

# Technical Reviewers' Rating Summary

Proposal Number  Application Title  Submitted By   
 Request For  Total Project Costs

## Section A. Scoring

Statement	Weighting Factor	G-49-04A	G-49-04C	G-49-04C	Average Weighted Score
1. Objectives	9	4	5	3	36
2. Achievability	7	2	4	4	21
3. Methodology	8	4	4	4	32
4. Contribution	8	4	4	4	32
5. Awareness / Background	5	4	5	3	20
6. Project Management	3	4	4	4	12
7. Equipment / Facilities	2	4	4	3	6
8. Value / Industry - Budget	4	4	4	3	12
9. Financial Match - Budget	4	3	4	3	12
<b>Average Weighted Score</b>		<b>182</b>	<b>214</b>	<b>176</b>	<b>190</b>
	Total: 50				<b>250 possible points</b>

## 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:

Application goals/objectives are consistent with the following OGRC goals: -Promote efficient, economic, and environmentally sound exploration, development, and use of North Dakota's oil and gas resources -Encourage, and promote the use of new technologies and ideas that will have a positive economic and environmental impact on oil and gas exploration, development, and production in North Dakota. -Improve the overall suitability of the oil and gas energy industry in North Dakota through the development of new environmental practices that will help to reduce the footprint of oil and gas activities

- Reviewer: G-49-04A  
 - Rating: 4

The proposal clearly delineated the goals of the proposed work and their direct correlation to OGRC goals. While the reviewer agrees with the correlation, the proposer's reference to pipeline-centered work might suggest that a better fit exists with current OGRC-funded projects such as iPIPE (G-046-88). In that respect, OGRC may wish to consider avoiding duplication of efforts by electing to not fund portions of proposed work specific to pipelines.

- Reviewer: G-49-04C
- Rating: 5

The project will provide meaning full data to the NDIC and other State agencies while giving the Oil and Gas industry a useful tool to comply with State governance.

- Reviewer: G-49-04C
- Rating: 3

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

The sixteen month timeline appears to be aggressive for both collecting new data and developing a tested/validated/deliverable automated analysis model. The funding appears to be adequate, but I do have some concern regarding the timeline.

- Reviewer: G-49-04A
- Rating: 2

In this reviewer's opinion, the proposed scope of work is quite aggressive for the limited budget proposed. Given the expertise and past experience of SolSpec, this reviewer believes that the scope can be achieved in the time specified. Budget management may be a challenge, but it is believed that SolSpec can complete this work without requests for additional funding. Although this reviewer is not deeply knowledgeable on this specific topic, the reviewer does question how model validation and refinement tasks will be completed without additional, repeated aerial data collection. On the surface, it seems this work would require multiple data capture sets from iSight to provide information required to adjust initial model datums.

- Reviewer: G-49-04C
- Rating: 4

The time available accounts for a full field season to validate the model and the two off-seasons for model development and validation post field investigations (ground truthing).

- Reviewer: G-49-04C
- Rating: 4

The team concurs that the project as was proposed follows an aggressive timeline. To address the reviewers' concerns and ensure that the project is completed on an agreed upon timeline, we propose an extension of the project by 6 months -- from 16 to 22. The additional 6 months will be allocated to model validation and refinement, with the final report submitted June 2021. Regarding the reviewer comment suggestion that multiple data capture events would improve the model, we want to underscore that these models will be continuously improved as more data are collected at the same and additional locations through future projects, as well as through the improvement of sensors used in data capture. However, we think it necessary to bound this project at a budget that is both reasonable and supports the development of functional models -- that is what we believe we have proposed.

- Applicant

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

I think the methodology is presented in a clear format and appears to be appropriate to meet the applicant's objectives.

- Reviewer: G-49-04A
- Rating: 4

In this reviewer's opinion, the presented methodology is logical and may result in probable project success, if questions related to the repeated data collection discussed above are addressed. It is apparent that SolSpec has expertise in this area, and has developed a solid plan of attack to successfully accomplish the proposed scope of work, but the reviewer can't help

but wonder whether additional aerial data collection would greatly improve this work.

- Reviewer: G-49-04C

- Rating: 4

I feel like the site visits places this project above other office based modeling projects.

- Reviewer: G-49-04C

- Rating: 4

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:

If the applicant can successfully develop an automated platform to rapidly analyse aerial remote sensing data, that would be a very significant step forward for the industry and state as petroleum development continues to mature. It has been proven that high quality sensing data can be efficiently collected using UAS, but thus far the industry has been challenged to quickly make use of the large data sets.

- Reviewer: G-49-04A

- Rating: 4

If successful, this project has potential to demonstrate valuable new tools to address significant oilfield reclamation validation/acceptance shortfalls that currently exist in North Dakota. Additionally, landslide susceptibility of oilfield assets has long been a priority interest of NDDMR. This work has potential to achieve advancements in that technical area, as well.

- Reviewer: G-49-04C

- Rating: 4

This project will allow NDIC, staff/inspectors, to me more efficient while providing meaningful and defensible data for use in closing reclamation projects. On the pipeline side, the landslide susceptibility model will assist/inform the Department and Operator when siting pipelines. These provide a technical and scientific to responsible resource development.

- Reviewer: G-49-04C

- 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:

PI and related staff appear to have appropriate skill sets and experience to execute the work outlined in the application.

- Reviewer: G-49-04A

- Rating: 4

It is clear that the proposal team has reviewed a significant quantity of literature specifically focused on North Dakota issues. The team has also demonstrated substantial knowledge of governing regulatory literature. This all contributes to an overall confidence that this work has been well-planned and thoughtfully proposed.

- Reviewer: G-49-04C

- Rating: 5

They team is made up of experienced technical members. While some projects are available the science is new.

- Reviewer: G-49-04C

- Rating: 3

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:

Methodology, schedule, standards of success, and deliverables are clearly outlined in the application.

- Reviewer: G-49-04A

- Rating: 4

A detailed timetable was provided to convey a logical sequencing of the proposed project. A central tenet of the Agile Method of software development project management is to facilitate information flow between parallel teams to ensure all teams pull in the same direction. It seems that SolSpec has a firm grasp of the Agile Method and will employ it to keep this multi-party team operating off the same sheet of music. The financial plan presents enough detail to convince the reviewer of its adequacy.

- Reviewer: G-49-04C

- Rating: 4

The schedule provided for a full field season and time to develop and validate the model during the winter months. The financial plan was lacking in detail.

- Reviewer: G-49-04C

- Rating: 4

The project team is happy to provide additional financial details where desired.

- Applicant

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

While no equipment is proposed, the related data acquisition and development expenses appear to be well justified to meet the applicant's objectives.

- Reviewer: G-49-04A

- Rating: 4

The proposal text indicates that no equipment or facilities purchases are required. The budget calls for purchase of aerial data, labor to develop and validate models with that data, and labor/services to accomplish ground truthing of the model output.

- Reviewer: G-49-04C

- Rating: 4

No equipment will be purchased.

- Reviewer: G-49-04C

- Rating: 3

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

The applicant has strong industry partners with Whiting, ONEOK (pending), and ISight. The industry support will be very important to ensure the validity and true practicality of the final model.

- Reviewer: G-49-04A

- Rating: 4

This reviewer feels that the budget value is quite good – a substantial amount of meaningful work leading to promising results for a modest budget.

- Reviewer: G-49-04C

- Rating: 4

Applicant and industry partners will provide half of the requested funding. The data acquisition seems to be the largest spend for the NDIC. There is not a clear justification for why unless that data already exists.

- Reviewer: G-49-04C

- Rating: 3

The justification for data collection is that this project seeks to develop analytic tools and outputs that are temporally relevant. For instance, the reclamation assessment model requires contemporary aerial imagery in order for the model to accurately represent current reclamation status. Current aerial imagery does not exist for the areas of interest (Whiting and ONEOK asset locations).

- Applicant

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

The application has the 50% minimum matching financial commitment. With that said, the applicant does have strong industry partnerships to support and enhance the overall work.

- Reviewer: G-49-04A

- Rating: 3

Although the proposed in-kind contribution is at the minimum required level, it is promising that the in-kind contributions may come from multiple North Dakota business operators, each with potential to ultimately improve revenues within the state, leading to obvious benefits to the state. There remains some concern about the firmness of commitment from ONEOK. If ONEOK opts, ultimately, to not participate, a major portion of the proposed work is negated.

- Reviewer: G-49-04C

- Rating: 4

Yes, Oneok, Inc. and Whiting Oil and Gas Corporation with SolSpec provide matching funds. I do feel this justifies funding as the NDIC will benefit from this research project.

- Reviewer: G-49-04C

- Rating: 3

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

Over the last several years, it has been proven that UAS can be a very effective platform for data collection to address a number of oilfield applications. While an effective data collection tool, the one major hurdle facing large scale UAS deployment is the management and processing of large data sets in an efficient manner. The applicant is confronting this challenge and is proposing to develop a tested/validated model for both industry and regulators. If successful, such a model could be a very important step for both the petroleum and UAS industries. One significant concern is the aggressive timeline (sixteen months) for new data collection, model development, testing, and refinement. Additionally, it would be good to know how any updates/modifications to the model would be handled after development.

- Reviewer: G-49-04A

High quality proposal with a logical scope of work. The budget request is not exorbitant. This reviewer's only critical comment is that some of the scope of work proposed is focused on potential landslide impacts to pipelines. This is a flavor of pipeline leak prevention technology development that OGRC is already potentially funding under a project called "iPIPE (G-046-88). OGRC will decide whether it wishes to invest in potentially-overlapping projects in this manner.

- Reviewer: G-49-04C

This project identifies and provides a solution to the pinch point with employing remote sensing Technology. The ability to process very large data into a useable form is a limiting factor. This with a region specific model make this a unique/beneficial project. If this project is successful it will allow many users in Government and Industry to make more informed decisions. My overall recommendation is to fund the project. I do wish the applicant would have provided a little more color to the budget.

- Reviewer: G-49-04C