OFFICE OF AIR QUALITY PLANNING AND STANDARDS
RESEARCH TRIANGLE PARK, NC 27711

1/14/2025

Dr. Asa Carre-Burritt
Bridger Photonics, Inc.
2310 University Way, Bldg. 4-4
Bozeman, MT 59715

Dear Dr. Carre-Burritt:

We are writing in response to your submission on behalf of Bridger Photonics Inc., located in Bozeman, Montana, dated May 23, 2024, and subsequent correspondence dated December 31, 2024, in which you request the approval of "Alternative Test Method for Methane Detection Technology" under the New Source Performance Standards of Performance for Crude Oil and Natural Gas Facilities for which construction, modification or reconstruction commenced after December 6, 2022 (40 CFR Part 60, Subpart OOOOb). We are considering this request under 40 CFR 60.5398b(d), based on the information you have submitted (as described below). The EPA's Office of Air Quality Planning and Standards has been delegated certain authorities under this provision, including authority to consider and/or approve alternative test methods for methane detection technology.

As we understand, Bridger Photonics, Inc., has developed a measurement solution that uses gas mapping LiDAR ("GML") methane detection technology affixed to an aircraft (manned or unmanned) to identify and localize methane emissions emanating from equipment or other surfaces on the ground.

To support your submittal, you have provided the following documents associated with your submission:

- Alternative Test Method Application Summary received on May 23, 2024, which summarizes the information submitted to the EPA by Bridger Photonics, Inc., and provides basic information about the company and technology.
- GML Description of Technology, received on May 23, 2024, that details the relevant measurement technology including measurement theory, instrumentation, application, and known limitations. See §60.5398b(d)(3)(iii).

- Peer reviewed research articles received on May 23, 2024, as supporting evidence that this aerial measurement technology can appropriately identify and localize methane emissions. See §60.5398b(d)(3)(vi).
    - Bell, C, Rutherford, J, Brandt, A, Sherwin, E, Vaughn, T, Zimmerle, D. 2022. Single-blind determination of methane detection limits and quantification accuracy using aircraft-based LiDAR. Elementa: Science of the Anthropocene 10(1). DOI: https://doi.org/10.1525/elementa.2022.00080. Peer-reviewed research article describing the detection limits and quantification accuracy of GML as determined by single-blind testing. Results indicate that GML has a 90% probability of detecting emission sources of 1 kg/hr and 2 kg/hr, depending on the altitude.
    - Conrad, B, Tyner, D, Johnson, M. 2023. Robust probabilities of detection and quantification uncertainty for aerial methane detection: Examples for three airborne technologies. Elsevier: https://doi.org/10.1016/j.rse.2023.113499. Peer-reviewed research article describing a new continuous probability of detection function and quantification uncertainty model for GML developed using fully-blinded and single-blind testing results. At typical altitudes, results indicate Bridger's GML has a 90% probability of detecting emission sources of 2.3 kg/hr.
    - Johnson, M., Tyner, D., Szekeres, A. 2021. Blinded evaluation of airborne methane source detection using Bridger Photonics LiDAR. Elsevier: https://doi.org/10.1016/j.rse.2021.112418. Peer-reviewed research article that assessed GML detection sensitivity and quantification accuracy through fully-blinded field testing. Results indicate a field sensitivity limit of 1 kg/hr based on common conditions.
    - Thorpe, M., et.al. Deployment-invariant probability of detection characterization for aerial LiDAR methane detection. Research article preprint describing a model developed to assess GML probability of detection for individual Target Area scans across widely varying measurement conditions, as based on fully-blinded and single-blind testing results. Reported are detection sensitivities achieved by GML during prior measurements within major North American oil and gas production basins. Results indicate that GML has on average a 90% probability of detecting emission sources of 1.27 kg/hr.
    - Letter from Daniel Zimmerle, METEC Director, Electric Power Systems Laboratory, Energy Institute, CSU to Peter Roos, Bridger Photonics. April 26, 2024. Third party review of Bridger's white paper describing testing of GML emission source localization performance.
    - Bridger Photonics. Characterization of Emission Source Localization Accuracy for Bridger Photonics' Gas Mapping LiDAR. White Paper #240326. March 26, 2024. White paper describing GML emission source localization performance determined through controlled release testing.

- A sampling protocol titled "Alternative Test Method – Detect and Localize Methane Emissions Using Gas Mapping LiDAR™ Technology." Final version received December 31, 2024, including all the required procedures and applicable quality assurance and control, which provides the company's qualifications that meets the requirements in §60.5398b(d)(2)(i) through §60.5398b(d)(2)(iv), and all information required for an alternative test method application according to §60.5398b(d)(3).

Your submission was determined complete on September 1, 2024.

Based on a review of the provided material and a recognition that Bridger Photonics, Inc. meets the criteria found in §60.5398b(d)(2), we have determined that your GML methane detection technology meets 1 kg/hr, 2 kg/hr, 3 kg/hr, 5 kg/hr, 10 kg/hr, and less than or equal to 15 kg/hr all at 90% probability of detection using the protocol described above. Additionally, we are approving your solution and the associated protocol for use by an owner or operator of an affected facility provided the following caveats are met in the alternative periodic screening process as described in §60.5398b(b).

Furthermore, your Gas Mapping LiDAR™ Technology, may be used as an alternative to fugitive emissions monitoring under the New Source Performance Standards for Crude Oil and Natural Gas Facilities for which construction, modification or reconstruction commenced after September 18, 2015, and on or before December 6, 2022 (40 CFR Part 60, Subpart OOOOa) provided the owner or operator using the solution complies with the requirements of §60.5371a and §60.5398b, including the notification, recordkeeping, and reporting requirements outlined in §60.5424b.

Because the alternative method may be used by owners and operators subject to the monitoring of fugitive emissions components affected facilities, and inspection and monitoring of covers and closed vent systems subject to 40 CFR part 60, Subparts OOOOa and OOOOb, we will post this letter as **MATM-002** on the EPA website at https://www.epa.gov/emc/oil-and-gas-alternative-test-methods for use by interested parties.

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If you should have any questions or require further information regarding this approval, please contact my staff at MethaneATM@epa.gov.

Sincerely,

STEFFAN JOHNSON

Digitally signed by STEFFAN JOHNSON
Date: 2025.01.14 14:52:11 -05'00'

Steffan M. Johnson, Group Leader
Measurement Technology Group

cc:
Ned Shappley, OAQPS/AQAD
Karen Wesson, OAQPS/AQAD
Elizabeth Leturgey, OECA/OC
Greg Fried, OECA/AED
Regional Testing Contacts

Attachments (1)

Bridger Photonics - Aerial Survey Alternative Test Method (MATM-002).pdf