | Are gen | eral observations being | ; made ai | ıd rec | orded? How? | | SSRF, logbook | | | |
| 5 | Are site fashion? | supplies on-hand and i | replenish | ed in | a timely | | | | | |
| 6 | Are sam | ple flow rates recorded | l? How? | | | | SSRF | | | |
| 7 | Are sam fashion? | ples sent to the lab on a | a regulai | schee | dule in a timel | y 🔽 | | | | |
| 8 | | ers protected from cont oping? How? | aminatio | n dur | ing handling | | Clean gloves on a | nd off | | |
| 9 | | site conditions reported ons manager or staff? | d regulai | ly to 1 | the field | | | | | |
| QC | Check P | erformed | | Freq | luency | | | Compli | ant | |
| N | Iulti-poir | nt MFC Calibrations | | Sem | iannually | 220312-012 | | | | |
| F | low Syste | em Leak Checks | | Wee | kly | and and the second | | | | |
| F | ilter Pac | k Inspection | | | | | | | | |
| | | Setting Checks | | Wee | kly | | | | | |
| v | isual Ch | eck of Flow Rate Rotor | neter 🗹 | Wee | kly | | | | | |
| Ь | n-line Fil | ter Inspection/Replace | ment 🗹 | Sem | iannually and a | s nee | ded | | | |
| | | ne Check for Dirt/Wat | And the second second | | | ACCENSION AND | | | | |
| Prov | ide anv a | dditional explanation (| photogra | aph or | sketch if nece | ssary |) regarding condi | tions liste | d above, or a | ny other features. |

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

The site operators are very knowledgeable with air quality monitoring. They are doing a very good job with site activities and filter handling.

Site Inventory by Site Visit

| Site | Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|------|------------|-----------------------|-----------------------|----------|----------------|---------------|
| CK | T136-Sandy | Grenville-03/18/2015 | | | | |
| 1 | 3/18/2015 | Computer | Dell | 000247 | D520 | unknown |
| 2 | 3/18/2015 | DAS | Campbell | 000354 | CR3000 | 2132 |
| 3 | 3/18/2015 | Elevation | Elevation | None | 1 | None |
| 4 | 3/18/2015 | Filter pack flow pump | Thomas | 02361 | 107CA18 | 0290006116 |
| 5 | 3/18/2015 | Flow Rate | Арех | 000468 | AXMC105LPMDPCV | illegible |
| 6 | 3/18/2015 | Infrastructure | Infrastructure | none | none | none |
| 7 | 3/18/2015 | Modem | Raven | 06590 | H4222-C | 0844350343 |
| 8 | 3/18/2015 | Ozone | ThermoElectron Inc | 000744 | 49i A1NAA | 1105347324 |
| 9 | 3/18/2015 | Sample Tower | Aluma Tower | 000822 | В | none |
| 10 | 3/18/2015 | Shelter Temperature | Campbell | none | 107-L | none |
| 11 | 3/18/2015 | Siting Criteria | Siting Criteria | None | 1 | None |
| 12 | 3/18/2015 | Temperature | RM Young | 04689 | 41342VO | 6703 |
| 13 | 3/18/2015 | Zero air pump | Werther International | 06902 | PC70/4 | 000829157 |

DAS Data Form

DAS Time Max Error: 0.13

| Mfg | Serial N | Number Site | e . | Fechnician | Site Visit Date | Parameter | Use Desc. |
|------------|----------------|-------------------------|----------------|-----------------|-----------------|-------------|---------------------|
| Campbell | 2132 | Ck | (T136 | Sandy Grenville | 03/18/2015 | DAS | Primary |
| Das Date: | 3 /18/2015 | Audit Date | | Mfg | Datel | Parameter | DAS |
| Das Time: | 12:16:57 77 | Audit Time Audit Day | 12:17:05 77 | Serial Number | 15510194 | Tfer Desc. | Source generator (D |
| Low Channe | | High Chann | | Tfer ID | 01320 | | |
| Avg Diff: | Max Diff: | Avg Diff: | Max Diff: | Slope | 1.0000 | 0 Intercept | 0.00000 |
| 0.0002 | 2 0.000 | 0.000 | 2 0.0003 | Cert Date | 2/2/201 | 0 CorrCoff | 1.00000 |
| | | | | 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 | -0.0001 | 0.0000 |) V | V | 0.0001 | |
| 7 | 0.1000 | 0.0998 | 0.0999 | | V | 0.0001 | |
| 7 | 0.3000 | 0.2996 | 0.2999 | | V | 0.0003 | |
| 7 | 0.5000 | 0.4995 | 0.4998 | | V | 0.0003 | |
| 7 | 0.7000 | 0.6995 | 0.6994 | | V | -0.0001 | |
| 7 | 0.9000 | 0.8993 | 0.8996 | | V | 0.0003 | |
| 7 | 1.0000 | 0.9992 | 0.9995 | 5 V | V | 0.0003 | |

Flow Data Form

| Mfg | Serial Nu | nber Ta | Site | Tee | chnician | Site Visit I | Date Param | ieter | Owner ID |
|-----------------|-----------------------|---------------|------------|-----------|-----------------|--------------|-------------------|-----------|-------------------|
| Арех | illegible | | CKT136 | Sa | indy Grenville | 03/18/2015 | 5 Flow R | ate | 000468 |
| | | | | | Mfg | BIOS | Р | arameter | Flow Rate |
| | | | | | Serial Number | 103471 | | fer Desc. | |
| | | | | | | 01420 | | | |
| | | | | | Tfer ID | 01420 | | | |
| | | | | | Slope | 0. | 96664 Inte | ercept | 0.03078 |
| | | | | | Cert Date | 2/ | 5/2015 Co | rCoff | 0.99996 |
| | | | | | Mfg | BIOS | Р | arameter | Flow Rate |
| | | | | | Serial Number | 103424 | Т | fer Desc. | BIOS cell |
| | | | | | Tfer ID | 01410 | | | |
| | | | | | Slope | 0. | 96664 Inte | ercept | 0.03078 |
| | | | | | Cert Date | 2/ | 5/2015 Cor | rCoff | 0.99996 |
| DAS 1: | | DAS 2: | | L | Cal Factor Z | ero | -0.0 |)4 | |
| A Avg % Diff: | A Max % Di | A Avg % | Dif A Max | x % Di | Cal Factor F | ull Scale | 0.9 | 97 | |
| 0.46% | 0.60% | | | | Rotometer R | eading: | 1 | .5 | |
| UseDescription: | | <u> </u> | Input STP: | MfcDisp.: | × | <u> </u> | | 1 0 | allPctDifference: |
| primary | pump off | 0.000 | 0.000 | 0.03 | 0.030 | -0.01 | l/m | l/m | |
| primary | leak check | 0.000 | 0.000 | 0.01 | 0.010 | -0.03 | l/m | l/m | |
| primary | test pt 1 | 1.500 | 1.501 | 1.53 | 1.540 | 1.51 | l/m | l/m | 0.60% |
| primary | test pt 2 | 1.505 | 1.505 | 1.53 | 1.540 | 1.50 | l/m | l/m | -0.33% |
| primary | test pt 3 | 1.508 | 1.507 | 1.53 | 1.540 | 1.50 | l/m | l/m | -0.46% |
| Sensor Compo | onent Leak Te | st | | Conditio | n | | Status | pass | |
| Sensor Compo | nent Filter Az | imuth | | Conditio | 270 deg | | Status | pass | |
| Sensor Compo | onent Filter De | pth | | Conditio | n 0.5 cm | | Status | pass | |
| Sensor Compo | onent Filter Po | sition | | Conditio | Good | | Status | pass | |
| Sensor Compo | onent Moisture | Present | | Conditio | n No moisture p | resent | Status | pass | |
| Sensor Compo | nent Rotomet | er Condition | า | Conditio | Clean and dry | | Status | pass | |
| Sensor Compo | onent System | Vemo | | Conditio | n | | Status | pass | |
| Sensor Compo | | | | Conditio | n Good | | Status | | |
| Sensor Compo | | | | | 1 4.0 cm | | Status | | |
| | | | | | | | | | |

Ozone Data Form

| Mfg | Serial Number Tag | Site | Te | echnician | | Site Visi | t Date | Paramet | er | Owner I | D |
|--------------------|-----------------------------------|--------------|---------|-----------------|--------|--------------------|----------|-----------------|-------------------------|---------------------|--------|
| ThermoElectron Inc | 1105347324 | CKT136 | S | andy Grei | nville | 03/18/20 | 015 | Ozone | | 000744 | |
| Intercept -0 | .00406 Slope: .50955 Intercept | 0.00000 | D | Mfg Serial N | umber | ThermoE 0419606 | | | ameter oz r Desc. Oz | one zone primary | / stan |
| CorrCoff 0 | .99998 CorrCoff | 0.0000 | 0 | Tfer ID | | 01112 | | | | | |
| DAS 1: | DAS 2: | | | Slope | | | 0.99405 | 5 Intero | ent [| -0.42 | 803 |
| A Avg % Diff: A M | | 6Dif A Max 9 | % Di | | | | | | | | |
| 0.9% | 2.2% | | | Cert Da | ite | | 3/9/2018 | Corr | | 1.00 | 000 |
| UseDescription: | ConcGroup: | Tfer Raw: | Tfer | Corr: | Si | te: | Site | Unit: | PctDif | ference: | |
| primary | 1 | 0.18 | | 61 | 0.3 | | ppb | | | | |
| primary | 2 | 29.95 | | .55 | 29. | | ppb | | | -2.19% | |
| primary | 3 | 49.90 | - | .62 | 50. | | ppb | | | -1.01% | |
| primary | 4 | 79.45 | | .35 | 80. | | ppb | | | 0.19% | |
| primary | 5 | 109.95 | 111 | 1.03 | 110 | .90 | ppb | | | -0.12% | |
| Sensor Componen | t Cell B Noise | | Conditi | on 1.4 pp | b | | | Status [| bass | | |
| Sensor Componen | t Cell B Tmp. | | Conditi | on | | | | Status [| bass | | |
| Sensor Componen | t Fullscale Voltage | | Conditi | on N/A | | | | Status [| bass | | |
| Sensor Componen | t Inlet Filter Condition | งท | Conditi | on Clean | | | | Status [| oass | | |
| Sensor Componen | t Line Loss | | Conditi | on Not te | sted | | | Status [| oass | | |
| Sensor Componen | t Offset | | Conditi | on -0.10 | | | | Status [| oass | | |
| Sensor Componen | t Span | | Conditi | on 1.008 | | | | Status [| oass | | |
| Sensor Componen | t Cell B Freq. | | Conditi | on 86.9 k | Hz | | | Status [| oass | | |
| Sensor Componen | t System Memo | | Conditi | on | | | | Status [| oass | | |
| Sensor Componen | t Sample Train | | Conditi | on Good | | | | Status [| oass | | |
| Sensor Componen | t Cell B Pressure | | Conditi | on | | | | Status [| oass | | |
| Sensor Componen | t Cell B Flow | | Conditi | on 0.72 l | pm | | | Status [| oass | | |
| Sensor Componen | t Cell A Tmp. | | Conditi | on 26.8 (|) | | | Status [| bass | | |
| Sensor Componen | t Cell A Pressure | | Conditi | on 711.8 | mmHg | | | Status [| bass | | |
| Sensor Componen | t Cell A Noise | | Conditi | on 1.1 pp | b | | | Status [| bass | | |
| Sensor Componen | t Cell A Freq. | | Conditi | on 86.9 k | Hz | | | Status F | bass | | |
| Sensor Componen | t Cell A Flow | | Conditi | on 0.81 l | pm | | | Status [| bass | | |
| Sensor Componen | t Battery Backup | | Conditi | on N/A | | | | Status [| bass | | |
| Sensor Componen | t Zero Voltage | | Conditi | on N/A | | | | Status [| bass | | |

Temperature Data Form

| Mfg | | Serial Nun | ıber Ta | Site | | Tec | hni | cian | Site V | isit Date | Param | eter | Owner II |) |
|-------------|-------|-------------|---------------|-----------|----------|------|--------------|------------|--------|-----------|---------|--------------|-------------|-----|
| RM Young | | 6703 | | CKT136 | | Sa | ndy | Grenville | 03/18 | 8/2015 | Temper | rature | 04689 | |
| | | | | | | | Mf | g | Extec | า | Pa | arameter Te | mperature | |
| | | | | | | | Ser | ial Number | H2327 | 734 | Tí | fer Desc. RT | D | |
| | | | | | | | Tfe | er ID | 01227 | |] | | | |
| DAS 1: | | | DAS 2: | | | | Slo j | ре | | 1.00343 | 3 Inte | rcept | -0.064 | 409 |
| Abs Avg Err | Abs | Max Er | Abs Avg | g Err Abs | Max Er | | Cer | rt Date | | 1/30/201 | 5 Cor | rCoff | 1.000 | 000 |
| 0.38 | | 0.47 | | | | | | | | | | | | |
| UseDesc.: | | Test type: | Inp | outTmpRaw | InputTmp | oCor | rr.: | OutputTmpS | ignal: | OutputSig | nalEng: | OSE Unit: | Difference: | |
| primary | Temp | Low Range | e | 0.07 | 0.13 | 3 | | 0.000 | | -0.2 | 2 | С | -0.28 | |
| primary | Temp | Mid Range | | 25.38 | 25.3 | 6 | | 0.000 | | 24. | 9 | C | -0.47 | |
| primary | Temp | High Rang | e | 48.40 | 48.3 | 0 | | 0.000 | | 47. | 9 | C | -0.4 | |
| Sensor Com | ponen | t Shield | | | Cond | itio | n C | lean | | | Status | pass | |] |
| Sensor Com | ponen | t Blower St | tatus Swi | tch | Cond | itio | n N | I/A | | | Status | pass | |] |
| Sensor Com | ponen | t Blower | | | Cond | itio | n N | I/A | | | Status | pass | |] |
| Sensor Com | ponen | t System M | lemo | | Cond | itio | n 🗌 | | | | Status | pass | |] |

Infrastructure Data For

| Sit | e ID | CKT136 | Technician | Sandy Grenville | | Site Visit Date | 03/18/2015 | |
|-----|-----------|--------|-----------------|-----------------|----------|-----------------|------------|--|
| | Shelter M | ake | Shelter Model | | Shelte | r Size | | |
| | Ekto | | 8810 (s/n 2116- | 2) | 640 cu | ft | | |
| | | | | | 19555446 | | | |

| Sensor Component | Shelter Roof | Condition | Poor | Status | Fail |
|------------------|----------------------|-----------|-------------|--------|------|
| Sensor Component | Sample Tower Type | Condition | Туре В | 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 | Rotometer | Condition | Installed | Status | pass |
| Sensor Component | Conduit | Condition | N/A | Status | pass |
| Sensor Component | Sample Tower | Condition | Good | Status | pass |
| Sensor Component | Shelter Condition | Condition | Poor | Status | Fail |
| Sensor Component | Shelter Floor | Condition | Poor | Status | Fail |
| Sensor Component | Shelter Temp Control | Condition | Functioning | Status | pass |
| Sensor Component | Signal Cable | Condition | Good | Status | pass |
| Sensor Component | Tubing Type | Condition | 3/8 teflon | Status | pass |
| Sensor Component | Shelter Door | Condition | Fair | Status | pass |
| Sensor Component | Sample Train | Condition | Good | Status | pass |

Shelter Temperature Data For

| Mfg | Serial Number Ta | Site | Technician | Site Visit Date | Parameter | Owner ID |
|-------------------|---------------------------|----------------|-----------------|-----------------|--------------------|-------------------|
| Campbell | none | CKT136 | Sandy Grenville | 03/18/2015 | Shelter Temperatur | e none |
| DAS 1: | DAS 2: | | Mfg | Extech | Parameter St | nelter Temperatur |
| Abs Avg ErrAb1.28 | os Max Er Abs Avg 1.49 | Err Abs Max Er | Serial Number | H232734 | Tfer Desc. R | TD |
| | | | Tfer ID | 01227 | | |
| | | | Slope | 1.00343 | 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 | 21.93 | 21.92 | 0.000 | 20.9 | С | -0.99 |
| primary | Temp Mid Range | 26.40 | 26.37 | 0.000 | 25.0 | С | -1.37 |
| primary | Temp Mid Range | 27.30 | 27.27 | 0.000 | 25.8 | С | -1.49 |

Field Systems Comments

1 Parameter: DasComments

Counterweights are present at the site to be installed on the sample tower. This should be performed as soon as possible to make it safer to lower the sample tower.

2 Parameter: ShelterCleanNotes

The shelter is very clean and well organized.

3 Parameter: PollAnalyzerCom

The meteorological tower has been removed. The sample tower has been replaced since the previous audit visit..

4 Parameter: MetOpMaintCom

The temperature sensor has been installed at approximately 8 meters from the ground on the sample tower in a naturally aspirated shield. The shelter roof is leaking and the site operator is preparing to attempt repairs. The walls are beginning to show signs of rot.

| Site ID CKT136 | Technician Sandy Grenvill | le Site Visit Date 03/ | 18/2015 |
|------------------------|---|--|--|
| A Constant | and the second | | |
| Site Sponsor (agency) | EPA | USGS Map | Dingus |
| Operating Group | private | Map Scale | |
| AQS# | 21-175-9991 | Map Date | |
| Meteorological Type | R.M. Young |] | |
| Air Pollutant Analyzer | Ozone | QAPP Latitude | 37.9211 |
| Deposition Measurement | dry | QAPP Longitude | -83.0658 |
| Land Use | woodland - mixed | QAPP Elevation Meters | 455 |
| Ferrain | rolling | QAPP Declination | 5.9 |
| Conforms to MLM | Yes | QAPP Declination Date | 2/22/2006 |
| Site Telephone | (606) 522-3560 | Audit Latitude | 37.9214 |
| Site Address 1 | 7687 Highway 437 | Audit Longitude | -83.06629 |
| Site Address 2 | | Audit Elevation | 37 |
| County | Morgan | Audit Declination | -6.1 |
| City, State | West Liberty, KY |] Present | |
| Zip Code | 41472 | Fire Extinguisher ✓ | No inspection date |
| lime 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 | Iodel 8810 (s/n 2116-2) | Shelter Size 640 cuft |
| Shelter Clean | Notes The shelter is very clean and | well organized. | |
| Site OK 🔽 | Notes | The state of the second s | |
| onto turn dirt r | n I-64 in Morehead go south on route 519 route 460. Continue approximately 1 mile right onto route 437. Continue approxima oad at the top of the hill before the closed oximately 1/2 mile on the left. | e and turn left onto route 172. (tely 8 miles staying on 437. Th | continue approximately 8 miles and ther ne road will climb a hill, turn left onto a |

Field Systems Data Form

CKT136

F-02058-1500-S2-rev001

Site ID

Technician Sandy Grenville

Site Visit Date 03/18/2015

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

Siting Distances OK

Siting Criteria Comment

| Field Systems Data Form | | | | | F-02058-1500-S3-rev001 | | | | |
|--|---|--|--|---------------|--|--|--|--|--|
| Site | e ID | CKT136 | Technician Sandy | Grenville | Site Visit Date 03/18/2015 | | | | |
| 1 | | id speed and direct ifluenced by obstru | ion sensors sited so as to a ctions? | void 🔽 | N/A | | | | |
| 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) | | | | or on a | N/A | | | | |
| 3 | | | | | N/A | | | | |
| 4 | Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc? | | | | | | | | |
| 5 | condition surface | ons? (i.e. ground be | ensors sited to avoid unna low sensors should be nati ped. Ridges, hollows, and woided) | ural | | | | | |
| 6 | Is the so | olar radiation sense | or plumb? | | N/A | | | | |
| 7 | Is it site light? | ed to avoid shading | or any artificial or reflect | ted 🗹 | N/A | | | | |
| 8 | Is the ra | ain gauge plumb? | | ✓ | N/A | | | | |
| 9 | Is it site towers, | | ng effects from buildings, t | rees, | N/A | | | | |
| 10 | Is the su facing n | | or sited with the grid surfa | ace 🔽 | N/A | | | | |
| 11 | Is it inc | clined approximate | ly 30 degrees? | | N/A | | | | |
| Dre | wide onv | additional evaluation | tion (nhotograph or skate | h if necessar | y) regarding conditions listed above or any 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:

| Field Systems Data Form | | | | | | | 00-S4-rev001 | |
|-------------------------|--|--------------------------------------|--|------------------|-------|----------------------|--------------|--------|
| Site | e ID | CKT136 | Technician | Sandy Grenville | 21.03 | Site Visit Date 03/1 | 8/2015 | |
| | | | | | | | | |
| 1 | | e meterological n, and well main | sensors appear to be ntained? | intact, in good | | Temperature only | | |
| 2 | Are all the meteorological sensors operational online, and reporting data? | | | | | Temperature only | | |
| 3 | | | | | | | | |
| 4 | Are the aspirated motors working? | | | | N/A | | | |
| 5 | Is the solar radiation sensor's lens clean and free of scratches? | | | free of | | N/A | | |
| 6 | Is the surface wetness sensor grid clean and undamaged? | | | indamaged? | | N/A | | |
| 7 | | sensor signal an n, and well maiı | nd power cables intact ntained? | t, in good | | | | |
| 8 | | | d power cable connected well maintained? | ctions protected | | | | |
| Pa | ameter | | Manufacturer | Model | | S/N | Cli | ent ID |
| Ter | nperature | | RM Young | 41342VO | NO.4 | 6703 | 046 | 89 |

The temperature sensor has been installed at approximately 8 meters from the ground on the sample tower in a naturally aspirated shield. The shelter roof is leaking and the site operator is preparing to attempt repairs. The walls are beginning to show signs of rot.

| Fie | eld Sy | vstems Data H | orm | | F-02058-1500-S5-rev001 |
|------|--------------------------------------|--|--------------------------------------|-------|---|
| Site | ID CKT136 Technician Sandy Grenville | | | | Site Visit Date 03/18/2015 |
| | Siting C | Criteria: Are the poll | itant analyzers and deposition ec | luibi | nent sited in accordance with 40 CFR 58, Appendix E |
| 1 | | sample inlets have at icted airflow? | least a 270 degree arc of | | |
| 2 | Are the | sample inlets 3 - 15 | neters above the ground? | | |
| 3 | | sample inlets > 1 me meters from trees? | ter from any major obstruction, | | |
| | Polluta | nt analyzers and dep | osition equipment operations and | l ma | <u>intenance</u> |
| 1 | | analyzers and equipr on and well maintain | nent appear to be in good ed? | | |
| 2 | | analyzers and monit ng data? | ors operational, on-line, and | | |
| 3 | Describ | e ozone sample tube | | | 1/4 teflon by 15 meters |
| 4 | Describ | e dry dep sample tul | ie. | | 3/8 teflon by 12 meters |
| 5 | | line filters used in the e location) | e ozone sample line? (if yes | | At inlet only |
| 6 | Are san obstruc | | of kinks, moisture, and | | |
| 7 | Is the z | ero air supply desicc | unt unsaturated? | | |
| 8 | Are the | re moisture traps in | the sample lines? | | |
| 9 | Is there clean? | a rotometer in the d | ry deposition filter line, and is it | | Clean and dry |
| D | | | Kanada staanaa Madal | | C/N Climat ID |

| Parameter | Manufacturer | Model | S/N | Client ID |
|-----------------------|-----------------------|-----------|------------|-----------|
| Ozone | ThermoElectron Inc | 49i A1NAA | 1105347324 | 000744 |
| Filter pack flow pump | Thomas | 107CA18 | 0290006116 | 02361 |
| Zero air pump | Werther International | PC70/4 | 000829157 | 06902 |
| Sample Tower | Aluma Tower | В | none | 000822 |

Provide any additional 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. The sample tower has been replaced since the previous audit visit..

| Fie | eld Sy | ystems Data | a Form | | | F-02058-1500-S6-rev00 | | | | |
|------|--|-------------------------------------|-------------------------|-----------------|--------------|-----------------------|------------|---------|--|--|
| Site | D | CKT136 | Technician | Sandy Grenville | | Site Visit Date | 03/18/2015 | | | |
| | DAS, s | ensor translators, | and peripheral equip | ment operatio | <u>ns ai</u> | nd maintenance | | | | |
| 1 | Do the well ma | DAS instruments aintained? | appear to be in good | condition and | | | | | | |
| 2 | | the components o 1, backup, etc) | of the DAS operationa | l? (printers, | | | | | | |
| 3 | | | | | | Met sensors only | | | | |
| 4 | Are the signal connections protected from the weather and well maintained? | | | | | | | | | |
| 5 | 5 Are the signal leads connected to the correct DAS channel? | | | | | | | | | |
| 6 | Are the ground | | nslators, and shelter p | roperly | | | | | | |
| 7 | Does th | ne instrument shel | ter have a stable pow | er source? | | | | | | |
| 8 | Is the i | nstrument shelter | temperature controll | ed? | | | | | | |
| 9 | Is the r | net tower stable a | nd grounded? | | | Stable | Grounder | ì | | |
| 10 | Is the s | ample tower stab | le and grounded? | | | | | | | |
| 11 | Tower | comments? | | | | Met tower removed | | | | |
| Par | ameter | | Manufacturer | Model | | S/N | Cl | ient ID | | |
| Cor | nputer | | Dell | D520 | 105272 | unknown | 00 | 0247 | | |

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

CR3000

H4222-C

Campbell

Raven

DAS

Modem

Counterweights are present at the site to be installed on the sample tower. This should be performed as soon as possible to make it safer to lower the sample tower.

2132

0844350343

000354

06590

| Field Systems Data Fo | orm | | | | F-02 | 058- | 1500-S7-rev001 |
|--|---|-----------------|------------------------|---|-------------|---|------------------------|
| Site ID CKT136 |] Tecł | nician Sa | ndy Grenville | Site Visit Date 03 | 3/18/2015 | | |
| Documentation | | | | | | | |
| Does the site have the required i | instrum | ont and eau | uinmont monuals? | | | | |
| <u>Does the site have the required r</u> | | AND HILL DOUGHT | <u>mpment manuals.</u> | | 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 pu | np | | | |
| Temperature translator | | | Filter flow p | oump | U. | | |
| Humidity sensor translator | | | Surge prote | ctor | | | |
| Solar radiation translator | | | UPS | | | | |
| Tipping bucket rain gauge | | | Lightning p | rotection device | | | |
| Ozone analyzer | ALC: NO. | | Shelter heat | | | | |
| Filter pack flow controller | | | Shelter air o | conditioner | | | |
| Filter pack MFC power supply | | | | | | | |
| Does the site have the required | l and m | ost recent (| OC documents and 1 | eport forms? | | | |
| Pr | esent | | | | Curre | nt | |
| Station Log | | | | The second se | | | |
| SSRF | | | | | | | |
| Site Ops Manual | | | | | | | |
| HASP | | Nov 2001 | | | | | |
| Field Ops Manual | | Oct 2001 | | | | | |
| Calibration Reports | | Electronic of | сору | | | | |
| Ozone z/s/p Control Charts | | | | | | | |
| Preventive maintenance schedul | | | | | | | |
| 1 Is the station log properly completed during every site visit? ✓ | | | | | | | |
| 2 Are the Site Status Report Forms being completed and current? | | | | | | | |
| 3 Are the chain-of-custody form sample transfer to and from 1 | AND REAL PROPERTY OF A DESCRIPTION OF A | erly used to | odocument 🔽 | | | | |
| 4 Are ozone z/s/p control charts current? | s proper | ly complete | ed and 🗌 Co | ntrol charts not use | d | | |
| Provide any additional explanation natural or man-made, that may af | | | | egarding condition | ns listed a | above, o | or any other features, |
| | | | | | | NAME OF A DESCRIPTION OF A | |

| Field Systems Data Form | | | | | F-02058-1500-S8-rev0 | | |
|-------------------------|--------------------|---------------------------------------|---|--------------------------------|----------------------|------------|--|
| Sit | e ID | CKT136 | Technician | Sandy Grenville | Site Visit Date | 03/18/2015 | |
| 1 | Has th course | e? If yes, when an | tended a formal CAS d who instructed? | | | | |
| 2 | | | or attended a formal when and who instru | PERCEPTION STOPPING CONSCIDENT | | | |
| 3 | Is the s schedu | | rly on the required T | uesday 🔽 | | | |
| 4 | | e standard CAST ed by the site ope | NET operational pro rator? | cedures being | | | |
| 5 | | | owledgeable of, and es? (including docum | | | | |

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

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

Are regular operational OA/OC checks performed on the ozone analyzer?

| | | NAMES OF THE OWNER |
|--|------------------|--|
| QC Check Performed | | Frequency |
| Multi-point Calibrations | | Semiannually |
| Automatic Zero/Span Tests | | Daily |
| Manual Zero/Span Tests | | |
| Automatic Precision Level Tests | | Daily |
| Manual Precision Level Test | | |
| Analyzer Diagnostics Tests | | Weekly |
| In-line Filter Replacement (at inlet) | | Every 2 weeks |
| In-line Filter Replacement (at analyze | | N/A |
| Sample Line Check for Dirt/Water | | Weekly |
| Zero Air Desiccant Check | | Weekly |
| | MANDRON WATER TO | |

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

<

Provide any additional 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

~

Logbook and call-in

Compliant

Compliant

~

~ ~ ~ ~

~ ~ \checkmark ~ ~ ~ ~ \checkmark

| Fie | eld Sy | stems Data Fo | rm | | | | F-02058-1500-S9-rev00 | | | | | |
|---|--|--|-----------|---------|------------------|--|-----------------------|------------------------|---------------------|--|--|--|
| Site | D | CKT136 | Techni | cian | Sandy Grenville | | Site Visit Date | e 03/18/2015 | | | | |
| | Site ope | eration procedures | | | | | | | | | | |
| 1 | Is the fi | lter pack being change | d every T | uesda | y as scheduled? | | Filter changed usu | ally at noon | | | | |
| 2 | Are the correctl | Site Status Report For y? | ms being | comj | pleted and filed | | | | | | | |
| 3 | 3 Are data downloads and backups being performed as scheduled? | | | | | | No longer required | | | | | |
| 4 | 4 Are general observations being made and recorded? How? | | | | | | SSRF, logbook | | | | | |
| 5 | 5 Are site supplies on-hand and replenished in a timely fashion? | | | | | | | | | | | |
| 6 | Are sample flow rates recorded? How? | | | | | | SSRF, logbook, ca | all-in | | | | |
| 7 | Are san fashion | aples sent to the lab on ? | a regular | sche | dule in a timely | | | | | | | |
| 8 | | ers protected from cont pping? How? | taminatio | n dur | ing handling | | Clean gloves on a | nd off | | | | |
| 9 | | site conditions reporte ons manager or staff? | d regular | ly to : | the field | | | | | | | |
| QC | Check P | erformed | | Free | luency | | | Compliant | | | | |
| N | Iulti-poi | nt MFC Calibrations | | Sem | iannually | | | | | | | |
| F | low Syst | em Leak Checks | | Wee | kly | | | | | | | |
| F | ilter Pac | k Inspection | | | | | | | | | | |
| F | Flow Rate Setting Checks Weekly | | | | | | | | | | | |
| V | isual Ch | al Check of Flow Rate Rotometer 🗹 Weekly | | | | | | | | | | |
| I | In-line Filter Inspection/Replacement Semiannually | | | | | | | | | | | |
| Sample Line Check for Dirt/Water Weekly | | | | 1540 | | | | | | | | |
| | | additional explanation (an-made, that may affe | | | | |) regarding condi | tions listed above, or | any other features, | | | |

APPENDIX B

CASTNET Site Spot Report Forms

Data Compiled: 2/18/2015 12:31:05 PM

| SiteVisitDate | Site | Technician |
|---------------|--------|-------------|
| 02/10/2015 | EVE419 | Eric Hebert |
| | | |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|------|--------------------------------|-----|-------|--------------|--------|----------|-------|-----------|
| 1 | Flow Rate average % difference | Р | 10 | 5 | 2 | 0.42 | % | Р |
| 2 | Flow Rate max % difference | Р | 10 | 5 | 2 | 0.52 | % | Р |
| 3 | DAS Time maximum error | Р | 0 | 5 | 1 | 3.57 | min | Р |
| 4 | DAS Voltage average error | Р | 16 | 0.003 | 28 | 0.0001 | V | Р |
| 5 | DAS Voltage average error | Р | 8 | 0.003 | 28 | 0.0001 | V | Р |

02/10/2015 EVE419

Eric Hebert

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: SiteOpsProcComm

Assistance was provided to the site operators regarding questions relating to the new SSRF. Corrections were made to the previous week's form to account for the non-routine sample duration.

2 Parameter: DasComments

A winch has been added to assist with lowering the sample tower.

Parameter: SitingCriteriaCom 3

Small parking lot for park employees and fire fighting equipment is within 100 meters of the site.

Parameter: ShelterCleanNotes 4

The shelter is very clean, neat and well organized. ARS is repairing the leak in the roof.

5 Parameter: MetSensorComme

The 10 meter temperature sensor has been removed and temperature is now being measured using a combination RH/temperature sensor mounted in a naturally aspirated shield at approximately 2 meters above the ground. This is a change from the previous temperature measurements which were made with an RTD in a forced-air aspirated shield at approximately 9 meters from the ground.

Data Compiled: 5/11/

led: 5/11/2015 8:32:54 AM

SiteVisitDateSiteTechnician02/27/2015CAD150Sandy Grenville

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|------|-----------------------------------|-----|-------|--------------|--------|----------|----------|-----------|
| 1 | Temperature average error | Р | 4 | 0.5 | 3 | 0.03 | c | Р |
| 2 | Temperature max error | Р | 4 | 0.5 | 3 | 0.05 | с | Р |
| 3 | Ozone Slope | Р | 0 | 1.1 | 4 | 1.01673 | unitless | Р |
| 4 | Ozone Intercept | Р | 0 | 5 | 4 | 0.00908 | ppb | Р |
| 5 | Ozone correlation | Р | 0 | 0.995 | 4 | 0.99992 | unitless | Р |
| 6 | Ozone % difference avg | Р | 7 | 10 | 4 | 2.0 | % | Р |
| 7 | Ozone % difference max | Р | 7 | 10 | 4 | 2.6 | % | Р |
| 8 | Flow Rate average % difference | Р | 10 | 5 | 2 | 0.18 | % | Р |
| 9 | Flow Rate max % difference | Р | 10 | 5 | 2 | 0.20 | % | Р |
| 10 | DAS Time maximum error | Р | 0 | 5 | 1 | 0.05 | min | Р |
| 11 | DAS Voltage average error | Р | 7 | 0.003 | 42 | 0.0001 | V | Р |
| 12 | Shelter Temperature average error | Р | 5 | 1 | 6 | 0.42 | с | Р |
| 13 | Shelter Temperature max error | Р | 5 | 1 | 6 | 0.52 | c | Р |

Field Systems Comments

1 Parameter: SiteOpsProcedures

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

2 Parameter: ShelterCleanNotes

The bottom of the shelter walls are very badly deteriorated. The floor and ceiling have been repaired.

3 Parameter: MetOpMaintCom

The shelter is in poor condition. The bottom of the walls have rot damage. The front wall and the section below the heater are severely damaged by ants.

Data Compiled: 5/11/2015 11:14:20 AM

SiteVisitDateSiteTechnician02/28/2015CVL151Sandy Grenville

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|------|-----------------------------------|-----|-------|--------------|--------|----------|----------|-----------|
| 1 | Temperature average error | Р | 4 | 0.5 | 3 | 0.13 | c | Р |
| 2 | Temperature max error | Р | 4 | 0.5 | 3 | 0.26 | с | Р |
| 3 | Ozone Slope | Р | 0 | 1.1 | 4 | 1.00543 | unitless | Р |
| 4 | Ozone Intercept | Р | 0 | 5 | 4 | -0.58714 | ppb | Р |
| 5 | Ozone correlation | Р | 0 | 0.995 | 4 | 1.00000 | unitless | Р |
| 6 | Ozone % difference avg | Р | 7 | 10 | 4 | 0.7 | % | Р |
| 7 | Ozone % difference max | Р | 7 | 10 | 4 | 1.9 | % | Р |
| 8 | Flow Rate average % difference | Р | 10 | 5 | 2 | 1.06 | % | Р |
| 9 | Flow Rate max % difference | Р | 10 | 5 | 2 | 1.32 | % | 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 | 6 | 0.37 | с | Р |
| 13 | Shelter Temperature max error | Р | 5 | 1 | 6 | 0.50 | с | Р |

Field Systems Comments

1 Parameter: DocumentationCo

The site operations manual does not apply to the currently installed instrumentation. The current HASP is not available onsite.

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

The shelter is somewhat cluttered. The floor has been repaired since the previous audit visit, however the roof is still leaking.

Data Compiled: 5/11/2

d: 5/11/2015 9:39:39 AM

SiteVisitDateSiteTechnician03/13/2015CDZ171Sandy Grenville

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|------|-----------------------------------|-----|-------|--------------|--------|----------|----------|-----------|
| 1 | Temperature average error | Р | 4 | 0.5 | 9 | 0.27 | с | Р |
| 2 | Temperature max error | Р | 4 | 0.5 | 9 | 0.48 | с | Р |
| 3 | Ozone Slope | Р | 0 | 1.1 | 4 | 1.01264 | unitless | Р |
| 4 | Ozone Intercept | Р | 0 | 5 | 4 | -0.64212 | ppb | Р |
| 5 | Ozone correlation | Р | 0 | 0.995 | 4 | 0.99999 | unitless | Р |
| 6 | Ozone % difference avg | Р | 7 | 10 | 4 | 0.5 | % | Р |
| 7 | Ozone % difference max | Р | 7 | 10 | 4 | 0.7 | % | Р |
| 8 | Flow Rate average % difference | Р | 10 | 5 | 3 | 0.35 | % | Р |
| 9 | Flow Rate max % difference | Р | 10 | 5 | 3 | 0.53 | % | Р |
| 10 | DAS Time maximum error | Р | 0 | 5 | 1 | 0.02 | min | Р |
| 11 | DAS Voltage average error | Р | 7 | 0.003 | 49 | 0.0001 | V | Р |
| 12 | Shelter Temperature average error | Р | 5 | 1 | 6 | 0.62 | с | Р |
| 13 | Shelter Temperature max error | Р | 5 | 1 | 6 | 0.67 | с | Р |

03/13/2015 CDZ171

Sandy Grenville

Field Systems Comments

1 Parameter: SiteOpsProcComm

Tower is still being lowered and the deposition filter changed without downing ozone channel. This is a new site operator who has been partially trained by the previous backup site operator. He would benefit from additional training. It was observed that he did not complete the SSRF correctly and was unsure of some of the required instrument checks.

Parameter: SitingCriteriaCom 2

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

3 Parameter: ShelterCleanNotes

The shelter floor is beginning to rot again by the door. The shelter is still cluttered and dirty.

Parameter: PollAnalyzerCom 4

The zero air desiccant is saturated and should be replaced.

5 Parameter: MetSensorComme

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

Data Compiled: 5/11/2015 12:13:29 PM

SiteVisitDateSiteTechnician03/15/2015MCK131Sandy Grenville

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|------|-----------------------------------|-----|-------|--------------|--------|----------|----------|-----------|
| 1 | Temperature average error | Р | 4 | 0.5 | 6 | 0.17 | с | Р |
| 2 | Temperature max error | Р | 4 | 0.5 | 6 | 0.36 | с | Р |
| 3 | Ozone Slope | Р | 0 | 1.1 | 4 | 0.99746 | unitless | Р |
| 4 | Ozone Intercept | Р | 0 | 5 | 4 | -0.87322 | ppb | Р |
| 5 | Ozone correlation | Р | 0 | 0.995 | 4 | 0.99995 | unitless | Р |
| 6 | Ozone % difference avg | Р | 7 | 10 | 4 | 2.3 | % | Р |
| 7 | Ozone % difference max | Р | 7 | 10 | 4 | 4.5 | % | Р |
| 8 | Flow Rate average % difference | Р | 10 | 5 | 4 | 0.29 | % | Р |
| 9 | Flow Rate max % difference | Р | 10 | 5 | 4 | 0.46 | % | Р |
| 10 | DAS Time maximum error | Р | 0 | 5 | 1 | 0.00 | min | Р |
| 11 | DAS Voltage average error | Р | 7 | 0.003 | 21 | 0.0001 | V | Р |
| 12 | Shelter Temperature average error | Р | 5 | 1 | 6 | 0.20 | с | Р |
| 13 | Shelter Temperature max error | Р | 5 | 1 | 6 | 0.42 | c | Р |

Field Systems Comments

1 Parameter: ShelterCleanNotes

The shelter is neat, clean, and well organized.

Data Compiled: 5/11/2015 12:32:33 PM

SiteVisitDateSiteTechnician03/15/2015MCK231Sandy 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 | 0.41 | с | Р |
| 3 | Ozone Slope | Р | 0 | 1.1 | 4 | 1.0075 | unitless | Р |
| 4 | Ozone Intercept | Р | 0 | 5 | 4 | -0.57296 | ppb | Р |
| 5 | Ozone correlation | Р | 0 | 0.995 | 4 | 0.99996 | unitless | Р |
| 6 | Ozone % difference avg | Р | 7 | 10 | 4 | 1.0 | % | Р |
| 7 | Ozone % difference max | Р | 7 | 10 | 4 | 2.3 | % | Р |
| 8 | Flow Rate average % difference | Р | 10 | 5 | 2 | 1.28 | % | Р |
| 9 | Flow Rate max % difference | Р | 10 | 5 | 2 | 1.75 | % | Р |
| 10 | DAS Time maximum error | Р | 0 | 5 | 1 | 0.00 | min | Р |
| 11 | DAS Voltage average error | Р | 7 | 0.003 | 49 | 0.0002 | V | Р |
| 12 | Shelter Temperature average error | Р | 5 | 1 | 6 | 0.45 | с | Р |
| 13 | Shelter Temperature max error | Р | 5 | 1 | 6 | 0.76 | с | Р |
| | | | | | | | | |

Field Systems Comments

1 Parameter: ShelterCleanNotes

The site instruments are located in the MCK131 shelter. The same site operator is servicing both sites.

Data Compiled: 5/11/2015 11:53:12 AM

SiteVisitDateSiteTechnician03/17/2015MAC426Sandy Grenville

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|------|-----------------------------------|-----|-------|--------------|--------|----------|----------|-----------|
| | T | Р | 4 | 0.5 | 6 | 0.27 | | Р |
| 1 | Temperature average error | P | 4 | 0.5 | 0 | 0.27 | с | r |
| 2 | Temperature max error | Р | 4 | 0.5 | 6 | 0.40 | с | Р |
| 3 | Ozone Slope | Р | 0 | 1.1 | 4 | 0.99762 | unitless | Р |
| 4 | Ozone Intercept | Р | 0 | 5 | 4 | -0.33402 | ppb | Р |
| 5 | Ozone correlation | Р | 0 | 0.995 | 4 | 1.00000 | unitless | Р |
| 6 | Ozone % difference avg | Р | 7 | 10 | 4 | 1.0 | % | Р |
| 7 | Ozone % difference max | Р | 7 | 10 | 4 | 1.6 | % | Р |
| 8 | Flow Rate average % difference | Р | 10 | 5 | 3 | 0.67 | % | Р |
| 9 | Flow Rate max % difference | Р | 10 | 5 | 3 | 0.74 | % | Р |
| 10 | DAS Time maximum error | Р | 0 | 5 | 1 | 0.42 | min | Р |
| 11 | DAS Voltage average error | Р | 2 | 0.003 | 35 | 0.0001 | V | Р |
| 12 | Shelter Temperature average error | Р | 5 | 1 | 9 | 0.46 | с | Р |
| 13 | Shelter Temperature max error | Р | 5 | 1 | 9 | 0.85 | с | Р |
| | | | | | | | | |

Field Systems Comments

1 Parameter: SiteOpsProcComm

The site operators are very knowledgeable with air quality monitoring. They are doing a very good job with site activities and filter handling.

2 Parameter: SitingCriteriaCom

Bowling Green is within 40 km of the site. The site is in a hay field which is harvested twice per year. The area to the west and south is comprised of livestock farms including cattle and poultry. The coordinates provided in the QAPP are incorrect.

3 Parameter: ShelterCleanNotes

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

Data Compiled:

5/11/2015 10:46:21 AM

SiteVisitDate Site Technician 03/18/2015 CKT136 Sandy Grenville

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|------|-----------------------------------|-----|-------|--------------|--------|----------|----------|-----------|
| 1 | Temperature average error | Р | 4 | 0.5 | 6 | 0.38 | c | Р |
| 2 | Temperature max error | Р | 4 | 0.5 | 6 | 0.47 | с | Р |
| 3 | Ozone Slope | Р | 0 | 1.1 | 4 | 1.00406 | unitless | Р |
| 4 | Ozone Intercept | Р | 0 | 5 | 4 | -0.50955 | 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 | 2.2 | % | Р |
| 8 | Flow Rate average % difference | Р | 10 | 5 | 3 | 0.47 | % | Р |
| 9 | Flow Rate max % difference | Р | 10 | 5 | 3 | 0.60 | % | 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 | 1.28 | c | Fail |
| 13 | Shelter Temperature max error | Р | 5 | 1 | 12 | 1.49 | c | Fail |

Field Systems Comments

1 Parameter: DasComments

Counterweights are present at the site to be installed on the sample tower. This should be performed as soon as possible to make it safer to lower the sample tower.

2 Parameter: ShelterCleanNotes

The shelter is very clean and well organized.

3 Parameter: PollAnalyzerCom

The meteorological tower has been removed. The sample tower has been replaced since the previous audit visit..

4 Parameter: MetOpMaintCom

The temperature sensor has been installed at approximately 8 meters from the ground on the sample tower in a naturally aspirated shield. The shelter roof is leaking and the site operator is preparing to attempt repairs. The walls are beginning to show signs of rot.

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

Data Compiled: 5/11/2015 12:42:03 PM

| SiteVisitDate | Site | Technician |
|---------------|--------|------------|
| 02/10/2015 | SUM156 | Alison Ray |
| | | |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|------|------------------------|-----|-------|--------------|--------|----------|----------|-----------|
| 1 | Ozone Slope | Р | 0 | 1.1 | 4 | 0.99871 | unitless | Р |
| 2 | Ozone Intercept | Р | 0 | 5 | 4 | -1.22779 | ppb | Р |
| 3 | Ozone correlation | Р | 0 | 0.995 | 4 | 0.99984 | unitless | Р |
| 4 | Ozone % difference avg | Р | 7 | 10 | 4 | 1.6 | % | Р |
| 5 | Ozone % difference max | Р | 7 | 10 | 4 | 2.4 | % | Р |

| Mfg | Serial Number Tag | Site | Те | chnician | | Site Visi | it Date | Paramet | er | Owner I | D |
|-----------------------------|---|----------------|---------|----------------------------|------------|-----------------------------|------------|----------|-----------------------|-----------------------|--------------|
| ThermoElectron Inc | 1105347328 | SUM156 | A | lison Ray | | 02/10/2 | 015 | Ozone | | 000724 | |
| Intercept 0 | .00000Slope:.00000Intercept.00000CorrCoff | 0.0000 | 0 | Mfg Serial N Tfer ID | | Thermol 49CPS-7 01110 | | | ameter o r Desc. (| ozone Dzone primar | y stan |
| DAS 1: A Avg % Diff: A M | | 6Dif A Max | % Di | Slope Cert Da | | | 1.00952 | | • | -0.24 | 4284 0000 |
| 1.6% | 2.4% | | | | | | | | | | |
| UseDescription: | ConcGroup: | Tfer Raw: | | Corr: | Si | | | Unit: | PctDi | ifference: | |
| primary | 1 | -0.03 | 0. | | -1. | | ppb | | | 2 2004 | |
| primary | 2 | 30.70 | | .65 | 29. | | ppb | | | -2.38% | |
| primary | 3 4 | 50.66 84.22 | | .42 .66 | 49. 82. | | ppb ppb | | | -0.85% | |
| primary primary | 5 | 115.25 | | .00 1.40 | 112 | | ppb ppb | | | -1.27% | |
| - · | | 115.25 | | | | .30 | ppo | | | -1.0470 | |
| Sensor Componen | Cell B Noise | | Conditi | on 0.9 pr | ac | | | Status [| Jass | | |
| Sensor Componen | t Cell B Tmp. | | Conditi | on | | | | Status F | bass | | |
| Sensor Componen | t Fullscale Voltage | | Conditi | on N/A | | | | Status [| bass | | |
| Sensor Componen | t Inlet Filter Condition | งท | Conditi | on Clear | 1 | | | Status F | bass | | |
| Sensor Componen | t Line Loss | | Conditi | on Not te | ested | | | Status [| bass | | |
| Sensor Componen | t Offset | | Conditi | on 0.3 | | | | Status [| bass | | |
| Sensor Componen | ıt Span | | Conditi | on 0.999 | | | | Status [| bass | | |
| Sensor Componen | t Cell B Freq. | | Conditi | on 114.8 | kHz | | | Status [| bass | | |
| Sensor Componen | t System Memo | | Conditi | on | | | | Status [| Dass | | |
| Sensor Componen | t Sample Train | | Conditi | on Good | | | | Status [| Dass | | |
| Sensor Componen | t Cell B Pressure | | Conditi | on | | | | Status [| bass | | |
| Sensor Componen | t Cell B Flow | | Conditi | on 0.77 I | pm | | | Status [| bass | | |
| Sensor Componen | t Cell A Tmp. | | Conditi | on 34.6 (| 2 | | | Status [| bass | | |
| Sensor Componen | t Cell A Pressure | | Conditi | on 725 n | nmHg | | | Status [| Dass | | |
| Sensor Componen | t Cell A Noise | | Conditi | on 0.8 pp | ob | | | Status [| bass | | |
| Sensor Componen | t Cell A Freq. | | Conditi | on 100.3 | kHz | | | Status [| bass | | |
| Sensor Componen | t Cell A Flow | | Conditi | on 0.70 I | pm | | | Status [| bass | | |
| Sensor Componen | t Battery Backup | | Conditi | on N/A | | | | Status [| Dass | | |
| Sensor Componen | t Zero Voltage | | Conditi | on N/A | | | | Status [| bass | | |

| Site | Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|------|------------|------------------|-----------------------|----------|--------------|---------------|
| SUM | 156-Alison | n Ray-02/10/2015 | | | | |
| 1 | 2/10/2015 | DAS | Campbell | 000335 | CR3000 | 2114 |
| 2 | 2/10/2015 | Ozone | ThermoElectron Inc | 000724 | 49i A1NAA | 1105347328 |
| 3 | 2/10/2015 | Ozone Standard | ThermoElectron Inc | 000363 | 49i A3NAA | 0726124691 |
| 4 | 2/10/2015 | Sample Tower | Aluma Tower | 03542 | A | none |
| 5 | 2/10/2015 | Zero air pump | Werther International | 06876 | C 70/4 | 000814286 |

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| SiteVisitDate | Site | Technician |
|---------------|--------|-------------|
| 02/11/2015 | IRL141 | Eric Hebert |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|------|------------------------|-----|-------|--------------|--------|----------|----------|-----------|
| 1 | Ozone Slope | Р | 0 | 1.1 | 4 | 0.98102 | unitless | Р |
| 2 | Ozone Intercept | Р | 0 | 5 | 4 | -0.5518 | ppb | Р |
| 3 | Ozone correlation | Р | 0 | 0.995 | 4 | 0.99999 | unitless | Р |
| 4 | Ozone % difference avg | Р | 7 | 10 | 4 | 2.8 | % | Р |
| 5 | Ozone % difference max | Р | 7 | 10 | 4 | 3.4 | % | Р |

| Mfg | Serial Number Tag | Site | Те | chnician | | Site Visi | it Date | Paramet | ter | Owner I | D |
|---------------------------|-----------------------------------|----------------|---------|------------------|--------|--------------------|------------|----------|----------|-----------------------|-------|
| ThermoElectron Inc | 1105347323 | IRL141 | E | ric Hebert | | 02/11/2 | 015 | Ozone | | 000729 | |
| • | .98102 Slope: .55180 Intercept | 0.0000 | 4 | Mfg Serial N | umbor | ThermoE 0517112 | Electron I | | ameter o | zone Dzone primary | |
| | .999999 CorrCoff | 0.0000 | 0 | | | | | IIC | | | otair |
| | | | | Tfer ID | | 01113 | | | | | |
| DAS 1: | DAS 2: | | | Slope | | | 1.00112 | Inter | cept | 0.01 | 063 |
| A Avg % Diff: A M 2.8% | ax % Di A Avg % 3.4% | 6Dif A Max | % Di | Cert Da | ite | | 1/7/2015 | 5 Corre | Coff | 1.00 | 000 |
| | | | | | | L | | | ' | | |
| UseDescription: | ConcGroup: | Tfer Raw: | | Corr: | Sit | | | Unit: | PctDi | fference: | |
| primary primary | 1 2 | -0.39 27.17 | | .40 | -1. | | ppb ppb | | | -3.43% | |
| | 3 | 51.49 | | .12 | 49. | | ppb nnh | | | -3.43% | |
| primary primary | 4 | 79.48 | | .42 .38 | 49. | | ppb ppb | | | -2.90% | |
| primary | 5 | 110.83 | | .38).69 | 107 | | ppb | | | -2.27% | |
| | | 110.85 | 1 | | | .80 | ppo | ~ [| | -2.01/0 | |
| Sensor Componer | t Cell B Noise | | Conditi | on 0.6 pp | dd | | | Status | pass | | |
| Sensor Componer | t Cell B Tmp. | | Conditi | on | | | | Status | pass | | |
| Sensor Componer | t Fullscale Voltage | | Conditi | on N/A | | | | Status | pass | | |
| Sensor Componer | t Inlet Filter Condition | วท | Conditi | on Clean | | | | Status [| pass | | |
| Sensor Componer | t Line Loss | | Conditi | on Not te | sted | | | Status [| pass | | |
| Sensor Componer | nt Offset | | Conditi | on 0.000 | | | | Status | pass | | |
| Sensor Componer | nt Span | | Conditi | on 1.025 | | | | Status [| pass | | |
| Sensor Componer | t Cell B Freq. | | Conditi | on 99.1 k | Hz | | | Status [| pass | | |
| Sensor Componer | t System Memo | | Conditi | on | | | | Status [| pass | | |
| Sensor Componer | t Sample Train | | Conditi | on Good | | | | Status | pass | | |
| Sensor Componer | t Cell B Pressure | | Conditi | on | | | | Status | pass | | |
| Sensor Componer | t Cell B Flow | | Conditi | on 0.72 l | pm | | | Status | pass | | |
| Sensor Componer | t Cell A Tmp. | | Conditi | on 33.3 (|) | | | Status | pass | | |
| Sensor Componer | t Cell A Pressure | | Conditi | on 736 m | nmHg | | | Status | pass | | |
| Sensor Componer | t Cell A Noise | | Conditi | on 0.9 pp | b | | | Status | pass | | |
| Sensor Componer | t Cell A Freq. | | Conditi | on 107.2 | kHz | | | Status | pass | | |
| Sensor Componer | t Cell A Flow | | Conditi | on 0.77 l | pm | | | Status [| pass | | |
| Sensor Componer | t Battery Backup | | Conditi | on Funct | ioning | | | Status | pass | | |
| Sensor Componer | t Zero Voltage | | Conditi | on N/A | | | | Status | pass | | |

| Site | Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|------|------------|------------------|-----------------------|----------|--------------|-----------------|
| IRLI | 41-Eric He | ebert-02/11/2015 | | | | |
| 1 | 2/11/2015 | DAS | Campbell | 000340 | CR3000 | 2119 |
| 2 | 2/11/2015 | Ozone | ThermoElectron Inc | 000729 | 49i A1NAA | 1105347323 |
| 3 | 2/11/2015 | Ozone Standard | ThermoElectron Inc | 000446 | 49i A3NAA | CM08200022 |
| 4 | 2/11/2015 | Sample Tower | Aluma Tower | 000020 | В | AT-61152-A-H8-F |
| 5 | 2/11/2015 | UPS | APC | 06790 | RS900 | unknown |
| 6 | 2/11/2015 | Zero air pump | Werther International | 06898 | C 70/4 | 000821905 |

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| SiteVisitDate | Site | Technician |
|---------------|--------|-----------------|
| 02/25/2015 | GAS153 | Sandy Grenville |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|------|------------------------|-----|-------|--------------|--------|----------|----------|-----------|
| 1 | Ozone Slope | Р | 0 | 1.1 | 4 | 1.01553 | unitless | Р |
| 2 | Ozone Intercept | Р | 0 | 5 | 4 | -0.00623 | ppb | Р |
| 3 | Ozone correlation | Р | 0 | 0.995 | 4 | 0.99997 | unitless | Р |
| 4 | Ozone % difference avg | Р | 7 | 10 | 4 | 1.7 | % | Р |
| 5 | Ozone % difference max | Р | 7 | 10 | 4 | 3.0 | % | Р |

| Mfg | Serial Number Tag | Site | Те | echnician | | Site Vis | sit Date | Paramet | ter | Owner I | D |
|--------------------|------------------------------------|-------------------|---------|-----------------|--------|---|----------|---------|---------|---------|--------|
| ThermoElectron Inc | 1030244807 | GAS153 | S | andy Grei | nville | 02/25/2 | 2015 | Ozone | | 000705 | |
| Intercept -0 | tercept -0.00623 Intercept 0.00000 | | | Mfg Serial N | | ThermoElectron Inc Parameter ozone 0419606966 Tfer Desc. Ozone primar | | | | | / stan |
| DAS 1: | DAS 2: | | | Tfer ID | | 01112 | | | _ | | |
| A Avg % Diff: A M | | 6Dif A Max | % Di | Slope | | | 0.9990 | | cept | -0.15 | |
| 1.7% | 3.0% | | | Cert Da | ite | | 1/27/201 | 5 Corr | Coff | 1.00 | 000 |
| UseDescription: | ConcGroup: | Tfer Raw: | Tfer | Corr: | Si | te: | Site | e Unit: | PctDiff | erence: | |
| primary | 1 | 0.21 | 0. | 36 | 0.2 | 27 | ppb | | | | |
| primary | 2 | 29.26 | 29 | .44 | 30 | .33 | ppb | | | 3.02% | |
| primary | 3 | 49.68 | 49 | .88 | 50 | .20 | ppb | | | 0.64% | |
| primary | 4 | 79.62 | | .84 | 81 | | ppb | | | 1.60% | |
| primary | 5 | 109.40 | 109 | 9.65 | 111 | .40 | ppb | | | 1.60% | |
| Sensor Componen | t Cell B Noise | | Conditi | on 1.2 pp | b | | | Status | pass | | |
| Sensor Componen | t Cell B Tmp. | | Conditi | on | | | | Status | pass | | |
| Sensor Componen | t Fullscale Voltage | | Conditi | on N/A | | | | Status | pass | | |
| Sensor Componen | t Inlet Filter Condition | งท | Conditi | on Clean | | | | Status | pass | | |
| Sensor Componen | t Line Loss | | Conditi | on Not te | sted | | | Status | pass | | |
| Sensor Componen | t Offset | | Conditi | on 0.000 | | | | Status | pass | | |
| Sensor Componen | ıt Span | | Conditi | on 1.000 | | | | Status | pass | | |
| Sensor Componen | t Cell B Freq. | | Conditi | on 100.1 | kHz | | | Status | pass | | |
| Sensor Componen | t System Memo | | Conditi | on | | | | Status | pass | | |
| Sensor Componen | t Sample Train | | Conditi | on Good | | | | Status | pass | | |
| Sensor Componen | t Cell B Pressure | | Conditi | on | | | | Status | pass | | |
| Sensor Componen | t Cell B Flow | | Conditi | on 0.72 l | pm | | | Status | pass | | |
| Sensor Componen | t Cell A Tmp. | | Conditi | on 30.7 (| 2 | | | Status | pass | | |
| Sensor Componen | t Cell A Pressure | | Conditi | on 703 m | nmHg | | | Status | pass | | |
| Sensor Componen | t Cell A Noise | | Conditi | on 1.0 pp | b | | | Status | pass | | |
| Sensor Componen | t Cell A Freq. | | Conditi | on 99.5 k | Hz | | | Status | pass | | |
| Sensor Componen | t Cell A Flow | | Conditi | on 0.60 l | pm | | | Status | pass | | |
| Sensor Componen | t Battery Backup | | Conditi | on N/A | | | | Status | pass | | |
| Sensor Componen | t Zero Voltage | | Conditi | on N/A | | | | Status | pass | | |

| Site | Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|------|------------|----------------------|-----------------------|----------|--------------|---------------|
| GAS | 153-Sandy | Grenville-02/25/2015 | | | | |
| 1 | 2/25/2015 | DAS | Campbell | 000635 | CR3000 | 4934 |
| 2 | 2/25/2015 | Ozone | ThermoElectron Inc | 000705 | 49i A1NAA | 1030244807 |
| 3 | 2/25/2015 | Ozone Standard | ThermoElectron Inc | 000371 | 49i A3NAA | 0726124692 |
| 4 | 2/25/2015 | Sample Tower | Aluma Tower | 000138 | В | none |
| 5 | 2/25/2015 | Zero air pump | Werther International | 06865 | C 70/4 | 000814277 |

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| SiteVisitDate | Site | Technician |
|---------------|--------|-----------------|
| 03/01/2015 | SND152 | Sandy Grenville |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|------|------------------------|-----|-------|--------------|--------|----------|----------|-----------|
| 1 | Ozone Slope | Р | 0 | 1.1 | 4 | 0.99947 | unitless | Р |
| 2 | Ozone Intercept | Р | 0 | 5 | 4 | -0.18338 | ppb | Р |
| 3 | Ozone correlation | Р | 0 | 0.995 | 4 | 0.99999 | unitless | Р |
| 4 | Ozone % difference avg | Р | 7 | 10 | 4 | 0.6 | % | Р |
| 5 | Ozone % difference max | Р | 7 | 10 | 4 | 1.4 | % | Р |

| Mfg | i | Serial Num | ıber Tag | Site | | Те | chnician | | Site Vis | it Date | Parame | ter | Owner] | D |
|---------------------------------|----------|---------------|-----------------------------|------|--------|---------|----------------------------|--------|---------------------------|--------------------|---------|---------------------|-----------------------|--------------|
| ThermoElect | tron Inc | 110634732 | 26 | SND1 | 52 | S | andy Gre | nville | 03/01/2 | 015 | Ozone | | 000725 | |
| Slope: Intercept CorrCoff | -0 | .18338 In | ope: ntercept orrCoff | | 0.0000 | D | Mfg Serial N Tfer ID | | Thermo 041960 01112 | Electron 6966 | | rameter er Desc. | ozone Ozone primar | y stan |
| DAS 1: A Avg % Di 0.6 | | | DAS 2: A Avg % | Dif | A Max | % Di | Slope Cert Da | | | 0.9990 1/27/201 | | • | | 5598 0000 |
| UseDesc | | | Group: | Tfor | Raw: | Tfor | Corr: | Si | to: | Site | e Unit: | Det | Difference: | |
| prim | | | 1 1 | | .05 | | 20 | 0.0 | | ppb | t Unit. | FUL | Jillelence. | |
| prim | • | | 2 | | 9.73 | | .91 | 29. | | ppb | | | -1.44% | |
| prim | ary | | 3 | 49 | 9.65 | 49 | .85 | 49. | .99 | ppb | | | 0.28% | |
| prim | • | | 4 | | 9.59 | | .81 | 79. | | ppb | | | -0.45% | |
| prim | | | 5 | 10 | 8.99 | 109 | 9.24 | 109 | .00 | ppb | | | -0.22% | |
| Sensor Co | omponen | t Cell B No | oise | | | Conditi | on 1.9 p | ob | | | Status | pass | | |
| Sensor Co | omponen | t Cell B Tr | ıp. | | | Conditi | on | | | | Status | pass | | |
| Sensor Co | omponen | t Fullscale | Voltage | | | Conditi | on N/A | | | | Status | pass | | |
| Sensor Co | omponen | t Inlet Filte | r Conditio | 'n | | Conditi | on Clear | 1 | | | Status | pass | | |
| Sensor Co | omponen | t Line Loss | 6 | | | Conditi | on Not te | ested | | | Status | pass | | |
| Sensor Co | omponen | t Offset | | | | Conditi | on 0.2 | | | | Status | pass | | |
| Sensor Co | omponen | t Span | | | | Conditi | on 0.994 | | | | Status | pass | | |
| Sensor Co | omponen | t Cell B Fre | əq. | | | Conditi | on 87.3 | κHz | | | Status | pass | | |
| Sensor Co | omponen | t System N | lemo | | | Conditi | on | | | | Status | pass | | |
| Sensor Co | omponen | t Sample T | Train | | | Conditi | on Good | | | | Status | pass | | |
| Sensor Co | omponen | t Cell B Pro | essure | | | Conditi | on | | | | Status | pass | | |
| Sensor Co | omponen | t Cell B Flo | w | | | Conditi | on 0.69 | pm | | | Status | pass | | |
| Sensor Co | omponen | t Cell A Tr | np. | | | Conditi | on 26.9 (| C | | | Status | pass | | |
| Sensor Co | omponen | t Cell A Pro | essure | | | Conditi | on 702 n | nmHg | | | Status | pass | | |
| Sensor Co | omponen | t Cell A No | oise | | | Conditi | on 1.0 p | b | | | Status | pass | | |
| | | t Cell A Fre | | | | Conditi | on 95.6 | κHz | | | Status | pass | | |
| | | t Cell A Flo | | | | Conditi | on 0.67 | pm | | | Status | pass | | |
| | | t Battery B | | | | Conditi | | | | | Status | pass | | |
| Sensor Co | omponen | t Zero Volt | age | | | Conditi | on N/A | | | | Status | pass | | |

| Site V | Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|--------|------------|----------------------|-----------------------|----------|--------------|---------------|
| SND | 152-Sandy | Grenville-03/01/2015 | | | | |
| 1 | 3/1/2015 | DAS | Campbell | 000357 | CR3000 | 2135 |
| 2 | 3/1/2015 | Ozone | ThermoElectron Inc | 000725 | 49i A1NAA | 1106347326 |
| 3 | 3/1/2015 | Ozone Standard | ThermoElectron Inc | 000220 | 49i A3NAA | 0622717868 |
| 4 | 3/1/2015 | Sample Tower | Aluma Tower | 000148 | В | none |
| 5 | 3/1/2015 | Zero air pump | Werther International | 06867 | C 70/4 | 000814279 |

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| SiteVisitDate | Site | Technician |
|---------------|--------|-----------------|
| 03/19/2015 | SPD111 | Sandy Grenville |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|------|------------------------|-----|-------|--------------|--------|----------|----------|-----------|
| 1 | Ozone Slope | Р | 0 | 1.1 | 4 | 1.00111 | unitless | Р |
| 2 | Ozone Intercept | Р | 0 | 5 | 4 | -0.84251 | ppb | Р |
| 3 | Ozone correlation | Р | 0 | 0.995 | 4 | 0.99998 | unitless | Р |
| 4 | Ozone % difference avg | Р | 7 | 10 | 4 | 1.5 | % | Р |
| 5 | Ozone % difference max | Р | 7 | 10 | 4 | 2.3 | % | Р |

| Mfg | Serial Number Tag | Site | Те | chnician | | Site Vis | it Date | Paramet | ter | Owner I | D |
|-----------------------------|---------------------------|------------|---------|-----------------------------|--------|---------------|----------|----------|-----------|-----------------------|--------|
| ThermoElectron Inc | 1105347313 | SPD111 | S | andy Gre | nville | 03/19/2 | 015 | Ozone | | 000742 | |
| Intercept -0 | -0.84251 Intercept 0.0000 | | 0 | Mfg Serial N | | 0419606966 Tf | | | rameter o | zone Dzone primary | y stan |
| DAS 1: A Avg % Diff: A M | | 6Dif A Max | % Di | Tfer ID Slope Cert Da | | 01112 | 0.99405 | | • L | -0.42 | 2803 |
| 1.5% | 2.3% | | | | | | 0/0/2010 | | | | |
| UseDescription: | ConcGroup: | Tfer Raw: | | Corr: | Si | | | Unit: | PctDi | fference: | |
| primary | 1 | 0.17 | | 60 | -0. | | ppb | | | | |
| primary | 2 | 29.79 | | .39 | 29 | | ppb | | | -2.34% | |
| primary | 3 | 49.91 | | .63 | 49 | | ppb | | | -2.11% | |
| primary | 4 | 79.96 | | .86 | 79. | | ppb | | | -1.35% | |
| primary | 5 | 108.89 | 1 | 9.97 | 109 | .60 | ppb | - | | -0.34% | |
| Sensor Componer | t Cell B Noise | | Conditi | on 0.9 pp | b | | | Status | pass | | |
| Sensor Componer | t Cell B Tmp. | | Conditi | on | | | | Status | pass | | |
| Sensor Componer | t Fullscale Voltage | | Conditi | on N/A | | | | Status | pass | | |
| Sensor Componer | t Inlet Filter Condition | ิท | Conditi | on Clean | 1 | | | Status | pass | | |
| Sensor Componer | t Line Loss | | Conditi | on Not te | sted | | | Status | pass | | |
| Sensor Componer | t Offset | | Conditi | on 0.3 | | | | Status | pass | | |
| Sensor Componer | <mark>it</mark> Span | | Conditi | on 1.005 | | | | Status | pass | | |
| Sensor Componer | t Cell B Freq. | | Conditi | on 94.8 k | κHz | | | Status | pass | | |
| Sensor Componer | t System Memo | | Conditi | on | | | | Status | pass | | |
| Sensor Componer | t Sample Train | | Conditi | on Good | | | | Status | pass | | |
| Sensor Componer | t Cell B Pressure | | Conditi | on | | | | Status | pass | | |
| Sensor Componer | t Cell B Flow | | Conditi | on 0.72 l | pm | | | Status | pass | | |
| Sensor Componer | t Cell A Tmp. | | Conditi | on 33.5 (| 2 | | | Status | pass | | |
| Sensor Componer | t Cell A Pressure | | Conditi | on 701 m | nmHg | | | Status | pass | | |
| Sensor Componer | t Cell A Noise | | Conditi | on 1.2 pp | b | | | Status | pass | | |
| Sensor Componer | | | Conditi | on 96.3 k | κHz | | | Status | pass | | |
| Sensor Componer | t Cell A Flow | | Conditi | on 0.70 l | pm | | | Status | pass | | |
| Sensor Componer | t Battery Backup | | Conditi | on Funct | ioning | | | Status | pass | | |
| Sensor Componer | t Zero Voltage | | Conditi | on N/A | | | | Status | pass | | |

| Site | Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|------|------------|----------------------|-----------------------|----------|--------------|---------------|
| SPD | 111-Sandy | Grenville-03/19/2015 | | | | |
| 1 | 3/19/2015 | DAS | Campbell | 000342 | CR3000 | 2121 |
| 2 | 3/19/2015 | Ozone | ThermoElectron Inc | 000742 | 49i A1NAA | 1105347313 |
| 3 | 3/19/2015 | Ozone Standard | ThermoElectron Inc | 000450 | 49i A3NAA | CM08200026 |
| 4 | 3/19/2015 | UPS | APC | 06096 | RS800 | 080331133278 |
| 5 | 3/19/2015 | Zero air pump | Werther International | 06928 | C 70/4 | 000822222 |

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| SiteVisitDate | Site | Technician |
|---------------|--------|-----------------|
| 03/20/2015 | COW137 | Sandy Grenville |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|------|------------------------|-----|-------|--------------|--------|----------|----------|-----------|
| 1 | Ozone Slope | Р | 0 | 1.1 | 4 | 1.00572 | unitless | Р |
| 2 | Ozone Intercept | Р | 0 | 5 | 4 | -0.36743 | ppb | Р |
| 3 | Ozone correlation | Р | 0 | 0.995 | 4 | 0.99998 | unitless | Р |
| 4 | Ozone % difference avg | Р | 7 | 10 | 4 | 0.5 | % | Р |
| 5 | Ozone % difference max | Р | 7 | 10 | 4 | 1.4 | % | Р |

| Mfg | Serial Number Tag | Site | Те | chnician | | Site Visi | it Date | Paramet | ter | Owner I | D |
|---|--------------------------|------------|---------|----------------------------|--------|--|---------|---------|--------|----------|--------|
| ThermoElectron Inc | 1105347314 | COW137 | S | andy Grei | nville | 03/20/2 | 015 | Ozone | | 000726 | |
| Slope: 1.00572 Slope: 0.00 Intercept -0.36743 Intercept 0.00 CorrCoff 0.99998 CorrCoff 0.00 | | | 0 | Mfg Serial N Tfer ID | | ThermoElectron IncParameterozone0419606966Tfer Desc.Ozone01112 | | | | | / stan |
| DAS 1: | DAS 2: | | | Slope | | | 0.9940 | 5 Inter | cont | -0.42 | 803 |
| A Avg % Diff: A M | | 6Dif A Max | % Di | | 4 | | 3/9/201 | _ | | 1.00 | |
| 0.6% | 1.4% | | | Cert Da | | | 3/9/201 | 5 Corr | | 1.00 | 000 |
| UseDescription: | ConcGroup: | Tfer Raw: | | Corr: | Si | | Site | e Unit: | PctDif | ference: | |
| primary | 1 | 0.04 | | 47 | 0. | | ppb | | | | |
| primary | 2 | 29.89 | | .49 | 30 | | ppb | | | -1.38% | |
| primary | 3 | 49.99 | | .71 | 50. | | ppb | | | 0.32% | |
| primary | 4 | 80.01 | | .91 | 81 | | ppb | | | 0.48% | |
| primary | 5 | 110.30 | 1 | 1.39 | 111 | .40 | ppb | - | | 0.01% | |
| Sensor Componen | t Cell B Noise | | Conditi | on 0.8 pp | b | | | Status | pass | | |
| Sensor Componen | t Cell B Tmp. | | Conditi | on | | | | Status | pass | | |
| Sensor Componen | t Fullscale Voltage | | Conditi | on N/A | | | | Status | pass | | |
| Sensor Componen | t Inlet Filter Condition | ึงท | Conditi | on Clean | | | | Status | pass | | |
| Sensor Componen | t Line Loss | | Conditi | on Not te | sted | | | Status | pass | | |
| Sensor Componen | t Offset | | Conditi | on 0.2 | | | | Status | pass | | |
| Sensor Componen | it Span | | Conditi | on 1.02 | | | | Status | pass | | |
| Sensor Componen | t Cell B Freq. | | Conditi | on 98.6 k | Hz | | | Status | pass | | |
| Sensor Componen | t System Memo | | Conditi | on | | | | Status | pass | | |
| Sensor Componen | t Sample Train | | Conditi | on Good | | | | Status | pass | | |
| Sensor Componen | t Cell B Pressure | | Conditi | on | | | | Status | pass | | |
| Sensor Componen | t Cell B Flow | | Conditi | on 1.4 lp | m | | | Status | Pass | | |
| Sensor Componen | t Cell A Tmp. | | Conditi | on 32.7 (| 2 | | | Status | pass | | |
| Sensor Componen | t Cell A Pressure | | Conditi | on 683.4 | mmHg | | | Status | pass | | |
| Sensor Componen | t Cell A Noise | | Conditi | on 0.9 pp | b | | | Status | pass | | |
| Sensor Componen | t Cell A Freq. | | Conditi | on 115.3 | kHz | | | Status | pass | | |
| Sensor Componen | t Cell A Flow | | Conditi | on 0.67 l | pm | | | Status | pass | | |
| Sensor Componen | t Battery Backup | | Conditi | on Funct | ioning | | | Status | pass | | |
| Sensor Componen | t Zero Voltage | | Conditi | on N/A | | | | Status | pass | | |

| Site | Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|------|------------|----------------------|-----------------------|----------|--------------|---------------|
| СОИ | V137-Sandy | Grenville-03/20/2015 | | | | |
| 1 | 3/20/2015 | DAS | Campbell | 000401 | CR3000 | 2529 |
| 2 | 3/20/2015 | Ozone | ThermoElectron Inc | 000726 | 49i A1NAA | 1105347314 |
| 3 | 3/20/2015 | Ozone Standard | ThermoElectron Inc | 000441 | 49i A3NAA | CM08200017 |
| 4 | 3/20/2015 | UPS | APC | none | 650 | unknown |
| 5 | 3/20/2015 | Zero air pump | Werther International | 06878 | C 70/4 | 000815254 |

Data Compiled: 5/11/2015 12:37:49 PM

| SiteVisitDate | Site | Technician |
|---------------|--------|-------------|
| 03/26/2015 | ESP127 | Eric Hebert |
| | | |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|------|------------------------|-----|-------|--------------|--------|----------|----------|-----------|
| 1 | Ozone Slope | Р | 0 | 1.1 | 4 | 0.98070 | unitless | Р |
| 2 | Ozone Intercept | Р | 0 | 5 | 4 | 0.19411 | ppb | Р |
| 3 | Ozone correlation | Р | 0 | 0.995 | 4 | 0.99999 | unitless | Р |
| 4 | Ozone % difference avg | Р | 7 | 10 | 4 | 1.6 | % | Р |
| 5 | Ozone % difference max | Р | 7 | 10 | 4 | 1.9 | % | Р |

| Mfg | Se | erial Number Tag | Site | Те | chnician | | Site Visit | t Date | Parame | ter | Owner I | D |
|-----------------------|-------|---------------------------|--------------|----------------------|------------|-------|------------|---------------|---------|-------------|-------------|--------|
| ThermoElectron | Inc 1 | 009241785 | ESP127 | E | ric Hebert | | 03/26/20 | 15 | Ozone | | 000622 | |
| Slope: | | 8070 Slope: | 0.00000 | | Mfg | | ThermoE | | | rameter OZO | | |
| Intercept CorrCoff | | 9411Intercept9999CorrCoff | 0.00000 | | Serial N | umber | 49CPS-7 | 0008-36 | 64 Tfe | er Desc. Oz | one primary | / stan |
| | 0.0 | correon | 0.00000 | 2 | Tfer ID | | 01110 | | | | | |
| DAS 1: | | DAS 2: | | | Slope | | | 1.00952 | 2 Inter | cent | -0.24 | 284 |
| A Avg % Diff: | A Max | x % Di A Avg % | bDif A Max (| % Di | | | | | _ | | | |
| 1.6% | | 1.9% | | | Cert Da | ite | | 1/7/2015 | 5 Corr | Coff | 1.00 | 000 |
| UseDescripti | ion: | ConcGroup: | Tfer Raw: | Tfer | Corr: | Sit | te: | Site | Unit: | PctDiff | erence: | |
| primary | | 1 | -0.04 | 0. | 20 | 0.4 | 40 p | opb | | | | |
| primary | | 2 | 30.69 | 30 | .64 | 30. | 10 p | opb | | | -1.76% | |
| primary | | 3 | 50.44 | 50 | .20 | 49. | 46 p | opb | | | -1.47% | |
| primary | | 4 | 84.31 | | .75 | 82. | | opb | | | -1.37% | |
| primary | | 5 | 116.99 | 116 | 5.12 | 113 | .90 g | opb | | | -1.91% | |
| Sensor Comp | onent | Cell B Noise | | Conditi | on 0.6 pp | b | | | Status | pass | | |
| Sensor Comp | onent | Cell B Tmp. | | Conditi | on | | | | Status | pass | | |
| Sensor Comp | onent | Fullscale Voltage | | Conditi | on N/A | | | | Status | pass | | |
| Sensor Comp | onent | Inlet Filter Conditio | n | Conditi | on Clean | | | | Status | pass | | |
| | | | | | | | | | L | | | 5 |
| Sensor Comp | | | | | on Not te | sieu | | | Status | | | |
| Sensor Comp | onent | Offset | | Conditi | on -0.10 | | | | Status | pass | | |
| Sensor Comp | onent | Span | | Conditi | on 1.007 | | | | Status | pass | | |
| Sensor Comp | onent | Cell B Freq. | | Conditi | on 96.4 k | Hz | | | Status | pass | | |
| Sensor Comp | onent | System Memo | | Conditi | on | | | | Status | pass | | |
| Sensor Comp | onent | Sample Train | | Conditi | on Good | | | | Status | pass | | |
| Sensor Comp | onent | Cell B Pressure | | Conditi | on | | | | Status | pass | | |
| Sensor Comp | | | | Conditi | on 0.54 l | pm | | | Status | pass | | |
| Sensor Comp | | | | | on 38.0 (| | | | Status | | | |
| Sensor Component Cell | | | | Condition 707.9 mmHg | | | | Status | | | | |
| Sensor Comp | | | | | on 0.2 pp | | | | L | | | |
| | | | | | | | | | Status | | | |
| Sensor Comp | | | | | on 85.4 k | | | | Status | | | |
| Sensor Compo | onent | Cell A Flow | | Conditi | on 0.54 l | pm | | | Status | pass | | |
| Sensor Comp | onent | Battery Backup | | Conditi | on N/A | | | | Status | pass | | |
| Sensor Comp | onent | Zero Voltage | | Conditi | on N/A | | | | Status | pass | | |

| Site | Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|------|------------|------------------|-----------------------|-----------|--------------|---------------|
| ESP | 127-Eric H | ebert-03/26/2015 | | | | |
| 1 | 3/26/2015 | DAS | Campbell | illegible | CR3000 | 3817 |
| 2 | 3/26/2015 | Ozone | ThermoElectron Inc | 000622 | 49i A1NAA | 1009241785 |
| 3 | 3/26/2015 | Ozone Standard | ThermoElectron Inc | 000327 | 49i A3NAA | 0622717852 |
| 4 | 3/26/2015 | Zero air pump | Werther International | 06874 | C 70/4 | 000815256 |