Alaska South Central LNG (SCLNG) Project

Overview for Alaska Legislators

February, 2013

Alaska SCLNG Project - Overview

- BP, ConocoPhillips, ExxonMobil and TransCanada are working together to progress an Alaska LNG project:
  - 300+ people developed concept, $25M spent thru Jan13
  - Key third party contractors engaged (URS, Fugro, exp)
  - Leveraging Denali, APP, related material ($700M past work)

- Concept work has defined key issues:
  - Integrated Basis of Design heat/material balance complete
  - Potential integration into existing operations
  - Required gas treating plant design (North Slope location)
  - Pipeline size and routing options (800+ miles, 42” x80 pipe)
  - LNG plant design (15-18 million tons per annum – “MTA”)
  - Gas off-take capacity for secure Alaska fuel supply
  - Preliminary capital estimate - $45-65 Billion (2011 dollars)

- Key project issues to address:
  - “Mega-project” challenges (labor, resources, equipment, etc)
  - Commercial and fiscal issues
  - Uncertainty related to permitting timing

- Forward Plans:
  - Use “Phased/Gated” process to advance project
  - Continue working together to optimize design

Alaska SCLNG Plant
Conceptual Layout

Results of
URS ArcGIS
Location Suitability
Screening Study

Work Product In Progress

Module Fabrication

Module Sealift

Module Transport

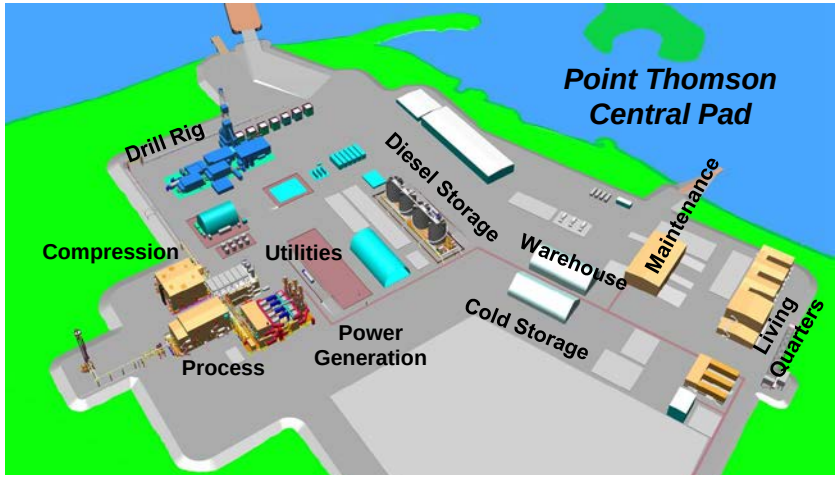
Module Hook Up – Plug and Play

SCLNG Concept Summary - Upstream

PTU (62 miles east of PBU/GTP area)

- Initial Production System (IPS) project in progress - 2016 SU
- Preliminary SCLNG design basis for PTU:
  - Leverage IPS facilities, add fourteen new wells
  - Add new gas facilities to existing central pad / facilities
  - New 30” gas line from PTU to GTP in Prudhoe Bay
  - Peak workforce – 500-1,500 people

PTU Field Layout



PBU Tie-in (adjacent to proposed GTP location)

- Installation / tie-in managed by Prudhoe Bay Operator
  - Tie into existing CGF, deliver gas to new Gas Treatment Plant
  - Gas project / deliveries tied to future PBU operations

- Preliminary plan is to inject CO_2 using existing injection systems as appropriate

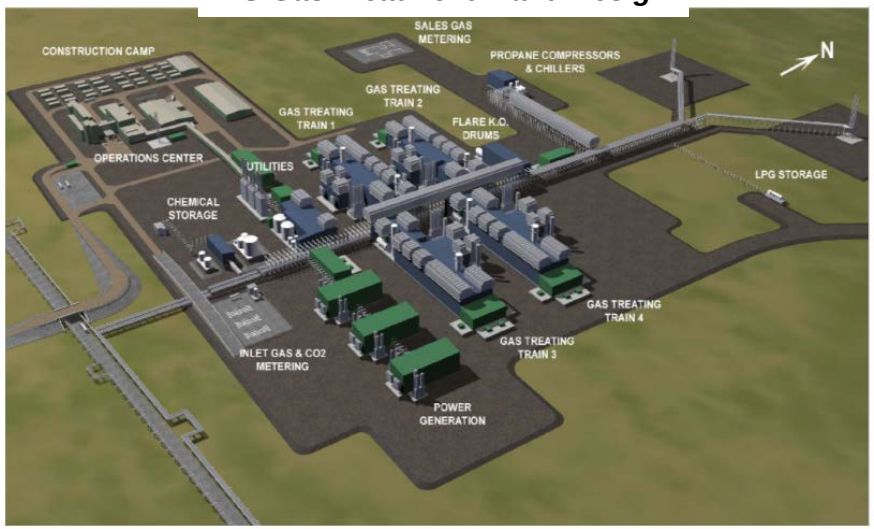
PBU Central Gas Facility Tie-in

SCLNG - Concept Summary - Midstream

NS Gas Treatment Plant

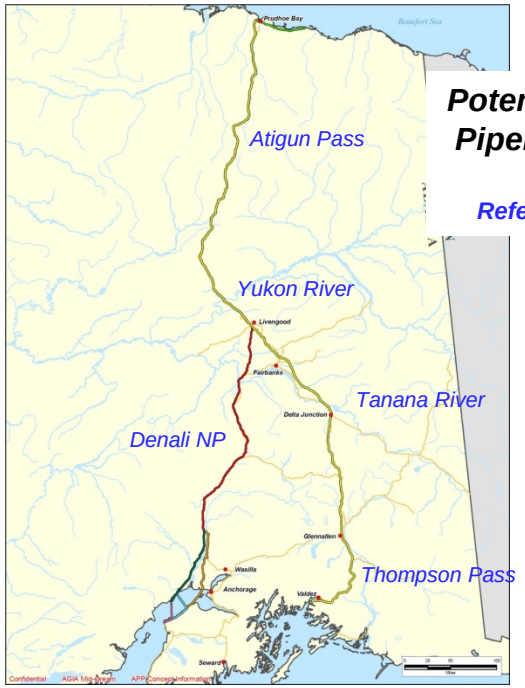
- Designed to remove gas impurities
- Four amine trains with compression, dehydration and chilling
- Prime power generation (5 units, 54kHP)
- All required utilities, infrastructure and camps
- Facility will be modularized, sealifted to location
- Peak workforce – 500-2,000 people

NS Gas Treatment Plant Design



Gas Pipeline and Compression Stations

- 800+ mile 42” x80 pipeline
- 3-3.5 billion cubic feet gas per day
- Eight compressor stations (30kHP each)
- Pipeline contents will be treated gas, impurities removed
- Designed to manage continuous and discontinuous permafrost regions
- Expansion potential with additional compression if appropriate
- Five off-take points for Alaska gas delivery
- Peak workforce – 3,500 - 5,000 people



Potential SCLNG Pipeline Routes

Reference Points

Work Product In Progress

SCLNG - Concept Summary – Downstream

LNG Plant and Storage

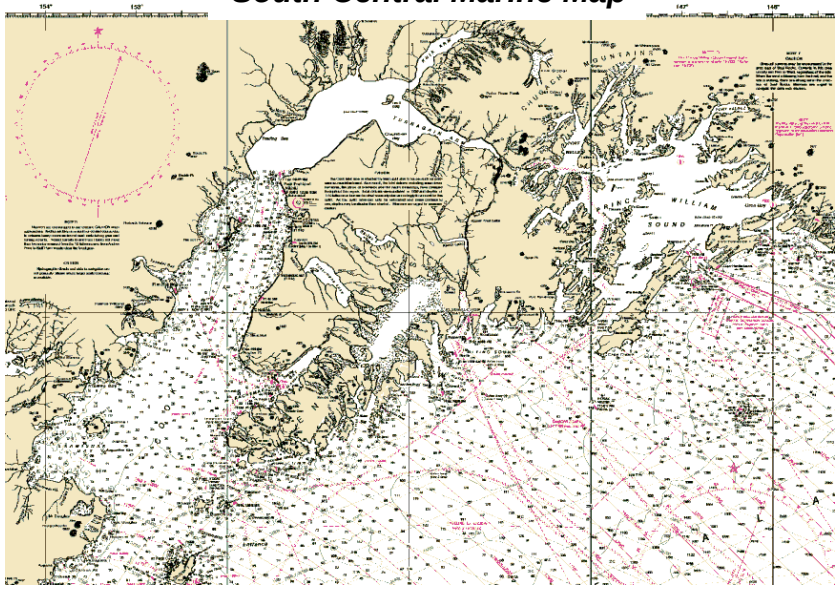
- Three 5.8 million tons per annum (MTA) LNG trains
  - Plant receives 2.2 - 2.5 billion cubic feet per day to liquefy
  - LNG production varies with ambient temp (4.9 - 6.3 MTA)
  - Small volume of stabilized condensate produced (~1,000 bbl/day)
- Integrated utility system with all utilities on site
- Two-three 160,000 cubic meter LNG storage tanks
- Peak workforce – 3,500 – 5,000 people

SCLNG Plant and Storage

Marine Offloading Facility

- Conventional jetty and trestle design
- Two berths
- Design based on 15-20 LNG carriers
- Marine support system includes required tugs, security boats
- Peak workforce – 1,000 – 1,500 people

South Central Marine Map



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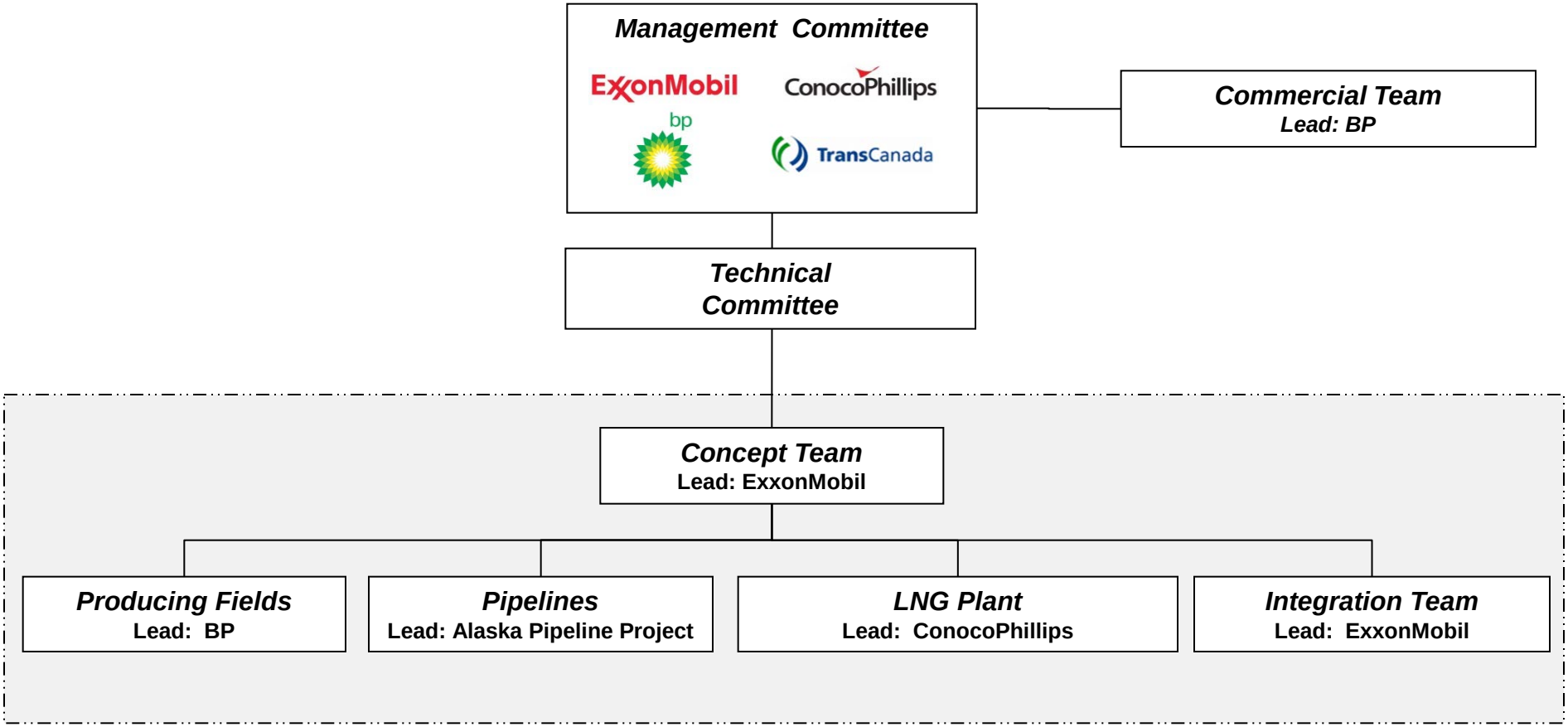
Back-Up Material

Attachments to Oct-12 Letter to Governor Parnell

February, 2013

Attachment 1

Southcentral Alaska LNG – Integrated Team



Multimillion Dollar, Four-Company Effort – 125+ Employees, 100+ Contractors

- **Joint work commenced March 31, 2012 after completion of the Pt. Thomson Settlement / joint work agreements**
- **Cooperative effort among the leading North Slope producers and a leading North American pipeline company**
- **Identified potentially viable LNG project options to monetize ANS natural gas**
- **Used company strengths, shared information / expertise; built upon past efforts, sought out new ideas**

Attachment 2

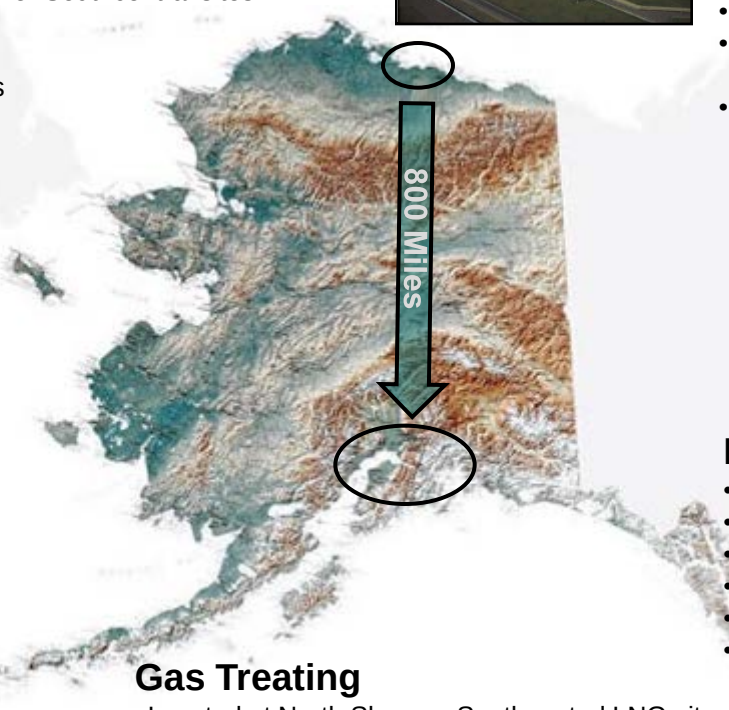
Alaska Southcentral LNG – Project Concept Description

Liquefaction Plant

- Capacity: 15 – 18 million tonnes per annum (MTA)
  3 trains (5-6 MTA / train)
- Potential areas: 22 sites assessed in Cook Inlet, Prince William Sound and other Southcentral sites
- Footprint: 400 - 500 acres
- Peak Workforce: 3,500 - 5,000 people
- Required Steel: 100,000-150,000 tons

Producing Fields

- ~35 TCF discovered North Slope resource
- Additional exploration potential
- Anchored by Prudhoe Bay and Pt. Thomson with ~20 years supply available
- Use of existing and new North Slope facilities
- Confirmed range of gas blends from PBU/PTU can generate marketable LNG product
- Peak Workforce: 500 – 1,500 people

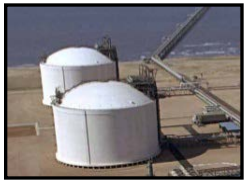


Pipeline

- Large diameter: 42”- 48” operating at >2,000 psi
- Capacity: 3 - 3.5 billion cubic feet per day
- Length: ~800 miles (similar to TAPS)
- Peak Workforce: 3,500 - 5,000 people
- Required Steel: 600,000 - 1,200,000 tons
- State off-take: ~5 points, 300-350 million cubic feet per day, based on demand

Storage / Loading

- LNG Storage Tanks, Terminal
- Dock; 1 - 2 Jetties
- Design based on 15– 20 tankers
- Peak Workforce: 1,000-1,500 people



Gas Treating

- Located at North Slope or Southcentral LNG site
- Remove CO_2 and other gases and dispose / use
- Footprint: 150 - 250 acres
- Peak Workforce: 500 - 2,000 people
- Required Steel: 250,000 - 300,000 tons
- Among largest in world

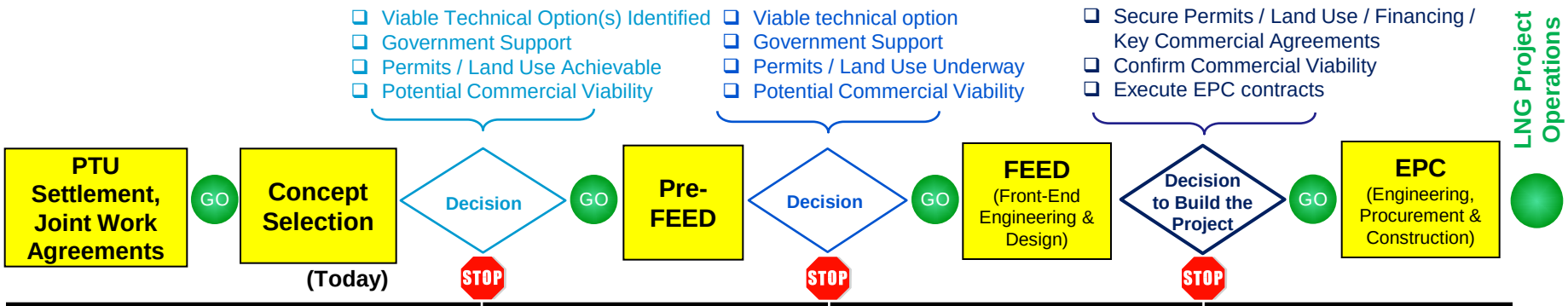
Estimated Total Cost: $45 – $65+ Billion **Peak Construction Workforce: 9,000 – 15,000 jobs**
Operations Workforce: ~1000 jobs in Alaska

Descriptions and costs are preliminary in nature and subject to change. Cost range excludes inflation.

Attachment 3

Southcentral Alaska LNG – Work Plans / Key Decision Points

Requirements to Take Next Step:



Peak Staffing:	~200	400 - 500	500 – 1,500	9,000 – 15,000
Cost ($):	Tens of Millions	Hundreds of Millions	Billions	Tens of Billions
Est. Engineering / Technical Duration*:		*12 - 18 Months*	*2 - 3 Years*	*5 - 6 Years*

Activities

Evaluate: • Range of technically viable options for major project components • Business Structure • In-state gas / export LNG demand	**Progress**: • Preliminary engineering to refine concept • Business structure • Financing plan	**Complete**: • Front-end engineering & design • Major contract preparation • Business structure • Financing arrangements	**Execute**: • Final engineering • Financing • Procurement • Fabricate / Logistics / Construct • Prepare for Operations
Solicit Interest of Others		**Solicit Interest of Others**	
Establish Government Support and Advance Regulatory Issues: • Competitive oil tax environment; predictable / durable LNG project fiscal terms; AGIA Issues • Assure ability to secure regulatory approvals / permits / land use • Environmental activities / Technical data collection • Stakeholder engagement • File DOE Export License		**Advance Gov't / Reg. Issues:** • Key permit / land use approvals • Stakeholder engagement • Secure DOE Export License	**Complete Gov't / Reg. Issues:** • Secure remaining construction / operating permits • Stakeholder engagement
	Start individual gas / LNG sales / shipping efforts	**Execute individual gas / LNG sales / shipping agreements**	**Implement business structure & agreements**
Screen commercial viability	**Assess commercial viability**	**Confirm commercial viability**	**Commission / start-up**

*** NOTE: Duration of various phases may be extended by protracted resolution of fiscal terms, permitting and regulatory delays, legal challenges, changes in commodity market outlook, time to secure long-term LNG contracts, labor shortages, material & equipment availability, weather, etc.**