HCR

13

ALASKA STATE LEGISLATURE
HOUSE RESOURCES COMMITTEE

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FAX

Please deliver the following pages to: Jack Chenoweth

Fm: Staff, Resources Committee

Fax #: 2029 **Total number of pages including cover: 1**

Date: 5/2/05 5:13 PM

Re: HCR 13 24-LS0943\Y

Please amend the above referenced resolution and final as a Resources CS

Page 1, Line 6 Delete "100" Insert "35"

Page 1, Line 8 Delete "to 15"

Page 1, Line 9 Delete "reserves" Insert "resources"

Page 2 line 8 & 9

Following: "Andex Resources," insert so it reads **"LLC, Usihelli Energy, LLC, Arctic Slope Regional Corp,** and ENSTAR Natural gas Company who have **worked** together, **and ENSTAR has** secured partial ...

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House District 10

House of Representatives

Sponsor Statement

HCR 13

"Expressing the legislature's support for the construction of a natural gas spur pipeline between Fairbanks and the Nenana Basin and Southcentral Alaska, commending the interest and initiative of the sponsors of that project, and encouraging the appropriate state resource agencies to lend support to those efforts."

HCR 13 acknowledges that the majority of the state's efforts for a gas pipeline are being directed at the 100 trillion cubic feet of natural gas stranded on the North Slope. There is, however other areas of stranded gas in the state that offers an excellent opportunity for lower cost fuel along the railbelt.

From the Nenana basin there is potentially 10 trillion cubic feet of natural gas. Several companies are exploring that area today and could be ready to bring gas on-line by 2008, if there is a line to bring it too.

Creating of a spur line between Fairbanks and Southcentral offers an opportunity for Alaskans to enjoy the benefits of natural gas without the volatile price fluctuations created by demand in the Lower 48.

A spur gas line will serve a large portion of the population of the state. The potential for conversion from diesel to propane in rural areas of the interior and the potential of lower cost fuel against growing demand is a consideration that we should ask the administration to seriously consider.

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FISCAL NOTE

STATE OF ALASKA
2005 LEGISLATIVE SESSION

Fiscal Note Number:
Bill Version: HCR 13
() Publish Date:

Revision Date/Time (Note if correction):
Dept. Affected: Legislature
Title "Expressing the legislature's support for the construction of a natural gas spur pipeline between..."
BRU Legislative Council
Component: Council and Subcommittees
Sponsor House Resources
Requestor House Resources
Component No. 783

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Personal Services	0.0	0.0	0.0	0.0	0.0	0.0
Travel	0.0	0.0	0.0	0.0	0.0	0.0
Contractual	0.0	0.0	0.0	0.0	0.0	0.0
Supplies	0.0	0.0	0.0	0.0	0.0	0.0
Equipment	0.0	0.0	0.0	0.0	0.0	0.0
Land & Structures	0.0	0.0	0.0	0.0	0.0	0.0
Grants & Claims	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL OPERATING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CAPITAL EXPENDITURES	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CHANGE IN REVENUES ( )	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF	0.0	0.0	0.0	0.0	0.0	0.0
1005 GF/Program Receipts						
1037 GF/Mental Health						
Other (Specify Type--Do not abbreviate)						
TOTAL	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Estimate of any current year (FY2004) cost: 0.0
Check this box (X) if funding for this bill is included in the Governor's FY 2005 budget proposal:

POSITIONS

Full-time						
Part-time						
Temporary						

ANALYSIS: *(Attach a separate page if necessary)*

This legislation has zero fiscal impact on the Legislative Affairs Agency.

Prepared by: Karla Schofield, Deputy Director
Phone 465-6626
Division Administrative Services
Date/Time 5/2/05 8:56 AM

Approved by: Pamela Varni, Executive Director
Date 5/2/2005
Agency Legislative Affairs Agency

(Revised 9/2001 OMB)

IOUSE COMMITTEE REPO

(9)

Date Referred to Committee: April 28, 2005 **FURTHER RE FERRALS:**

Date of Committee Action: 5/2/05

The RESOURCES Committee considered: **HCR 13**

HOUSE CONCURRENT RESOLUTION NO. 13 **NATURAL GAS SPUR LINE CONSTRUCTION**

Expressing the legislature's support for the construction of a natural gas spur pipeline between Fairbanks and the Nenana Basin and Southcentral Alaska, commending the interest and initiative of the sponsors of that project, and encouraging the appropriate state resource agencies to lend support to those efforts.

Recommends it be replaced with [ ] HCS *or* [✓] CS *for* HCR 13 (RES)

***For Senate Bills with new title: [ ] Technical Title [ ] New Title: HCR*____ [ ] Same Title [ ] New Title**

[ ] attach amendments
[ ] add new referral to ____________Committee
[ ] Letter of Intent___________Committee

List of Abbrev for Depts.:
ADM
CED
COR
CRT
EED
DEC
DFG
GOV
HSS
LEG
LAW
LWF
MVA
DNR
DPS
REV
DOT
UA

NEW FISCAL NOTES (*Assigned by Chief Clerk's Office)

List by Dept(s):	*FN#	Fiscal	Indet.	Zero
LEG				✓

PREVIOUS FISCAL NOTES

List by Dept(s):	FN#	Fiscal	Indet.	Zero

Signing with recommendations	Printed Last Name	DP	DNP	NR	AM
[signature]	OLSON			✓	
[signature]	Gatto			✓	
[signature]	ELKINS	✓			
[signature]	LeDOUX			✓	
[signature]	CRAWFORD	✓			
Chair: [signature]	SAMUELS			X	
Chair: [signature]	RAMRAS	X			

Petroleum

North America's Source for Oil and Gas News
March 2005

Vol. 10, No. 10 Week of March 06, 2005

Nenana wildcat gets green light

First gas to Fairbanks, but Andex sees Anchorage, North America as potential markets for Interior Alaska gas

Steve Sutherlin

Petroleum News Associate Editor

Proximity to market is gold in the natural gas business. The proximity of Fairbanks and other Interior Alaska communities has encouraged Andex Resources to issue a green light for drilling in its Nenana basin gas project in early 2006. The company wants to be selling natural gas in Fairbanks by 2008.

Just 35 miles away from the Nenana project, the Fairbanks gas market has been underserved for years. Costly fuel oil and coal-fired electricity bills drain the pockets of Fairbanks consumers every winter. A Nenana gas find would be especially sweet because plentiful natural gas in the winter-kissed Interior would likely be a very popular product.

As sweet as the local market may be, Andex believes it has more than just a local-sized gas field. Gas from a find at Nenana could end up in Anchorage, or at the Chicago hub of a future pipeline from Alaska's North Slope, according to Bob Mason, Andex vice president of exploration for the northern region.

"The Nenana basin is a very uniquely situated exploration opportunity," Mason said.

"The lynchpin that made Andex decide to go forward on this project was the presence of transportation infrastructure that comes up right along the east side of this basin."

NENANA BASIN STORY

Currently, Fairbanks natural gas customers are served by a system that uses LNG trucked from Cook Inlet.

"This is a very, very large reserve potential project, it's a gas-prone basin," Mason said. "It will have a lot of gas and could possibly have associated liquids; it's very strategically located in the state; it could serve not only the energy needs of the Alaska Interior where the project is located, but could also become a very important new source of gas reserves for the greater Anchorage area."

Based on its analysis to date, the company is hopeful that its Nenana project will be large enough to serve the Alaska market, with gas left over for consumers in the Midwestern United States.

"If it's of sufficient reserve size, we could also be selling gas to the pipeline coming down from the North Slope," Mason said. "As a matter of fact, the reserve size potential we've got here could possibly impact and help in the decision to build that pipeline."

Considering thermogenic hydrocarbons alone, the company's analysis of the data indicated the most likely recoverable gas reserves are 3 trillion cubic feet, but the company believes the actual reserves could be as high as 10 tcf, Mason said.

"That number was based on some very, very conservative inputs," he said. Biogenic gas is a wild card — not included in the projections, but the biogenic component could be a significant add-on to thermogenic reserves.

"We know that there's biogenic gas in this basin," Mason said.

Mason said he wants to drill the initial wells to depths of at least 10,000 feet, and if seismic indicates, to 12,000 feet, regardless of what is discovered on the way down. Eventually the company may drill shallower wells, but it wants to go deep enough initially to understand sediment depths in the basin, measuring 20,000 feet or more.

"I want to take a look at structures that preserve a very thick layer for my initial well," he said. "We are evaluating structures deeper in the basin where we don't have to worry about flushing, we don't have to worry about section missing — that sort of thing."

Fast track

The company has four years remaining on the primary term of its initial exploration license, with an option to convert the license to leases with an additional seven-year term. It has a $2.5 million work commitment associated with the license.

Andex isn't sitting still; it is spending the money on additional seismic data.

"PGS Onshore is in the field acquiring proprietary 2D seismic, infilling the ARCO and Shell seismic grid, and pursuing a number of structural leads identified on the grids," Mason said, adding that data is anticipated to be in hand before the end of March.

Andex and its partners, Usibelli Energy, an affiliate of Usibelli Coal Mine of Healy, Alaska, Fairbanks-based Doyon Ltd. and Barrow-based Arctic Slope Regional Corp. are pushing a tight timeline to drill for gas in the Nenana basin.

"Our intention is to have that data processed and interpreted such that we'll be able to define drill sites so that we can be drilling our first wildcats next drilling season, in early 2006," Mason said. "With success, we could be moving into the development phase based on our initial wells, as early as late 2006, or 2007, and depending on the results we see from this drilling, we could be in the process of negotiating, and then finally building a pipeline into Fairbanks, such that we could have first gas sales in 2008.

"It's a very, very high-risk exploration project but it contains a very high quality, unique dataset that defines the opportunity," Mason said, referring to two early wells drilled in the basin, and existing seismic the company has studied.

"Andex purchased the ARCO and Shell seismic; we reprocessed it, and incorporated that seismic into the subsurface data and actually into the outcrop data," Mason said. "If this kind of data set had existed anywhere in the Lower 48 states, the critical wells to evaluate this basin would have been drilled years ago."

The data clearly says the basin needs more wells, Mason said In 2008, with a line in place to Fairbanks, and if reserves prove large enough, the next logical step is a line to Anchorage, Mason said. Once Andex has a spur line already built to Anchorage from Fairbanks, it would be easy to join Anchorage with the North Slope natural gas pipeline — but it may not be necessary.

"The knee jerk reaction is that you're going to get this huge quantity of gas coming down from the North Slope and they'll be able to flood the Fairbanks market with cheap gas," Mason said. "If that's the case then this is the only commodity I've ever seen that somebody has the opportunity to sell for five bucks in Chicago, but they'il be happy to drop it off in Fairbanks for two."

With a pipeline to amortize, North Slope gas won't be cheap, and once it's in the line the sellers would just as rather sell it in Chicago, Mason said, adding that North Slope gas is liquids-rich, and it would need to be processed to burner tip quality for businesses and homes in Fairbanks. Fairbanks doesn't need gas liquids, so the liquids would have to be handled and re-shipped — very inefficient.

Conversely, Alberta needs gas liquids to feed its underused liquids processing capacity, so it is eager to get the North Slope gas. The North Slope reserves are, he said, some of the few that are large enough to supply the infrastructure that

already exists in Canada.

Nenana vs. Cook Inlet

Nenana basin and Cook Inlet are like fraternal twins. Both basins were formed in a similar fashion — there are similarities, but there are some vital differences. Andex has reason to be optimistic, based on known geological similarities to Cook Inlet, Mason said. Because of a few key differences, however, Nenana may in fact be better than Cook Inlet.

The Nenana basin is part of a series of Interior basins that have been developed as a result of extension, associated with movement along right-lateral faults that are present in the state, Mason said.

"This is one of the richest most widespread source rock packages I've ever worked with in 30-some odd years of exploration, predominately down in the Rockies," he said. People who are familiar with Cook Inlet know that the best reservoirs are at the top of the section, and that reservoir quality and thickness deteriorates as you go down, Mason said.

"That is not the case with the Usibelli group," he said. "You have very thick widespread reservoirs all through the section and the reason is that you're much closer to a regional tertiary source for a higher percentage of proximal reservoir quality rock."

In the Cook Inlet oil and gas fields, cumulative production has been just over 5 trillion cubic feet of gas and about 1.2 billion barrels of oil, leaving remaining reserves on the order of between 3 tcf and 3.5 tcf of gas, Mason said. All Cook Inlet oil and gas comes from tertiary, non-marine sediments that range in age from Eocene to Pliocene, he said.

"In the Kenai group you've got thermogenic hydrocarbons — oil and thermogenic gas — from the lower part of the section and predominately biogenic gas from the upper part of the section — in particular, the Sterling formation, which contains most of the economic reservoirs in the basin," Mason said. "Cook Inlet is an asymmetric basin — very steep east side, tertiary depocenter just to the north of the village of Kenai. The tertiary is in excess of 20,000 feet thick and it's got a very gentle west side."

At Nenana, he said, the depocenter is also hugging the steep east side, while the west side has a gentle slope.

Regional structural noses and closures — both simple anticlinal four-ways, faults and anticlines form all of the major oil and gas accumulation in the Cook Inlet, Mason said. Like Cook Inlet, the Nenana basin is infilled with a very thick, non-marine coal-bearing tertiary section, Mason said. The Usibelli group, like the Kenai group ranges in age from Eocene to Pliocene.

"When you take a look at the outcrops, the Usibelli group not only contains potential reservoirs that are very thick and very widely distributed, it also has interformational seals, (like Cook Inlet.)" Mason said.

In addition to the interformational seals, there are regional seals at Nenana — a promising difference between Nenana and Cook Inlet, Mason said. It seems Nenana has all of the prospectivity of Cook Inlet, buttressed nicely by chances for bigger, deeper, higher quality reservoirs.

"You've got both an intercrop regional seal, and a regional seal that sits on top of all of the coal-bearing sediment in the Nenana basin," Mason said. "That's something you don't have in the Cook Inlet."

South Central Alaska Spur Pipeline - Scope of Work

2/18/05

Phase 1 & Phase 2

Timer Period June 1, 2005 – September 30, 2006 15 months total
Budget **$3.0 Million Dollars**

Introduction

The objective of the South Central Alaska Spur Line Project is to select the best route for the installation of a natural gas pipeline between the Interior to South Central Alaska. Cook Inlet Tribal Council (CITC) and NORSTAR Pipeline Company, a sister company of Enstar Natural Gas, have entered into a Memorandum of Understanding ("MOU") to study the feasibility of constructing a natural gas pipeline that would connect North Slope gas and other gas discoveries to the existing Cook Inlet gas pipeline infrastructure.

Phase 1 will consider the two primary possible routes, Fairbanks to Wasilla and Delta Junction to Palmer. The work activity will include preliminary permitting, engineering, project estimating, right of way, public outreach, and social/economic impact of the project on adjacent communities. This study is in conjunction with the South-Central Alaska Natural Gas Study prepared in June 2004 for the US Department of Energy. That report documented the declining proven reserves in Cook Inlet and the need of either additional gas discoveries or the construction of a spur line to move North Slope natural gas to South Central. The outcome of Phase 1 will determine the best route to transport Natural Gas from the Interior to South Central

Phase 2 will expand upon Phase 1 activities focusing upon the specific engineering, economic, environmental, and right-of-way issues of the selected route. Phase 2 activities will commence the process of securing the necessary Federal, State, and local government permits necessary for the construction of the natural gas line. Phase 2 activities will clarify remaining gaps, particularly permitting, and environmental issues, that will need to be resolved to ensure construction approval by respective government agencies.

When Constructed the South Central Alaska spur line will bring to market gas reserves from the North Slope, and in addition potential finds in the Nenanna or the Copper River Basins. Depending upon the route, additional exploration and production activities will become economically attractive in the railbelt areas.

Time & Cost Considerations

This study is necessary due to the rapidly declining proven gas reserves of the Cook Inlet region. Proven reserves in Cook Inlet are forecasted to meet demand until 2012, the Agrium fertilizer plant is expected to shut down in 2005 due to lack of adequate affordable gas supplies and LNG export is expected to end when the export license expires in 2009.[1] This study will enable for the timely construction of a well-researched

[1] South Central Alaska Natural Gas Study, June 2004, pg 3

route prior to the projected Cook Inlet gas shortage. The costs of not performing this study include higher energy prices for South Central Alaska, loss of existing value added industry, the inability to attract new industry to South Central, and higher engineering and construction costs due to an expedited schedule.

Regulatory Framework

Natural gas transmission pipelines constructed in the United States are regulated by the US Department of Transportation, Research and Special Programs Administrations' Office of Pipeline Safety ("OPS"). OPS ensures that pipelines are built and operated in a safe manner through the enforcement of comprehensive regulations: regulations CFR Parts 190, 191, 192, and 1999. The South Central Alaska Spur Line will be designed, engineered, constructed, maintained and operated in strict compliance with the OPS regulations and utilizing Best Available Technology.

Additional permitting will be required by various State and Federal agencies depending upon the rout selected. These include Corps of Engineers, US Fish & Wildlife, Department of Natural Resources, Department Fish & Game, Department of Transportation, & State Pipeline Coordinator's Office and other agencies.

Project Timetable

The project period for Phase 1 & Phase 2 activities will be a 15 month time frame beginning in June 2005 and ending in September 2006.

Project Objectives

Pipeline Route

The study will consider two routes for the South Central Spurline. The first route, the Parks Highway Spurline, extends directly from Fairbanks along the Parks Highway terminating in Wasilla, a distance of approximately 325 miles. The second route, The Glenn Highway Spurline , begins in Delta Junction and proceeds to Glennallen ending near Palmer, a distance of approximately 290 miles. Each route has various alternatives that need to be identified during the analysis, including using existing utility right-of – ways. Specific factors in selecting one route over the other will include careful consideration of the environmental permitting issues, ease of construction, long-term right-of-way rental rates, construction costs, access to future gas development, and cumulating into which route will have the greater benefit to Alaskan communities.

The Parks Highway Spurline has three existing transportation corridors; the Alaska Railroad, the Electric Power Intertie, and the Parks Highway. Particular attention will be focused upon construction within Denali State Park & Mount McKinley National Park , as well as the challenges presented in crossing the Alaska Range and numerous river and canyon crossings.

South Central Alaska Spur Pipeline - Scope of Work

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The Parks Highway Spurline traverses a 325-mile wilderness expanse with three previously disturbed transportation corridors, namely, the Alaska Railroad, the Electric Power Intertie, and the Parks Highway. Each corridor will be carefully considered in developing the most cost effective and environmentally desirable route. It is anticipated that to best satisfy environmental, engineering and project costing constraints, all three corridors will likely be utilized for portions of the pipeline. When selecting rights-of-way for the Parks Highway route, special attention will be devoted to construction within Mount McKinley National Park and the Denali State Park, hard rock installation in the Alaska Range, numerous river and canyon crossings, and protection of wetland areas. In every instance, the availability and cost of temporary construction permits, long-term right-of-way rental or acquisition costs and environmental impact will be carefully factored into route selection. Finally, thought will be given to locating the Parks Highway route within reasonable proximity to existing and future gas exploration and production fields with the aim to make additional gas reserves available for use by future generations of Alaskans.

The Glenn Highway Spurline will, for the most part, utilize the transportation corridors that have been created by the Richardson and Glenn Highways. However, geophysical, environmental and other considerations may make departure from these Highways desirable. For example, a cross-country course in the vicinity of Lake Louise would shorten the length of the Delta Junction Spur by nearly 15 miles. Bypassed communities such as Glennallen could be served with smaller diameter, less expensive distribution pipe. Departure from the Glenn Highway may also be called for at the head of the Matanuska River Valley to avoid expensive construction through hard rock formations.

The study will provide a construction cost estimate for each route, and conclude with a recommendation for the preferred route.

Demand Projections/Pipeline Sizing.

Current and future demand for natural gas in South Central Alaska is the primary consideration for determining the size of the South Central Spur Pipeline. The CITC/NORSTAR Study will start with current gas consumption data in South Central Alaska and consider reasonable growth assumptions. NORSTAR will meet with existing industry leaders, including electric power generators, the Marathon/ConocoPhillips liquefied natural gas facility and the Agrium ammonia/urea plant to better estimate continuing demand by these important natural gas consumers. An economist will be commissioned to report on the likelihood of additional industry being attracted to South Central Alaska by the promise of an abundant and stable priced natural gas supply.

Pipeline sizing will also require a decision whether the use of gas storage facilities would be cost effective. Because of Alaska's severe climate, gas usage varies significantly between winter and summer. One scenario is to build the South Central Spur Pipeline with a larger diameter and vary its flow as demand increases or decreases. Larger pipe would cost more. The price of gas might also increase if a peaking component is added.

The other alternative is to design and build a smaller diameter pipeline that would have a constant gas flow throughout the year. Winter peaking requirements would be met by converting depleted Cook Inlet gas fields into gas storage facilities. The lower construction cost of smaller diameter pipe would be offset by the cost to create the needed storage facilities and charge them with natural gas. NORSTAR will employ an expert in the field of gas storage to assess the viability and cost of using gas storage in conjunction with the South Central Spur Pipeline.

With numbers for projected demand and a determination whether gas storage facilities make economic sense, the NORSTAR Study will discuss options for the diameter of the South Central Spur Pipeline.

Permitting

A key consideration for the construction of the South Central Alaska Spur Pipeline is whether an environmental assessment ("EA") or a more involved environmental impact statement ("EIS") will be required for the project. An EA is relatively inexpensive and can be completed in as few as 12 months. An EA is appropriate for projects that have minimal environmental impact and do not traverse extensive areas of federal property. An EIS, on the other hand, requires an in-depth study of environmental and social impact of a project. Preparation of an EIS can take as long as 24 months and cost significantly more than an EA. The CITC/NORSTAR Study will carefully examine this issue. If possible, the study will develop a route for both the Parks Highway and Glenn Highway that take advantage of the less stringent requirements associated with an EA.

The CITC/NORSTAR Study will also become deeply involved in preliminary permitting for the project. Each permitting agency, including the US Army Corps of Engineers, the Alaska Department of Natural Resources, Alaska Department of Transportation and Public Facilities, Alaska Department of Fish and Game, Alaska Department of Environmental Conservation, and the US Environmental Protection Agency will be identified and consulted. With those agencies input and advice, permitting problems will be minimized, and the most favorable route for each Pipeline Spur can be chosen. Particular areas of know concern to the various agenicies include wetland delineations, impact to wild life particularly endangered species, fish habitat, and archeological sites.

Pipeline Compression.

The CITC/NORSTAR Study will recommend an optimum level of pipeline compression. Gas quantity throughput can be dramatically increased with compressors, enabling the use of smaller diameter pipe. Offsetting that savings is the cost of compressor facilities and the expense associated with required environmental permits.

South Central Alaska Spur Pipeline - Scope of Work

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Conceptual Pipeline Design and Engineering.

Completion of the CITC/NORSTAR Study will require preliminary design and engineering of both the Fairbanks and Delta Junction Spurs. Pipeline sizing must be correlated with such factors as compression, delivery pressure, flow rates and potential storage utilization. In addition, NORSTAR's engineers will identify geophysical obstacles such as rivers, canyons, earthquake faults, and wet lands along each Spur route, and develop solutions to these specific challenges. All such work will be completed in strict compliance with applicable national codes and standards, including the regulations of the US Department of Transportation, Office of Pipeline Safety, found in 49 CFR Parts 191 and 192.

Construction Cost Estimates

As discussed above, the CITC/NORSTAR Study will recommend a specific pipeline size, establish a route for both the Parks Highway Spurline and Glenn Highway Spurline and perform preliminary engineering and design work for both potential pipeline routes. With this information, NORSTAR, will be able to accurately estimate the cost to construct both Spur Pipelines. The construction cost numbers will be pivotal in selecting a preferred route for the South Central Spur Pipeline. Construction cost will also be an important factor in the final price for delivered North Slope gas to Alaska's Railbelt.

Operating Costs

The cost to operate and maintain the South Central Spur Pipeline will be an important component of the delivered price of natural gas in South Central Alaska. ENSTAR owns, operates and maintains over 400 miles of natural gas transmission and 2,500 miles of distribution pipelines in South Central Alaska. NORSTAR has a long-term contract to operate and maintain the Kenai - Kachemak Pipeline that was constructed in 2003 & 2004 on the Kenai Peninsula. That combined experience will facilitate an accurate prediction of operation and maintenance ("O&M") costs for the South Central Alaska Spur Pipeline. In developing projected O&M costs not only will the NORSTAR Study calculate traditional O&M costs (e.g., cathodic protection, U.S. Department of Transportation regulation compliance, aerial and leak surveys, and the like), but will also include a detailed study of Borough property taxes, gas compression expenses and right-of-way rental charges.

Gas Pricing for South Central Alaska

We anticipate that Regulatory Commission of Alaska ("RCA") will regulate the South Central Spur Pipeline as common carrier gas transportation pipeline under AS 42.06 *et seq.* The RCA must issue a certificate of public convenience and necessity for the Pipeline, and determine that the owner is "willing, fit and able" to provide service. In addition, the RCA will approve the terms and conditions of service, as well as rates and rate structure. The RCA uses traditional ratemaking methodology to develop rates that

allow for recovery of operating and maintenance costs, financing and insurance expense, and a rate of return to compensate the owner for its investment. Again, because of their combined experience with Alaskan regulatory agencies, ENSTAR and NORSTAR are uniquely qualified to forecast the expected tariff rate and terms of service for the pipeline in question.

The estimated tariff rate for gas transportation through the South Central Spur Pipeline will be added to the expected price of North Slope gas, which will include an estimate of the transportation cost from the North Slope to the South Central Spur Pipeline. Additional pipeline tariff charges for gas transportation through ENSTAR's transmission and distribution system will likewise be factored in. The combined total of these expenses will determine the delivered cost of North Slope gas in South Central Alaska. This number will allow comparison to current prices for natural gas in this region of the state and make possible a meaningful cost/benefit analysis of the South Central Spur Pipeline project.

Pipeline Ownership

The CITC/NORSTAR Study will contain a discussion that addresses potential ownership of the South Central Spur Pipeline. It is anticipated that a single owner of the facility is unlikely because of market uncertainties and the very significant capital investment that will be required. A more likely ownership scenario is for a consortium of interested parties to finance, construct and own the Pipeline. Possible stakeholders include large industrial energy consumers on the Kenai Peninsula and elsewhere in South Central Alaska, the power generation industry, ENSTAR Natural Gas Company, and possibly owners of gas discoveries along the selected route. With the potential for a long-term, low cast gas supply to Cook Inlet region of Alaska, additional stakeholders may come forward.

Public Education

The CITC/NORSTAR Study will commence identifying key stakeholders along the route to identify public issues and concerns associated with the construction and long term operations of a natural gas pipeline. Identifying such issues early in the process is crucial to the engineering and permitting process. Once a route is designated additional public education will be necessary to successfully permit the pipeline. CITC and NORSTAR have the experience necessary to hold public meetings in the various communities along the route and will work with those communities to identify concerns unique to each area.

Socio/Economic Impact Analysis

The CITC/NORSTAR Study will conduct an analysis of the economic benefits that the project and operations of a line will have upon both South Central Alaska and the communities along the route. Particular attention will be paid to the benefits of the project to Alaska Native populations along the route. Primarily Alaska Natives along the two routes belong to the Alaska Native Corporations of CIRI, AHTNA, or DOYON. CITC has particular expertise in working with Alaska Natives through job training programs and other activities that will benefit from this project.

Conceptual Study Team

CITC will manage the overall funding by the Department of Energy for the South Central Alaska Spur Pipeline. CITC will focus upon the Public Education and Socio/Economic issues of the project. NORSTAR will lead the engineering, right-of way, permitting activities of the study. NORSTAR spearheaded the permitting and engineering , and served as the construction manager of the Kenai – Kachemak Pipeline. Currently NORSTAR is leading the right of way activity on the ANGDA spur line project for the State of Alaska.

Augmenting CITC & NORSTAR's experts will be a number of specialists who will address such questions as market demand, gas storage analysis, tariff structure determination, environmental permitting, and pipeline design and engineering.

Grant Administration

The grant funding the CITC/NORSTAR South Central Alaska Spur Pipeline study will be administered by CITC. Cook Inlet Tribal Council provides social, educational and employment services to Alaska Natives and Native Americans living in the Cook Inlet region. Established in 1983 a Native nonprofit tribal organization, CITC administers over 30 programs designed to provide culturally appropriate services for Native peoples to achieve self-determination through individual, family and community development.

Steering Committee

Oversight of the CITC/NORSTAR study will occur through the implantation of Steering Committee composed of industry, Alaska Native and public sector leaders. The Steering Committee will meet regularly to ensure the CITC/NORSTAR study is meeting its stated objectives. A list of proposed members will be developed prior to commencement of the effort.

Natural Gas Spur Line

Load Analysis

Parks Highway Route

September 30, 2004
ENSTAR Natural Gas Company

LOAD ANALYSIS

Natural Gas Spur Line
Load Analysis – Parks Highway Route

Executive Summary

In the Department of Energy South-central Alaska demand study, the authors introduced a natural gas spur line from Fairbanks to Anchorage via the Parks Highway as an alternative solution to the supply problem facing South-central Alaska's major users. Broadly, a route selection for a natural gas line to South-central Alaska from the Alaska Natural Gas Pipeline (Alaska Highway Route) could originate from either of two main points:

- Fairbanks or
- Delta Junction.

The analysis in this paper looks at a spur line routed from Fairbanks to the south-central region via the Parks Highway. Initial review of the total convertible load (in Mcfs) along the Parks Highway indicates a maximum possible consumption of 27.2 Bcf. The breakdown of that load by customer class and location is listed in the following table[1]:

Total Market Available

Count	Population	Residential	Small Commercial	Large Commercial	Industrial/ Power	Total
Fairbanks NSB	45,418	18,605	2,100	300	5	21,010
Yukon Koy	402	171	15	2	-	188
Denali	1,364	610	24	11	2	647
Mat-Su	3,816	1,422	16	-	-	1,438
Total	51,000	20,808	2,155	313	7	23,283
Mcf/Unit		235	571	6250		

Load (Mcf)	Population	Residential	Small Commercial	Large Commercial	Industrial/ Power	Total
Fairbanks NSB	-	4,180,885	1,199,100	1,875,000	12,727,008	19,981,993
Yukon Koy	-	40,185	8,565	12,500	-	61,250
Denali	-	167,085	15,417	68,750	6,596,157	6,847,409
Mat-Su	-	366,894	14,280	2,076	-	383,250
Total	-	4,755,049	1,237,362	1,958,326	19,323,165	27,273,902

Notes:

- These tables indicate the total potential conversion customers by location and class (customer count and approximate Mcf load). However, ENSTAR's Business Development Department anticipates that the rate of customer conversions to natural gas in communities along this route to be similar to those of the Matanuska-Susitna Valley and Soldotna/Kenai areas.
- Consumer sensitivity to natural gas pricing will impact the conversion rate to natural gas. Price sensitivity and its effect on upon conversion is not a part of this analysis. The cost of gas is unknown at this point since the Alaska Natural Gas Pipeline is more than 10 year away.

[1] Data above was extracted from a variety of sources including: US Census Bureau, prior ENSTAR Marketing surveys of FNSB commercial marketplace, power consumption data collected from Military Energy RFPs, and the Alaska Natural Gas In-State Demand Study (2001).

Role of Power

The largest potential target market for natural gas consumption is electric and "cogeneration" power plants. The following table represents what ENSTAR Business Development believes is the total available load at 100% conversion.

Load (Mcf)	Count	Energy Source	Consumption	Unit Comsumption	Btus/Unit	Unit Measure	Lbs/Ton	Btus	Mcf	
Eielson AFB	1	Coal	183,000	Tons	6,900	lbs	2,240	2,828,448,000,000	2,828,448	
North Pole	1	Diesel/Oil	28,000,000	Gallons	141,000	Gallon		3,948,000,000,000	3,948,000	
Ft Wainwright	1	Coal	195,000	Tons	6,900	lbs	2,240	3,013,920,000,000	3,013,920	
Fairbanks	1	Coal	130,000	Tons	6,900	lbs	2,240	2,009,280,000,000	2,009,280	
College/UAF	1	Coal/Oil	60,000	Tons	6,900	lbs	2,240	927,360,000,000	927,360	
Clear AFS	1	Coal	61,770	Tons	6,900	lbs	2,240	954,717,120,000	954,717	
Healy, GVEA	1	Coal	170,000	Tons	6,900	lbs	2,240	2,627,520,000,000	2,627,520	
Healy. Clean Coal	1	Coal	195,000	Tons	6,900	lbs	2,240	3,013,920,000,000	3,013,920	[2]
Total								19,323,165,120,000	19,323,165	

We believe that the greatest load potential along the Parks Highway route will come from the partial or full conversion of existing power plants (listed above at estimated total Mcf load). The Alaska Natural Gas In-State Demand Study of 2001 for the Department of Natural Resources (Division of Oil and Gas) did not include the Clear AFS and the Healy Clean Coal power plants.

We further postulate that if full adoption of natural gas takes place at the military and civilian (Golden Valley Electric Association (GVEA) and University of Alaska Fairbanks (UAF)) power plants it would be difficult for Usibelli to maintain a viable domestic market for their coal. However, the Alaska Natural Gas In-State Demand Study[3] indicates that power plant managers would look only at partial use of natural gas for plant operations (possibly to improve btu efficiency of plants). Emissions at these power plants are high in particulates even though CO2 and NO emissions meet regulatory approval.

[2] Combined Data from a) David E. Dismukes, Ph.D., Report Prepared by the Collaboration of: Econ One Research, Inc. Los Angeles, California and Acadian Consulting Group Baton Rouge, Louisiana January 23, 2002 Alaska Natural Gas In-State Demand Study (ASP 20011000-2650), pgs 112 & b) Military Solicitation SP060002-R-0007, Defense Energy Support Center, November 30, 2001, pgs. 3, 7, 11

[3] David E. Dismukes, Ph.D., January 23, 2002 Alaska Natural Gas In-State Demand Study (ASP 20011000-2650), pg 110

Natural Gas Spur Line
Load Analysis – Parks Highway Route

Table of Contents

Natural Gas Pipeline
Load Analysis – Parks Highway Route

Introduction: In the Department of Energy South-central Alaska demand study, the authors introduce a spur line from Fairbanks to Anchorage via the Parks Highway as a alternative solution to the supply issue (long-term shortage) facing the south-central region's major wholesale users of natural gas.

South Central Demand Requirements: "Currently, the total industrial demand is 130 Bcf/yr and commercial and residential demand is about 70 Bcf/yr."[4] Utility base demand (power and distribution) would be the primary demand driving the economics of a natural gas spur line.

Spur Line Capacity & Cost: "A spur gas pipeline from a North Slope pipeline with a takeoff point at Fairbanks to the Anchorage area is estimated to cost $500 million for 330 million cubic feet per day capacity (120 billion cubic feet/year, Bcf/yr) and may allow North Slope gas to be delivered to South-central Alaska at a price advantage of $1.00/Mcf below Lower 48 prices."[5] This cost is viewed as competitive when compared to exploration and development costs associated with new field development in the Cook Inlet.

Interior Demand: The Fairbanks North Star Borough (FNSB) represents one of the greatest potential natural gas markets for a Local Distribution Company (LDC) in Alaska. The FNSB represents a likely location for a major regulation station associated with the Alaska Natural Gas Pipeline because of its proximity to the pipeline's route. Natural gas deliveries would be to an LDC (residential, commercial and power delivery) and possible new industrial customers, principally petrochemicals.

- Residential/Commercial Demand: There exists a multitude of residential, small and large commercial customers all looking for a clean, reliable and competitively priced energy supply for space and hot water heating.
- Power/Industrial Demand: The Interior represents the highest potential for electric and cogeneration power plant conversion to natural gas in Alaska.

[4] Charles P. Thomas, Tom C. Doughty, David D. Faulder, David M. Hite, Prepared for the U.S. Department of Energy, National Energy Technology Laboratory, Arctic Energy Office, "SOUTH-CENTRAL ALASKA NATURAL GAS STUDY", Page 3
[5] Charles P. Thomas, Tom C. Doughty, David D. Faulder, David M. Hite, Prepared for the U.S. Department of Energy, National Energy Technology Laboratory, Arctic Energy Office, "SOUTH-CENTRAL ALASKA NATURAL GAS STUDY", Page 3
[6] http://146.63.75.50/research/cgin/cenmaps/statemap.htm

Natural Gas Pipeline
Load Analysis – Parks Highway Route

The Parks Highway Route: The Parks Highway7 is the main transportation corridor between interior and South-central Alaska and holds the greatest potential for growth compared to other routes under consideration.

Estimated Consumption by Customer Class for the FNSB (Mcf/year): The Interior experiences much colder winters than South-central Alaska. The consumption allocation by customer class is higher than ENSTAR's average natural gas consumption for similar rate class groups.

The following table represents the average annual consumption by consumer class for the Fairbanks North Star Borough (FNSB). These consumption loads were used for the FNSB, Yukon Koyukuk Borough, & Denali Borough:

	Residential	Small Commercial	Large Commercial
Mcf/Unit	235	571	6250 [8]

"Average temperatures in the greater FNSB range from –22 degrees Fahrenheit during winter to 72 degrees Fahrenheit during summer. Seasonal extremes can far exceed these temperate ranges. According to the Stone and Webster *Railbelt Intertie Reconnaissance Study* (1989, Intertie Study), heating degree-days in the Fairbanks area are approximately 40 percent greater than Anchorage. The average occupied household would consume approximately 235 Mcf of natural gas per year."[9] For areas south of the Alaska range, ENSTAR's average annual consumption levels were applied by customer class.

Consumption Loads Used for Matanuska-Susitna Borough:

	Residential	Small Commercial	Large Commercial
Mcf/Unit	187	420	2076 [10]

Adoption Rates: For the purpose of this study, natural gas conversion rates were structured based on principle used in the Alaska Natural Gas In-State Demand Study (2002). A key factor in energy mode switch is recovery of upfront investment cost of heating system conversion to the alternate fuel.

- "The rule-of-thumb for gas utilities' market planning is that if a customer can recoup their cost of conversion within three years then the penetration rate will be over 95

[7] http://alaskaoutdoorjournal.com/maps/parkshiwaymap.html
[8] David Webb ENSTAR Marketing survey estimate from 2000 Fairbanks Market Survey & 83% based on Stone and Webster Engineering Corporation. *Railbelt Intertie Reconnaissance Study, 1989*
[9] David E. Dismukes, Ph.D., January 23, 2002 Alaska Natural Gas In-State Demand Study (ASP 2001000-2650), pg 80-81
[10] ENSTAR Natural Gas Yearly Consumption Data

percent, at increments of 30 percent to 35 percent each year over a three to five year period."[11] (Citing Dan Dieckgraeff, ENSTAR's Manager of Finance & Rates)

- Adoption is also predicated on ease of delivery from a LDC perspective. "Over 50 percent of all the unserved households in the state that are within 10 miles of the proposed Alaska Highway Route (AHR) project are in the Interior region of the state."[12] ENSTAR Business Development believes this is true for most of the Interior areas identified in this analysis for the Parks Highway spur pipeline.

Total Market Available

Count	Population	Residential	Small Commercial	Large Commercial	Industrial/ Power	Total
Fairbanks NSB	45,418	18,605	2,100	300	5	21,010
Yukon Koy	402	171	15	2	-	188
Denali	1,364	610	24	11	2	647
Mat-Su	3,816	1,422	16	-	-	1,438
Total	51,000	20,808	2,155	313	7	23,283
Mcf/Unit		235	571	6250		

Load (Mcf)	Population	Residential	Small Commercial	Large Commercial	Industrial/ Power	Total
Fairbanks NSB	-	4,180,885	1,199,100	1,875,000	12,727,008	19,981,993
Yukon Koy	-	40,185	8,565	12,500	-	61,250
Denali	-	167,085	15,417	68,750	6,596,157	6,847,409
Mat-Su	-	366,894	14,280	2,076	-	383,250
Total	-	4,755,049	1,237,382	1,958,326	19,323,165	27,273,902

Fuel Distribution Opportunity (Propane): Propane, which is found in high abundance in the North Slope gas to be shipped via the Alaska Natural Gas Pipeline, provides an opportunity to supply heating fuel to many of the remaining consumers not within economic range of a distribution system. This additional business opportunity is not within the scope of this study, but may be worth perusing at some later date.

Pipeline Data:	
Pressure (psi)	2,500
Temperature (F)	25
btu/scf	1,070
CO2	1.50%
N2	0.67%
Methane	**89.19%**
Ethane	6.20%
Propane	**2.11%**
iButane	0.12%
nButane	0.16%
iPentane	0.02%
nPentane	0.02%

[11] David E. Dismukes, Ph.D., January 23, 2002 Alaska Natural Gas In-State Demand Study (ASP 2001-1000-2650), pg 86
[12] David E. Dismukes, Ph.D., January 23, 2002 Alaska Natural Gas In-State Demand Study (ASP 2001-1000-2650), pg 80

Scenario Analysis:

The following page provides three levels of consumer conversion to natural gas based on the possibility of unpredictable natural gas prices relative to close competitors. These may be viewed as low medium and high case adoption rates during the first 3 to 5 years of marketing natural gas main extensions in the FNSB and related areas along the Parks Highway.

25% Market Penetration - 95 to 100% likelihood within 3 to 5 years
50% Market Penetration - 75 to 95% likelihood within 3 to 5 years
75% Market Penetration - 50 to 75% likelihood within 3 to 5 years

Residential: Residential markets mainly consume home heating oil as the primary source of space heat and hot water heating. This conversion market is considered price sensitive to the commodity price of fuels.

Commercial: Commercial markets consume home heating oil as the primary source of space heat and hot water heating. This conversion market is considered the most price sensitive to the commodity price of fuels.

Power/Industrial (Base Load for LDCs): As noted earlier, the power plant managers may consider only partial conversion. In the analysis below, the number of power plants utilizing natural gas does not change, however the level of natural gas utilization changes (combined utilization of fuels by power plants) with each scenario.

The power plant load should be considered critical to the ability of an distribution or transmission company to penetrate communities along the Parks Highway route. Areas located away from central the population center of Fairbanks such as Eielson AFB, North Pole, Clear AFS, and Healy, require base load to make a local distribution system viable. By themselves, these locations are a not considered viable for competitive conversion to natural gas without the power plants as a base load.

Natural Gas Pipeline
Load Analysis – Parks Highway Route

The following table represents three levels of possible natural gas adoption:

Adoption Scenarios

Customer Count

Low	25.00%	Residential	Small Commercial	Large Commercial	Industrial/ Power	Total
Fairbanks NSB		4,651	525	75	5	5,256
Yukon Koy		43	4	1	-	47
Denali		153	6	3	2	163
Mat-Su		356	4	-	-	360
		5,202	539	78	7	5,826

Medium	50.00%	Residential	Small Commercial	Large Commercial	Industrial/ Power	Total
Fairbanks NSB		9,303	1,050	150	5	10,508
Yukon Koy		86	8	1	-	94
Denali		305	12	6	2	325
Mat-Su		711	8	-	-	719
		10,404	1,078	157	7	11,645

High	75.00%	Residential	Small Commercial	Large Commercial	Industrial/ Power	Total
Fairbanks NSB		13,954	1,575	225	5	15,759
Yukon Koy		128	11	2	-	141
Denali		458	18	8	2	486
Mat-Su		1,067	12	-	-	1,079
		15,606	1,616	235	7	17,464

Mcf Load Estimate

Low	25.00%	Residential	Small Commercial	Large Commercial	Industrial/ Power	Total
Fairbanks NSB		1,093,044	299,775	468,750	3,181,752	5,043,321
Yukon Koy		10,046	2,141	3,125	-	15,313
Denali		35,838	3,426	17,188	1,864,131	1,920,582
Mat-Su		83,543	2,284	-	-	85,827
		1,222,470	307,626	489,063	5,045,883	7,065,042

Medium	50.00%	Residential	Small Commercial	Large Commercial	Industrial/ Power	Total
Fairbanks NSB		2,186,088	599,550	937,500	6,363,504	10,086,642
Yukon Koy		20,093	4,283	6,250	-	30,625
Denali		71,675	6,852	34,375	3,728,263	3,841,165
Mat-Su		167,085	4,568	-	-	171,653
		2,444,940	615,253	978,125	10,091,767	14,130,084

High	75.00%	Residential	Small Commercial	Large Commercial	Industrial/ Power	Total
Fairbanks NSB		3,279,131	899,325	1,406,250	9,545,256	15,129,962
Yukon Koy		30,139	6,424	9,375	-	45,938
Denali		107,513	10,278	51,563	5,592,394	5,761,747
Mat-Su		250,628	6,852	-	-	257,480
		3,667,410	922,879	1,467,188	15,137,650	21,195,126

Power Markets:

Table 8.7: Fairbanks North Star Borough Electric Power Survey

	Coal					Fuel Oil				
			Rate of Gas Consumption After Conversion					Rate of Gas Consumption After Conversion		
	Average Price Paid	Max Price for Conversion to Gas	Average	Seasonal Peak	Seasonal Low	Average Price Paid	Max Price for Conversion to Gas	Average	Seasonal Peak	Seasonal Low
	$/Ton	$/MmBtu	Mmcf/d	Mmcf/d	Mmcf/d	$/Gallon	$ per MmBtu	Mmcf/d	Mmcf/d	Mmcf/d
FMUS[1]	$44	$2.50	5	5	5	$0.71	$2.50	0.1	n/a	n/a
GVEA	$23.40	$1.50	7	7	7	$0.45	$2.50	12	14	10
FT Wainwright	$46.22	$3.00	7.8	11.6	3.6	n/a	n/a	n/a	n/a	n/a
Eielson AFB	n/a	$3.60	6.4	12.8	5.01	n/a	n/a	n/a	n/a	n/a
UAF	$44	$2.82	2.5	3.2	0.5	$0.89	$6.34	0.14	1	0

[1] The Fairbanks Municipal Utility System assets were acquired by GVEA and Aurora Power in 1999

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Total Electric/Cogeneration Power Plant Market:

Load (Mcf)	Count	Energy Source	Consumption	Unit Consumption	Btus/Unit	Unit Measure	Lbs/Ton	Btus	Mcf
Eielson AFB	1	Coal	183,000	Tons	6,900	lbs	2,240	2,828,448,000,000	2,828,448
North Pole	1	Diesel/Oil	28,000,000	Gallons	141,000	Gallon		3,948,000,000,000	3,948,000
Ft Wainwright	1	Coal	195,000	Tons	6,900	lbs	2,240	3,013,920,000,000	3,013,920
Fairbanks	1	Coal	130,000	Tons	6,900	lbs	2,240	2,009,280,000,000	2,009,280
College/UAF	1	Coal/Oil	60,000	Tons	6,900	lbs	2,240	927,360,000,000	927,360
Clear AFS	1	Coal	61,770	Tons	6,900	lbs	2,240	954,717,120,000	954,717
Healy, GVEA	1	Coal	170,000	Tons	6,900	lbs	2,240	2,627,520,000,000	2,627,520
Healy, Clean Coal	1	Coal	195,000	Tons	6,900	lbs	2,240	3,013,920,000,000	3,013,920
Total								19,323,165,120,000	19,323,165

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- "All generating units in the state were examined to identify facilities that could potentially shift their primary fuel to natural gas. Fuel oil and diesel facilities were the most attractive candidates. The highest concentrations of these facilities were located in the Interior section of the state. There are approximately 200 MWs of capacity in this region that could shift from fuel oil to natural gas. Annual natural gas usage would be about 15 Bcf per year if all of the eligible facilities were to switch fuels. (Chapter 8, Tables 8.1 and 8.4)"

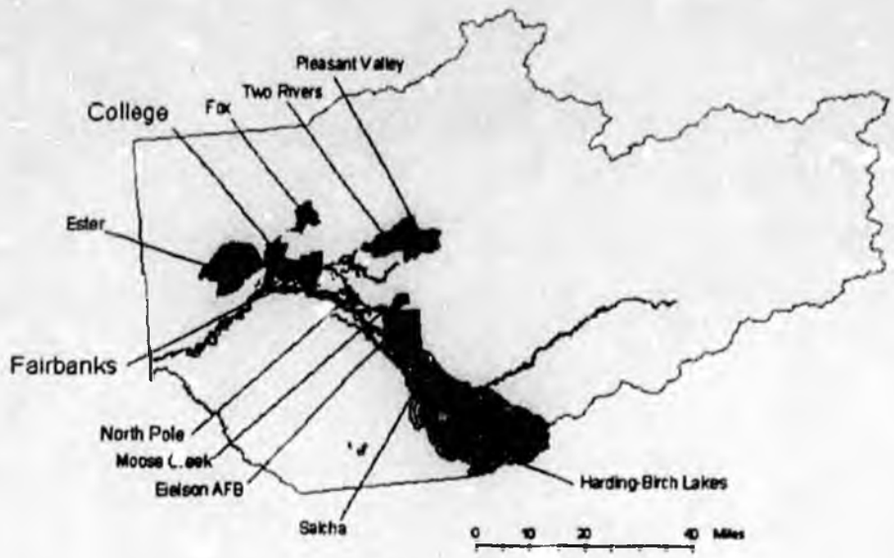
- There is a supply side efficiency opportunity for new central station gas fired generation. The economics of a 250 MW combined cycle facility stack up favorably with the marginal costs of existing generating units. This new generation could account for about 12.5 Bcf of natural gas usage per year. However, prior studies of power markets performed on behalf of the Regulatory Commission of Alaska, have noted that Alaska does not have a potential capacity need until the year 2014. If a new generating unit were to be added prior to that time, older generation could be displaced."[15]

[11] David E. Dismukes, Ph.D., January 23, 2002 Alaska Natural Gas In-State Demand Study (ASP 2001-1000-2650), pg 111

[14] Combined Data from a) David E. Dismukes, Ph.D., Report Prepared by the Collaboration of: Econ One Research, Inc. Los Angeles, California and Acadian Consulting Group Baton Rouge, Louisiana January 23, 2002 Alaska Natural Gas In-State Demand Study (ASP 2001-1000-2650), pgs 112 & b) Military Solicitation SP0600-02-R-0007, Defense Energy Support Center, November 30, 2001, pgs 3, 7, 11

[15] David E. Dismukes, Ph.D., January 23, 2002 Alaska Natural Gas In-State Demand Study (ASP 2001-1000-2650), pg xiv

Fairbanks North Star Borough



Source: Alaska Department of Labor and Workforce Development, Research and Analysis and US Census Bureau, 2000 Tigerline files

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Fairbanks Area Market: The Fairbanks North Star Borough is located in the heart of Interior Alaska. It is the second most populated region in the state. The City of Fairbanks lies at the confluence of the Richardson, George Parks, Steese, and Elliot highways, with road access to Anchorage, Canada, and the lower 48 states. The Alaska Railroad links the city to Anchorage, while air carriers provide passenger service to Seattle, Canada, and Alaska destinations. In addition to serving as the region's transportation hub, Fairbanks is the economic, medical, educational, and cultural center of Interior Alaska. Originally founded as a trading post, Fairbanks soon became a gold mining community, a distinction it retains with the Fort Knox mine. The region's history, dramatized in the novels of Jack London, now attracts large numbers of tourists.

- Two local refineries process North Slope crude oil.
- Uniformed personnel at Eielson Air Force Station and Fort Wainwright play an important role, generating enough civilian jobs to make the Department of Defense the borough's second largest employer.
- The University of Alaska Fairbanks, with a distinguished faculty and excellent programs, attracts students from across the nation. It is also the borough's largest employer.
- The native people of the region are served by Tanana Chiefs Conference, Inc., which is based in Fairbanks and provides health and social services as well as employment and training.

[16] http://www.labor.state.ak.us/research/cgin/cenmaps/cas/fbks.htm

Natural Gas Pipeline
Load Analysis – Parks Highway Route

Basic Data:

Population Statistics:

Fairbanks North Star Borough	2003	82,214

Conversion Statistics:

Count	Population	Residential	Small Commercial	Large Commercial	Industrial/ Power	Total
Eielson AFB					1	1
Moose Creek	542	280				280
North Pole	1,570	653			1	654
Ft Wainwright					1	1
Fairbanks	30,224	12,357	2,100	300	1	14,758
College	11,402	4,501			1	4,502
Ester	1,680	814				814
Total	45,418	18,605	2,100	300	5	21,010
Mcf/Unit		235	571	6250		

Load (Mcf)	Population	Residential	Small Commercial	Large Commercial	Industrial/ Power	Total
Eielson AFB		-	-	-	2,828,448	2,828,448
Moose Creek		65,800	-	-	-	65,800
North Pole		153,455	-	-	3,948,000	4,101,455
Ft Wainwright		-	-	-	3,013,920	3,013,920
Fairbanks		2,903,895	1,199,100	1,875,000	2,009,280	7,987,275
College		1,057,735	-	-	927,360	1,985,095
Ester		191,290	-	-	-	191,290
Total	-	4,180,885	1,199,100	1,875,000	12,727,008	20,173,283

Note: The population statistics for these areas do not reflect the non-incorporated areas of the Fairbanks North Star Borough.

Note: The "Fairbanks statistic includes Ft Wainwright's housing and commercial.

Assumption: Conversion statistics represent a possible full conversion for the most likely customer base located up to 10 miles from the core areas listed. Conversion would occur over a 3 to 5 year period for the core areas and a 5 to 10 year period for areas located as far as 10 miles away from the core. Each of the core areas listed have a major power plant operating which would be viewed as potential base load from which natural gas distribution systems can be built to serve residential and commercial customers.

Table 6.12: Fairbanks North Star Borough Population and Housing Characteristics, 2000-2001

		Population			Housing Units				Average Household Size[2]
					Occupied	Vacant		Total	
Item		In Occ HHs	In Group Qs	Total		Total	Seasonal		
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1	College	10,651	751	11,402	4,104	397	54	4,501	2.60
2	Ester	1,600	80	1,680	727	87	22	814	2.20
3	Fairbanks[1]	28,325	1,899	30,224	11,075	1,282	121	12,357	2.56
4	Fox	300	-	300	119	40	2	159	2.52
5	Harding Lake	216	-	216	98	391	371	489	2.20
6	Moose Creek	541	1	542	223	57	-	280	2.43
7	North Pole	1,561	9	1,570	605	48	1	653	2.58
8	Pleasant Valley	623	-	623	219	27	13	246	2.84
9	Salcha	854	-	854	317	71	36	388	2.69
10	Two Rivers	482	-	482	177	15	7	192	2.72
11	Subtotal	45,153	2,740	47,893	17,664	2,415	627	20,079	2.56
12	Eileson AFB	5,090	310	5,400	1,448	83	-	1,531	3.52
13	Subtotal	50,243	3,050	53,293	19,112	2,498	627	21,610	2.63
14	Unincorporated	29,517	30	29,547	10,665	1,016	366	11,681	2.77
15	Fairbanks NSB	79,760	3,080	82,840	29,777	3,514	993	33,291	2.68
16	Fairbanks NSB (1990)	74,139	3,581	77,720	26,693	5,130	-na-	31,823	2.70

[1] Includes Fort Wainwright.

[2] Equal to ratio of population in occupied households (a) to occupied housing units (d)

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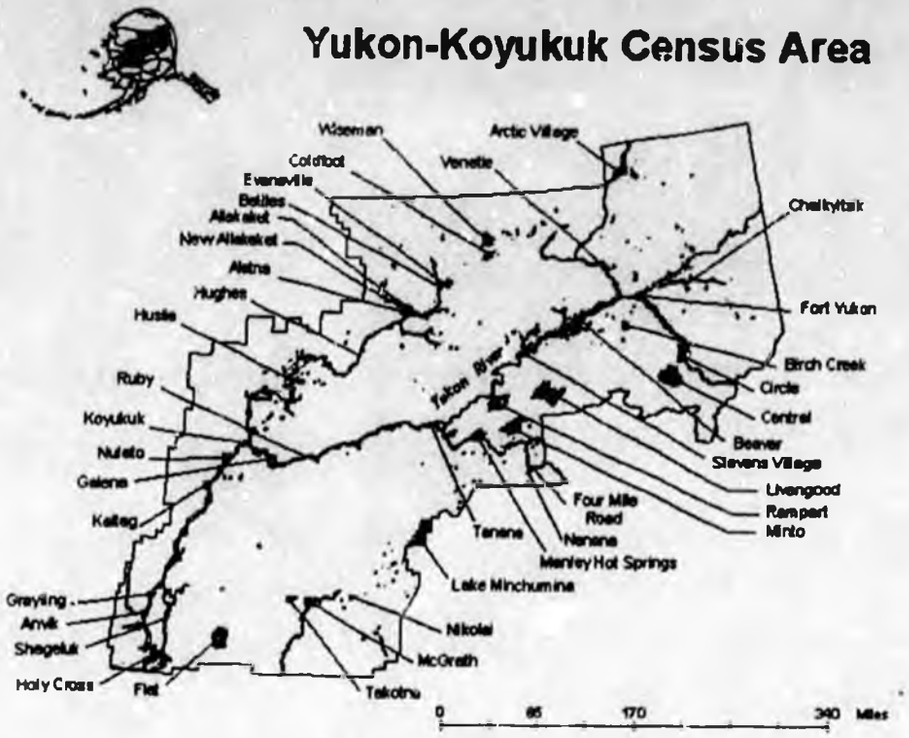
Note: Unincorporated areas include areas such as Farmer's Loop road, Chena Ridge/Pump, Blaine Road/College Subdivision, etc. where natural gas distribution lines could be successfully run (opinion of ENSTAR Business Development).

[17] David E. Dismukes, Ph.D., January 23, 2002 Alaska Natural Gas In-State Demand Study (ASP 2001000-2650), pg 82



Source: Alaska Department of Labor And Workforce Development, Research and Analysis and US Census Bureau, 2000 Tigerline files.

[18]

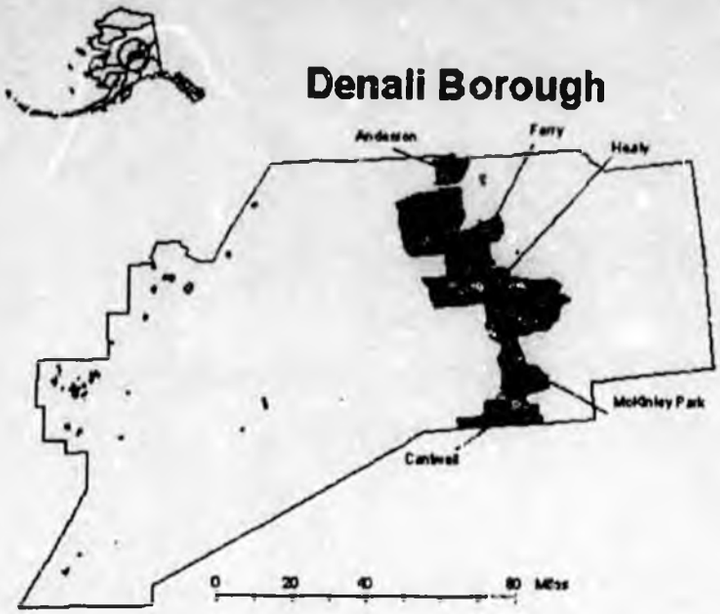
Count	Population	Residential	Small Commercial	Large Commercial	Industrial/ Power	Total
Nenana	402	171	15	2	-	188
Total	**402**	**171**	**15**	**2**	**-**	**188**
Mcf/Unit		235	571	6250		

Load (Mcf)	Population	Residential	Small Commercial	Large Commercial	Industrial/ Power	Total
Nenana		40,185	8,565	12,500	-	61,250
Total	**-**	**40,185**	**8,565**	**12,500**	**-**	**61,250**

Nenana

"**Nenana Alaska** is located at mile 305 of the Parks Highway. This historic community / Athabascan Native Village is 56 miles from Fairbanks and 75 miles north of Denali National Park. Nenana has all services needed for the highway, river, railroad or small aircraft traveler. The population now is about 460, with additional 600 or so residents in the surrounding area."[19]

[18] http://www.labor.state.ak.us/research/cgin/cenmaps/cas/yuk.htm
[19] http://www.nenanahomepage.com/Nenana/chamber.html



Source: Alaska Department of Labor And Workforce Development, Research and Analysis and US Census Bureau, 2000 Tigerline files.

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The Denali Borough covers more than 12,000 square miles of the Alaska Interior. The west side of the region is home to Denali National Park and Preserve, which contains the nation's highest peak. The park attracted 364,000 visitors in 2000, and much of the borough's economy is based on tourism. During the summer months, seasonal non-resident workers triple the population. Most seasonal non-resident workers are employed by hotels and other enterprises related to the tourism industry (service sector jobs).

Nearly all the area's residents live along a 70-mile stretch of the Parks Highway. Anderson, Cantwell, Ferry, Healy, and McKinley Park, the five identified communities in the borough, are all located on this route. Healy, with a population of 1,000, is the largest. The commercial and transportation needs of the borough are primarily served by businesses in Fairbanks.
The federal government plays a major role in the region's economy. In addition to the National Park Service, the Department of Defense employs significant numbers of civilian workers at Clear Air Force Station. The base is a radar surveillance site designed to detect and track intercontinental ballistic missile movement.

Although the Usibelli mine has experienced some cutbacks, the Healy coalfields continue to provide year round employment for over 100 workers. If problems with the 50-megawatt power generating complex at Healy can be resolved, the local demand for coal may soon increase.

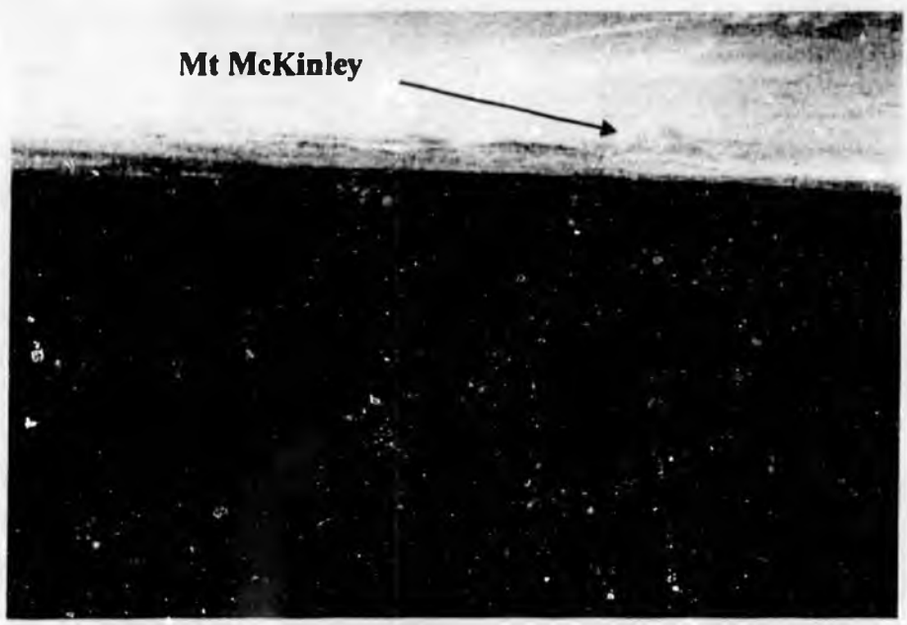
[20] http://www.labor.state.ak.us/research/cgin/cenmaps/cas/den.htm

Natural Gas Pipeline
Load Analysis – Parks Highway Route

Count	Population	Residential	Small Commercial	Large Commercial	Industrial/ Power	Total
Clear AFS					1	1
Anderson	367	101	3			104
Ferry						-
Healy, GVEA	1000	436	11	4	1	452
Healy, Clean Coal					1	1
McKinley	142	72	8	7		87
Cantwell	222	102	5			107
Total	**1,364**	**610**	**24**	**11**	**2**	**647**
Mcf/Unit		**235**	**571**	**6250**		

Load (Mcf)	Population	Residential	Small Commercial	Large Commercial	Industrial/ Power	Total
Clear AFS		-	-	-	954,717	954,717
Anderson		23,735	1,713	-	-	25,448
Ferry		-	-	-	-	-
Healy, GVEA		102,460	6,281	25,000	2,627,520	2,761,261
Healy, Clean Coal					3,013,920	3,013,920
McKinley		16,920	4,568	43,750	-	65,238
Cantwell		23,970	2,855	-	-	26,825
Total	**-**	**167,085**	**15,417**	**68,750**	**6,596,157**	**6,847,409**

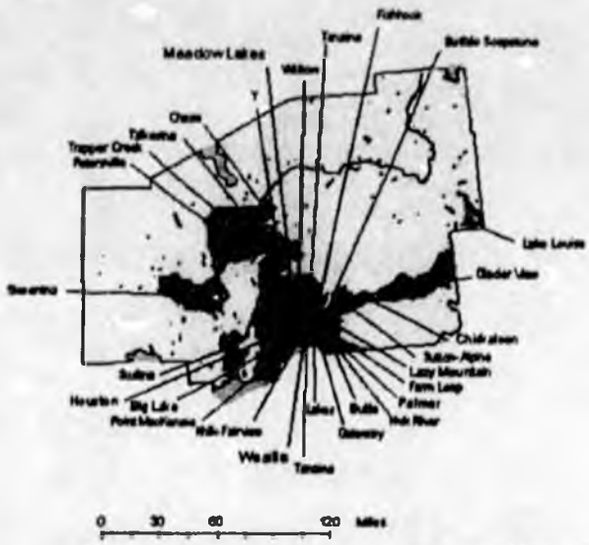
Clear AFS - http://www.clear.af.mil/13SWS_Org.htm



Cogeneration Plant (Coal) Equal to 954,000 Mcf/year.

Natural Gas Pipeline
Load Analysis – Parks Highway Route

Matanuska-Susitna Borough



Source: Alaska Department of Labor And Workforce Development, Research and Analysis and US Census Bureau, 2000 Tigerline files

[21]

Count	Population	Residential	Small Commercial	Large Commercial	Industrial/ Power	Total
Trapper Creek	423	182	3			185
Talkeetna	772	358	15	1		374
Y	956	412	3			415
Willow	1658	654	8			662
Nancy Lake						-
Houston	1202	356	5	0		361
Total	**3,816**	**1,422**	**16**	**-**	**-**	**1,438**
Mcf/Unit		**187**	**420**	**2076**		

Load (Mcf)	Population	Residential	Small Commercial	Large Commercial	Industrial/ Power	Total
Trapper Creek		34,034	1,260	-	-	35,294
Talkeetna		66,946	6,300	2,076	-	75,322
Y		77,044	1,260	-	-	78,304
Willow		122,298	3,360	-	-	125,658
Nancy Lake					-	-
Houston		66,572	2,100	-	-	68,672
Total	**-**	**366,894**	**14,280**	**2,076**	**-**	**383,250**

[21] http://www.labor.state.ak.us/research/cgin/cenmaps/cas/mat.htm

Appendixes:

Bibliography

David Webb ENSTAR Marketing survey estimate from 2000 Fairbanks Market Survey

David E. Dismukes, Ph.D., Report Prepared by the Collaboration of: Econ One Research, Inc. Los Angeles, California and Acadian Consulting Group Baton Rouge, Louisiana January 23, 2002 "Alaska Natural Gas In-State Demand Study" (ASP 2001-1000-2650)

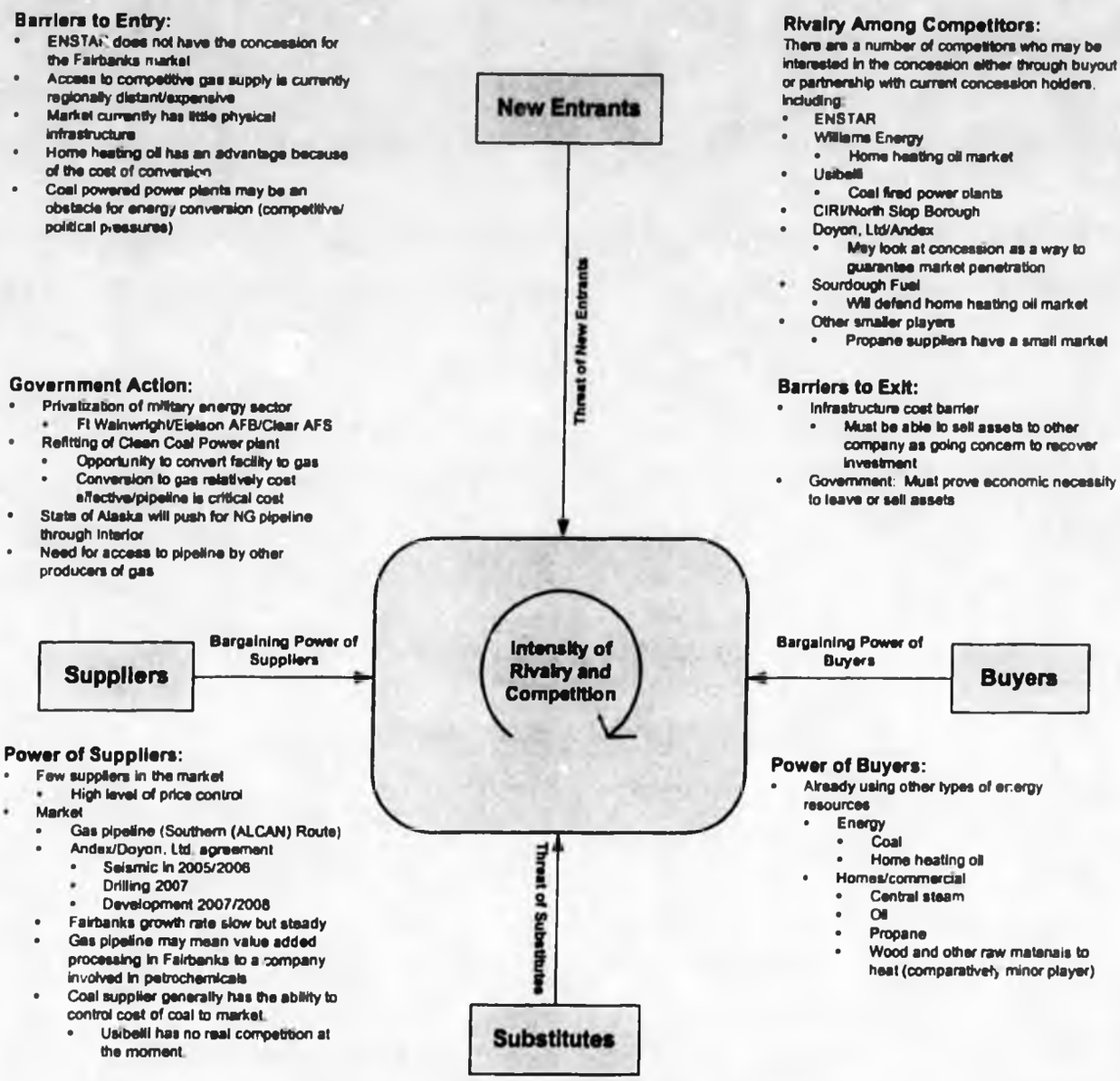
Charles P. Thomas, Tom C. Doughty, David D. Faulder, David M. Hite, Prepared for the U.S. Department of Energy, National Energy Technology Laboratory, Arctic Energy Office, Contract DE-AM26-99FT40575, "SOUTH-CENTRAL ALASKA NATURAL GAS STUDY"

Military Solicitation SP0600-02-R-0007, Defense Energy Support Center, November 30, 2001

http://www.labor.state.ak.us/research/cgin/cenmaps/cas/mat.htm

Environmental Scan of Fairbanks Market:

Fairbanks/Tanana Valley Market **Figure 1**



Barriers to Entry:
- ENSTAR does not have the concession for the Fairbanks market
- Access to competitive gas supply is currently regionally distant/expensive
- Market currently has little physical infrastructure
- Home heating oil has an advantage because of the cost of conversion
- Coal powered power plants may be an obstacle for energy conversion (competitive/ political pressures)

Rivalry Among Competitors:
There are a number of competitors who may be interested in the concession either through buyout or partnership with current concession holders, including:
- ENSTAR
- Williams Energy
  - Home heating oil market
- Usibelli
  - Coal fired power plants
- CIRI/North Slop Borough
- Doyon, Ltd/Andex
  - May look at concession as a way to guarantee market penetration
- Sourdough Fuel
  - Will defend home heating oil market
- Other smaller players
  - Propane suppliers have a small market

Government Action:
- Privatization of military energy sector
  - Ft Wainwright/Eielson AFB/Clear AFS
- Refitting of Clean Coal Power plant
  - Opportunity to convert facility to gas
  - Conversion to gas relatively cost effective/pipeline is critical cost
- State of Alaska will push for NG pipeline through interior
- Need for access to pipeline by other producers of gas

Barriers to Exit:
- Infrastructure cost barrier
  - Must be able to sell assets to other company as going concern to recover investment
- Government: Must prove economic necessity to leave or sell assets

Power of Suppliers:
- Few suppliers in the market
  - High level of price control
- Market
  - Gas pipeline (Southern (ALCAN) Route)
  - Andex/Doyon, Ltd. agreement
    - Seismic in 2005/2006
    - Drilling 2007
    - Development 2007/2008
  - Fairbanks growth rate slow but steady
  - Gas pipeline may mean value added processing in Fairbanks to a company involved in petrochemicals
  - Coal supplier generally has the ability to control cost of coal to market.
    - Usibelli has no real competition at the moment.

Power of Buyers:
- Already using other types of energy resources
  - Energy
    - Coal
    - Home heating oil
  - Homes/commercial
    - Central steam
    - Oil
    - Propane
    - Wood and other raw materials to heat (comparatively minor player)

Availability of Substitutes:
- Energy
  - Coal (plentiful but poor quality on mmbtu basis)
  - Oil
- Commerical
  - Steam heat
  - Heating oil
  - Propane
- Home Heating
  - Home heating oil
  - Steam heat
  - Electricity
  - Propane

Significance of Complementors:
- Knock-out facilities may provide avenue for additional revenue sources
  - Propane and other knock-out raw materials may provide reach into housing and areas not reachable through gas main extensions
- Co-generation opportunities at compression stations in "smaller" communities along pipeline
  - Take advantage of waste heat in the system

Source: Adapted from Michael E. Porter, *Competitive Advantage*, New York: The Free Press 1985

Strategic Issues:

- **Exploration in Cook Inlet:** "A potential downside to a spur pipeline, from an exploration and production company point-of-view, is that a large supply of gas from the North Slope at a structural price below the Lower 48 prices may establish a price cap for new Cook Inlet reserves in the 10- to 15-year time frame. This could have a dampening effect on exploration and development for new gas reserves in the Cook Inlet. Hence, it is urgent that decisions such as the date and timing for a North Slope pipeline be made soon so that all options for south-central Alaska region can be determined in a timely manner so that high-cost reactive solutions are not required to meet critical needs."[22]
    - The authors of this report did not have the benefit of knowledge of the UNOCAL contract terms. It is ENSTAR's belief that this issue is mitigated by the UNOCAL contract being a template for additional contracts in the Cook Inlet should UNCOAL fail to fill future undesignated demand.

- **Demand Side Management:** "Part of the solution to the supply-demand problem would be to curtail demand by stopping or reducing industrial use but this only delays the problem and will have negative economic impact on Alaska and especially on the Kenai Peninsula Borough. Future demand can also be reduced by:
    - (a) conservation by consumers;
    - (b) more efficient electric generation through investment in more efficient equipment by the utilities (Anchorage Municipal Light and Power (ML&P) and Chugach Electric Association);
    - (c) power generation from alternative sources such as coal, wind, or hydropower, which would also require major investments; and
    - (d) gas storage in depleted or near-depleted oil or gas fields for short-term and peaking needs.

  The impact and cost of these options are not analyzed in this study. More efficient electricity generating equipment and alternatives such as wind, coal, and additional hydropower are being studied by the utilities. Gas storage has occurred in the past in the Swanson River field and is expected to continue; however, storage capacity and deliverability are likely to be more critical in the future to meet peaking demands, if the supply-demand margin continues to decrease."[23]

- **LNG – Supply Side Option:** "A final option would be to import LNG from foreign sources through existing LNG export facilities at Nikiski, Alaska. This would require facilities to re-gasify the LNG and increase the pressure to levels necessary to input gas to the ENSTAR gas pipeline system. Importing natural gas into Alaska would have negative impact on the region and state through lost revenue from royalty gas and taxes and the economic drain of capital from the region to pay for imports. It would also make Alaska part of the worldwide LNG market and subject to worldwide LNG prices for gas to serve local markets. These prices could turn out to be higher or lower than gas can be found and developed in the Cook Inlet basin or delivered from the North Slope."[24]

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[22] Charles P. Thomas, Tom C. Doughty, David D. Faulder, David M. Hite, Prepared for the U.S. Department of Energy, National Energy Technology Laboratory, Arctic Energy Office, 'SOUTH-CENTRAL ALASKA NATURAL GAS STUDY", Page 6

[23] Charles P. Thomas, Tom C. Doughty, David D. Faulder, David M. Hite, Prepared for the U.S. Department of Energy, National Energy Technology Laboratory, Arctic Energy Office, 'SOUTH-CENTRAL ALASKA NATURAL GAS STUDY", Page 10

[24] Charles P. Thomas, Tom C. Doughty, David D. Faulder, David M. Hite, Prepared for the U.S. Department of Energy, National Energy Technology Laboratory, Arctic Energy Office, 'SOUTH-CENTRAL ALASKA NATURAL GAS STUDY", Page 10

"***4.5.1.5 North Slope natural gas pipeline and spur to south-central Alaska***

It is assumed that natural gas from a North Slope gas pipeline through Fairbanks will be available in to connect to the south-central Alaska distribution system at Wasilla, Alaska. The timing for a North Slope pipeline remains uncertain with a range of 2011 to 2013 (Mid-America, 2004; ConocoPhillips, BP, ExxonMobil, 2004). Pipeline operations for the North Slope and spur pipelines are modeled as a common carrier charging a regulatory tariff structure for capital and cost recovery. The assumptions used are: annual O&M costs are 2.5% of the installed capital investment, gas consumption is 1.1% of the throughput volumes, and the regulatory cost of capital is 9.97%.

North Slope Pipeline--Capital costs are based on a North Slope gas pipeline to the Yukon border using the Mid-American proposal for cost estimates.26 This 745-mile, 48-inch pipeline is estimated to cost a total of $8.72 billion (2003$), all a tangible investment: $4.72 billion for the pipeline, compression facilities at $1.6 billion, and $2.4 billion for a gas conditioning facility on the North Slope with a gas throughput of 4.5 Bcf/day. The estimated average tariff charges for the first 10 years are $0.99 per Mcf to the Yukon border. The tariff, pro-rated for the 530 miles from the North Slope to Fairbanks, is $0.704/Mcf.

Spur Pipeline--Preliminary capital costs, basic operating parameters, and gas flow rates at different levels of compression were provided by ENSTAR to estimate tariffs. The pipeline capital cost is estimated at $300/foot for a 24-inch line ($12.50 per diameter inchfoot) and would be approximately 300 miles long, although the actual distance will depend on the exact route chosen. At the takeoff from the North Slope pipeline, a measurement and pressure reduction station would be required for a cost of $2 million. Throughput on the line without compression would be 330 MMscf/d assuming 1,400 psi in and 800 psi out. Increased throughput with one compressor station at 1.75 compression ratio (discharge pressure/inlet pressure) would be 465 MMscf/d and with two compressor stations at 1.75 compression ratio would be 670 MMscf/d. Each compression station would require two compressors at $10 million each (primary and backup) and for the 670 MMscf/d case would require two active compressors at each station (2 stations required) and one backup compressor. Installed compressor capital costs are estimated at $10 million for 6,000 horsepower.

The tariff calculation allows for capital recovery at the regulatory rate of return plus cost recovery for operating cost, ad valorem taxes, depreciation, a dismantlement charge, and state and federal income taxes. The tariff charge per Mcf is thus dependent on the transported volumes of gas, with larger volumes resulting in lower tariffs, as shown in Table 4.11. Due to the nature of the tariff calculation, capital cost overruns scale almost directly; i.e., a 25% overage results in a 25% increase in the tariff.

Table 4.11. Spur pipeline tariff at different throughput rates.

Case	Capital Investment, then current $	Average 10-year Tariff, $/Mcf	25% Increase in Capital, Tariff, $/Mcf	50% Increase in Capital, Tariff, $/Mcf
330 MMcf/day	$541.5 million	0.751	0.940	1.128
465 MMcf/day	$577.4 million	0.563	0.695	0.829
670 MMcf/day	$613.2 million	0.411	0.503	0.596

These results indicate the tariff for gas transported from the North Slope to south-central Alaska vary from $1.12 to $1.46/Mcf, depending on the volumes, with greater volumes having a lower tariff; i.e., tariff from North Slope to Fairbanks estimated at $0.704/Mcf plus values from Table 4.11 ranging from $0.411/Mcf for 670 MMcf/d to $0.751/Mcf for 330 MMcf/d). The proposed delivery point for the North Slope gas pipeline is the Chicago city gate. Tariff estimates by the operator consortia for gas delivered from the North Slope to Chicago are $2.25 to $2.50/Mcf (ADN, 2004c). A $2.50 tariff results in a net back to the well head $2.50 less than Chicago city gate. The price differential between Chicago and Henry Hub varies and, for simplicity, we assume no Chicago – Henry Hub differential. The wellhead netback and a $1.50 tariff from the North Slope to Anchorage provide approximately a $1.00/Mcf market advantage over Henry Hub prices. This analysis implicitly assumes static gas markets. Any differential between Chicago and Henry Hub reduces this cost advantage between Anchorage and Henry Hub.

The potential for a price advantage over Henry Hub prices provides an opportunity to encourage large industrial users to relocate to Alaska. One major requirement for feasibility of a spur pipeline is large industrial demand, as even the lowest rate of 330 MMscf/day, equates to 120 Bcf/yr (the combined industrial demand for LNG and Agrium facilities at capacity is 130 Bcf/yr). This potential structural price advantage may be attractive to Gulf Coast industrial users looking for a price arbitrage opportunity. This price arbitrage potential warrants further investigation and analysis, but is beyond the scope of this static analysis.

The preceding analysis (Section 4.5.1.2) indicates that Cook Inlet reserves are sufficient with the assumed reserves growth for the power generation and utility needs to 2025; therefore, initially, the primary market to be served by a spur pipeline would be large industrial users. If the spur pipeline option is to maintain viability, it is necessary to either continue operations of one or both of the current industrial users or attract new, large users. For example, ConocoPhillips owns approximately 37% of the gas resources at Prudhoe Bay and the ability to use a portion of their Prudhoe Bay gas to continue operation of the Kenai LNG facility may have economic merit. However, there is a narrow time window for this to occur, as the export license expires at the end of the first quarter of 2009 and the earliest gas delivery from the North Slope is expected to be 2012 to 2015 (ConocoPhillips, BP, ExxonMobil, 2004). Economic, regulatory, and policy signals can encourage continued operation of this facility, as well as attract other industrial users to create value-added products with the natural gas.

If these tariff estimates are reasonable and Henry Hub prices remain at $4/Mcf or above, the price advantage for North Slope gas to south-central Alaska does not appear likely to provide gas at a price low enough to meet Agrium's target of $2/Mcf at the plant in Nikiski based on market

forces alone. Policy decisions by the state would likely be required to provide special pricing of state royalty gas or other support options to meet this target.

This potential price advantage for the users of natural gas over Henry Hub prices has a possible downside. This structural price differential also applies to the sale of gas produced in the Cook Inlet basin and could be seen as a disincentive (all things being equal) for producers to continue to explore and develop new reserves, especially if there is major uncertainty on the timing of a North Slope pipeline and spur line in the long term. For example, if the North Slope netback wellhead value is $2.00/Mcf, gas could be delivered for $3.40/Mcf to $3.08/Mcf, depending on the capacity of the spur pipeline. This delivered price would vary up or down depending on the North Slope netback wellhead price and throughput volumes. Even at the lowest throughput rate of 330 MMcf/day (120 Bcf/yr), these results suggest a spur pipeline could supply gas at a price less than a Henry Hub price basis, thus discouraging Cook Inlet exploration and development. However, the demand for this additional gas must exist from continued or expanded industrial use, new industrial users or both, the economics of which are yet to be determined and require additional study.

4.5.2 Gas Cost – Supply Relationship

Development of new reserves or building a spur pipeline will require prices for natural gas that are adequate to encourage large investments. Table 4.12 shows the cost-supply data for three time period, 2004, 2010, and 2015, in then-current dollars for the contract prices (see Table 4.3) and the forecast production for all fields except the fields dedicated to industrial use. The reserves growth from the reserves growth scenario is included because without reserves growth or successful exploration, demand would be higher than supply in 2010 without gas from the fields dedicated to industrial use and before a spur pipeline can be built. The utility and power generation demand is included in Table 4.12 for reference. These data are shown graphically in Figure 4.15 and illustrate the variation in supply with the existing contract prices and the increase in gas prices that have occurred to date with the recent Unocal/ENSTAR contract on a Henry Hub price basis.

If a spur pipeline is built and a Henry Hub price basis is used, the structural cost advantage to the south-central Alaska region is estimated to be about $1.00/Mcf as discussed in Section 4.5.1.5. This price advantage over Henry Hub is likely to remain as prices escalate due to inflation but the amount is dependent on timing, final costs of pipelines, and world LNG and gas prices. Thus, a spur pipeline has the potential to moderate gas prices in the south-central Alaska region. Additionally, if all of the current industrial demand can be preserved, delivery volumes of 330 MMscf/day (120 Bcf/yr) would be insufficient to meet all the demand requirements, requiring the additional compression to increase volumes to the next increment of 465 MMscf/day (170 Bcf/yr), providing additional price advantage over Henry Hub prices in the region (see Table 4.11)."[25]

[25] Charles P. Thomas, Tom C. Doughty, David D. Faulder, David M. Hite, Prepared for the U.S. Department of Energy, National Energy Technology Laboratory, Arctic Energy Office, "SOUTH-CENTRAL ALASKA NATURAL GAS STUDY", Page 180-184