Study to determine the feasibility of developing salt caverns for hydrocarbon storage in Western North Dakota

Submitted by:

ATCO ENERGY SOLUTIONS, LTD.

- **Funding Request - $1,047,500**
  Total Project Costs - $2,095,000
  Project Duration: 18-24 months

Project Description

- The objective of this study is to prove the viability of developing salt caverns in western North Dakota for hydrocarbon storage capable of supporting a large petrochemical industry. A key requirement for petrochemical development is the availability of affordable large capacity hydrocarbon storage in the form of salt caverns. In general, the salt formations across the state are very thin and too deep for the development of salt caverns. A preliminary review of available geological data from the State and other sources was conducted which identified salt formations in several locations that potentially meet requirements for the development of caverns.

This study will produce the following results:

- Determine locations in western North Dakota that salt cavern development is viable;
- Establish the maximum size of cavern that can be developed;
- Establish a solution mining plan for developing caverns;
- Develop a cost estimate for mining the caverns.
- The results and conclusions developed through the project will support the assessment of the suitability of western North Dakota as a location for petrochemical development.
- ATCO will conduct the Study in two phases: Phase 1) Geomechanical and a geological review of the study area using existing information. Phase 2) Field study to obtain data and refine models.

TECHNICAL REVIEWERS' RATING SUMMARY					
		Technical Reviewer			
Statement	**Weighting Factor**	**G-50-03A**	**G-50-03B**	**G-50-03C**	**Average Weighted Score**
Objectives	**9**	4	3	3	27
Achievability	**7**	4	3	3	21
Methodology	**8**	4	2	3	24
Contribution	**8**	3	3	3	24
Awareness / Background	**5**	4	1	2	10
Project Management	**3**	4	3	2	9
Equipment / Facilities	**2**	3	2	3	4
Value / Industry-Budget	**4**	4	2	3	12
Financial Match – Budget	**4**	4	3	2	12
Average Weighted Score		190	126	138	151
Maximum Weighted Score				**250 possible points**	

Technical Reviewer Totals

- G-50-03A

Average Weighted Score: **190 out of 250**

FUND

- G-50-03B

Average Weighted Score: **126 out of 250**

DO NOT FUND

- G-50-03C

Average Weighted Score: **138 out of 250**

FUNDING TO BE CONSIDERED

Technical Reviewer Comments

Reviewer G-50-03A

From a research perspective, the application has significant potential to answer some key questions as ND continues to pursue value-added NGL opportunities. The one significant hurdle is the extended confidentiality timeline. In the "Standards of Success" section, the applicant notes, "These results can be immediately used for economic development and by the state's Industrial Commission to attract value-added investment to the state." The extended confidentiality request pushes the public release of the results out five years, on top of the roughly two years it would take to fully complete the work. This timeline significantly reduces the value to ND, as gas capture and NGL value-added investments are immediate needs and cannot wait seven years before information is publicly available. Along with the concerns surrounding the confidentiality window, the other two items that may need addressing include; 1) the potential inclusion or collaboration with the NDGS to streamline existing state data and knowledge transfer, 2) A clear method of determining the necessity of Phase 2 after the initial Phase 1 work is complete. With the items above addressed, I would recommend funding the project.

Recommendation: Fund

Technical Reviewer Comments

Reviewer G-50-03B

The primary shortcoming of the proposed work is the applicant's request to keep the results of the effort confidential for a period of 5 years following completion of the study. Thus, given the proposed 20-month duration of the effort, it would be almost 7 years until the results of the study were made public. Given the urgent and critical need for solutions to help the industry meet the state's gas capture requirements, including gas storage and petrochemical industry development, keeping the results of the proposed work confidential for that length of time would not help to address the short term needs of the state and the oil and gas industry. The overall concept of evaluating the feasibility of salt cavern development in western ND is a good idea and would be a good use of OGRC resources. Phase 1 is consistent with that concept, and the proposed effort would provide value to the state and to the oil and gas industry, IF the results were made publicly available within 1 year following completion of the work. The value provided by Phase 2 is questionable, given that it appears to be focused on identifying and further evaluating the suitability of a single site for salt cavern development. This seems like the type of work that should be funded by the private sector and not a good use of OGRC dollars.

Recommendation: Do Not Fund

Reviewer G-50-03C

This project has the potential to produce important data, necessary to encourage the entry of a petrochemical industry to North Dakota, but some discussion may be warranted regarding the extended confidentiality period. Even better would be the inclusion of a petrochemical industry partner, and a commitment from an oil and gas well operator concerning the coring activities.

Recommendation: Funding to be Considered

Director's Recommendation:

Fund in the amount of $932,500 with the following contingencies:

1. Reduce confidentiality period to 3 years from the date of the contract.
2. Allow the ND OGRP Executive Director and Director a "go or no go" determination after Phase I is completed.
3. Analysis and Reporting totals $115,000 of the budget; do not recommend funding for this line item.