



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

1/02/2025

Dr. Daniel Bon
Carbon Mapper, Inc.
680 East Colorado Blvd.
Pasadena, CA 91101

Dear Dr. Bon

We are writing in response to your submission on behalf of Carbon Mapper Inc., located in Pasadena, California, dated October 4, 2024, and subsequent correspondence dated December 23, 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, Carbon Mapper Inc., has developed an aerial survey solution that uses a hyperspectral spectrometer (*NASA Jet Propulsion Laboratory (JPL) AVIRIS-class imaging spectrometer*) mounted in an aircraft to image and quantify methane plumes during planned surveys of target regions. To support your submittal, you have provided the following documents associated with your submission to meet the requirements in [§60.5398b\(d\)](#):

- Airborne System Executive Summary received on October 4, 2024, which summarizes the information submitted to the EPA by Carbon Mapper Inc., details the company’s qualifications and provides basic information about the company and technology. See §60.5398b(d)(2)) and §60.5398b(d)(3)(i – ii).
- Airborne System Description of Technology, first received on October 4, 2024 and a revision received on December 23, 2024, that details the relevant measurement technology including measurement theory, instrumentation, and application. This document also generally covers the workflow for how data is acquired and translated into a mass emission

rate. See §60.5398b(d)(3)(iii - iv).

- Algorithm Theoretical Basis Documents¹, Product Guide, and QC guide received on October 4, 2024, which provides more complete detail on the workflow, including information on how data products are developed and reported. See §60.5398b(d)(3)(iv and v).
- Peer reviewed journal articles^{2,3} received on October 4 as supporting evidence of that this aerial measurement technology can appropriately identify the approximate location of large emission events and reasonably quantify these emissions. See §60.5398b(d)(3)(vi)(A).
- Provided a sampling protocol titled “Carbon Mapper Airborne System – Formal Alternative Test Method” (*Version 2, Revised December 23, 2024*), which includes all the required procedures and applicable quality assurance and control requirements, consistent with your operation of the solution, and consistent with the requirements in §60.5398b(d)(3)(vi)(A) - (D).

Based on a review of the provided material for completeness consistent with 40 CFR 60.5398b(d)(1)(i), and with a recognition that Carbon Mapper Inc.’s Airborne System meets the criteria found in §60.5398b(d)(2) and (3), this aerial survey solution has a sensitivity to identify emission sources of greater than or equal to 100 kg/hr of methane using the protocol described above and is adequate for identifying super-emitter events as described in § 60.5371b. Accordingly, we are approving this solution and the associated protocol for use by certified third parties in making notifications to EPA’s Super Emitter Program as described in [§60.5371b\(c\)](#). The use of this solution in the Super Emitter Program is dependent on a candidate third party having sufficient work history, education, skill set, and training for evaluating the results of the technologies that will be used to identify super-emitter events, becoming certified under the Super Emitter Program to use this technology, as described in [§60.5371b\(b\)](#), and choosing to use this technology consistent with the applicable requirements of the Super Emitter Program.

Because the alternative method described herein could be used broadly in the Super Emitter Program, subject to approval of candidate third parties to use this technology as noted above, we will post this letter as **MATM-001** on the EPA website at <https://www.epa.gov/emc/oil-and-gas-alternative-test-methods> for consideration for use by candidate third parties seeking certification under the Super Emitter program.

¹ “L2b: Methane and Carbon Dioxide Concentration Retrievals for Satellites” and “L3/L4: Methane and Carbon Dioxide Emission Quantification for Satellites”

² Duren, R.M., Thorpe, A.K., Foster, K.T. *et al.* California’s methane super-emitters. *Nature* 575, 180–184 (2019). <https://doi.org/10.1038/s41586-019-1720-3>

³ Sahar H. El Abbadi, Zhenlin Chen, Philippine M. Burdeau, Jeffrey S. Rutherford, Yuanlei Chen, Zhan Zhang, Evan D. Sherwin, and Adam R. Brandt *Environmental Science & Technology* 2024 58 (22), 9591-9600 DOI: 10.1021/acs.est.4c02439

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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 M. Johnson, Group Leader
Measurement Technology Group

cc:

Ned Shappley, OAQPS/AQAD

Michael Barrette, OECA/OC

Regional Testing Contacts

Attachments (1)