Public Quarterly Report

Date of Report: 9th Quarterly Report – December 31, 2024

Contract Number: 693JK32210006POTA

Prepared for: The U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (DOT-PHMSA)

Project Title: Accelerating Pipeline Leak Detection Quantification Solutions Through Transparent and Rigorous Scientific Validation

Prepared by: Colorado State University / Southern Methodist University

Contact Information: Kathleen M Smits / ksmits@smu.edu/ 719-200-7648; Venkata Rao Gundapuneni/ venkataraog@mail.smu.edu / 682-406-3695; Daniel Zimmerle/ dan.zimmerle@colostate.edu / (970) 581-9945/ Wendy Hartzell/ Wendy.Hartzell@colostate.edu, (970-491-8058)

For quarterly period ending: December 31, 2024

1: Items Completed During this Quarterly Period:

Item #	*Task #*	*Activity/Deliverable*	*Title*	*Federal Cost*	*Cost Share*

2: Items Not Completed During this Quarterly Period:

Item #	*Task #*	*Activity/Deliverable*	*Title*	*Federal Cost*	*Cost Share*
19	7	Prepare and Submit Draft Final Report			

The Report for Deliverable 9 and 10, Recommended Advancements to Remote Methane Leak Detection Technologies was distributed to TAP members for their review and feedback on December 17, 2024. The Final Draft Report is being compiled and will be submitted by January 15, 2025. Final project items 19-23 will be invoiced at project close, the end of the next quarter.

3. Project Technical Status:

The team completed edits to the Recommended Advancements to Remote Methane Leak Detection Technologies Report (Deliverables 9 and 10), attached here as Appendix A *(redacted in public version*). The Final Report, Report on Understanding of Probability of Detection under Diverse Operating Conditions (Deliverable 6), is currently undergoing revisions based on comments from the project's Principal Investigator (PI). The final version is expected to be completed by the end of March 2025.

Real-World Field Trials and POD Analysis (Tasks 5.2, 5.3, and 5.4):

The team completed the following tasks/deliverables:

- Finalize preparations for submitting the Soil Moisture paper to a peer-reviewed journal.
- Complete the draft of the Urban Canyon paper and diverse operating conditions paper, utilizing complete data sets to analyze the impacts of sloped and urban conditions.

Presentations and Conferences:

Presentations:

- Dr. Venkata Rao Gundapuneni presented the poster titled "Performance of Mobile Survey Solutions for Natural Gas Pipeline Leaks under Different Soil Texture, Moisture, and Atmospheric Stability Conditions" and was shortlisted for the Outstanding Student Presentation Awards (OSPA) program under the New Technologies section at the AGU Conference in Washington DC on December 7-13, 2024.
- Rachel Day presented the poster titled "Implementation of Protocol for Natural Gas Leak Detection Solution Surveys at Underground oil and Gas Pipeline" at the AGU Conference in Washington DC on December 7-13, 2024.

Academic Publications/Journal Articles (Task 4.7):

- **Atmospheric Stability and Gas Plume Behavior:** Titled "Improving the efficacy of mobile leak survey methods for belowground natural gas leaks by incorporating knowledge of atmospheric stability and gas plume behavior". Submitted for peer review to *Process Safety & Env. Protection*.

- **Gas Composition Impact Paper:** Titled "Impacts of mixed hydrocarbon compositions on the probability of detection from belowground pipeline leaks using mobile survey methods". Reviewed by the group and PI, to be submitted by January 15, 2025.
- **Soil Moisture Paper:** Titled "Performance of Mobile Survey Solutions for Natural Gas Pipeline Leaks under Different Soil Texture, Moisture, and Surface Conditions." Reviewed by the group and PI, to be submitted by January 15, 2025.
- **Urban Canyon Paper**: Titled "Performance of mobile survey solutions for belowground natural gas pipeline leaks in urban environments." In preparation.
- **Diverse operating conditions**: Titled "Understanding the probability of detection of multiple mobile survey platforms under diverse operating conditions." In Preparation.

Meetings:

- The Technical Advisory Meeting was held on November 6, 2024

4. Project Schedule

The team will have the draft Final Report ready for initial review by January 15, 2025.

Appendix:

A. Deliverable 9, 10 - The Recommended Advancements to Remote Methane Leak Detection Technologies Report *(redacted in public version).*