Oil and Gas Geologic Data for New North Slope Exploration Targets **FY2007 Request: $265,000** **Reference No: 39988**

AP/AL: Appropriation
Project Type: Planning
Category: Development
Location: North Slope Borough
Contact: Nico Bus
House District: Arctic (HD 40)
Contact Phone: (907)465-2406
Estimated Project Dates: 07/01/2006 - 06/30/2007

Brief Summary and Statement of Need:
Successful new exploration ventures depend on high quality geologic data, especially where limited sub-surface data exist. This project will investigate the petroleum geology across the poorly-explored south-central and southeastern North Slope, evaluating the potential for new exploration targets in the foothills region of the Brooks Range. Reliable new geologic data has a direct effect on the state's goal of encouraging exploration-capital investment in Alaska, particularly by smaller independent oil and gas companies. Furthermore, this study will identify and document the resource potential of this gas-prone region, providing critical constraints on the long term supply to the proposed natural gas pipeline.

Funding:	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	Total
Gen Fund	$265,000						$265,000
Total:	$265,000	$0	$0	$0	$0	$0	$265,000

☐ State Match Required ☐ One-Time Project ☐ Phased - new ☑ Phased - underway ☐ On-Going
0% = Minimum State Match % Required ☐ Amendment ☐ Mental Health Bill

Operating & Maintenance Costs:

	Amount	Staff
Project Development:	0	0
Ongoing Operating:	0	0
One-Time Startup:	0	
Totals:	0	0

Additional Information / Prior Funding History:
FSSLA05/CH3 - $145,000
Year 1 of 2 year project began on July 1, 2005. Field work was conducted during summer of 2005. Samples are currently being analyzed for petroleum characteristics. Preliminary reports are in preparation. Based on technical interpretations, additional laboratory analyses will be conducted throughout FY2006.

Project Description/Justification:
INTRODUCTION
Alaska's North Slope remains the most promising onshore oil and gas province in North America. It is estimated that future drilling in this world class petroleum province will discover at least 36% of the United States' remaining reserves of oil and gas[1]. Despite more than 35 years of drilling, the North Slope remains underexplored relative to other sedimentary basins around the world. In order to capitalize on this enormous resource, new exploration will require high quality geologic data. The primary purpose of this project is to acquire a comprehensive new geologic data set that will catalyze new private-sector oil and gas exploration beyond the core Prudhoe Bay area.

All data collected during this project will be available via DGGS technical reports and other peer-reviewed scientific literature. The products will include detailed surface geologic maps, reservoir and source rock data, and interpretive reports that will be made available to the public prior to the annual foothills oil and gas lease sales. These publications are highly valued by oil companies exploring for oil and gas in northern Alaska, particularly by smaller independents that

often lack the proprietary database to effectively explore. Establishment of a more robust knowledge of North Slope geology will provide an incentive to companies seeking to reduce their investment risk. Many foreign governments provide voluminous publicly available geologic data to entice companies to explore for oil and gas resources. Increasing the availability of high-quality data will make the exploration landscape in Alaska more globally competitive and attractive to new companies.

FUTURE EXPLORATION TARGETS

Exploration for new oil and gas resources is fundamentally driven by geologic data. For example, the largest onshore discovery in North America in almost 20 years (Alpine Field) was the result of a novel geological model based on interpretations of new technical data. Despite many nearby wells drilled in previous years, this new type of oil accumulation in northern Alaska awaited a different exploration concept based on improved geologic understanding.

Exploration interest in northern Alaska remains strong, as suggested by aggressive bids totaling $53.9 million during the recent 2004 lease sale in northeastern NPRA. However, exploration activity could be considerably improved by attracting new companies to invest in Alaska. The future of oil and gas exploration in northern Alaska will depend on high quality geologic data and the timely application of new geologic concepts. The purpose of this project is to collect valuable data and provide a framework to guide these exploration efforts. This project will focus on analyzing important outcrops and constructing geologic models for the depositional history of key stratigraphic intervals. In particular, this work will synthesize widely spaced geologic observations from across the North Slope. This regional perspective is acutely needed and will fill a gap in the publicly available data on the petroleum geology of northern Alaska.

Geologic work on the North Slope has historically been limited to understanding oil prone areas due to the lack of a foreseeable gas market, and the significant stranded gas reserves in existing North Slope fields. However, the geologic setting in the Brook Range foothills suggests it is prone to the generation and accumulation of natural gas, very similar to the prolific foothills region of the Canadian Rocky Mountains. This type of geologic model has significant implications for the long term supply of gas for the proposed natural gas pipeline, and it is critically important for the state to identify and document this resource potential. In addition, detailed structural and stratigraphic data generated in this study will have implications for potential future exploration in the ANWR 1002 area.

PROJECT PLAN

The project will acquire new geologic data salient to the North Slope petroleum system. Field studies will be focused on integrating new data with existing data collected from the central and eastern North Slope. The project objectives will be accomplished through completion of the following work plan:

- Conduct detailed field work to clarify critical stratigraphic relationships
  - Local geologic mapping
  - Detailed measured stratigraphic sections
- Collect data on reservoir units and evaluate resource potential
  - Reservoir geometry, quality, and diagenetic history
  - Rock composition (provenance)
  - High resolution stratigraphic age control
- Analyze oil- and gas-prone source rocks
  - Source rock distribution and quality
  - Stratigraphic correlations and age constraints
- Interpret and summarize overall geologic evolution of the North Slope sedimentary basin
  - Construct regional geologic maps and cross sections
  - Analyze basin-wide structural history (folding and faulting)
  - Integrate available surface and subsurface data

This phase of the project will complement DGGS Energy section geologic mapping and topical studies in the Mt. Michelson quadrangle (funded separately by federal receipts, state matching funds, and industry sponsorship monies). Although the CIP proposed here is a stand alone project, with unique goals, the sharing of logistical resources and equipment between projects has historically proven a very cost-effective strategy for conducting field studies under challenging conditions in remote portions of Alaska.

DGGS MISSION & STATE BENEFITS

The Energy section within DGGS is ideally suited to conduct this project and has led most of the field-based geologic research on the North Slope in the last decade. The proposed project builds on this experience, including a previously authorized CIP project undertaken in the central Brooks Range foothills[2]. However, the new geologic research proposed here represents a new and unique evaluation (both topically and geographically).

This project is consistent with DGGS' mission to "…conduct geological and geophysical surveys to determine the potential of Alaskan land for production of metals, minerals, fuels, and geothermal resources…[3]". Furthermore, this study fulfills DGGS' charge to "enhance Alaska's natural resources by collecting, archiving, and distributing the geological information that will catalyze private-sector energy- and mineral resource exploration and support wise land-use decisions[4]". The fundamental geologic data generated in this study will also provide critical unbiased information for State agencies responsible for managing Alaska's petroleum resources.

The reduction in oil-generated revenue has adversely affected Alaska's economy. This project is expected to encourage new exploration, thus accelerating capitalization of the state's petroleum resources and indirectly contributing to future revenue payments to the State of Alaska. Execution of this project will directly benefit the private sector through the employment of Alaska-based consultants. Approximately 75% of the expenditures in this proposal will be spent in Alaska, benefiting state commerce. The remainder will fund highly specialized analyses that must be sent to outside laboratories.

The state of Alaska has made the construction of a natural gas pipeline from northern Alaska a high priority. However, the economic details of this project are clouded by the uncertainty surrounding future gas discoveries on the North Slope. The project proposed here will provide a more robust knowledge of the gas potential of this region, which will assist the ongoing planning and negotiations to bring this natural resource to market.

REFERENCES

[1]Department of Interior national estimates (studies by the USGS and MMS)
[2]FY2005 CIP "Reservoir Potential for gas in the Brooks Range Foothills" (SLA-04, CH-159, SEC-1, P/L-30/21)
[3]Alaska Statute 41.08.020
[4]State of Alaska FY2005 Governor's Operating Budget, DNR component summary

Why is this Project Needed Now:

Alaska is at a crossroads in its history of oil and gas exploration and development. As the petroleum province matures, and infrastructure expands, many smaller independent companies are venturing into Alaska. During this critical transition, this project will serve to encourage these companies by providing a timely, comprehensive data set to help offset the high cost of exploration, and difficulty in training their staff in the geology of the North Slope. The negative impact of not proactively encouraging new exploration is to see companies invest their exploration capital in other countries whose governments are producing high quality, publicly available geologic data.

Furthermore, this project will impact the states' planning and negotiations concerning the proposed natural gas pipeline. The engineered life-span and through-put of this multi-billion dollar pipeline will depend in part on ultimate reserves of natural gas present in northern Alaska. Therefore, it is critically important for the state to identify and document the gas potential of under-explored lands, such as the Brooks Range foothills. The potential negative impact of not fully understanding the future gas potential on the North Slope could be a pipeline infrastructure that is incapable of handling new discoveries, leaving Alaska's natural resources stranded.

Specific Spending Detail:

The following budget is based on extensive agency experience with similar field-based resource studies:

Line Item Expenditures:

Personal Services	$37,500	Partial funding for existing permanent staff and student intern
Travel	$5,000	Attend industry meetings to present results and promote exploration
Services	$170,000	Helicopter & fixed wing contracts, lodging, lab analyses, consultant
Commodities	$30,000	Helicopter fuel, field supplies
Capital Outlay	$22,500	Field electronics and equipment

Project Support:

Major and independent oil companies
Oil and gas support industry
Alaska Oil & Gas Conservation Commission
U.S. Bureau of Land Management

Regional Native corporations
Alaska Division of Oil & Gas
U.S. Geological Survey
U.S. Minerals Management Service

Project Opposition:
None Known