

Geologic Assessment of North Slope Shale Oil Potential**FY2013 Request:****\$100,000****Reference No:****53984****AP/AL:** Appropriation**Project Type:** Energy**Category:** Natural Resources**Location:** Prudhoe Bay**House District:** Arctic (HD 40)**Impact House District:** Arctic (HD 40)**Contact:** Jean Davis**Estimated Project Dates:** 07/01/2012 - 06/30/2017**Contact Phone:** (907)465-2422**Brief Summary and Statement of Need:**

This phased project will stimulate new investment and exploration activity by producing new geologic data on North Slope shale oil resource potential. This work will include examination of available subsurface data and the acquisition of new field information from outcrops that are correlative to potential subsurface unconventional source/reservoir units. The publication of this type of reliable new geologic data will have a direct effect on the state's goal of encouraging exploration-capital investment in Alaska, particularly by smaller independent oil and gas companies who rely heavily on the Division of Geological and Geophysical Surveys (DGGS) publicly available maps and technical reports.

Funding:	<u>FY2013</u>	<u>FY2014</u>	<u>FY2015</u>	<u>FY2016</u>	<u>FY2017</u>	<u>FY2018</u>	<u>Total</u>
Gen Fund	\$100,000						\$100,000
Total:	\$100,000	\$0	\$0	\$0	\$0	\$0	\$100,000

<input type="checkbox"/> State Match Required	<input type="checkbox"/> One-Time Project	<input checked="" type="checkbox"/> Phased - new	<input type="checkbox"/> Phased - underway	<input type="checkbox"/> On-Going
0% = Minimum State Match % Required		<input type="checkbox"/> Amendment	<input type="checkbox"/> Mental Health Bill	

Operating & Maintenance Costs:

	<u>Amount</u>	<u>Staff</u>
Project Development:	0	0
Ongoing Operating:	0	0
<u>One-Time Startup:</u>	0	
Totals:	0	0

Additional Information / Prior Funding History:**Project Description/Justification:**

The North Slope of Alaska is a world class petroleum province and experts agree that it includes some of the most prospective onshore regions remaining in North America. Despite this heralded potential, the North Slope remains underexplored relative to other sedimentary basins around the world. The primary purpose of this two-phase project is to acquire a comprehensive new geologic data set that will catalyze private-sector oil and gas exploration beyond the core Prudhoe Bay area.

North Slope oil production is in decline as the main conventional fields mature, highlighting the need for new exploration and production. Maturing petroleum basins in the Lower 48 have recently been rejuvenated by the advent of shale oil and shale gas exploration. These unconventional resource plays evolved from new geologic models and advances in well stimulation (engineering). The result has been a remarkable surge in industry activity and successful revitalization of moribund oil and gas provinces.

The North Slope petroleum system includes three excellent organic-rich, source rock intervals—a characteristic that is required for the successful creation of shale oil accumulations. Industry has recently recognized this potential, as indicated by one company spending more than \$6.5 million to lease ~500,000 acres of State land for the stated purpose of exploring for shale oil resources.

Numerous geologic factors control the productivity of shale oil systems. Organic geochemical properties, thermal and tectonic history, porosity and permeability characteristics, and mechanical properties (brittleness) can each control whether the resource can be commercially produced. These key characteristics are poorly understood on the North Slope. This project will fill this gap in geological knowledge by acquiring key subsurface and surface data on prospective rock units. Phase one of the project will include a short field season to identify outcrops that correlate to the potential source-reservoir units and collect a diverse suite of samples for laboratory analysis. Phase two will build on the reconnaissance field program and conduct more detailed examination of critical outcrop sections. In addition, geological analysis and interpretation of available subsurface data (seismic, well log, and core) will be integrated with field results to arrive at an improved understanding of North Slope shale oil potential.

New exploration ventures in northern Alaska are hampered by the limited amount of published geologic data, much of it reconnaissance in nature. This problem is particularly acute for smaller companies with limited access to proprietary industry data. All data collected during this project will be publicly available via Division of Geological and Geophysical Surveys (DGGS) technical reports and other peer-reviewed scientific literature. These publications are highly valued by petroleum companies and provide a reliable regional geologic framework for their exploration. The 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.

The DGGS Energy Resources section is ideally suited to conduct this project and has led most of the field-based petroleum geologic work on the North Slope in the last decade in close cooperation with the Division of Oil and Gas. This project builds on this experience and is consistent with DGGS' statutory mission to "...conduct geological and geophysical surveys to determine the potential of Alaskan land for production of metals, minerals, fuels, and geothermal resources..." 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."

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 contractors. More than 80 percent of the expenditures in this proposal will be spent in Alaska, benefiting state commerce (a small portion goes to outside laboratories for sample analyses).

Alaska's North Slope is an expensive area to conduct field work and DGGS regularly seeks external funding from the federal government and private sector to support our petroleum geology studies.

Funds for this capital project will be leveraged with these other sources to more efficiently execute our program objectives.

This project will result in a total of three additional reports on unconventional energy resource potential of state-interest lands. Following phase 1 of this project (FY2013), DGGS will publish one report summarizing newly acquired field data bearing on North Slope shale oil resource potential. An expanded phase two of the project will result in two additional publications, one expected to be released in FY2014 and another in FY2015.

Why is this Project Needed Now?:

Alaska is at a crossroads in its history of oil and gas exploration and development. To stem the decline in North Slope production and maintain reliable flow in the Trans Alaska Pipeline, new reserves of oil must be discovered and brought online. Many far-reaching resource related decisions are pending, and many of the deliberations surrounding these questions ultimately require reliable geologic information to inform the long term investment, infrastructure and policy decisions.

Furthermore, 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 with more readily available geologic information.

Specific Spending Detail:

<u>LINE ITEM</u>	<u>DOLLAR AMOUNT</u>	<u>DESCRIPTION</u>
Personal Services	\$ 22,000	Partial funding for existing permanent staff
Travel	\$ 3,000	Industry meetings to present results and promote North Slope exploration
Services	\$ 75,000	Contract geologist; camp, fuel, and helicopter contracts; laboratory analyses

State Match Required: (check one)

NO

YES (If Yes, provide percentage of GF or GFM required, and description of how match will be met.)

Project Support:

Oil and gas companies are typically very appreciative of DGGS technical studies and would support any work that improves our understanding of the petroleum geology and reduces exploration risk.

Resource related government agencies will benefit from this project, particularly those charged with resource assessment responsibilities:

U.S. Geological Survey
U.S. Bureau of Land Management
Alaska Division of Oil and Gas
Alaska Oil and Gas Conservation Commission

Regional Native Groups (mostly the Arctic Slope Regional Corporation) have extensive land holdings on the North Slope and stand to benefit from an improved understanding of resource potential as well as any future exploration investment.

The University of Alaska Fairbanks regularly participates in State-led field programs and would support the additional opportunities for collaboration.