UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Marc Hamilton
President
DEECO, Inc.
3404 Lake Woodard Road
Raleigh, NC 27604

10/18/2023

Dear Mr. Hamilton:

This letter is in response to your request dated December 21, 2022, and finalized on October 6, 2023, in which you seek an alternative test method to allow the use of a continuous emission monitor (CEM) or other electronic instrument capable of meeting the calibration error specifications in EPA Method 3A (40 CFR part 60, Appendix A) in place of the analysis procedures in Method 3B (40 CFR part 60, Appendix A). The Office of Air Quality Planning and Standards, as the delegated authority, must make the determination on any major alternatives to test methods and procedures required under 40 CFR parts 59, 60, 61, 63, and 65. Your proposed alternative test method and our approval decisions are discussed below. According to Method 3B, the method is performed as follows:

> *"A gas sample is extracted from a stack by one of the following methods: (1) single-point, grab sampling; (2) single-point, integrated sampling; or (3) multi-point, integrated sampling. The gas sample is analyzed for percent CO2, percent O2, and, if necessary, percent CO using an Orsat combustion gas analyzer."*

According to the information provided, you seek this request because of "the inability to obtain oxygen (O_2) absorbent from (an)outside vendor." The O_2 adsorbent is necessary to conduct the analysis using an Orsat combustion gas analyzer. You further state that your "last known source (Burrell Scientific) has discontinued production of "Oxsorbent" and no third-party vendor has any leftover stock. Going forward this will make any use of an Orsat analyzer require either self-made O_2 absorbent or the Fyrite equivalent (which is a different chemical, and not sold in bottles of sufficient volume for use in an Orsat analyzer)."

Based on the information cited above, you seek an approval to use analysis procedures similar to those found in Method 3A to analyze the bag sample(s) collected according to Method 3B. The analysis procedures proposed are detailed in the attachment to this letter.

After reviewing the information you provided, we have confirmed the information regarding the lack of availability of an oxygen absorbent and, considering Method 3A is more sensitive and has better accuracy and precision than Method 3B, we approve your request to use the analysis procedures similar to those found in Method 3A to analyze the bag sample(s) collected according to Method 3B as required under 40 CFR parts 59, 60, 61, 63, and 65 with the following conditions:

- This alternative test method must be performed as described in the attachment to this letter and must not deviate for the methodology described herein.

- A copy of this approval letter and the attachment must be included in all test reports that use this alternative test method.

Since this alternative method may be applicable to similar facilities required to use Method 3B under 40 CFR parts 59, 60, 61, 63, and 65, we will post this letter on our website as ALT-153 at *http://www.epa.gov/ttn/emc/approalt.html,* which will allow other interested parties to make use of this alternative method.

If you have any questions or concerns, please feel free to contact Walter Lin of my staff at (919) 541-1341 or *lin.walter@epa.gov*.

Sincerely,

STEFFAN
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Steffan Johnson
Group Leader
Measurement Technology Group

attachment

Cc:	Ryan Brown, EPA – Region 4	(brown.ryan@epa.gov)
	Walter Lin, EPA- OAQPS/MTG	(lin.walter@epa.gov)
	Regional Testing Contacts	

ATTACHMENT

Alternative Test Method Procedures for Using Instrumental Analysis in Lieu of an ORSAT Under Method 3B

1.0 Summary

An integrated sample will be extracted from the exhaust stack, at a constant rate, during each test run. The sample is collected utilizing the integrated procedures of Method 3B (40 CFR 60, Appendix A) in a flexible bag, which can be sealed and transported to another location for analysis. Concentrations of oxygen (O_2) and carbon dioxide (CO_2) are determined using the analysis procedures found in Method 3A (40 CFR 60, Appendix A) using calibrated O_2 and CO_2 analyzers.

2.0 Sample Collection

Same as in Method 3B, section 8.0

3.0 Data Recording

Manual or electronic (computerized data acquisition system, digital recorder, or data logger) recording may be used.

3.1 *Manual Recording.* Recording of instrument readings must be performed using an appropriate data sheet. After introduction of calibration or sample gas and once a stable reading is observed, begin recording readings from the instrument readout at intervals of a minimum of 15 seconds. Continue recording until 4 consecutive intervals meet the criteria in section 4.5.

3.2 *Electronic Recording*. Recording of stable calibration or sample gas readings for a minimum of 60 seconds or at least 4 instrument updates, whichever is longer, and meets the criteria in section 4.5.

4.0 Analytical Procedure

4.1 *Measurement System.* The O_2 and CO_2 analyzer configuration will vary depending on whether the analyzer uses an internal sample pump or requires sample gas to be fed to the instrument.

4.1.1 Internal Sample Pump Configuration

When using an instrument with an internal sample pump the calibration and sample gases are simply introduced at the inlet of the analyzer. Calibration gases are introduced with a tee fitting with an atmospheric bypass to avoid pressurizing the instrument.

Note: The atmospheric bypass on the tee fitting should include a six-inch section of tubing. This adds minimal backpressure and can prevent entrainment of ambient air due to pump pulsation.

A flowmeter must be included so the gas flow rate can be measured and controlled. If the analyzer does not have an internal flowmeter (rotameter or electronic flow reading), a rotameter must be added at the inlet to the analyzer.

4.1.1 External Sample Pump Configuration

If the analyzer does not use an internal sample pump, then the sample gas must be fed to the instrument using a small diaphragm pump. To avoid bias from sample pressure variations, both the calibration gas and sample gas must be introduced at the inlet to the pump.

An external rotameter must be placed between the pump and the analyzer. The rotameter should include a needle valve to control the flow rate. This external flowmeter needs to be used even if the analyzer has an internal flowmeter because it can reduce pulsation from the pump that can bias the measurements.

4.2 *Initial Calibration*. After you have assembled your measurement system and allow the analyzer to warm-up, you must calibrate your analyzer by conducting a 3-point analyzer calibration error (CE) test before the first run. You must follow the procedures in section 8.2.3 of Method 7E.

Record the analyzer's response to each calibration gas on a form similar to Table 7E-1 of Method 7E. For each calibration gas, calculate the analyzer calibration error using Equation 7E-1 in section 12.2 of Method 7E or the system calibration error using Equation 7E-3 in section 12.4 (as applicable) of Method 7E.

The CE must be within ±2.0 percent of the calibration span.

4.3 *Initial System Bias and System Calibration Error Check.* Before analysis of bag samples, determine whether the high-level or mid-level calibration gas best approximates the emissions and use it as the upscale gas. You must follow the procedures in section 8.2.5 of Method 7E.

The initial system bias and system CE check must be performed with the calibration gases in Tedlar bags. Prepared calibration bags must be used within 4 hours.

Record the result on a form similar to Table 7E-2 of Method 7E. Operate the measurement system at the normal sampling rate during all system bias checks. Make only the adjustments necessary to achieve proper calibration gas flow rates at the analyzer.

Calculate the initial system bias using Equation 7E-2 in section 12.3 of Method 7E. The system bias must be within ±5.0 percent of the calibration span.

4.4 *Interference Check.* Prior to its use in the field, an interference test on the instrumental analyzer will be performed in accordance with section 8.3 of Method 3A.

4.5 *Sample Bag Analysis*. Each field sample must be analyzed according to the following procedure within four hours of collection.

Following bag sample collection, the bag must be attached directly to the inlet port of the measurement system. The sample flow rate selected must be identical to the rate at which the analyzer was calibrated, and in accordance with manufacturer specifications. Analysis must continue until the following criteria is met:

%CO_2

-Differ by no more than 0.3% when CO_2 is greater than 4.0%, or,

-Differ by no more than 0.2% when CO_2 is less than 4.0%.

%O_2

-Differ by no more than 0.3% when O_2 is less than 15.0%, or,

-Differ by no more than 0.2% when O_2 is greater than 15.0%.

4.6 *Post-Run Bias and Drift Assessment.* After analysis of the bag samples, repeat system bias check to validate the run. Do not make adjustments to the measurement system (other than to maintain the target sampling rate) between the end of the run and the completion of the post-run system bias.

Calculate the low-level and upscale calibration drift (CD), using Equation 7E-4 in section 12.5 of Method 7E. The CD must be within ±3.0 percent of the calibration span.