

**02/03/14  
PRESENTATIONS  
GASLINE KEY  
THEMES AND  
ALASKA LNG  
PROJECT**

<TARGET><BILL></BILL><SUBJECT>02-03-14 PRESENTATIONS  
GASLINE KEY THEMES AND ALASKA LNG  
PROJECT</SUBJECT><COMM>SRES28</COMM></TARGET>

# ALASKA STATE LEGISLATURE

Sen. Cathy Giessel, Chair  
Sen. Fred Dyson, Vice Chair  
Sen. Lesil McGuire  
Sen. Anna Fairclough  
Sen. Click Bishop  
Sen. Peter Micciche  
Sen. Hollis French



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## Senate Resources Committee

Butrovich Room 205  
Monday, February 3, 2014  
3:30-6:30 p.m.

### AGENDA

#### ➤ Gasline Key Themes

- Consultants: Janak Mayer and Nikos Tsafos, Enalytica

Testimony: By Invitation

#### ➤ Alaska LNG Project

- Steve Butt, Senior Project Manager, ExxonMobil

Testimony: By Invitation

Teleconference

# PROJECT CHOICES, COMMITMENTS & MIDSTREAM OPTIONS

Prepared for Senate Resources Committee  
Juneau, Alaska > February 3, 2014

Janak Mayer, Partner > [janak.mayer@enalytica.info](mailto:janak.mayer@enalytica.info)  
Nikos Tsafos, Partner > [nikos.tsafos@enalytica.info](mailto:nikos.tsafos@enalytica.info)

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# SB 138/HOA/MOU: IMPORTANT STEP IN A LONG PROCESS

<b>Upstream</b>	<b>Delineate resource base, certify reserves, define production plan</b>
<b>Midstream</b>	<b>Define pipeline path, secure right-of-way, environmental permits</b>
<b>Liquefaction</b>	<b>Define project size, processing / gas quality, project structure</b>

**Shipping**      **Decide whether to own, lease or outsource shipping to buyers**

**Marketing**      **Define commercialization plan, secure buyers, sign contracts**

**Financing**      **Define financing plan, secure in-house and third-party lending**

**Permitting**      **Secure permits to construct facility, export gas**

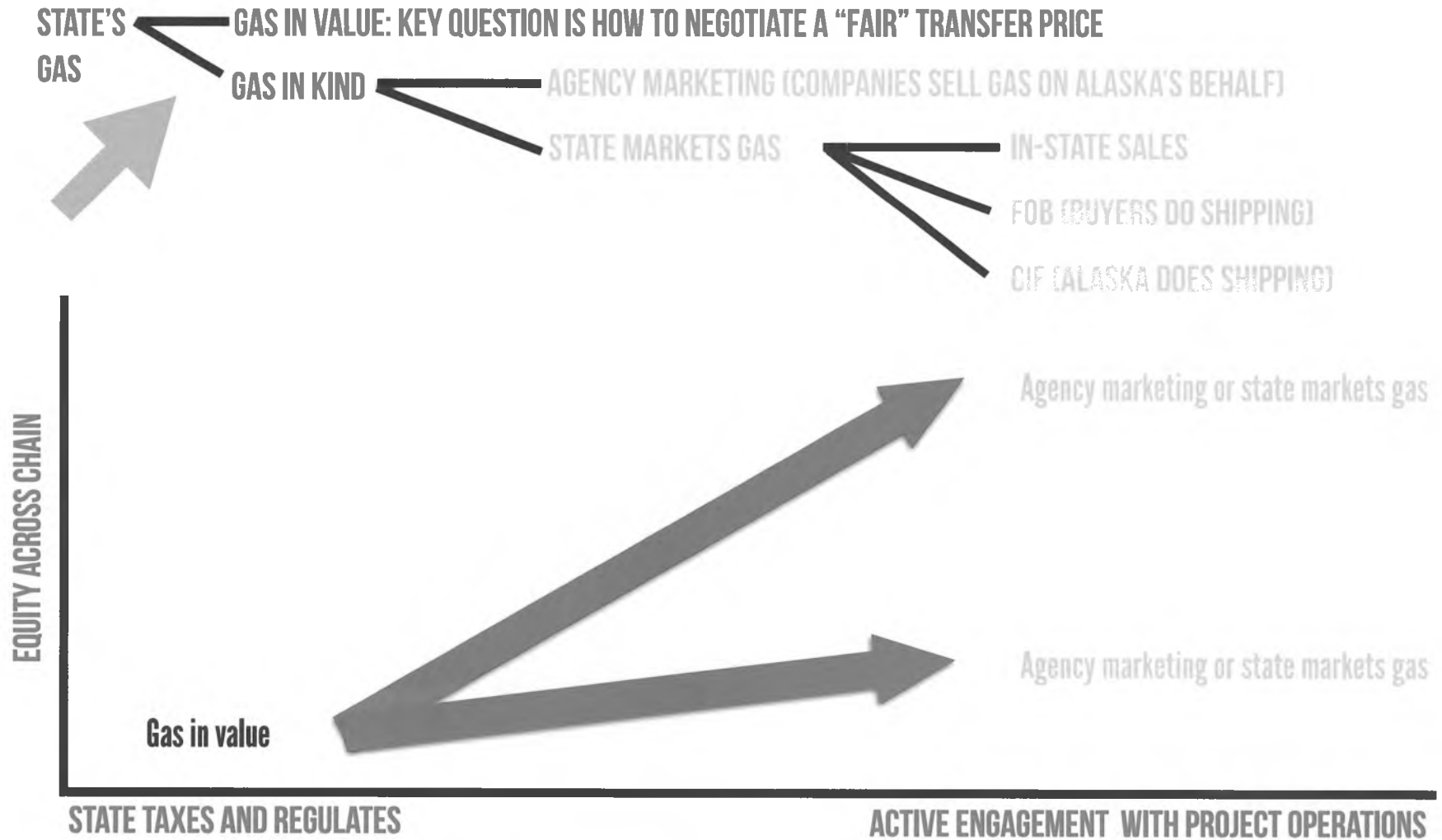
**Partners conduct front-end engineering and design studies (pre-FEED and FEED)**

**They then sign engineering, procurement and construction (EPC) contracts**

**Construction starts with final investment decision (FID); usually less than 10% of CAPEX spent before FID**



# SB 138/HOA/MOU: DESIRED PATH BUT MUCH STILL OPEN



# LNG PROJECTS EVOLVE: QC LNG (AUSTRALIA) CASE STUDY

	FEED (JULY 2008)	FID (OCTOBER 2010)	JANUARY 2014
<b>Size</b>	One train: 3-4 mmtpa Expandable to 12 mmtpa	Two trains 8.5 mmtpa	Two trains 8.5 mmtpa
<b>Upstream</b>	BG owned 9.9% of QGC and 20% of QGC's coal-bed methane in Surat Basin	All BG except CNOOC 5% and Tokyo Gas 1.25% in parts of Surat Basin	Gas from AP LNG; Same as FID plus CNOOC 25% in Surat and Bowen Basin
<b>Liquefaction</b>	T1: BG 70%, QGC 30%	T1: BG 90%, CNOOC 10% T2: BG 97.5%, Tokyo Gas 2.5%	T1: BG 50%, CNOOC 50% T2: BG 97.5%, Tokyo Gas 2.5% T3: CNOOC option for 25%
<b>Off-take*</b>	BG Group: 100%	CNOOC: 3.6 mmtpa* Tokyo Gas: 1.2 mmtpa* BG Group: balance	CNOOC: 8.6 mmtpa* Tokyo Gas: 1.2 mmtpa* Chubu Electric: ~0.6 mmtpa*
<b>External Financing</b>			JBIC: 175 mn to Tokyo Gas US EX-IM: \$1.8 billion

*\* Off-take is supplemented by BG's global portfolio—not all LNG will come from Australia*

SOURCE: BG GROUP DATABOOK 2008—2013 EDITIONS, INDUSTRY PRESS

# HOW COULD ALASKA STRUCTURE THE MIDSTREAM?



# PATH OF THE MEMORANDUM OF UNDERSTANDING (MOU)



**PRODUCER-SOA  
ALIGNMENT**

**Minimize disputes over where value is allocated  
Tariffs reflect value maximization across the entire chain**

**THIRD-PARTY  
EXPANSION**

**Midstream becomes an enabler for further exploration and development  
Expansion principles favor development of additional transportation capacity**

**IN-STATE  
DELIVERIES**

**Alaskan consumers receive cost at the lowest cost possible (given adequate  
returns on investment)**

**EXECUTION**

**Pipeline is delivered on time and at the lowest possible cost**

**CONTINUITY &  
MOMENTUM**

**Project maintains and accelerates current investment interest;  
Project leverages work to date and is not delayed by possible litigation**

# PRODUCER ONLY: ALIGNMENT / EXPANSION WEAK POINTS



- X PRODUCER-SOA ALIGNMENT** Significant potential for disputes over allocation of value, and optimal level for midstream tariff
- X THIRD-PARTY EXPANSION** Focus on commercializing producers' resources over gas belonging to third parties
- X IN-STATE DELIVERIES** Uncertain tariff for in-state deliveries (of SOA's gas)
- ✓ EXECUTION** Strong and proven ability to execute, but midstream becoming less of a core focus for majors
- ? CONTINUITY & MOMENTUM** Uncertainty about possibility of limitation and loss of work done to date

# SOA EQUITY: MORE EXPANSION BIAS BUT BURDEN ON SOA



- ✓ **PRODUCER-SOA ALIGNMENT** Strong alignment between producers and SOA
- ? **THIRD-PARTY EXPANSION** Relies on SOA to drive expansions, seeking new entrants and / or new partners; SOA may not be best placed to fill this role
- ✓ **IN-STATE DELIVERIES** SOA can use its equity-entitled capacity to carry gas to local markets at lower cost
- ✓/? **EXECUTION** Strong and proven ability to execute for initial investment; expansion will depend on securing capabilities and/or another party
- ? **CONTINUITY & MOMENTUM** Uncertainty about possibility of limitation and loss of work done to date

# MOU: EXPANSION BIAS & MOMENTUM; BUT BEST DEAL?



- ✓ **PRODUCER-SOA ALIGNMENT** Strong alignment between producers and SOA; capital structure for rate-setting purposes appears within norm, but unclear if new bidding could have produced lower tariff
- ✓✓ **THIRD-PARTY EXPANSION** TransCanada will be advocate for a project structure that encourages expansion and will have incentive to drive expansion of the infrastructure based on market interest
- ✓✓ **IN-STATE DELIVERIES** SOA can use its equity-entitled capacity to carry gas to local markets at lower cost; pro-expansion bias further incentivizes possible in-state deliveries
- ✓ **EXECUTION** TransCanada brings execution knowhow and expertise, while producers reinforce cost discipline (to ensure lowest possible tariff)
- ✓ **CONTINUITY & MOMENTUM** Project maintains and accelerates investment interest and leverages work done to date

# BID: WILL REWARD COMPENSATE FOR COST IN TIME AND \$?



✓/?	<b>PRODUCER-SOA ALIGNMENT</b>	Strong alignment between producers and SOA; new bid could lead to a lower tariff, but it could also lead to a higher one; low investor interest could also slow down entire process
✓	<b>THIRD-PARTY EXPANSION</b>	Third party will have incentive to drive expansion of the infrastructure based on market interest, but would likely have less influence over current negotiations
✓✓	<b>IN-STATE DELIVERIES</b>	SOA can use its equity-entitled capacity to carry gas to local markets at lower cost; pro-expansion bias further incentivizes possible in-state deliveries
✓	<b>EXECUTION</b>	Third party would presumably bring execution knowhow and expertise, while producers would reinforce cost discipline (to ensure lowest possible tariff)
✗	<b>CONTINUITY &amp; MOMENTUM</b>	Uncertainty about possibility of limitation and loss of work done to date; HOA negotiations could slow down in anticipation of new bidding process and license award

# SOA NEEDS TO CAREFULLY WEIGH KEY QUESTIONS

What compensation might the SOA have to pay and what intellectual property will Alaska LNG retain?

Will the HOA process slow down if the midstream is tied in litigation?

What are the odds that a new selection process will deliver better terms than those available today?

To what extent was the AGIA process representative of the industry’s interest in an Alaskan pipeline?

*Would a new tariff offset absence from negotiating table; reduced momentum; cost to dissolve AGIA?*

	PRODUCERS	PRODUCERS + STATE OF ALASKA	PRODUCERS + STATE OF ALASKA + TRANSCANADA	PRODUCERS + STATE OF ALASKA + 3RD PARTY
PRODUCER-SOA ALIGNMENT	X	✓	✓	✓/?
THIRD-PARTY EXPANSION	X	?	✓✓	✓
IN-STATE DELIVERIES	X	✓	✓✓	✓✓
EXECUTION	✓	✓/?	✓	✓
CONTINUITY & MOMENTUM	?	?	✓	X

- ▶ NATURAL GAS MARKET OUTLOOK
- ▶ FUNDAMENTALS OF LNG BUSINESS
- ▶ IMPLICATIONS FOR ALASKA
- ▶ **APPENDICES**

**JANAK MAYER**  
**PARTNER**

*enalytica*

**JANAK.MAYER@ENALYTICA.INFO**

Before co-founding *enalytica*, Janak led the Upstream Analytics team at PFC Energy, focusing on fiscal terms analysis and project economic and financial evaluation, data management and data visualization.

Janak has modeled upstream fiscal terms in all of the world's major hydrocarbon regions, and has built economic and financial models to value prospective acquisition targets and develop strategic portfolio options for a wide range of international and national oil company clients. He has advised Alaska State Legislature for multiple years on reform of oil and gas taxation, providing many hours of expert testimony to Alaska's Senate and House Finance and Resources Committees.

Prior to his work as an energy consultant, Janak advised major minerals industry clients on a range of controversial environmental and social risk issues, from uranium mining through to human rights and climate change. He has advised bankers at Citigroup and policy-makers at the US Treasury Department on the management and mitigation of environmental and social impacts in major projects around the world, and has undertaken macroeconomic research with senior development economists at the World Bank and the Peterson Institute for International Economics.

Janak holds an MA with distinction in international relations and economics from the Johns Hopkins School of Advanced International Studies (SAIS), and a BA with first-class honors from the University of Adelaide, Australia.

**NIKOS TSAFOS**  
**PARTNER**

*enalytica*

**NIKOS.TSAFOS@ENALYTICA.INFO**

Nikos Tsafos has a diverse background in the private, public and non-profit sectors. He is currently a founding partner at *enalytica*. In his 7 ½ years with PFC Energy, Nikos advised the world's largest oil and gas companies on some of their most complex and challenging projects; he also played a pivotal role in turning the firm into one of the top natural gas consultancies in the world, with responsibilities that included product design, business development, consulting oversight and research direction.

Prior to PFC Energy, Nikos was at the Center for Strategic and International Studies (CSIS) in Washington, DC where he covered political, economic, and military issues in the Gulf, focused on oil wealth, regime stability and foreign affairs. Before CSIS, he was in the Greek Air Force, and prior to his military service, Nikos worked on channeling investment from Greek ship-owners to Chinese shipyards.

Nikos has also written extensively on the domestic and international dimensions of the Greek debt crisis. His blog (Greek Default Watch) was listed as one of "Europe's Top Economic Blogs" by the Social Europe Journal, and his book "Beyond Debt: The Greek Crisis in Context" was published in March 2013.

Nikos holds a BA with distinction in international relations and economics from Boston University and an MA with distinction in international relations from the Johns Hopkins School of Advanced International Studies (SAIS).

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# Alaska LNG



# The Alaska LNG Project

The Alaska LNG export project is about innovative people and technology combining to develop Alaska's vast North Slope natural gas resources. BP, ConocoPhillips, ExxonMobil and TransCanada are working with the state of Alaska on an export LNG project to fuel Alaska's future.

ACCOMPLISHMENTS

POTENTIAL BENEFITS

SAFETY, HEALTH  
AND ENVIRONMENT

CHALLENGES

NEXT STEPS



Alaska LNG

## Accomplishments

- Completed project design, announced concept Feb13
- Finalized lead LNG plant site decision, announced Oct13
- Safe and successful summer field season and data collection
- Confirmed ability to integrate into existing operations at producing fields
- Advanced GTP design work and LNG plant modeling
- Progressed pipeline routing, line hydraulics and materials design
- Evaluating sealift options and other logistics



Alaska LNG



## Potential Benefits

- Single largest investment in Alaska's history
- Creates 9,000-15,000 jobs for design and construction plus ~1,000 jobs for operations
- Generates billions of dollars of new tax revenue for Alaska
- Provides access to natural gas for Alaskans



INCREASED REVENUE



15,000 ADDED JOBS



INVESTMENT IN LOCAL ECONOMY



Alaska LNG



## Next Steps

- Continue field studies and environmental baseline assessments
- Continue engineering and design work for integrated project
- Prepare state and federal permit and license applications
- Establish a durable gas fiscal regime

NATURAL GAS DEMAND  
INCREASES 65% BY 2040



2010



2020



2030



2040





## **Safety, Health and Environment (SHE)**

- Committed to operating in a safe and environmentally responsible manner
- Protecting biodiversity and ecosystems
- Respect traditional knowledge





## Challenges

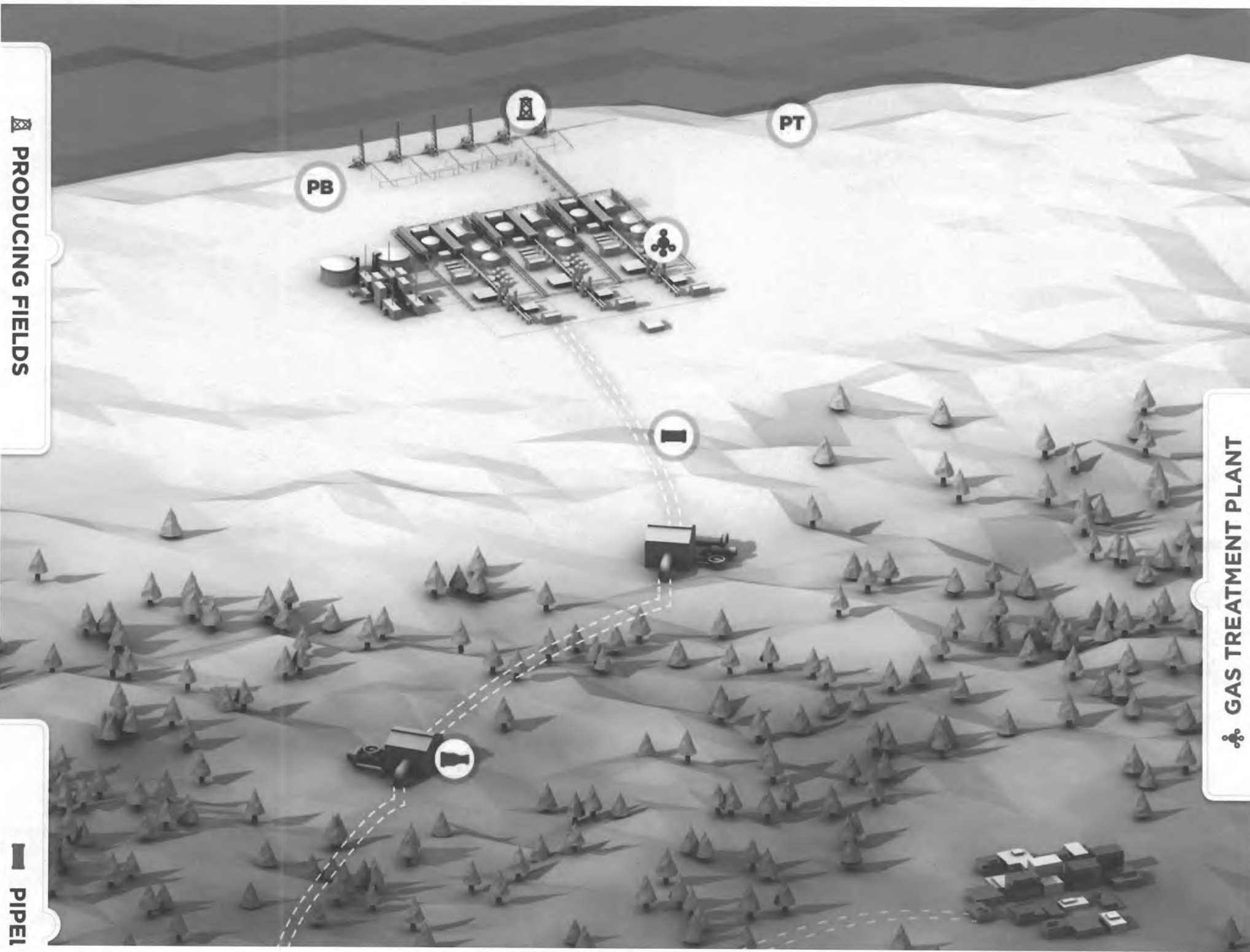
- Megaproject requiring labor, resources and equipment that can handle Alaska's extreme, remote environment
- Complex commercial arrangements with foreign markets require long-term commitments
- Reducing impacts and risks of environmental and socioeconomic aspects
- Uncertainty related to permit timing / scope
- Working commercial and fiscal issues with all parties, including the State of Alaska



Alaska LNG

PRODUCING FIELDS

PIPELINE



GAS TREATMENT PLANT

LIQUEFACTION PLANT



PELINE



STORAGE AND LOADING



# Modular Construction



# Progress

Further development in the Alaska LNG Project



2014 FIELD SEASON



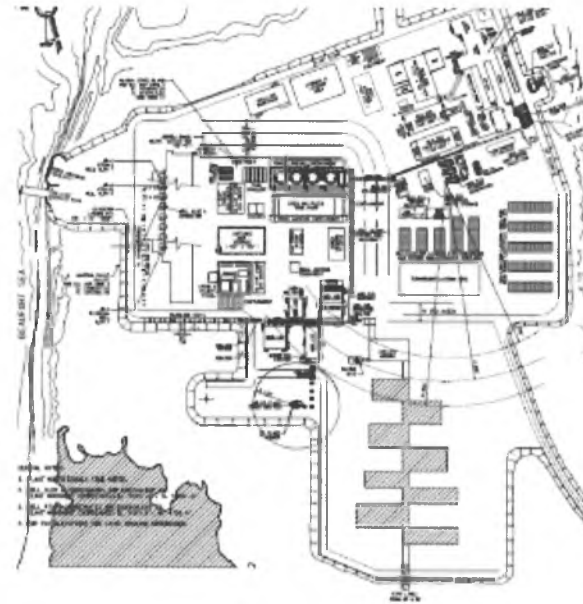
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## Point Thomson

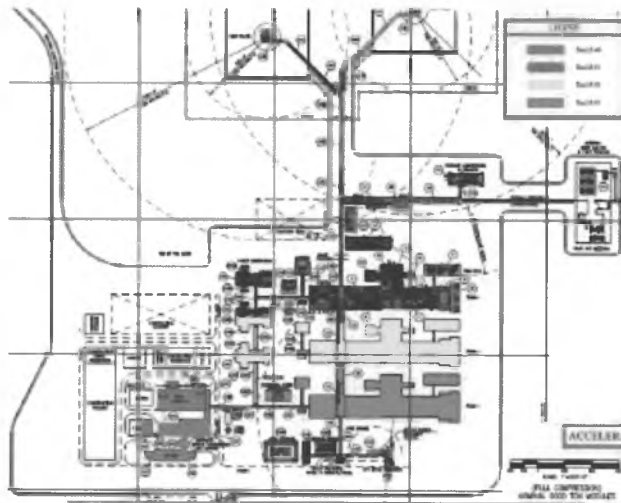
- Comparing plot plan options for safety and operability
- Evaluated process design requirements
- Developing design basis for future engineering work





## Gas Treatment Plant

- Confirmed viability of 3 trains design, aligns gas treatment plant with LNG plant
- Finalized CO<sub>2</sub> design / handling basis
- Working to modularize plant design
- Evaluating sealift plans / order





## Pipeline

- Refined route from PBU to Livengood, finalizing preliminary route from Livengood to Cook Inlet
- Working 'special design areas'
  - Atigun Pass
  - Denali National Park Area
  - Yukon River
  - Cook Inlet
- Progressing fundamental technical work on geohazard analysis, waterway crossings, hydraulics and design

DENALI NATIONAL PARK



COOK INLET





## Environmental, Regulatory and Land

- **Safe summer field season 2013**
  - No incidents for >40,000 man-hours, 90,000 miles
  - No reportable spills or public complaints
- **Peak workforce of over 130 contractor staff completed survey work from PBU to Livengood**
  - Over 6,500 acres surveyed for cultural resources
  - Over 75 hydrology, lakes and fisheries surveyed
  - Traditional knowledge and ethnographic surveys



## Plans for a safe 2014 field season

- Civil and scientific surveys from Livengood to Nikiski
- Subsistence and health impact surveys
- Marine current and ice profiling
- Geotechnical and geophysical surveys
- Collaboration with state and federal agencies for permitting and approvals
- Local community engagement for field study scopes



# Alaska LNG