

Technical Reviewers' Rating Summary

Proposal Number **G-58-01** Application Title **Roughrider Carbon Storage** Submitted By
ONEOK, Inc. Request For **\$1,050,000.00** Total Project Costs
\$16,550,000.00

Section A. Scoring

Statement	Weighting Factor	G-58-01A	G-58-01B	G-58-01C	Average Weighted Score
1. Objectives	9	4	5	4	36
2. Achievability	7	4	4	3	21
3. Methodology	8	3	5	4	32
4. Contribution	8	4	5	4	32
5. Awareness / Background	5	4	5	4	20
6. Project Management	3	5	5	4	12
7. Equipment / Facilities	2	4	5	3	8
8. Value / Industry - Budget	4	4	5	5	16
9. Financial Match - Budget	4	5	5	5	20
Average Weighted Score		199	243	199	213
	Total: 50				250 possible points

OVERALL RECOMMENDATION

FUND **X** **X** **X**
 FUNDING TO BE CONSIDERED
 DO NOT FUND

Section B. Ratings and Comments

- The objectives or goals of the proposed project with respect to clarity and consistency with North Dakota Industrial Commission/Oil and Gas Research Council goals are:

The objectives are clearly stated and support goals laid out by Governor Burgum, the entire state congressional delegation and relevant regulatory agencies.

- Reviewer: G-58-01A
 - Rating: 4

The grant application clearly outlines the project outline, timetable, budget, and those participating.

- Reviewer: G-58-01B
 - Rating: 5

This project is quite comprehensive in regard to addressing all the goals and objectives of the ND OGRP. The potential of the Roughrider Carbon Storage Hub to create jobs, revenue streams, and address potential environmental concerns related to carbon dioxide release to the atmosphere is significant.

- Reviewer: G-58-01C

- Rating: 4

2. With the approach suggested and time and budget available, the objectives are:

The proposed study is most likely to almost certainly achievable given the usual complications associated with drilling, logging and coring deep Precambrian test holes, However, the associated science and engineering studies should be completed within the time frames proposed.

- Reviewer: G-58-01A

- Rating: 4

Although a small number of roadblocks remain in the successful location and selection of geology for a CO2 hub, the data generated, and conclusions developed will be helpful for the State of North Dakota.

- Reviewer: G-58-01B

- Rating: 4

The program timetable is aggressive, but potentially achievable. The documented support of the project at both federal and state levels should help overcome common regulatory and logistical hurdles often seen with this type of project. The companies and research organizations, having local experience will be able to navigate the unique surface topography, land ownership, and weather obstacles to help meet the timeline and budget schedules.

- Reviewer: G-58-01C

- Rating: 3

3. The quality of the methodology displayed in the proposal is:

It would appear that the specific stratigraphic intervals are not currently established. There is a single mention of investigating the Inyan Kara, Broom Creek, Madison and Deadwood. Three of these are clastic dominated sections and one is largely carbonate/evaporite sections that may require different methodologies to adequately define the behavior of CO2 in these units. One of the primary goals is to also evaluate the seals that are associated with these units that might be expected to vary substantially on the basis of dominant mineralogy/rocktype (i.e. shale vs salt).

- Reviewer: G-58-01A

- Rating: 3

EERC developed the methodology and therefore it will be state of the art.

- Reviewer: G-58-01B

- Rating: 5

The inclusion of the EERC researchers in the project, along with a local experienced sub-contractor Neset Consulting, by ONEOK, Inc., will facilitate the implementation of the project. The EERC has substantial experience in the carbon dioxide storage and injection research arena, and Neset Consulting's geologic experience in the Williston Basin is unmatched. Support from ND government agencies will facilitate acquisition of much of the needed baseline subsurface data, and as well as obtaining necessary permitting and regulatory approvals in a timely manner..

- Reviewer: G-58-01C

- Rating: 4

With respect to the first comment, the EERC recognizes that the targeted potential CO2 storage formations have unique characteristics from a lithologic and depositional framework. Understanding the petrophysical and depositional character of each of the target formations is a primary goal of the proposed research. The adequacy of the primary seals (cap rock) for

each formation will also be assessed through laboratory investigation of the collected core.

- Applicant

4. The scientific and/or technical contribution of the proposed work to specifically address North Dakota Industrial Commission/Oil and Gas Research Council goals will likely be:

This study is designed to help mitigate environmental issues that arise from ND energy dependent economy. Curtailing the emission of CO₂ into the atmosphere has become one of the most important national priorities that this project is designed to help solve.

- Reviewer: G-58-01A

- Rating: 4

The goal of creating a CO₂ hub aligns with Governor Burgum's net carbon neutrality and carbon-negative goals.

- Reviewer: G-58-01B

- Rating: 5

There is currently very limited research or experience, within the ND portion of the Williston Basin, on the subterranean injection and long-term storage of carbon dioxide. This type of cutting-edge research, and the resulting data gathered, is essential to the successful development of the proposed Roughrider Carbon Storage Hub. In addition, the stratigraphic test well and operational data acquired for this project will likely also be useful for other technologies like geothermal, oil and gas exploration, EOR development, etc.

- Reviewer: G-58-01C

- Rating: 4

5. The background of the principal investigator and the awareness of current research activity and published literature as evidenced by literature referenced and its interpretation and by the reference to unpublished research related to the proposal is:

Wesley Peck, EERC Assistant Director for Subsurface Strategies, will be the project manager and principal investigator (PI) on the DOE-funded project. Other key personnel include Mr. Chad Schneeberger, ONEOK Renewable Project Development Director, who will serve as a project advisor and direct and coordinate efforts by ONEOK to assist in project activities and provide land and data access. Mr. Schneeberger will work closely with the EERC team to ensure project team members have the appropriate resources/information and that ONEOK meets internal deliverables for the proposed project. Mr. Schneeberger has over 25 years of experience in midstream operations.

- Reviewer: G-58-01A

- Rating: 4

EERC has conducted scientific studies and published numerous papers that are relevant to this grant application.

- Reviewer: G-58-01B

- Rating: 5

The EERC has an established record of work in carbon dioxide research with projects in multiple states and countries. ONEOK is an established midstream company with substantial experience in the natural gas gathering and transmission pipeline sector, as well as natural gas processing, within ND and around the United States.

- Reviewer: G-58-01C

- Rating: 4

6. The project management plan, including a well-defined milestone chart, schedule, financial plan, and plan for communications among the investigators and subcontractors, if any, is:

The documentation describing the project management is consistent with the excellent management that EERC has demonstrated over the course of many years and many similar projects.

- Reviewer: G-58-01A

- Rating: 5

All requirements are detailed in the grant application.

- Reviewer: G-58-01B

- Rating: 5

The project management plan is typical of the well-developed plans produced by the EERC. The EERC is well versed in the required financial records, reporting requirements and schedules.

- Reviewer: G-58-01C

- Rating: 4

7. The proposed purchase of equipment and the facilities available is:

The facilities available are more than adequate to conduct this study.

- Reviewer: G-58-01A

- Rating: 4

Purchases included data software for stratigraphic determinations and drilling and completion of a Class VI well.

- Reviewer: G-58-01B

- Rating: 5

Although not listed, some expenditures for materials, like conductor and surface casing, required for the stratigraphic test well would be expected, but may not be considered project equipment in the context of this section.

- Reviewer: G-58-01C

- Rating: 3

8. The proposed budget “value”¹ relative to the outlined work and the commitment from other sources is of:

The included budget is short on details though the contribution by the NDIC is rather small compared to the overall cost of the projects and significant level of external support.

- Reviewer: G-58-01A

- Rating: 4

The grant request for \$1 million dollars on a \$16.5 million dollar project is a small amount to ask for the value that will be created for the State of North Dakota.

- Reviewer: G-58-01B

- Rating: 5

This research is potentially of very high value, with little if any equivalent source available. The value of acquired stratigraphic data likely extends beyond the scope of this project. The time limit on the availability of the DOE funding is a concern, but simply means the approval and implementation need to occur sooner rather than later.

- Reviewer: G-58-01C

- Rating: 5

9. The “financial commitment”² from other sources in terms of “match funding” have been identified:

The total project expense is \$16,550,000 with the NDIC share being approximately 6%. Given the total project cost and the relatively modest contribution by the NDIC this seems to

be a good investment in developing a new industrial component to North Dakota's economy

- Reviewer: G-58-01A

- Rating: 5

The DOE grant of \$9 million, as well as ONEOK's in-kind donations promised, clearly exceed the requirements for an OGRC grant.

- Reviewer: G-58-01B

- Rating: 5

The 6% commitment of \$1,050,000 requested from the OGRP is very low relative to the total anticipated project cost of \$16,550,000. The commitment from ONEOK of \$6,500,000 represents 39% of the proposed project cost, and an additional \$9,000,000 commitment from the DOE rounds out the total. This cost to the ND OGRP is a bargain and worthy of strong consideration.

- Reviewer: G-58-01C

- Rating: 5

1 “value” – The value of the projected work and technical outcome for the budgeted amount of the project, based on your estimate of what the work might cost in research settings with which you are familiar. A commitment of support from industry partners equates to a higher value.

2 “financial commitment” from other sources – A minimum of 50% of the total project must come from other sources to meet the program guidelines. Support less than 50% from Industrial Commission sources should be evaluated as favorable to the application; industry partnerships equates to increased favorability.

General Comments

Merits: - The project objectives align with the goals set by Governor Burgum, the state congressional delegation, and regulatory agencies, demonstrating a clear alignment with the state's priorities. - The proposed study is likely to be achievable, despite the expected complications associated with drilling and coring deep Precambrian test holes. The project timeline appears reasonable for completing the associated science and engineering studies. - The project recognizes the need to investigate different stratigraphic intervals, including clastic-dominated and carbonate/evaporite sections, which may require different methodologies. This demonstrates an understanding of the complexity involved in defining the behavior of CO₂ in different geological units and the importance of studying seals associated with these units. - The project aims to mitigate environmental issues arising from North Dakota's energy-dependent economy, specifically targeting the reduction of CO₂ emissions, which is a critical national priority. - The project management team, led by Wesley Peck and Chad Schneeberger, possesses relevant expertise and experience in subsurface strategies and midstream operations, respectively, providing confidence in the project's execution. - The documentation and past performance of the EERC in managing similar projects indicate a track record of excellent management. - The available facilities are deemed more than adequate to conduct the proposed study. Flaws: - The specific stratigraphic intervals to be investigated are not clearly established, with only a mention of certain formations. This lack of clarity may lead to challenges in defining the behavior of CO₂ in these units and evaluating associated seals. - The budget details provided in the documentation are lacking, making it difficult to assess the allocation of funds and the overall financial plan for the project. - The contribution from the North Dakota Industrial Commission (NDIC) is relatively small compared to the total project cost and external support, raising questions about the level of commitment from the NDIC. Overall, the project appears to be well-aligned with the state's goals, has a competent management team, and addresses important environmental concerns. However, the need for clearer stratigraphic intervals, more detailed budget information, could be considered areas for improvement.

- Reviewer: G-58-01A

This reviewer does not see any flaws in the proposal. Any roadblocks that may exist are unknown at this time. The merits are to clearly advance North Dakota's carbon neutrality or carbon-negative goals. The goal of carbon capture in ND cannot be accomplished without this type of study, data generation and development.

- Reviewer: G-58-01B

This project is on of the greatest bargains to the ND OGRP that I have seen, especially considering the potential new carbon dioxide storage technology and stratigraphic data to be gleaned.

- Reviewer: G-58-01C