May 31, 2019

Response to Findings:

RTI International Audit Report -

40 Code of Federal Regulations Part 58 Technical Systems Audit of CASTNET Program Ozone Monitoring Process

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Prepared for

U.S. Environmental Protection Agency (EPA),
Clean Air Markets Division

Below please find the Wood Environment and Infrastructure Solutions, Inc. (Wood) response to findings documented in the RTI International (RTI) report for the technical systems audit (TSA) performed for the Clean Air Status and Trends Network (CASTNET) ozone laboratory facility and one remote monitoring site November 12-13 and November 6, 2018 respectively. Responses are organized according to sections that list findings in the RTI report. Findings are quoted from the RTI report without modification.

Section 2: General Program

FINDING 1:

There were no records maintained at the field site to demonstrate the training of the site operators.

Discussion:
Field Site:
When the RTI auditor visited the field site, he could not find any evidence of training records (electronic or hard copies) demonstrating the site operator was capable of performing his job. Mr. Wright stated he was trained by the previous site operator and has taken over the site operator role in 2015. The RTI auditor checked the site's laptop computer for training records and also reviewed the site's logbook. He could not find any training files on the laptop desktop. He also checked and reviewed the entries for the January and July 2018 6-month calibration in the Calibration Folder for documentation of any training. No training notes stood out. He reviewed the site's logbook for training records during the 6-month calibration entries, but much of the writing was too difficult to read (illegible). In observing the site operator during the visit, the RTI auditor is totally convinced the site operator has full capability to perform his functions at the site for ozone collection.

Ozone Calibration Laboratory:
The RTI auditor discussed the training program with the QA Officer. The training program for new site operators is generally conducted during a 6-month calibration. The calibrator completes a Site Operator Evaluation Questionnaire and follows up on subsequent 6-month calibration visits. The questionnaire is maintained on the Wood E&IS network server. Mr. Michael Smith completed a questionnaire for Mr. Wright (site operator) on May 8, 2016. The QA Officer reviews statistics (data capture and accuracy checks) pulled from database entries and logbooks of the site operator's performance to determine if further training is needed. The training is also reinforced through the 6-month calibrations and through telephone communications.

RECOMMENDATION:

It is possible that all field TSAs will not include a visit to the Ozone Calibration Laboratory. Wood E&IS appears to have a training program designed for their site operators and the documentation demonstrating the steps are maintained at the Newberry facility, but documentation of this training program should extend to records at the field site. These records then would be assessable to any auditor that visits the site. Wood E&IS should extend their current training protocol for accessing, reviewing, and maintain training records for the site operators to include placing those records on the site's laptop computer. This possibly can be set up at the Newberry facility through their network server and then placed on the site's computer desktop by the QA Officer after a 6-month calibration. ARS that oversees the NPS CASTNET field sites has developed a Site Visitation Checklist that is a simple form to track activities during the 6-month calibrations. This form has 10 sections (included a training tracking section) that the field staff calibrator checks while conducting the calibration. It is part of the 6-month check and can be electronically placed in a folder on the site's laptop computer desktop at the completion of the 6-month calibration. This form along with your current Site Operator Evaluation Questionnaire will help supplement training records for the site operator at the site.

Wood RESPONSE:

The existing training records library will be duplicated on the laptop at each EPA-sponsored site by December 2019. The records will be maintained semi-annually during site calibration visits going forward.

FINDING 2:

There were missing or no records of the last or any NPAP performance audits or TSAs or PEs conducted by EE&MS

Discussion:

Field Site:

At the field site, there were no records or missing records of any NPAP performance audits or TSAs or PEs conducted by EE&MS. There is a folder on the site's laptop computer desktop for the 6-month calibration performed over the last four years, but this folder does not contain any information of NPAP or EE&MS audits. In reviewing the 6-month calibrations for 2018 (July) at this site, the RTI auditor was not able to locate PDF copies of the Excel files for components calibrated such as shelter temperature or sample (ozone) temperature. The site calibrator

should develop PDFs for all of the components calibrated or verified during the 6-month calibration.

Ozone Calibration Laboratory:

The RTI auditor discussed the lack (missing) of assessment reports for PEs and TSAs at the field site with the QA Officer. Mr. Stewart was able to provide the copies of the PE audit conducted by the State of Georgia on May 10, 2018, the last TSA and annual PE conducted by EE&MS on May 10, 2018, and the last NPAP audit conducted by EPA Region 3 on August 14, 2018. A Wood E&IS staffer later informed the RTI auditor that NPAPs may be out of their hands depending on EPA decisions on what their auditors leave onsite. The introduction of the EPA Performance Evaluation Audit Tool (PEAT) at least initially meant that there was no official document available to leave onsite. Data went directly into the interface program to be loaded automatically into AQS. What has received since the PEAT program development; has been provided by the individual auditor from their personal record of the audit.

NOTE: PEAT is a tool that assists auditors in performing NPAP audits for sites. Audits can be scheduled, performed and the results uploaded immediately to AQS. All data is verified against AQS data and business rules to ensure the submitted data will be accepted by AQS.

During discussions with the Field Operations Manager, it was explained that the calibrator is supposed to place the PDF forms on the site's laptop computer desktop in the Calibration Folder. The calibrator also places an Excel spreadsheet with data from the calibrations for all components in this folder. In this instance, he believes the calibrator just forgot to place the shelter and sample (ozone) temperature sensor forms in the folder as a PDF file. He showed the RTI auditor the Excel spreadsheet for the July 2018 calibration and there were worksheets for the shelter temperature and sample temperature sensor calibrations.

RECOMMENDATION:

All assessments (audits) conducted at the field site should have a record of the audit maintained at the site. Wood E&IS should develop an assessment folder for the site's computer desktop to maintain records for internal and external assessments of the ozone collection program. If the NPAP audits are directly loaded to EPA AQS database through PEAT, Wood E&IS management should be pulling the results to confirm the site is within NPAP acceptance limits for ozone. These results should then be posted to the site's laptop computer as site records.

Currently, there is a folder for the site's 6-month calibrations, but other external audits, PEs, and TSAs should also be placed in a folder on the site's computer. Be consistent in these folders from one site to another throughout the CASTNET program. For 6-month calibrations, be sure the calibrator places all forms in the folder for that audit. It would also be recommended to place the summary form so the auditor would have an understanding of the devices and parameters audited/calibrated.

Wood RESPONSE:

Third party audit data for 2018 along with available data for 2019 will be gathered and loaded onto the laptop at each EPA-sponsored site by December 2019. Third party audit data (e.g. NPAP and PE) will subsequently be obtained twice per year on a 6-month schedule and loaded onto the laptops at each EPA-sponsored site during calibration visits.

Section 6: Data Review and Data Management

FINDING 3:

When generating the AQS formatted file, the current approach applies a universal "AN – Machine Malfunction" flag for all records with a "B" flag in the Wood E&IS database. As a result, data invalidated during ZSP checks get flagged as "AN" in AQS. Likewise, data invalidation due to an audit also received a "AN" flag. A universal "AN" flag does not provide useful information to a data user.

Discussion:

During the data review, the RTI off-site auditor found that the hourly data agreed perfectly between CASTNET, AQS, and the data provided by Wood E&IS. Null data also agreed between the databases. However, when comparing the individual flags, the auditor noticed that the data flags in the AQS database for invalidated data, had the "AN – Machine Malfunction" flag for events corresponding to the daily automated ZSP checks in the morning, and the time period corresponding to the NPAP audit on 8/14/2018. These events get a "B" flag in the Wood E&IS database. Discussions with Mr. Rogers indicated that all "B" flags in the Wood E&IS database are universally translated to the "AN – Machine Malfunction" data flag in AQS. The auditor feels that use of appropriate data flags in AQS is important as it will benefit the data users when they use the data for their analysis. As of now, the data users are led to believe that there are quite frequent instances of machine malfunction leading to invalid data (e.g., daily at 2 or 3 am for ZSP), when in fact those are not instances of problems with the machine but rather QC processes to ensure data quality. Use of a more relevant flag in AQS such as "AY- QC Control Points (Zero/Span)" or "BF – Precision/Zero/Span" will provide more information to the data users on the robustness of the dataset and the QC checks performed. Chris agrees that more details to the hourly flagging would enhance the value of the data.

RECOMMENDATION:

It is recommended that Wood E&IS choose appropriate flags in AQS to represent the specific reason for invalidation, which will enhance the hourly flagging by provided more relevant and specific detail for a data user.

Wood RESPONSE:

Wood will begin utilizing AQS flags as indicated in Table 1 for submissions to AQS beginning in

July 2019.

Table 1. Wood-AQS Flagging Crosswalk

Flag	Description	AQS Flag	AQS Flag Description
B (ZPS)	Field instrument channel down for > 75% of an hourly sampling period to perform ZPS	BF	Zero/Span/Precision
B (other)	Field instrument channel down for > 75% of an hourly sampling period due to equipment malfunction	AN	Machine Malfunction
C	Invalid data collected during field calibration of instrument	AT	Calibration
F	Field instrument power failure	AV	Power Failure
I	Invalid reading - determined by data validation including system operational data	DA	Aberrant Data
J	Invalid reading - related to critical criteria failures	AS	Poor Quality Assurance Results

Note: ZPS = Zero/Span/Precision