TECHNICAL REVIEWER RATING SUMMARY

G-019-B

Identification of Shallow Biogenic Gas Systems in Eastern North Dakota

Submitted by GeoShurr Resources, LLC

Principal Investigators: George W. Shurr & David W. Fischer

Request for $90,000 Total Project Costs $180,000

Duration: 12 months

Rating Category	Weighting Factor	Technical Reviewer 19B-02 Rating	Technical Reviewer 19B-06 Rating	Average Weighted Score
Objective	9	4	3	31.5
Availability	9	4	4	36.0
Methodology	7	3	3	21.0
Contribution	7	4	2	21.0
Awareness	5	4	5	22.5
Background	5	5	5	25.0
Project Management	2	3	4	7.0
Equipment Purchase	2	5	3	8.0
Facilities	2	3	3	6.0
Budget	2	3	3	6.0
Average Weighted Score		194	174	**184**
Maximum Weighted Score				**250**

OVERALL RECOMMENDATION

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

1. *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: 1 – very unclear; 2 – unclear; 3 – clear; 4 – very clear; or 5 – exceptionally clear.*

Reviewer 019B-02 (Rating: 4)
The main objective of the proposed project, as noted in the proposal, is to identify areas of shallow gas potential in non-producing counties.

Reviewer 019B-06 (Rating: 3)
No comment

2. *With the approach suggested and time and budget available, the objectives are: 1 – not achievable; 2 – possibly achievable; 3 – likely achievable; 4 – most likely achievable; or 5 – certainly achievable.*

Reviewer 019B-02 (Rating: 4)
Although the proposed study area covers a significant area (the eastern one third of North Dakota), there is a tremendous amount of flexibility that has been built into this proposal because of the lack of detail concerning the deliverable products. The number of generated lineament maps, sweet spot maps, etc. is not given nor is the scale of these maps. Although it is noted that sweet spots the size of counties would be identified. As currently written, an 8.5 x 11 inch map covering all of eastern North Dakota could be acceptable. Also there is no estimate of the number of wells that would be tested, yet an estimate would have been needed to generate project costs.

Reviewer 019B-06 (Rating: 4)
No comment

3. *The quality of the methodology displayed in the proposal is: 1 – well below average; 2 – below average; 3 – average; 4 – above average; or 5 – well above average.*

Reviewer 019B-02 (Rating: 3)
The methodology is straightforward and has been proven by both the authors and the North Dakota Geological Survey, but as noted above the final product lacks detail.

Reviewer 019B-06 (Rating: 3)
No comment

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: 1 – extremely small; 2 – small; 3 – significant; 4 – very significant; or 5 – extremely significant.*

Reviewer 019B-02 (Rating: 4)
The project has the potential to encourage companies to expand gas exploration into nonproducing counties in Eastern North Dakota.

Reviewer 019B-06 (Rating: 2)
I am concerned that with the large volumes of shale gas being produced in other states natural gas prices will continue to be depressed for a long period. This project likely will not deliver as high a potential for wealth and jobs as other projects that could be funded in other areas such as the extraction of shale oil.

5. *The principal investigator's 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: 1 – very limited; 2 – limited; 3 – adequate; 4 – better than average; or 5 – exceptional.

Reviewer 019B-02 (Rating: 4)
The principal investigators cite some of the pertinent work of the North Dakota Geological Survey and George Shurr's work along the margins of the Williston Basin. In addition, the investigators are obviously familiar with biogenic gas production in the Michigan, Denver and Alberta Basins as well as along the Cedar Creek Anticline.

Reviewer 019B-06 (Rating: 5)
No comment.

6. *The background of the investigator(s) as related to the proposed work is: 1 – very limited; 2 – limited; 3 – adequate; 4 – better than average; or 5 – exceptional.*

Reviewer 019B-02 (Rating: 5)
The principal investigators both have a strong background in this field. George Shurr has published numerous articles on lineaments and on shallow gas. Dave Fischer has extensive experience in oil and gas exploration in the Williston Basin.

Reviewer 019B-06 (Rating: 5)
No comment.

7. *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: 1 – very inadequate; 2 – inadequate; 3 – adequate; 4 – very good; or 5 – exceptionally good.*

Reviewer 019B-02 (Rating: 3)
A timetable is used to divide the project into four quarters with the anticipated accomplishments listed for each quarter. Since the vast majority of funding in this proposal is for the salary of one of the principal investigators, there is not much in the way of management other than self-management and not much in the way of communication. This being the case, it should be much easier to demonstrate a more detailed work plan with more description of project deliverables.

Reviewer 019B-09 (Rating: 4)
No comment.

8. *The proposed purchase of equipment is: 1 – extremely poorly justified; 2 – poorly justified; 3 – justified; 4 – well justified; or 5 – extremely well justified. (Circle 5 if no equipment is to be purchased.)*

Reviewer 019B-02 (Rating: 5)
No equipment to be purchased, but $5,000 in supplies (satellite images) are proposed.

Reviewer 019B-06 (Rating: 3)
No comment.

9. *The facilities and equipment available and to be purchased for the proposed research are: 1 – very inadequate; 2 – inadequate; 3 – adequate; 4 – notably good; or 5 – exceptionally good.*

Reviewer 019B-02 (Rating: 3)
The proposed work does not require specialized facilities, satellite images can be interpreted in a normal office setting. Water or gas samples to be analyzed in a commercial laboratory.

Reviewer 019B-06 (Rating: 3)
No comment.

10. The proposed budget "value"[1] relative to the outlined work and the financial commitment from other sources is of: 1 – very low value; 2 – low value; 3 – average value; 4 – high value; or 5 – very high value. (See below)

Reviewer 019B-02 (Rating: 3)
The 1,160 total hours appear reasonable for a project of this scope and magnitude. Although the difference in salaries for the principal investigators is noted, it is not explained as to why a shorter time commitment should command a higher salary.

The travel expenses appear reasonable.

Detailed costs should be listed under the heading of direct expenses. How was $5,000 arrived at for satellite images ($x per sheet) and how many weeks/months of gas detector rental can you get for $4,000? What happens to the satellite images at the end of the project? What is the cost of bicarbonate and sulfate analysis as well as isotopic analysis and how many samples are anticipated to be taken? These costs should all be documented.

It would have been preferable had the White Eagle Exploration, Inc cash contribution been used to lower the requested amount to the NDOGRC rather than decreased GeoShurr Resources, LLC in-kind labor contribution. White Eagle Exploration, Inc. should disclose their interest in this project.

Reviewer 019B-06 (Rating: 3)
It is difficult to ascertain this value as there are no hours attached to the In-Kind Labor Contributions, or method to determine/verify that the In-Kind hours will be completed. However, the professionals conducting this research are dedicated and may in fact put more labor into the study than indicated.

Section C. Overall Comments and Recommendations:
Please comment in a general way about the merits and flaws of the proposed project and make a recommendation whether or not to fund.

Reviewer 19B-02 (**FUNDING MAY BE CONSIDERED**)
The proposal has some shortcomings in its lack of detail regarding deliverable products and the lack of detailed itemization of direct expenses, both of which can be corrected before it goes to the Council for a vote. The principal investigators are very knowledgeable in this field and the proposed methodology follows a successful model that has been used in this region and in other places to explore for shale gas.

The Council should determine how much consideration, if any, be given to projects with similar scope to those being conducted by the State of North Dakota. As noted in the proposal, the Department of Mineral Resources has been systematically testing monitoring wells for methane since 2006 in an ongoing project and recently published lineament maps of the Parshall area. That is why I recommended that funding be considered rather than recommending outright funding for this project. The Council must consider if it wants to expend funds on projects within the mission and scope of the Department of Mineral Resources.

Reviewer 19B-06 (**FUNDING MAY BE CONSIDERED**)
Unlocking North Dakota's shallow gas potential is a meaningful project. However, the lower volume of shall natural gas production combined with low natural gas prices may mean that the data acquired will not be used until economics improve.