CAAP Quarterly Report

December 31, 2024

Project Name: **Characterize Expected CO_2 Specification Ranges for Various Product Streams**

Contract Number: **693JK32450003CAAP**

Prime University: **Energy & Environmental Research Center, affiliated with the University of North Dakota**

Prepared By:

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Reporting Period: 09/30/2024 – 12/31/2024

Project Activities for Reporting Period:

1) Task 1: Project management, planning, and reporting
   a) Contract activity
      i) Contract signed with Pipeline and Hazardous Materials Safety Administration (PHMSA) on 09/20/24.
      ii) Subaward contracts signed as follows:
         (1) Lamar University
         (2) Stress Engineering
      iii) Finalizing contract with Pipeline Research Council International (PRCI) (project cost-share partner).
   b) Graduate students
      i) Graduate research students at the EERC and Lamar University hired and actively working on research within project.
   c) Kickoff meeting held with project partners on October 23, 2024.
   d) Developed and provided file sharing program with project partners.
   e) Discussions held with PRCI and the National Energy Technology Laboratory (NETL) on collaborating on their respective CO_2 stream composition projects. The expectation is that the PHMSA CAAP project will be in joint discussions with PRCI and NETL on their respective efforts.
   f) Biweekly meetings held with Lamar University concerning research efforts being conducted on the intended industries.

2) Task 2: Research into composition of CO_2 streams from industrial sources.
   a) Researched composition of CO_2 streams listed in literature from sources such as NETL, CarbonNet carbon capture and storage (CCS) hub, Aramis Project, Northern Lights Project, Kinder Morgan, Wood, DYNAMIS, Det Norske Veritas (DNV), and other sources.
   b) Prepared Excel sheet to summarize the compositions to reflect climate, and industry to provide a comparison of expected and actual (where available) CO_2 stream specifications for the effects on the transportation system.
   c) Requested permission to use public information on CO_2 stream composition submitted by ethanol plant.
   d) Initiated purchasing thermodynamic analysis software REFPROP and corrosion analysis software OLI CO_2 transport app. These will be used in CO_2 stream modeling.

3) Task 3: Integration of CO_2 stream composition
   a) Based on research in Task 2, initialized a summary for the CO_2 stream composition as reported by various groups.

4) Task 4: Prioritization of emitters
   a) Work in this task is pending research in Tasks 2 and 3.

5) Task 5: Review of CO_2 standards and development of knowledge base.
   a) Work in this task is pending research in Tasks 2, 3, and 4.

Project Financial Activities Incurred During the Reporting Period:

	Total Project Expenses as of 12/27/2024	
	CAAP Funds	**Nonfederal**
Personnel	$13,768	–
Fringe Benefits	$7,453	–
Travel	–	–
Equipment	–	–
Supplies	$99	–
Contractual	–	–
Construction	–	–
Other	$148	–
Total Direct Charges	$21,468	–
Indirect Charges	$10,948	–
Totals	**$32,416**	–
Total Cost Share %	**100%**	**0%**

*EERC payroll is 2 weeks behind, so the payroll for 12/16–12/31 will be expensed in January. Our funds do not finish posting for the month until around January 10th, so the amount for December could change.
*Please also note that these totals are for PHMSA costs and don't include cost-share spending.

Project Activities with Cost-Share Partners:

Research efforts and information sharing between project partners has been developed and is ongoing.

Project Activities with External Partners:

Discussions with project team members (Lamar University, Stress Engineering, and PRCI) initiated with kickoff meeting held on October 23, 2024. Information sharing between project partners has been ongoing.

Initial discussions were held with PRCI and NETL on collaborating research efforts on characterizing CO_2 specification ranges. An agreement was reached for collaborating on research efforts, with joint monthly meetings between all parties to be scheduled.

Potential Project Risks:

None known at this time.

Future Project Work:

1) Continue research efforts on CO_2 streams from industries.
2) Request CO_2 composition from active projects and include within documentation of CO_2 stream summary.
3) Review identified stream compositions, differences between capture methods, and limits to compositions and provide findings to PHMSA and other groups.

Potential Impacts to Pipeline Safety:

Carbon capture at the various industries results in CO_2 streams that contain impurities. The level and type of impurities are influenced by feedstock that is used where the carbon capture occurs. Through this investigation, recommendations on limits for various impurities contained within CO_2 streams will be determined, whether individually or with other compounds. With these limits, the design, operation, and safety of CO_2 pipelines will be enhanced.