

Alaska LNG

Fueling Alaska's Future TM

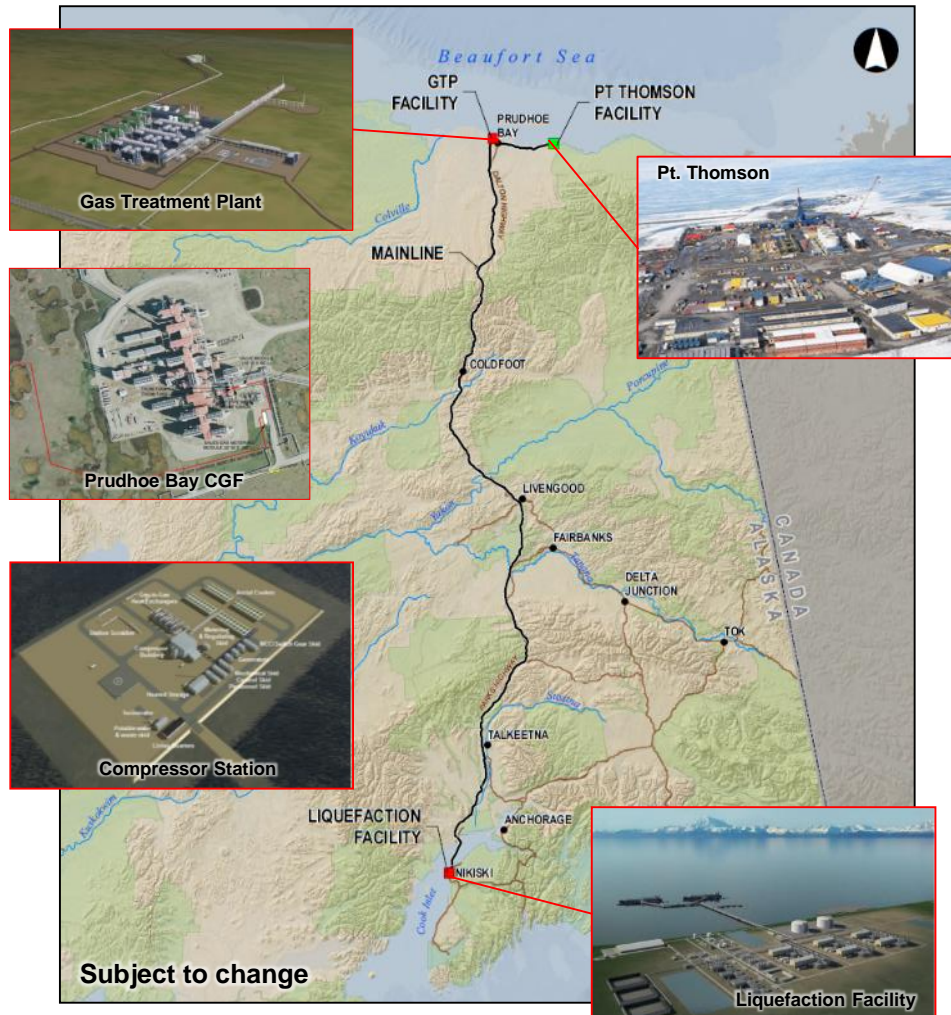


25 January 2016

Project Update
Presented by Steve Butt

Alaska LNG – Project Overview

An integrated liquefied natural gas export project providing access to gas for Alaskans



North Slope

Point Thomson: Deliver natural gas to GTP

Prudhoe Bay: Deliver natural gas to GTP, receive CO₂ / impurities for further handling

Gas Treatment Plant (GTP): Clean, dehydrate, chill and compress 3.5 BCFD of natural gas and deliver to pipeline

North Slope, Interior & Southcentral

Gas Pipeline: Transport 3.3 BCFD of natural gas over 800 miles to Nikiski, with at least five interconnection points for in-state gas

Southcentral

Liquefaction Facility: Create, store, and load up to 20 million tons of LNG per year (15-20 LNG cargos per month)

Safety, Health and Environment Report:

- ✧ Completed all work in 2015 incident free – continue building culture of caring

Executive Summary:

- ✧ Spend: \$370M on pre-FEED through December 2015
- ✧ Initial design scope ~85% complete, updated to reflect optimization work
- ✧ Finalizing project design/execution basis for cost and schedule estimates
- ✧ Key 2015 milestones – FERC RR (Draft 1), export authorizations, AOGCC rulings

2016 Priorities - Optimize Pre-FEED, progress EIS

- ✧ Evaluate 48" pipeline option – targeting April 2016 decision
- ✧ Additional G&G and field work to support Resource Report Draft 2
- ✧ Contract strategy development and market engagement to ensure project is globally competitive while maximizing opportunities for qualified Alaskans
- ✧ Provide owners with information for FEED decision

Key Messages:

- ✧ Alaska LNG is an integrated LNG project – *plants plus pipeline*
- ✧ Focus on lowest cost of supply to compete in a global market
- ✧ Alignment, risk and cost reduction (ARC) remain key to success



Project Design Basis

- ✧ Completed base case Pre-FEED design
- ✧ Integrated hydraulic / compositional model of system
- ✧ Continuing to evaluate design efficiencies

Project Specification Development

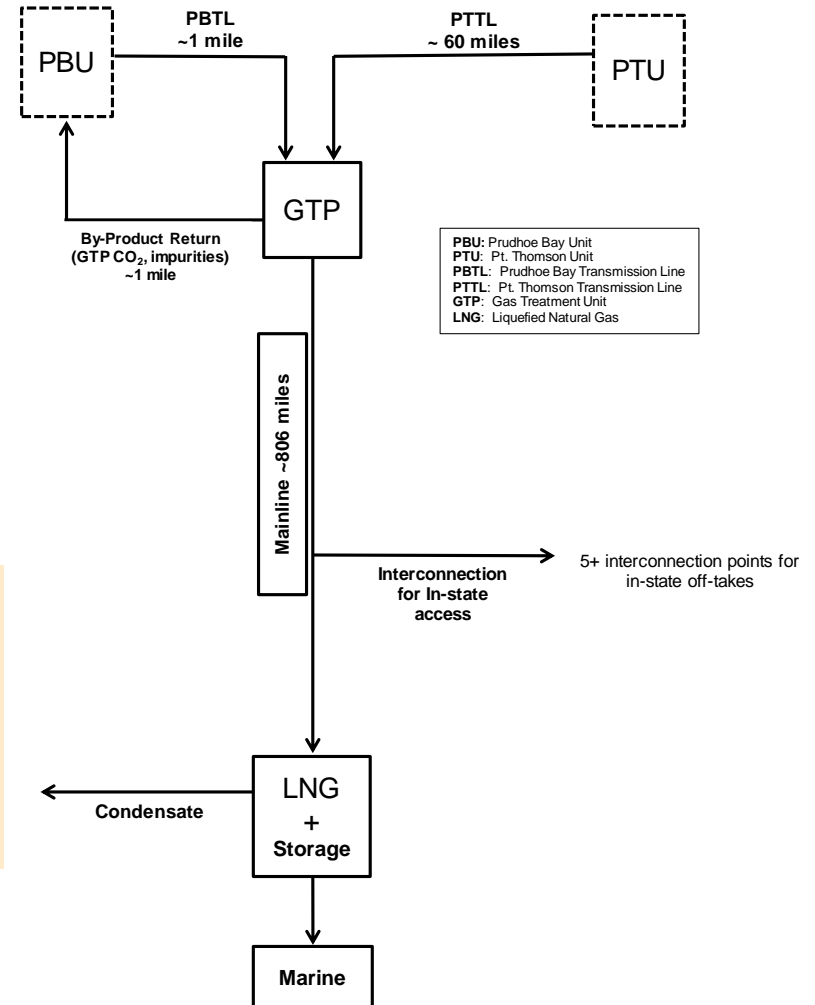
- ✧ Developing 'fit-for-purpose' project specifications including common specifications for GTP, Pipeline and LNG Plant

Reliability, Availability & Maintainability (RAM)

- ✧ Completed base case project-wide RAM modelling and analysis

Optimization – Focus on Cost Reduction

1. Evaluating technical and economic feasibility of optimization opportunities
2. Improved integrated system efficiency – align planned maintenance, sparing of key equipment, etc.



LNG Plant and Marine Terminal Update

Completed Pre-FEED design, initiated optimization studies

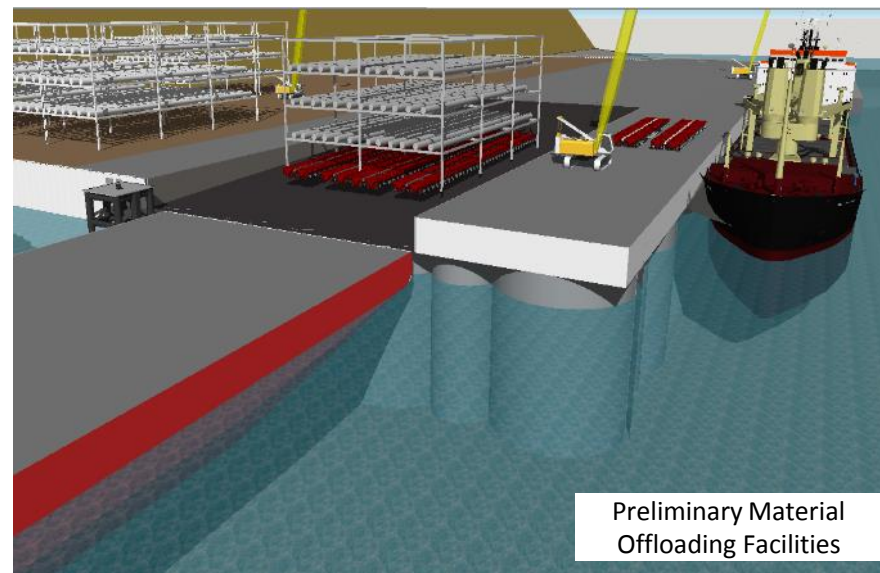
Advancing technical evaluations - drivers / containment

Continuing to improve marine terminal design / operations

- ✧ Completed navigation simulation work – incorporate findings
- ✧ Finished jetty trestle construction study

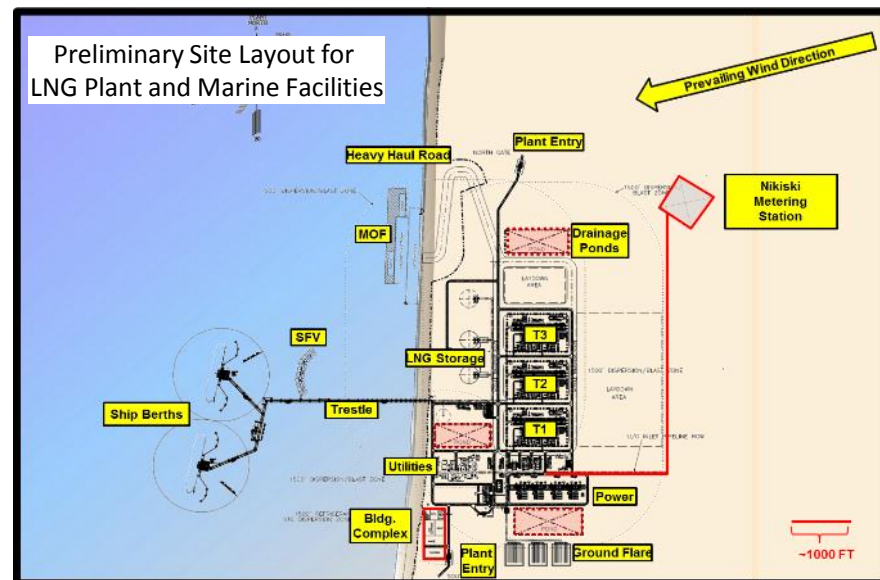
Successful 2015 G&G Program

- ✧ Drilled 61 on- / 25 off-shore boreholes / 20 monitoring wells
- ✧ ~240,000 feet of seismic (all depths)
- ✧ Completed ~60 square km of seafloor mapping / bathymetry



Optimization Studies – Focus on Cost Reduction

1. Technical qualification of new gas turbine drivers - reduced kit
2. Use of current limiters to eliminate electrical equipment
3. Modularization improvements – revise layout, increase density
4. Evaluate alternative tank technology - reduce cost, schedule
5. Potentially reduce total LNG storage capacity
6. Reduce material offloading facility size
7. Evaluating alternative ice management options



Initial design scope 91% complete through end of 2015

Pipeline materials design and testing in progress

- ✧ Evaluating weld processes / procedures
- ✧ Evaluating alternative coating designs / applications
- ✧ Full scale testing of 42" pipe completed
- ✧ 48" test pipe ordered and expected arrival in 2Q16

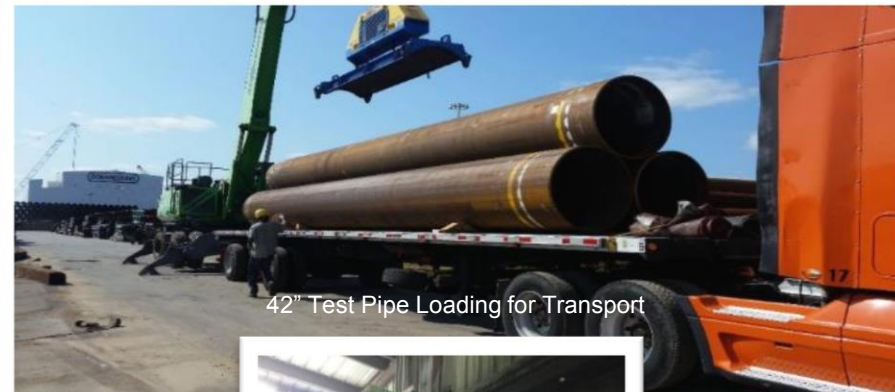
Continued engagement with federal pipeline regulator (PHMSA) to confirm design basis / align on special permits

Evaluating cost / schedule impacts of 48" pipeline

- ✧ All 48" engineering deliverables underway
- ✧ Cost estimate in final stages of development
- ✧ Offshore installation feasibility studies underway
- ✧ Decision for 42" vs. 48" pipeline expected in April 2016

Optimization Studies – Focus on Cost Reduction

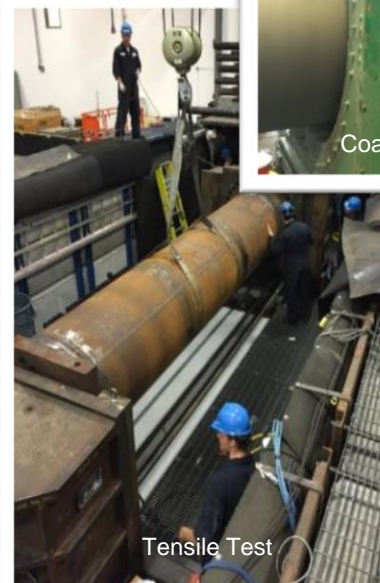
1. Construction – fine-tune pipeline route, reduce gravel
2. Camps – capture logistics and procurement opportunities
3. Pipeline design – safely increase valve / crack arrestor spacing and evaluate heater station requirements
4. ASAP Project – cooperation on routing and data sharing



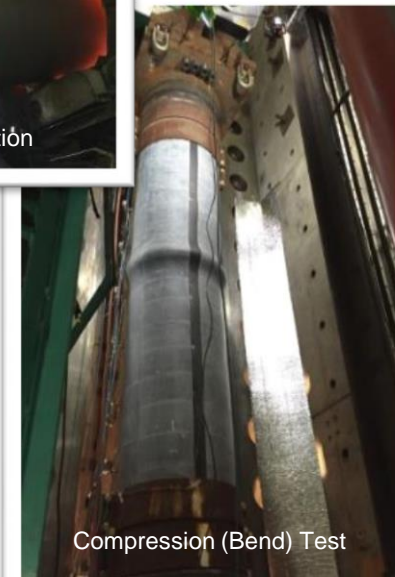
42" Test Pipe Loading for Transport



Coating Simulation



Tensile Test



Compression (Bend) Test

Full Scale Pipe Test (compressive)



Alaska LNG™

Completed field program in support of execution planning

1. Reduce total module weight / layout optimization
2. Electrical design - meet required load with min equipment
3. Machinery selection –highest reliability / lowest cost
4. Review plan utilities for optimization opportunities
5. Streamline project execution plan to identify lowest cost



Finished Alaska LNG Labor Study

- ✦ Sharing results with key stakeholders / Alaska Dept. of Labor
- ✦ Incorporating key finding into Alaska LNG labor strategy

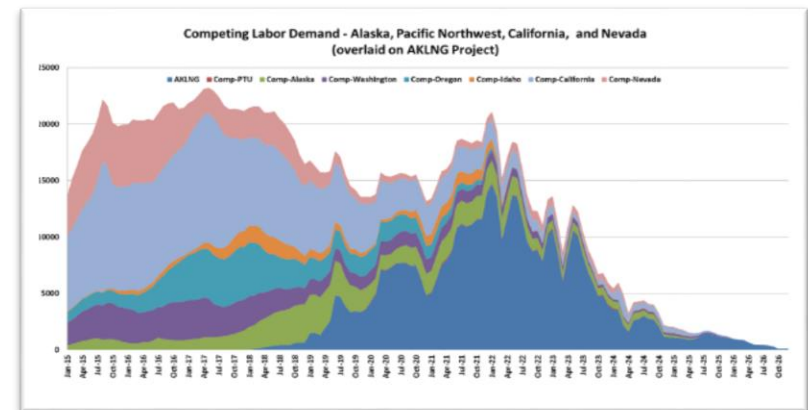
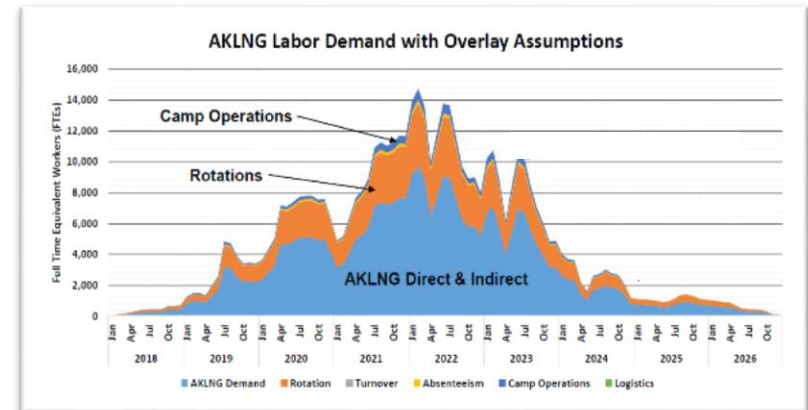
Key Findings / Recommendations

- ✦ Project labor demand exceeds current Alaska capacity
- ✦ Competing global projects will challenge labor acquisition
- ✦ Maximize use of Alaskans / focus on workforce development
- ✦ Project Labor Agreements can minimize contingency and risk impacts to EPC bidding

Strong coordination with AK Dept. of Labor & Workforce Development, Alaska Native corporations, training providers

Optimization – Focus on Cost Reduction

1. Evaluate potential impacts of 48" pipe
2. Finalize labor sourcing strategy
3. Develop structure and plan for Project Labor Agreements
4. Develop skills training roadmap and timing



Study focus on construction-related craft labor

Pipefitters, welders, ironworkers, carpenters, scaffolds, sheet metal workers, boilermakers, equipment operators, truck drivers, instrument technicians, insulators, electricians, laborers, etc.

Logistics Update

Completed Alaska LNG Logistics Study for Pre-FEED

- ✧ Sharing results with key stakeholders / AK Dept of Labor
- ✧ Incorporating key findings into Alaska LNG execution plans

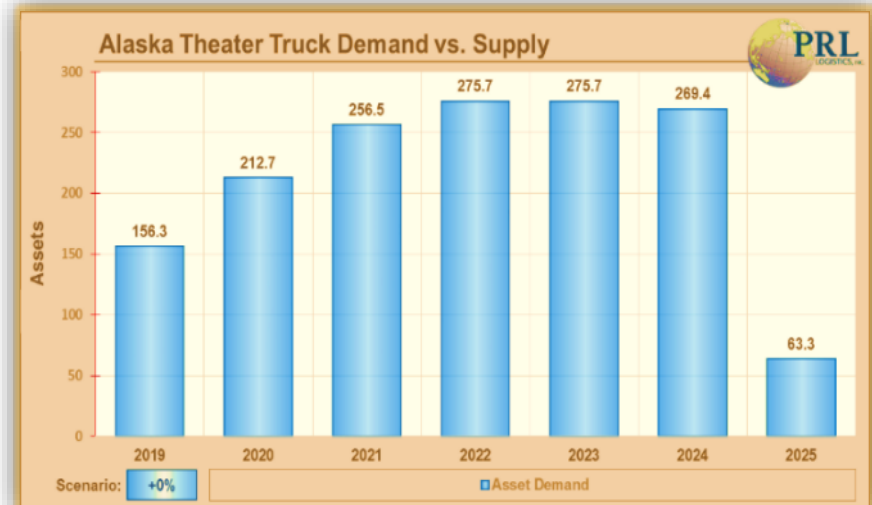
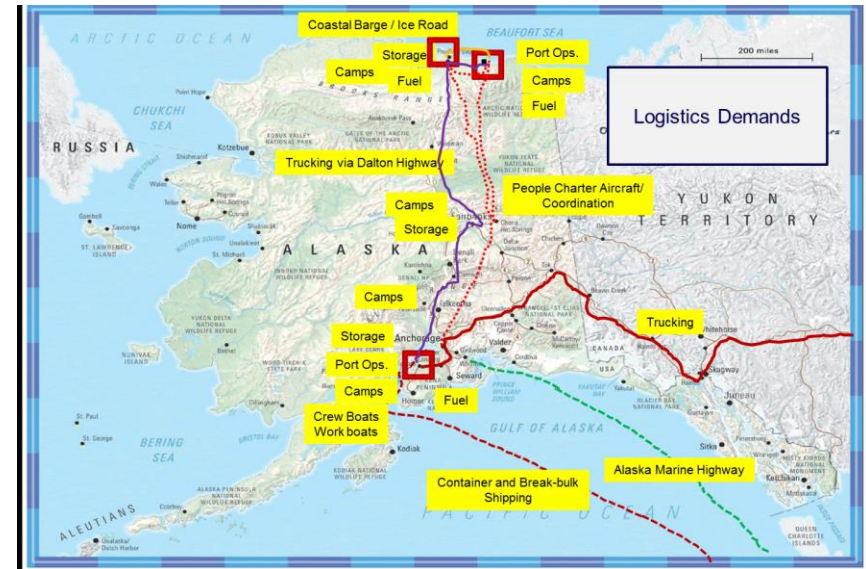
Key findings / recommendations for managing

- ✧ Trucking equipment and driver capacity
- ✧ Logistics standards, training and certification requirements
- ✧ Alaska Railroad utilization
- ✧ Coastal barges and tugs
- ✧ Aviation capacity

Strong coordination with AK Dept. of Transportation and local industry to develop Alaska logistics capabilities for trucking, rail, marine transport, airfreight, facilities

Optimization – Focus on Cost Reduction

1. Optimize project-wide logistics routes, transport alternatives
2. Evaluate identified opportunities for most efficient methods to move materials and equipment
3. Identify logistics infrastructure synergies across project
4. Incorporate into project execution, contracting strategies



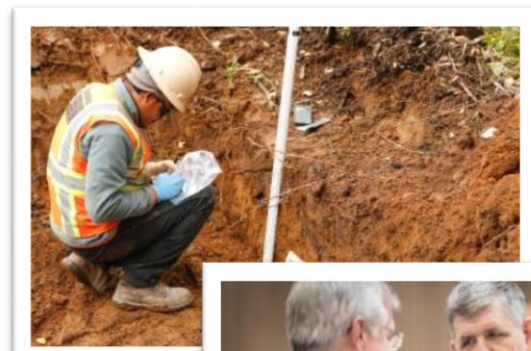
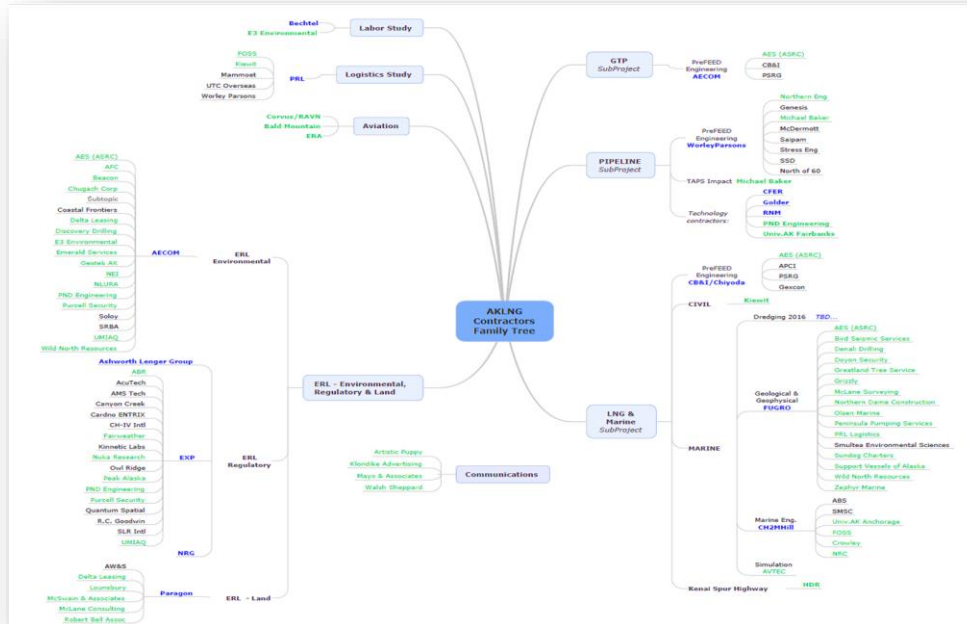
Contracting Approach

Combine ‘Global LNG’ and ‘Local Alaska’ skills / experience

- ✳ Expertise of Alaska businesses leveraged via global prime contractors
- ✳ Alaskans know State regulations, requirements and processes
- ✳ Ensure commitment to communities where we work

Near Term Contracting Goals

- ✳ Complete “market engagement” with qualified FEED/EPC bidders
- ✳ Continue public business information sessions
- ✳ Request FEED bids from qualified prime contractors
- ✳ Networking forums for global / Alaska contractors (2Q-3Q)
- ✳ Complete Alaska “focus group” sessions on execution plans



Summer Field Season / Regulatory Work **Alaska LNG™**

Successful 2015 Field Season - 250,000+ hours in field

- ✧ Supported pipeline routing and siting of project facilities
- ✧ Captured key lessons learned – continue to build on success

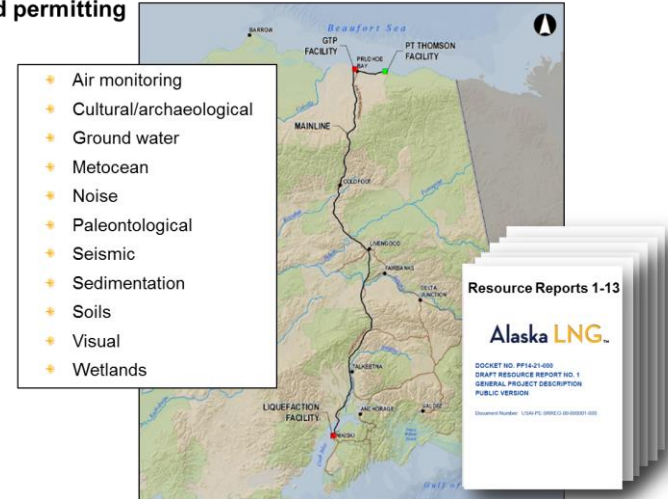
Progressing 2016 field planning – last season before filing

- ✧ “Wrap up” outstanding field work, fewer hours / focused effort

Federal Environmental Regulatory Agency (FERC) filing

- ✧ Nearing completion of second draft Resource Reports
- ✧ Capturing stakeholder input ahead of 1Q/2Q submission

Continued data collection throughout Alaska to support engineering, FERC filing, and permitting



Pre-Filing

Draft Resource Reports

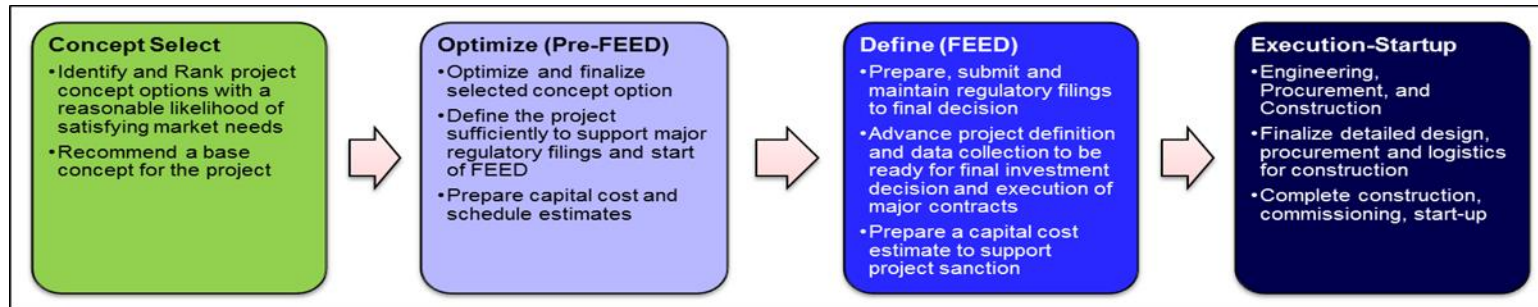
1. Project Description
2. Water Use & Quality
3. Vegetation & Wildlife
4. Cultural Resources
5. Socioeconomics
6. Geological Resources
7. Soils
8. Land Use, Recreation & Aesthetics
9. Air & Noise Quality
10. Alternatives
11. Reliability & Safety
12. PCB Contamination
13. LNG Information

Filing – planned October 2016

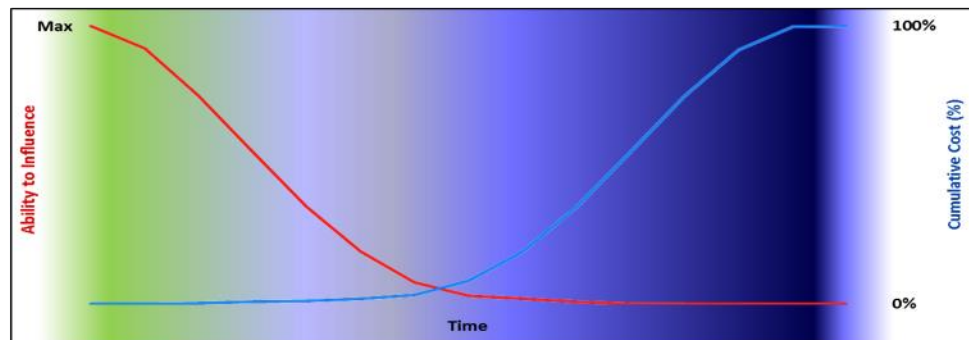
Natural Gas Act Section 3 Application

- Exhibit A -- Articles of incorporation and bylaws
- Exhibit B -- Statement of corporate and financial relationships
- Exhibit C -- State authorization
- Exhibit D -- Agreement between the applicant and border facilities
- Exhibit E -- Safety and reliability statement
- Exhibit E-1 -- Earthquake hazards and engineering
- Exhibit F -- “Final” Resource Reports**
- Exhibit G -- Location of facilities
- Exhibit H -- Statement regarding additional federal authorizations





Project Influence Curve



Forward Plans

- ✧ Select pipeline size, identify offtakes and complete integrated hydraulic model
- ✧ Complete pre-FEED deliverables
- ✧ Continue cost optimization work to improve project competitiveness - lowest 'cost of supply' wins
- ✧ Progress FERC Resource Report Draft 2 and EIS application