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1. Executive Summary

Pentex through its subsidiaries FNG and Titan constructed, enhanced and has owned and operated a 50,000 gallon per day (gpd) Liquefied Natural Gas (LNG) facility ("Titan I") in Pt. Mackenzie, Alaska for 18 years. A subsidiary of Pentex, Polar, completed significant development work on an LNG project in Deadhorse, Alaska prior to refocusing efforts on an expansion of the Titan facility in Pt. Mackenzie.

Pentex is owned by the Alaska Industrial Development and Export Authority (AIDEA), a public corporation of the State of Alaska. AIDEA has been working on LNG efforts in conjunction with the Interior Energy Plan since 2013.

The Titan II LNG Project (the "Project" or "Titan II") will benefit from and utilize and leverage the experience of years of safe and reliable operation of the Fairbanks distribution system and associated LNG production, transportation and storage facilities by Pentex and its subsidiaries. The Titan II option is also the lowest cost option among alternatives that have been considered. AIDEA's financing, through the IEP is a key component providing certainty that Titan II will have adequate low-cost financing that will be translated into lower natural gas rates for end users.

Qualifications of Pentex and Subsidiaries

Pentex operated the only small scale LNG facility in Alaska for over 18 years. FNG operated the natural gas distribution system for Fairbanks since 1998 ("LDC"). Pentex's operations are managed by a highly qualified, experienced management team that is well known to the Fairbanks community and the state and has over 50 years of combined industry experience and 40 years of combined experience managing the operations of FNG. FNG's operations are dependent on LNG and as a result FNG's management team has developed unrivaled experience managing the sourcing of gas as well as developing, building and operating the associated liquefaction, transportation, storage and ultimately distribution facilities in a safe, reliable manner. These same skill sets are utilized for the Titan II development and will be essential in the construction and operation of the Project in future years. Pentex's current operations include: i) sourcing gas from the Cook Inlet, ii) transporting the gas to the Point Mackenzie Liquefaction facility which operates around the clock and where the gas is converted into LNG, iii) transporting the LNG by truck to Fairbanks where FNG owns and operates two storage and vaporization facilities in which the LNG is converted back into gas and injected into the distribution system for delivery to FNG's customers. As more fully discussed herein, FNG is in the process of finalizing a large storage expansion project.

In summary, Pentex and its affiliates are qualified from a financial, technical, operational and management perspective to lead the effort to construct and operate the expanded Titan LNG facility and all other Project aspects. Given the previous development work on LNG projects, the ability to



Pentex Alaska Natural Gas Company, LLC



provide a comprehensive and integrated end-to-end Titan II Project, the experience of management, operational history at Pentex and the financial support of AIDEA through the IEP, there is no better-suited entity to execute this important project.

1. Overview of Proposed Project

Pentex through its subsidiaries Titan Alaska LNG, LLC (“Titan LNG”) and Fairbanks Natural Gas, LLC (“FNG”), has developed a comprehensive plan to construct a liquefied natural gas (“LNG”) liquefaction train (the “Titan II LNG Project” or “Titan II”) and integrate elements of Titan II with Pentex’s existing (“Titan I”) to create a combined 150,000 gpd LNG facility (the “Titan LNG Facility”). LNG produced from the Titan LNG Facility will be trucked to Fairbanks and other markets via the Parks highway, utilizing specialized LNG trailers. Titan contracts the operation and staffing of the transportation component to one or more existing qualified transport companies in Alaska.

FNG, with headquarters and operations in Fairbanks, and the Interior Gas Utility (“IGU”), will take delivery of the LNG at one of two existing storage facilities and at additional facilities under development. The LNG will be off-loaded into storage tanks, heated, returned to a gaseous state, and distributed by underground transmission and distribution pipelines to residences and businesses in the FNSB. In addition, the capacity of the Project not utilized by FNG and IGU will be sold to other customers, such as GVEA.

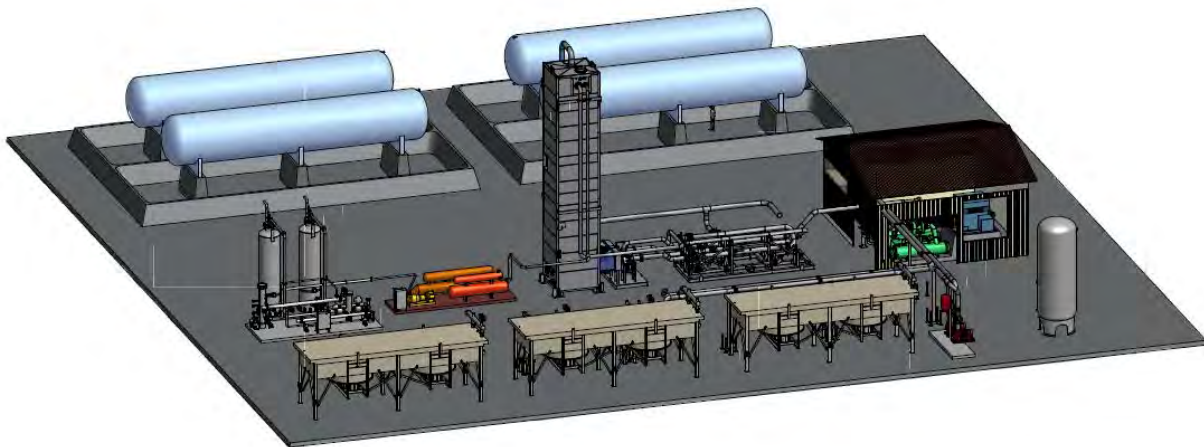


Figure 1 – Rendering of 100,000 GPD LNG Train with LNG Storage

Description of Project

Titan II will be co-located with Titan I on a 17.1-acre tract of land located in Pt. Mackenzie currently owned by Titan. The new LNG train is sized to a nameplate capacity of 100,000 gallons per day (“gpd”) or 3 billion cubic feet/year (“Bcf/yr”). The facility can be economically expanded in the future by adding additional production trains. The design contemplates one production train co-located and operated with the existing 50,000 gpd Titan I LNG plant. A future additional LNG train of 100,000



gpd will be considered during site planning and civil engineering. Timing of any future expansions will be dependent on demand and need. The timing of these expansions can be adjusted to meet market demands by accelerating or delaying their installation.

During the initial development of its North Slope LNG project, Pentex utilized industry experts such as CHI Engineering, Chicago Bridge and Iron, Haskell Corporation, Anvil Corporation and others to determine initial and final project scope and engineering. Pentex has utilized its historical LNG construction and operating experience as well as consultation with recent and relevant LNG project developers to solidify key project design and engineering criteria. Current project plan and budgets utilize these historical efforts as well as information specific to the Titan II project and site.

Associated Facilities included in the Titan II LNG Project

The Titan II LNG Project consists of the following sub-processes:

- 1) 0.5 mile 6-8 inch NPS feed gas pipeline rated to 1100 psig, capable of flow in excess of 50 MMscfd, designed and constructed in accordance with 49 CFR 192.
- 2) Pipeline Metering Module with Electronic Gas Measurement providing custody transfer, line loss detection, gas quality measurement, flow control, emergency shutdown and pig launching equipment.
- 3) Pig receiving equipment and receipt metering for line loss detection if required.
- 4) Gas Pre-Treatment plant to strip carbon dioxide, water and hydrogen sulfide from gas stream sized to replace the existing plant pre-treatment and the new LNG train.
- 5) Liquefaction process train.
- 6) Power Generation facility providing the electrical power to operate the process including conversion of existing facility to self-produced power vs. utility power if cost justified.
- 7) LNG Storage Tanks integrated with existing facility and new LNG train.
- 8) LNG Tanker Loading facility integrated with existing facility and new LNG train.
- 9) Electrical Switchgear Building.
- 10) Nitrogen Generator addition to existing nitrogen generation.
- 11) Trailer Wash Building.

Suitability of Design to Alaska Environment

Titan II is specifically designed for arctic conditions. The module buildings are designed using construction methods proven over 40 years of Alaska operation or will be housed in protective buildings. The low temperatures encountered in Alaska can benefit some of the processes. The gas generators used in the power generation station operate more efficiently when drawing in the cold dense air of winter conditions. The modules are fully enclosed, and designed to withstand wind loads, as required by 49 CFR 193, and protect operators and equipment from the elements. The modular design of Titan II allows it to be economically expanded over time and provides for construction of the main components outside of Alaska, with assembly to occur at the Pt. Mackenzie

facility during the summer months of 2017 and 2018. In addition, the module design provides the greatest level of opportunity to maximize the facility life in the event there is a desire to re-locate the facility in the future.

Land Requirements

The combined Titan LNG Facility will be located on the existing 17.1-acre site owned by Titan. The property is substantially cleared with a gravel base. Surveying has been completed and will be incorporated into the engineering design of the facilities.

The facility is in close proximity to the Enstar pipeline, Titan has an existing pipeline ROW and the location provides access to the feed-gas prior to odorization therefore reducing feed gas pre-treatment costs.



Figure 2 – Aerial Photo of Existing Titan Facility

2. Process Overview: Raw Gas to Delivered LNG

Pipeline

The Project requires construction of a 0.5 mile, 6-8" diameter pipeline to carry feedstock gas from the Enstar Valve Station to the liquefaction site. The route uses an existing right-of-way. The pipeline will be designed for 1100 psig, for compatibility with existing Enstar facilities. The normal operating pressure will be 550 to 850 psig. The pipeline is fusion-bonded epoxy coated for corrosion resistance. The pipeline will be designed to accommodate future expansion of the LNG facility. Pigging connections at each end of the line for portable pigging devices will be included in the design if required.

Pipeline Metering Module

Pipeline gas travels from the tie-in point through a Pipeline Metering Module. This module contains emergency shutdown valves, custody transfer metering, leak detection, electronic gas measurement, and flow control. Pig launching connections for portable pig launchers are also located here if necessary. Space is also allocated for the addition of mercury traps. Gas analysis provided to date shows no indications of mercury, however, given the critical impact of mercury contamination, space is available to easily add a mercury removal vessel should the need arise.

Gas Pre-Treatment

The Cook Inlet Gas that is used as feed stock for the Titan LNG Project contains approximately 0.5% CO₂ and a small percentage of H₂S. Neither of these compounds is compatible with the liquefaction process, and must be removed from the gas stream before liquefying. These compounds are removed using a conventional amine adsorption process. The pretreatment system removes carbon dioxide and water from the feed gas to levels that eliminate solidification in the liquefier. The system is designed to treat feed gas with a 0.5% CO₂ concentration and 3 ppm water at the design feed rate. The system consists of an amine unit that provides the removal of the CO₂ and a dehydrator for the removal of the water. The system will remove CO₂ in the inlet gas to a concentration equal to or less than 50 ppmv. Water will be removed to a concentration of less than 1 ppmv. The system will be designed with adequate over-design factors to ensure the pretreatment system will not limit the capacity of the liquefaction system. The gas first passes through an Inlet Separator before entering the Inlet Gas Heater where it is heated to 66°F by hot oil. The hot oil is provided by waste heat recovery units on the exhausts of the gas generators in the power generation section. It is then further heated to 100°F in a Feed Gas to Treated Gas exchanger before entering the amine contactor. The gas is treated by a 50 wt. % MDEA solvent in the tray contactor. The treated gas exits the top of the contactor at 120°F and is then cooled to 85°F in the Feed Gas to Treated Gas exchanger. The treated gas, with the carbon dioxide removed, is mixed with regeneration gas and is routed to the Treated

Gas Coalescer to remove any free water and amine prior to its entering the molecular sieve dryer system. The molecular sieve dries the gas stream by adsorbing the water vapor in a downward direction in one of two parallel vessels. The dry gas passes through a dust filter before exiting the dryer system. Regeneration gas is taken from the dry gas stream to regenerate the off-line molecular sieve vessel. The regeneration gas is heated to 450° F using hot oil in the Regeneration Gas Heater. The gas flows up through the off-line molecular sieve vessel until the molecular sieve material is regenerated. The off-line bed is then cooled to 100° F with flow in an upward direction until fully cooled and ready to be switched to the on-line vessel. The regeneration gas exiting the off-line bed is cooled by the Regeneration Gas Cooler (an air cooled exchanger), and then put through the Regeneration Gas Scrubber prior to being compressed by the Regeneration Gas Compressor. It then is mixed with the gas out of the Amine Contactor prior to entering the Treated Gas Coalescer. The gas stream exiting the molecular sieve system is dry (<1 ppmv water), and practically CO₂ free (< 50 ppmv). At this point the gas stream will be 85° F, and will be at a pressure of approximately 550 psig and is now suitable for liquefaction.

Liquefaction Process

The liquefaction facility uses a nitrogen process for refrigerating the natural gas. The process is selected for its inherent safety, since it compresses only inert nitrogen, and not flammable gases, its ease of operation, and the proven technology of the process. The nitrogen recycle process is essentially the same method used in hundreds of existing air separation plants currently producing liquid nitrogen, oxygen, argon, and other cryogenic fluids. The nitrogen is compressed and then undergoes a pressure drop through a turbo-expander, which decreases its temperature. The cold nitrogen is sent through one side of the main cryogenic exchanger ("Cold Box") and natural gas is sent through the other side of the exchanger, where it is refrigerated to liquid phase at approximately -250°F. The temperature of the nitrogen can be regulated through the compression and expansion cycle, allowing the LNG to be subcooled to -270°F if desired. The nitrogen remains a vapor, is recycled to the compressor, and the liquefied gas is sent to Truck Loading or the Surge Tanks. Subcooling of the LNG provides operational flexibility in the storage and transfer operations, and reduces the boil off gas rate.

The initial phase of the process is sized with one new LNG production train and incorporates the existing LNG production to allow scaling of output. The production trains operate at best efficiency at near full rate, so trains can be shutdown to match plant production to demand while maintaining best efficiency. The new train produces 100,000 gallons of LNG per day, and the existing facility produces 50,000 gpd for a total output of 150,000 gallons per day. The dual train approach also allows for sequenced scheduling of maintenance activities, while maintaining partial plant output.

The Nitrogen Recycle Process is very similar to the air separation process used to produce nitrogen, oxygen, argon and other industrial gases. There are hundreds of air separation units in operation across the United States, including at least two in Alaska. The air separation equipment and cold box



looks very similar to the equipment used in the nitrogen recycle liquefaction process. As a result of the large number of air separation facilities in operation, substantial improvements in efficiency in the compressors and cold boxes have been achieved. This results in the nitrogen recycle process delivering efficiency performance in the range of 0.85 kWh/gal which is very comparable to mixed refrigeration processes. In addition, the major components such as compressors and turbo-expanders are common units with repair parts readily available.

The liquefaction compressor needs 3.7 MW of power when operating at full rate. The power generation will be sized appropriately and to provide extra capacity for in-rush current requirements when the large compressor motors are started. When the full capacity of the power generation facility is not required, it is either backed down to match demand, or the excess capacity could be made available to the local electrical utility. The generator voltage will be consistent with local utility use.

The attached Process Flow Diagram in "Appendix C: Liquefaction Process at Titan LNG" depicts the plant operations.

Storage and Truck Loading

The LNG will be produced directly to the cryogenic tankers that haul the LNG, through a new, combined truck-loading system drawing from both Titan I and Titan II. For those times when there are no tankers in the loading bays, there are two 75,000-gallon water capacity LNG Surge Tanks to receive the output. The 75,000-gallon Surge Tanks are conventional ASME shop-fabricated vacuum jacketed design, using a stainless steel inner tank surrounded by super insulation, and jacketed with a carbon steel outer shell. Each tank is 12 ft. 6 in. wide x 12 ft. 10 in. high x 116 ft. long, and is the largest size shop built tank that can be economically transported to the site.

The tanker loading facility is an automated design consisting of two LNG loading stations complete with automatic controls and scales for commercial inventory control, and all of the LNG code required safety controls. The system is configured to reduce operator workload and improve transfer operations, by limiting the operator tasks to the connection and disconnection of the LNG and vapor hoses to the trailer, and the operation of the trailer valves, and the hose valves on the skid.



Figure 3 – FNG’s Trailer being unloaded in one of FNG’s Storage Facilities. FNG operates 14 LNG transports capable of delivering LNG to its various site locations, including Fairbanks, Talkeetna Alaskan Lodge, and Big Lake. Trucking service, including the tractors and drivers, is provided by Third Part Carriers. Each delivery contains up to 12,500 gallons of LNG (approximately 1000 Mcf of natural gas equivalent).

The operator kiosk is configured to provide the operator with all of the amenities that are required for the trailer unloading or loading operations, record keeping, hand warming, and communications.

A gas fired water glycol system is provided to heat the kiosk, and to provide the heat for snow melting of the operations areas and the LNG spill control structures.

Two signal poles, complete with ultraviolet/infrared (“UV/IR”) fire detectors, and Red and Green traffic lights are supplied for control of loading operations and to ensure that trucks are only cleared to drive off after all hoses and connections are secured.

The skid is configured with one UV/IR fire detector for each trailer loading station, one gas detector inside the kiosk, one in the gas chromatograph and heater enclosure, one over the valve cold box, and two LNG spill detectors.

There will be emergency shutdown stations located at each transfer station, wired into the fire alarm panel inside the kiosk with supervised circuits. The control system is configured with two touch screen HMI stations, and a local computer for back-up to the plant for inventory control.



Tanker Fleet and Trucking Operations

Titan will own the specialty LNG tanker trailers, and contract the hauling to local trucking firms. The demand will dictate the number of tankers per day hauling an average 12,000-gallon load from Pt. Mackenzie to Fairbanks. The trucks operate on a 20 hour round trip cycle. Titan has an existing fleet of 13 tankers and has 3 new units on order. Titan will continue to add units as the market increases. The tankers not in route at any given time will be staged at the Pt. Mackenzie facility.

The tankers are loaded by weight using scales at the tanker loading facility.

Fairbanks LNG Storage

FNG currently owns and operates two LNG storage and regasification facilities in Fairbanks with a total storage capacity of 340,000 gallons and regasification capacities of 12 MMSCF/day or 4 Bcf/year. Recognizing the need to have additional quantities of LNG in storage in Fairbanks to meet increasing demand, FNG began work on expanding its storage capacities. In May 2012, FNG announced it will greatly expand its storage capacity in Fairbanks by adding a 5,250,000-gallon storage tank, including additional vaporization capabilities. The engineering and design work is well underway and construction is expected to begin in the summer of 2017 with completion in late 2018. This schedule ensures the added storage capacity is available for use as soon as the Titan II LNG Project begins production of LNG. The storage tank is anticipated to qualify for the State of Alaska refundable tax credit of 50% of the capital costs, up to a maximum credit of \$15 million. Appendix I contains an engineering drawing of the new LNG storage tank design.

The LNG storage tank design includes consideration for the delivery of high pressure gas (800psig) into a transmission system for efficient delivery of gas to North Pole to include power generation, refinery and space heat needs, and a transmission network to bolster pressures and supply volumes to the existing and expanded distribution network in the remainder of the FNSB should it be needed.

A key component to providing natural gas to an increasing number of residents and businesses of the Fairbanks area is having sufficient storage capacity to allow for stabilization of LNG production and filling of storage tanks prior to the winter heating season. The LNG inventory from the storage tanks can then be utilized during the heating season, with on-going replenishments from the Titan LNG Project, while still maintaining adequate security levels of LNG to provide for a minimum of five days of peak demand. In the initial years of use the storage tank will provide a much greater level of supply back-up as the market demand in the FNSB area grows.

The Figure 4 below provides a representation of where the new 5.25-million-gallon storage tank will be located at the FNG storage facility #2, located on Tria road in South Fairbanks. The construction of the new tank and facilities can be completed without interruption to the existing facilities. The existing four tanks shown in the graphic below, will become surplus to this facility and may be redeployed for use by IGU for a North Pole facility or other markets such as South Central Utilities or

other communities and industrial markets.



Figure 4 – New Storage Tank Location in FNG’s Storage Facility #2

System Control Facilities, Fire Suppression Systems, SCADA

The existing Titan LNG Facility Control Room at the Pt. Mackenzie plant site will be modified and expanded to monitor the pipeline, both liquefaction trains and truck loading operations, and will be continuously operated. The Plant Control System will be available for remote monitoring and operation from Fairbanks. The Plant Control System monitors and controls pipeline pressure and flow, pipeline leak detection, and feed gas quality. The pipeline will be able to be shut down and depressurized from the control room. The pipeline will be patrolled by ground at intervals required by 49 CFR 192.

The Plant Control System monitors all operations of the power generation, gas pre-treatment, liquefaction, storage, and tanker loading. A control operator will operate from the control panel in the control room. The operator will be able to monitor truck loading operations to ensure proper loading procedures are used.

The new liquefaction system is essentially a “one-button” start-up. The operator monitors the automated startup sequence to ensure the equipment performs as designed. Other facilities using the same equipment as Titan start and operate the liquefaction units remotely. The existing facility requires a greater level of manual operation and as such the existing Plant staff are well versed in LNG facility operations and will be able to readily adapt to the new facilities.

The process area of the plant is fitted with gas detectors and flame detectors. The Fire and Gas Panel will control module ventilation systems on gas detection to increase ventilation and remove the gas



from the buildings. Upon flame detection, the ventilation is shutdown to help control the air supply to the fire. The Fire and Gas Panel also controls the gas shutoff valves and depressurization system so that the supply of fuel can be cut off in an emergency.

Portable fire extinguishers will be located throughout the facility.

Module Design

Loss of productivity due to weather, the cost of transportation and billeting, and the short building season make Alaska an expensive place to construct. Off-site construction, using module design has proven to be a cost-effective solution for Alaska construction. Titan LNG will use off-site module construction. Titan will select suppliers and contractors with module design, fabrication and installation experience

The Titan II liquefaction train and related equipment will be constructed in multiple modules at vendor facilities or near intermodal shipping routes. The modules are nominally 12 feet wide by 50 feet long by 13 feet high, and weigh from 30,000 to 100,000 lbs. They will be hauled by truck to the shipping terminal in Tacoma, Washington, and shipped via regularly scheduled steamship or barge to the Port of Anchorage. They will then be rolled off the barge and trucked overland to the Pt. Mackenzie site. By utilizing truckable modules, Titan eliminates any schedule risk associated with a sea lift barge approach and ensures future portability.

The modules are pre-constructed off-site and require only placing and anchoring to the foundations, interconnection of piping, wiring, and ductwork. The enclosed modules or modules placed in buildings allow interconnect work to proceed efficiently indoors through the winter season, therefore reducing weather related schedule and cost overrun risk.

Point Mackenzie Experience

The gas pre-treatment process used at Titan's existing Point Mackenzie plant is substantially the same as that proposed replacement for the combined LNG plant. Titan has been operating an amine recirculation plant and molecular sieve dryer at Point Mackenzie since 1998 to remove CO₂ from the gas feedstock prior to liquefaction. The liquefaction process used at Point Mackenzie is somewhat more complicated than the process proposed for the new LNG train. Point Mackenzie uses a mixed refrigerant cascade system, in which separated components of natural gas (ethane, propane, methane) are used to chill the gas in stages. The Point Mackenzie plant produces LNG directly into the tankers, and does not use intermediate storage, so the tanker loading operations are somewhat more complicated than that proposed for the combined expanded LNG plant.



Figure 5 – Titan’s Liquefaction Facility in Point Mackenzie. Liquefaction plant strips the Cook Inlet gas of water and other impurities. The natural gas is liquefied through a process of cooling and pressure reduction. Titan operates around the clock during peak demand, and takes two hours from plant startup to producing liquids.

The Titan II LNG Plant Control System will use the same HMI (human-machine interface) software package as is in use in Titan I at Point Mackenzie, so that there will be a consistent look and operating practice across all operations.

3. Construction Process Overview

Pre-FEED work to date and budget development has utilized Pentex’s significant prior efforts developing LNG facilities. FEED engineering will firm up design, engineering and budget assumptions.

Engineering will be completed during FEED to the level necessary to achieve a definitive project budget, complete permits and issue “scopes of work” to contractors and suppliers for fixed price bids, and will result in the work product and documents listed below by engineering discipline:

- **PROCESS**
 - Hazard Identification
 - Consequence based risk scenarios developed
 - Gas Pre-Treatment
 - P&ID
 - Conceptual module layout
 - Liquefaction

- Process equipment manufacturer has made efficiency improvements to process
 - P&ID
 - Conceptual module layout
- LNG Storage
 - P&ID
 - Tank Design
 - Vapor dispersion calculations
 - Thermal exclusion calculations
- LNG Truck Loading
 - P&ID
 - Module layout
- Power Generation & WHRU
 - P&ID
 - Equipment selection
 - Layout
- Pipeline
 - Sizing & hydraulics
 - Route finalized
 - Metering P&ID
 - Metering equipment selection
 - Topographic survey
- *CIVIL/STRUCTURAL/ARCHITECTURAL*
 - Plot Plan
 - Foundation sizing
 - Site survey complete
 - Pad fill complete
 - Module frame design
 - Module siding design
- *MECHANICAL*
 - Ancillary equipment selection
 - HVAC design specifications
 - Fire and Gas ventilation plan
- *PIPING*
 - Specifications
 - Sizing
 - Outside piping plan
 - Preliminary pipe stress on large rotating equipment
- *ELECTRICAL*

- Load study
 - Switchgear selection
 - Transformer sizing
 - Distribution wiring plan
 - Motor starting plan
 - Module Lighting plan
 - Yard Lighting plan
- *INSTRUMENTATION*
 - Block diagram
 - Cabinet sizing
 - Preliminary instrument index
 - Preliminary I/O list
 - SIS block diagram
- *PAINTING/COATINGS/INSULATION*
 - Pipe insulation specification
 - Pipeline corrosion coating specification
 - Noise attenuation specification
- *CONSTRUCTABILITY*
 - Contracting plan
 - Letters of intent/MOU in place for:
 - Process engineering & equipment supply
 - Liquefaction, and gas pre-treatment equipment supply
 - Pipeline EPC
 - Power Generation & Waste Heat Recovery Units
 - Balance of Plant EPC (including module design, fab & install)
 - Escalation forecast updated monthly (currently does not exceed 2%)
 - Risk analysis
 - Contingency calculations



4. LNG Facility Operations

Pentex plans to utilize existing staff and experience to operate the expanded Titan LNG Facility. Pentex is uniquely positioned to draw upon its expertise in operating a gas liquefaction facility in Alaska through its subsidiaries FNG and Titan. The experienced liquefaction facility personnel at the Point Mackenzie LNG facility will participate in the plant commissioning and receive training throughout construction.

Existing operations staff will be trained during the final year of the LNG plant construction, participating in the commissioning and start-up of all major components. This hands-on participation in the final phases of construction is extremely beneficial in developing the appropriate knowledge base and expertise in dealing with a new facility. Titan operation staff will experience and learn from commissioning challenges and gain first-hand trouble shooting and problem solving knowledge.

The Titan LNG Facility will be operated on a 24 hour per day, 365 days per year basis. The normal operating crew consists of one Control Room Operator, who monitors the Plant Control System and the operations of the pipeline, power generation station, pre-treatment process, liquefaction process, and truck loading. A maintenance technician will also be on duty during the day operations shift to provide preventive maintenance and repairs as required. The truck loading facility is an automated process intended to be operated by the truck drivers, in the same way that FNG operates its truck offload facilities in Fairbanks today.

Titan will have one full-time Manager and 8- 10 full-time employees. [Plant operators will complete routine maintenance of the LNG facility and the LNG transport trailers.](#) Administrative assistance will be provided by FNG accounting and administrative staff as it is done now.

LNG Transportation Strategy and Capabilities

Pentex has significant experience in the safe transportation of LNG in Alaska. FNG and Titan have been transporting LNG by highway from Point Mackenzie to the Fairbanks storage yards, a one-way distance of 340 miles, for over 16 years. During this time there have not been any third party damages or environmental impacts resulting from a release of LNG during transport operations.

Pentex has worked directly with major LNG trailer manufactures to design a LNG tanker trailer unit to meet the vigorous duty requirements of trailers used on Alaska's demanding roads.



Figure 6 –One of Titan’s High Capacity LNG Trailers

In addition to significant advancement of LNG trailer designs for use in the harsh environments of Alaska, Pentex has recognized the economic and environmental benefits of ensuring the heavy-duty trucks used to pull the LNG trailers are fueled by LNG instead of Diesel. So as to ensure project readiness and applicability of design, Pentex and its subsidiaries have constructed two LNG fueling stations, one in Fairbanks and one in Big Lake, so that Titan could begin using LNG fueled units in its existing operations to ensure maximum reliability and preparedness when a large truck order is needed for meeting the increased demands from the expanded Titan LNG Facility. Titan has received two new LNG fueled Kenworth T-800 tractors which where be put into full service in February of 2013.

The continued use of LNG-fueled tractors in trucking operations could result in reduced transportation costs, the benefits of which pass-through to natural gas customers. LNG as a transportation fuel may be meaningfully less costly than the alternative diesel fuel.



Figure 7 – One of Titan’s LNG Tractors

Although Pentex feels strongly that the transportation assets necessary to meet the Project needs should be owned by Titan, the operation and staffing of the transportation needs are more effectively provided by existing third party transportation companies familiar with the day-to-day operations of trucking. Titan will issue a Request for Proposal to pre-qualified Alaskan companies for these services and will select one or more based on qualifications, safety record and economics. By owning the assets, Titan is not bound to any particular company and can ensure maximum safety and efficiency through the competitive process.



Figure 8 – One of Pentex’s LNG Fueling Stations



LNG fueling stations as depicted above will be located in strategic areas of Alaska to provide fueling support to the Titan LNG Facility, as-well as other Alaska trucking fleets.

Utilization of FNG Storage Facilities

Pentex, as the owner of both the Titan LNG Facility and FNG will be able to seamlessly integrate the transport of LNG from the Titan LNG Facility into the FNG storage and distribution systems. The LNG storage facilities are ready to be expanded to accommodate significant quantities of LNG from the Titan LNG Facility and existing storage facilities are in place to meet the current needs and affect a seamless transfer to expanded storage. The utilization of FNG's storage tanks benefits Interior Alaska in two primary ways. During the winter heating season, ample LNG will be kept in storage in the Fairbanks area to assure the citizens of Fairbanks that natural gas will be available even during extended periods of extreme cold weather. The LNG in storage provides security of supply availability, even during times of transportation disruptions or LNG facility outages. Additionally, the 5.25 million gallon new storage tank combined with the Titan LNG Project will enable FNG and IGU to serve the majority of the space heating market in the Fairbanks area, significantly reducing heating costs to the residents and businesses compared to the current usage of heating oil.

The fact that FNG has current storage facilities in operation and a substantial expansion in progress is of major benefit to the Titan LNG Project. First, the storage facilities capital costs have an established and immediate customer base in which to begin amortizing the costs, and therefore reducing Project revenue lag and ensuring adequate Project cash flows, which do not have to be borne by the Project alone. Second the Project completion risk and timing of storage completion is greatly reduced since storage facilities are constructed and in operation well before they are required by the expanded Titan LNG Facility. Finally, any Project risk associated with property acquisition has been eliminated.

Integration into FNG & IGU Distribution System

Pentex will also integrate the LNG from the Titan LNG Facility all the way to the end user business or home customer through the FNG and IGU natural gas pipeline distribution system. FNG and IGU's distribution system provides a major starting point in which to serve existing customer base and expanded to future customers. Similar to the benefits of the LNG storage project, the fact that FNG and IGU have developed an existing market, established a safe and reliable distribution network and has immediate access to an expanded customer base, ensures the Titan LNG Facility will have a well-defined market upon which to rely. FNG and IGU have the experience and expertise necessary to expand the natural gas distribution system to the greatest number of customers at the lowest cost.



5. Conclusion

Pentex and IGU are fit, willing and able to participate with AIDEA to finalize the Titan II LNG Project. The Pentex-managed project is the most timely, cost effective and complete project, with substantial engineering, permitting and physical construction complete today.

Pentex, through FNG has an existing and growing market for the LNG and is experienced in all aspects of LNG production, transportation and storage and natural gas transmission and distribution. The comprehensive plan developed by Pentex and IGU results in the lowest cost energy to the Interior in the quickest timeframe with the least amount of risk.

The Pentex management team has the necessary skills, experience and dedication to ensure a successful project is completed safely and efficiently with the maximum benefit to consumers. The combination of AIDEA equity and low cost debt with Pentex entrepreneur spirit and drive results in the best of both worlds, low cost of capital and efficient management and operations.



Appendix A: Budgetary Cost Estimate for the Titan II LNG Project

ITEM	Pentex 2014 Scope @ 2016 \$	Scope Adjustments	Titan 2 Estimate	SOURCE	Pentex 2014 Estimate
	3.00%				
PROCESS EQUIPMENT					
Liquifier / Air Pre-cooler	\$ 9,296,000	\$ -	\$ 9,296,000	BUDGET QUOTE	\$ 8,300,000
Pre-Treatment (Dickson Amine)	7,230,160	-	7,230,160	BUDGET QUOTE	6,455,500
Boil-off gas compressor	-	600,000	600,000		-
Titan 1 - Booster Compression	-	740,000	740,000		-
SUBTOTAL - PROCESS EQUIPMENT	\$ 16,526,160	\$ 1,340,000	\$ 17,866,160		\$ 14,755,500
PLANT POWER					
Transmission Line	\$ 3,360,000	\$ (3,360,000)	\$ -	ROM	\$ 3,000,000
Transformers	1,120,000	(1,120,000)	-	ROM	1,000,000
Direct drive turbine OR on-site power gens	-	5,000,000	5,000,000		-
SUBTOTAL - PLANT POWER	\$ 4,480,000	\$ 520,000	\$ 5,000,000		\$ 4,000,000
LNG STORAGE					
75,000 Bullet	\$ 1,400,000	\$ -	\$ 1,400,000	COMP	\$ 1,250,000
2nd 75,000 Bullet	-	1,400,000	1,400,000		-
SUBTOTAL - LNG STORAGE	\$ 1,400,000	\$ 1,400,000	\$ 2,800,000		\$ 1,250,000
CONTROLS / REVENUE EQUIPMENT					
System Integration	168,000	-	168,000	ALLOWANCE	150,000
Truck Loading Skid	1,232,000	-	1,232,000	ROM	1,100,000
Shed over truck loading area + scales	-	337,991	337,991		-
LNG loading scales	-	238,000	238,000		-
Transmission Supply Gas Meter & Regulator	-	300,000	300,000		-
SUBTOTAL - CONTROLS / REVENUE EQUIPMENT	\$ 1,400,000	\$ 875,991	\$ 2,275,991		\$ 1,250,000
BALANCE OF PLANT					
Excavation / Backfill	\$ 336,000	\$ -	\$ 336,000	PARAMETRIC	\$ 300,000
Enstar Pipeline	1,120,000	-	1,120,000	PARAMETRIC	1,000,000
Grading	112,000	-	112,000	PARAMETRIC	100,000
EQ Foundations	224,000	-	224,000	PARAMETRIC	200,000
Building (Compressor)	168,000	-	168,000	PARAMETRIC	150,000
Building (Expander)	67,200	-	67,200	PARAMETRIC	60,000
Equipment Setting and Crane	1,008,000	-	1,008,000	PARAMETRIC	900,000
Piping	560,000	-	560,000	PARAMETRIC	500,000
Yard Lighting	84,000	-	84,000	PARAMETRIC	75,000
Electrical (incl. SoftStart)	560,000	-	560,000	PARAMETRIC	500,000
Instrumentation Install	56,000	-	56,000	PARAMETRIC	50,000
Electrical Building	38,640	-	38,640	QUOTE	34,500
Nitrogen Make-up	56,000	-	56,000	PARAMETRIC	50,000
Nitrogen Storage Tank	56,000	-	56,000	COMP	50,000
Insulation	560,000	-	560,000	PARAMETRIC	500,000
Truck/trailer wash bay	-	750,000	750,000		-
SUBTOTAL - BALANCE OF PLANT	\$ 5,005,840	\$ 750,000	\$ 5,755,840		\$ 4,469,500



Pentex Alaska Natural Gas Company, LLC



ITEM	Pentex 2014 Scope @2016 \$	Scope Adjustments	Titan 2 Estimate	SOURCE	Pentex 2014 Estimate
	3.00%				
OWNER / SOFT COSTS					
Project Staff	\$ 1,016,947	\$ -	\$ 1,016,947	FACTOR	\$ 907,988
Operator training	197,790	-	197,790	FACTOR	176,598
Engineering	2,533,849	(250,000)	2,283,849	FACTOR	2,262,365
Geo-tech	-	250,000	250,000	FACTOR	-
Enviro / Permit Consultants	1,585,858	-	1,585,858	FACTOR	1,415,945
Freight	1,120,000	-	1,120,000	FACTOR	1,000,000
SUBTOTAL - OWNER / SOFT COSTS	\$ 6,454,444	\$ -	\$ 6,454,444		\$ 5,762,896
TOTAL BEFORE CONTINGENCY	\$ 35,266,444	\$ 4,885,991	\$ 40,152,435		\$ 31,487,896
CONTINGENCY	3,955,784	2,067,081	6,022,865	FACTOR	3,531,950
% Contingency for Conceptual Estimate			15.00%		
GRAND TOTAL	\$ 39,222,228	\$ 6,953,072	\$ 46,175,300		\$ 35,019,846



Appendix B: Operating Cost Estimate for the Titan II LNG Project

	2016 Budget	Expansion Activities Increase (Decrease)	Revised Budgeted	% Increase (Decrease)
Gas liquefaction expenses				
Communications	\$ 7,480	\$ 1,870	\$ 9,349	25.0%
Utilities	\$ 43,257	\$ 10,814	\$ 54,072	25.0%
Other Expenses	\$ 10,115	\$ 2,529	\$ 12,644	25.0%
Safety Material	\$ 10,506	\$ 2,627	\$ 13,133	25.0%
Freight Expense	\$ 1,905	\$ 476	\$ 2,381	25.0%
Yard Maintenance	\$ 920	\$ 230	\$ 1,149	25.0%
Maint - Structure Materials	\$ 888	\$ 222	\$ 1,110	25.0%
Maintenance - Processing Equipment	\$ 400,125	\$ 100,031	\$ 500,157	25.0%
Maint - Transp Truck Materials	\$ 13,071	\$ 3,268	\$ 16,339	25.0%
Maint - Transportation Trailers	\$ 97,500	\$ 24,375	\$ 121,875	25.0%
Maint - Other Equip Materials	\$ 2,190	\$ 548	\$ 2,738	25.0%
Maint - Light Truck	\$ 3,500	\$ 875	\$ 4,375	25.0%
Maint - Heavy Equip	\$ 6,756	\$ 1,689	\$ 8,445	25.0%
Maint - Small Tools	\$ 6,494	\$ 1,623	\$ 8,117	25.0%
Maint - Shop Consumables	\$ 26,742	\$ 6,686	\$ 33,428	25.0%
	\$ 631,450	\$ 157,863	\$ 789,313	25.0%
Talkeetna maintenance				
Maint - Equip Materials	\$ 7,500	\$ -	\$ 7,500	0.0%
Maint - Small Tools	\$ 250	\$ -	\$ 250	0.0%
	\$ 7,750	\$ -	\$ 7,750	0.0%
Admin & general expenses LNG				
Computer & Office Supplies	\$ 528	\$ -	\$ 528	0.0%
Office Supplies & Expense	\$ 2,340	\$ -	\$ 2,340	0.0%
Postage & Mailing Exp	\$ 317	\$ -	\$ 317	0.0%
Outside Services - General	\$ 37,813	\$ -	\$ 37,813	0.0%
Outside Services - Legal	\$ 20,000	\$ -	\$ 20,000	0.0%
Outside Services - Accounting	\$ 25,688	\$ -	\$ 25,688	0.0%
Outside Services - Engineering	\$ 39,240	\$ -	\$ 39,240	0.0%
Property Insurance - Equipment	\$ 76,817	\$ 300,000	\$ 376,817	390.5%
Property Insurance - Auto	\$ 11,643	\$ -	\$ 11,643	0.0%
General Liability Insurance	\$ 13,519	\$ -	\$ 13,519	0.0%
Workers Compensation Insurance	\$ 30,325	\$ -	\$ 30,325	0.0%
Employee Incentive	\$ 50,000	\$ -	\$ 50,000	0.0%
Insurance - Health	\$ 24,083	\$ -	\$ 24,083	0.0%
Misc General Expenses	\$ 16,296	\$ -	\$ 16,296	0.0%
Dues and Subscriptions	\$ 709	\$ -	\$ 709	0.0%
Meals & Entertainment	\$ 206	\$ -	\$ 206	0.0%
Transportation Fuel	\$ 2,013	\$ -	\$ 2,013	0.0%
Travel	\$ 458	\$ -	\$ 458	0.0%
Training & Seminars - Admin	\$ 4,090	\$ -	\$ 4,090	0.0%
General Maintenance Building	\$ 5,000	\$ -	\$ 5,000	0.0%
	\$ 361,083	\$ 300,000	\$ 661,083	83.1%



Appendix B: (continued)

G&A - LNG

Salaries	\$	651,623	\$	-	\$	651,623	0.0%
A dditional Payroll (Overtime)	\$	50,094	\$	-	\$	50,094	0.0%
A dditional Payroll (Night Diff)	\$	4,160	\$	-	\$	4,160	0.0%
Payroll Taxes & Benefits							
Payroll Taxes		7.65%				7.65%	
SUI		2.07%				2.07%	
401(k)		4.00%				4.00%	
		<u>13.72%</u>				<u>13.72%</u>	
Benefits	\$	16,563	\$	-	\$	16,563	0.0%
Payroll Taxes	\$	60,446	\$	-	\$	60,446	0.0%
Total Payroll Taxes & Benefits	\$	77,009	\$	-	\$	77,009	0.0%
Total LNG Labor Costs	\$	<u>782,887</u>	\$	-	\$	<u>782,887</u>	0.0%
Total Operating Cost	\$	<u>1,783,170</u>	\$	<u>457,863</u>	\$	<u>2,241,033</u>	<u>25.7%</u>

