

Technical Reviewers' Rating Summary

Proposal Number Application Title Submitted By Request For Total Project Costs

Section A. Scoring

Statement	Weighting Factor	G-51-02B	G-51-02C	G-51-02B	Average Weighted Score
1. Objectives	9	2	5	3	27
2. Achievability	7	2	5	4	21
3. Methodology	8	2	4	2	16
4. Contribution	8	2	3	4	24
5. Awareness / Background	5	4	5	4	20
6. Project Management	3	2	3	3	6
7. Equipment / Facilities	2	2	5	3	6
8. Value / Industry - Budget	4	3	4	4	12
9. Financial Match - Budget	4	2	3	3	8
Average Weighted Score		114	208	166	162

Total: 50

250 possible points

OVERALL RECOMMENDATION

FUND X

FUNDING TO BE CONSIDERED X

DO NOT FUND X

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:

It is clear from the application that the goal is to promote the education of students in UND's DPE, but no clear deliverables were outlined in the proposal. The donated drilling equipment appears to have potential, but further details are desired to clearly understand what need it will fill.

- Reviewer: G-51-02B
- Rating: 2

The project seeks to continue advancement of a cornerstone of ND's oil & gas industry - a vibrant Petroleum Engineering program at UND.

- Reviewer: G-51-02C
- Rating: 5

The proposed project is described in three areas, 1) support for 15 Ph.D. students (including summer salaries), 2) an additional Endowed Associate Professor position, and 3) setting up and providing 3 year funding for a full-scale reservoir simulated drilling and completions lab. The first two objectives are well supported by results from the first phase of the project funding including significant publications, very successful graduation rate/timing, and 100% of the Ph.D. candidates being hired in North Dakota. While a letter of support from the US Department of Energy - NETL supporting the establishment of the lab is provided, a clear, forward looking plan for the lab is not provided. See more discussion below.

- Reviewer: G-51-02B
- Rating: 3

The objectives of this proposal are three folds: 1- Education, 2- Research and 3- Industry services. In the proposal the significant role of PhD students to support the undergrad students in absence of adequate faculty members is mentioned. The research in the 5 areas defined by the NDIC in line with the needs of ND industry is carried out by PhD students and faculty and the results of these studies and the new lab set up provide a great resource of industry services to the ND oil and gas sector.

- Applicant

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

No detailed timelines or research objectives were provided by applicant. Roughly half of the budget was student tuition, stipends, and staff salary. The other half of the budget was lab facility rent and equipment prep/refurbishing.

- Reviewer: G-51-02B
- Rating: 2

The track record thus far has been excellent. Well rounded graduates, and a growing roll of grad students.

- Reviewer: G-51-02C

- Rating: 5

The proposed budget and timetable appear to be reasonable and achievable.

- Reviewer: G-51-02B

- Rating: 4

The assumption, when the PI submitted this proposal, was that it will not go through the normal NDIC proposal assessment process and it will be treated similar to the last round of the funding that the DPE received. Therefore, not much of details were presented in terms of the budget as the expectation was that the OGRC members who already seen the previous proposal are aware of the tuition and GRA for PhD students and range of salaries for faculty which are based on the UND roles. However, details can be provided in need be. With regards to the new lab set up, we did a detailed analysis of the costs for initial set up and operating the equipment together with the donor of the equipment who built them and one of the professional person who has a detailed knowledge in lab set up. The budget presented for the equipment is on this basis and if need be further details can be provided and also these people can be asked to meet with the OGRC to present further information.

- Applicant

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

No clear research objectives or methodologies were outlines in the proposal.

- Reviewer: G-51-02B

- Rating: 2

No comment

- Reviewer: G-51-02C

- Rating: 4

As discussed above, the first two objectives are well supported.

- Reviewer: G-51-02B

- Rating: 2

The format of this proposal is different than normal NDIC proposals where there is a specific project to discuss the methodology etc. We have 5 research topics to work on and different tasks will be assigned to over 15 PHD students to work on together with the faculty and the industry partners. the progress reports and presentations are designed to provide continuous feedback to the NDIC to ensure the projects are progressing well. Also, the idea of requesting funding to support one faculty member is to make sure that someone with direct contact with the NDIC will provide frequent check on projects and report back to the NDIC.

- 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:

The proposal did not have clear outcomes other than very general funding of student education and research activities. It is possible that work performed by the UND DPE using the proposed funds could have a very significant positive impact on the industry, but without a list of deliverables, that is very difficult to justify.

- Reviewer: G-51-02B

- Rating: 2

No comment

- Reviewer: G-51-02C

- Rating: 3

Contributions by the Ph.D. program at UND to the North Dakota Industrial Commission and OGRC is likely to be very significant in advancing future development and operational efficiencies in the Bakken and Three Forks play as well as identifying other opportunities.

- Reviewer: G-51-02B

- Rating: 4

I believe the proposal has objectives specific to the needs and expectations of the NDIC and is in line with the future growth of Bakken and Three Forks in terms of education, research and industry services.

- Applicant

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:

The application PI and UND DPE faculty have had great program success thus far. I believe they have the capabilities to perform and foster research that could be very beneficial to the oil industry in North Dakota.

- Reviewer: G-51-02B

- Rating: 4

Dr. Rasouli is a recognized subject matter expert, and his leadership of the program is well recognized.

- Reviewer: G-51-02C

- Rating: 5

The principal investigator has significant experience and expertise in the area of the proposed activities.

- Reviewer: G-51-02B

- Rating: 4

It is my duty and job to serve ND people and industry in education sector. My clear objective is to educate hands on and practical Petroleum Engineers who need minimum on job training to join the oil and gas industry workforce in ND upon completion of their degree. It is with this idea that I pushed significantly to convince the donor of the new lab equipment to give it to us while there were many other Universities and research institutes who wanted them. I certainly believe that this new facility will provide a great training platform for our students and a unique resource for industry services. The NDIC funding is the only way that we can achieve the above 3 objectives and move to the next step of our expansion to become a reputable program among US departments of Petroleum Engineering. I am therefore hoping that the OGRC considers this funding request positively, specially that the feedback of two reviewers are strongly supportive.

- Applicant

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:

Application did not contain a well defined management plan. With total overall funding of over \$1 million per year, I would like to have seen a much more detailed outline of how the funds will be used and what potential outcomes will be.

- Reviewer: G-51-02B

- Rating: 2

No comment

- Reviewer: G-51-02C

- Rating: 3

The first two proposed objectives are well justified in this area. The drilling and completions lab, while having a very specific description of donated equipment, would benefit from a forward looking business and operations plan. The business plan should identify the type of investigations and services that will be provided, the customers (UND-DPE, NDIC, DOE, Oil and Gas Industry Operators), is there adequate demand for the services to be provided, competitor analysis - can the lab successfully compete for services, what is the marketing plan to develop external customers, what is the potential for future external revenue, etc?

- Reviewer: G-51-02B

- Rating: 3

As mentioned above, the milestone and financial schedule in this proposal has a different nature than normal funding proposals. The salaries are paid on a routine payments of UND and there is no specific schedule for the lab set up, except that we have considered the first year to complete the initial set up and operating the equipment with some support for the following years. If required, further details can be provided to clarify specific inquiries.

- Applicant

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

The large equipment donation was very generous, but it appears that assembly, housing, and ongoing expenses will be very high. With the high costs associated with the equipment, I would like more details on exactly what type of new research could be performed using the equipment. I would also be interested in knowing if the EERC sees any value in the equipment and whether a collaborative lab setting could be arranged to help justify the related expenses.

- Reviewer: G-51-02B

- Rating: 2

The recently donated equipment described in the proposal will provide exceptional training and hands-on opportunity for the students of this program.

- Reviewer: G-51-02C

- Rating: 5

Objectives 1 and 2 do not include significant purchases of equipment or facilities, and objective 3 is primarily setting up and operating donated equipment.

- Reviewer: G-51-02B

- Rating: 3

As explained above, the new lab includes unique facilities that has already attracted several universities and DOE NETL to contact us for forming a working consortium and apply for joint funding. The NDIC fund, if approved, can be considered as cost share for these funding requests. The letter of support from DOE NETL and IEP have been submitted. It is a facility that can be used for training, education, research and industry services. In my initial discussion with the EERC, they are supportive of this lab set up, as it will educate a number of students who will be hired by them, however, it is proposed to contact the EERC and receive their view of the new lab set up.

- Applicant

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

This is a difficult question to answer, as a large portion of the funding would be used for tuition, stipends, and salaries. The software and donated equipment are very generous, but no clear research outcomes are provided by the applicant to indicate how the industry software or equipment will be used.

- Reviewer: G-51-02B

- Rating: 3

Again, the recently donated equipment is quite notable.

- Reviewer: G-51-02C

- Rating: 4

The history of this project demonstrates good value from sponsoring Ph.D. students and hiring an endowed assistant professor should also support this objective. As discussed above the value of the drilling and completions lab is less well understood.

- Reviewer: G-51-02B

- Rating: 4

The new lab facility will be an add value source to UND, and ND as it can serve three areas of education, research and industry services. The lab has unique features that no other labs have and this will enhance our chances for funding opportunity.

- Applicant

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

The UND and industry cost share is slightly less than 50% of the total budget.

- Reviewer: G-51-02B

- Rating: 2

After the value of the equipment is tallied, it seems that the matching funds are less compelling... Should the "Endowed Professor" and "Lab Manager" salaries be 100% borne by the NDIC ?

- Reviewer: G-51-02C

- Rating: 3

This project meets the requirements for match funding, including the donation of a significant amount of unique lab equipment from TerraTek in Salt Lake City.

- Reviewer: G-51-02B

- Rating: 3

A new letter of industry cost share from SimTech emailed on Nov 22 to Ms. Karlene Fine with a total of \$715,000 cost share. This will bring the total cost share above the expected amount.

- Applicant

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

As proposed, I recommend not funding the project. I believe that the UND DPE is capable of performing great work that would align with the OGRP goals, but many additional details are needed before proceeding. It may be beneficial for the applicant to break the funding request into smaller applications with clearly outlined objectives, budgets, and timelines. I would also be interested in knowing what value the EERC sees in the donated equipment and whether or not there could be some collaborative efforts to properly implement its usage.

- Reviewer: G-51-02B

This has been an exemplary program to date, providing critical funds for immersion of students in practical Williston Basin applications. The PI, Dr. Rasouli is a well recognized subject matter expert. This program should be continued !!! Perhaps slightly less funding toward the program could be made available ? - not sure if the OGRP should pay for 100% of a new hire faculty member and/or the lab manager.

- Reviewer: G-51-02C

The proposed project is well aligned with OGRC goals and will continue to provide Ph.D. graduates from UND Petroleum Engineering Program, who are highly likely to be employed in North Dakota. Development of this expertise will help meet the OGRC goal to promote efficient, economic, and environmentally sound exploration, development, and use of North Dakota's oil and gas resources. Donation of the TerraTek Drilling and Completions Lab equipment to UND provides an opportunity to develop a unique research facility that could elevate the UND-PE capabilities and program stature. The lab development has received support from the DOE - NETL lab. This opportunity would benefit from further evaluation and development of a business/operations plan.

- Reviewer: G-51-02B