

Reservoir Studies to Evaluate Oil and Gas Resources on the North Slope

FY2008 Request: \$4,000,000
Reference No: 45278

AP/AL: Appropriation
Category: Development
Location: Statewide
House District: Statewide (HD 1-40)
Estimated Project Dates: 07/01/2008 - 06/30/2014

Project Type: Planning
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Brief Summary and Statement of Need:

This project will enable the Division of Oil and Gas to evaluate the best use of gas resources on the North Slope from Prudhoe Bay and other units and State leases on the North Slope. Other reservoirs with large gas potential that will be considered for evaluation include Northstar, Endicott, Alpine, Pt. McIntyre, Pt. Thomson and reservoirs yet to be developed. The study will help the state determine how best to provide the optimal amount of North Slope gas into a pipeline, while maximizing oil production and balancing and weighing alternative uses for gas that could enhance oil recovery.

Funding:	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	Total
Gen Fund	\$4,000,000		\$4,000,000	\$2,000,000			\$10,000,000
Total:	\$4,000,000	\$0	\$4,000,000	\$2,000,000	\$0	\$0	\$10,000,000

<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>	<u>0</u>	<u>0</u>
Totals:	0	0

Additional Information / Prior Funding History:

This is a new project request - no prior funding history.

Project Description/Justification:

This project will provide funds for consultants and contractors with expertise in construction and use of geologic and engineering models used to evaluate oil and gas reservoirs. The study will require assimilation and processing of data and measurements from over 2000 penetrations and thousands of surveillance measurements in the Prudhoe Oil Pool. Models of this sort attempt to replicate the geology and physics of reservoirs so that detailed evaluation of depletion scenarios may be performed. Geologic and reservoir models may contain tens of thousands to millions of cells, each programmed with physical rock and fluid properties to allow an accurate replication of reservoir performance. The complexity of modeling a reservoir of Prudhoe's magnitude and history requires a large component of manpower, computing power and prior experience with modeling such large reservoirs. Other North Slope reservoirs with viscous oil (such as Aurora, Borealis, Ugnu, West Sak, Schrader Bluff, Orion, Polaris, Ooguruk, Nikaitchuq) will need to be considered for their Enhanced Oil Recovery (EOR) potential utilizing gas from Prudhoe or other reservoirs with an abundance of gas after the oil is depleted. DNR's stewardship responsibility requires the State to conduct its own independent evaluation(s) to ensure its citizens' interests are being safeguarded.

Since Prudhoe Bay Unit production began in 1977, the State has endeavored to encourage development of gas resources on the North Slope. Gas re-injection and cycling at Prudhoe have been effectively used to recover over 3 billion barrels of oil beyond initial estimates of 9.6 billion barrels. Today, gas from Prudhoe is being injected into at least six

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other North Slope reservoirs to improve and enhance oil recovery. Reservoirs at Endicott, Northstar, Pt. McIntyre, Alpine and Pt. Thomson will ultimately be gas resources once their oil and liquids have been depleted.

The most pressing question faced by the state is how to provide an adequate and dependable supply of gas from North Slope reservoirs for sales to a gas pipeline, while still efficiently producing the over 21 billion barrels of oil left in developed North Slope reservoirs upon their depletion under currently understood development strategies. In addition to Prudhoe, how will gas be produced and effectively utilized from other oil reservoirs on the North Slope?

There are over 24 billion barrels of viscous oil contained in undeveloped reservoirs that may benefit from lean gas injection, miscible gas injection, fuel for enhanced oil recovery (EOR) techniques, or other useful alternatives. Can gas be produced for export and still provide sufficient gas for EOR or improved recovery? In order to maximize the benefit of this valuable resource to the State, DNR needs to understand these complex reservoirs.

Hiring outside consultants and contractors with the necessary expertise will expedite the studies and ensure the State of the best possible objective evaluation of its interests in gas development. In addition it will allow the State to evaluate industry claims and respond to their proposals for gas development, impact of gas offtake on liquids production and potential utility of gas to improve or promote the recovery of billions of barrels of viscous oil on the North Slope.

Why is this Project Needed Now?

It is important to begin this effort now as the planning is done to transition the North Slope fields from oil to gas recovery. Not approving this project can mean optimal alternatives may not be considered prior to establishing gas offtake plans from North Slope oil reservoirs. The State's stake could be an incremental 250-600 million barrels of royalty oil. Legislative and public interest has been elevated by initiatives to encourage gas development on the North Slope. The undeveloped viscous oil and remaining unrecovered oil-in-place represent a 45 billion barrel target to apply gas for additional oil recovery. A 5-10% incremental recovery could recover an additional 2-4.5 billion barrels of recoverable oil. Gas not consumed in oil recovery would still be available for export.

Specific Spending Detail over three-year duration of project:

LINE ITEM	DOLLAR AMOUNT	DESCRIPTION (text)
Travel	\$ 250,000	Travel is for state personnel and contractors to travel between Anchorage and Houston over a three-year period. A large portion of the travel expense is associated with per diem and lodging expenses as both employees and contractors will be in Houston and Anchorage for extended time frames.
Services	\$ 9,000,000	Geologic, Geophysical & Engineering Consultants
Commodities	\$ 750,000	Software licenses and computer hardware