ANALYSIS OF AMENDMENT APPLICATION AND PROPOSED DECISION
BADAMI SALES OIL PIPELINE RIGHT-OF-WAY LEASE, ADL 415472

INSTALLATION OF NEW PIPING AND TIE-IN BETWEEN BADAMI SALES OIL PIPELINE AND THE POINT THOMSON EXPORT PIPELINE

Proposed Action: Savant Alaska, LLC (Savant) as majority owner of and on behalf of Nutaaq Pipeline, LLC (Nutaaq), lessee for the Badami Sales Oil Pipeline (BSOP) Right-of-Way (ROW) Lease, ADL 415472, submitted a request to amend the BSOP ROW Lease to add approximately 0.22 acres of land just west of the Badami Central Production Facility pad.

The purpose of the request is to add lands associated with the installation of approximately 55 feet of new pipeline and the tie-in connecting the Badami Sales Oil Pipeline to the Point Thomson Export Pipeline (PTEP). The construction of temporary gravel pads is anticipated to begin July 2015. Installation of the pipe and the piggable wye will occur in early September 2015. See drawings for more details (Attachments A, B and C).

The lands are generally described as: A rectangular area measuring 240 feet by 40 feet within the NE4 of Section 8, Township 9 North, Range 20 East, Umiat Meridian.

Authority: Alaska Statute (AS) 38.35.015 and the Badami Sales Oil Pipeline (BSOP) ROW Lease, ADL 415472.

Administrative Record: The BSOP ROW Lease, ADL 415472, and the associated casefile.

Background: Nutaaq is lessee for the BSOP ROW Lease, ADL 415472. Savant holds a 67.5% interest in Nutaaq. The remaining 32.5% interest is held by Badami Pipeline Holding, LLC, which is owned entirely by Arctic Slope Regional Corporation, LLC.

On October 31, 2012, the PTEP ROW Lease was approved by the State Pipeline Coordinator’s Office (SPCO). The PTEP installation was completed by ExxonMobil Development Corporation in 2014 with plans to connect to BSOP with a piggable wye connection in late 2015. In anticipation of this tie-in, Savant, on behalf of the lessee, applied for and received approval from the State Pipeline Coordinator on January 26, 2015, to construct Vertical and Horizontal Supports for the planned tie in piping. On April 3, 2015, Savant submitted a ROW amendment application requesting a lease amendment for the proposed PTEP and BSOP tie-in.
The notice of the amendment application was published on the State of Alaska Online Public Notice website, https://aws.state.ak.us/OnlinePublicNotices/default.aspx, and the SPCO website, https://dnr.alaska.gov/commis/pco/notices.html, on April 22, 2015; and notice of the amendment application was published in the Arctic Sounder and the Alaska Dispatch News, on April 23, 2015.

Per AS 38.35.070, the following coordinate agencies were notified of the amendment application and provided with a web link to the application and public notice documents: Alaska Department of Environmental Conservation, Department of Labor and Workforce Development, Department of Transportation and Public Facilities, and the Regulatory Commission of Alaska.

In addition, the following agencies were notified of the amendment application: Alaska Department of Administration, Oil and Gas Conservation Commission; Alaska Department of Fish and Game; Alaska Department of Law; Alaska Department of Natural Resources, Northern Region Office, Alaska Department of Public Safety, Fire Marshal’s Office; and the Alaska Department of Revenue.

Copies of the Notice of Application were sent to the following entities: Native Village of Kaktovik; Inupiat Community of the Arctic Slope; Kaktovik Inupiat Corporation; Arctic Slope Native Association, Ltd; City of Kaktovik; North Slope Borough; and the Arctic Slope Regional Corporation. In addition, copies of the public notice were sent to the Barrow, Kaktovik and Prudhoe Bay post offices to be posted for the entire notice period.

The SPCO identified PTE Pipeline LLC, lessee, PTEP Right-of-Way Lease, ADL 418975, as a third-party interest in the area. PTE Pipeline LLC also received notification and was provided with a web link to the application and notice of application. Other interests in the area, ADL 415965 Badami Utility Pipeline Right-of-Way Lease; and ADLs 367011 and 365533, Oil and Gas Competitive Leases on LST BS0134 Oil and Gas Lease Sale Tract are all interests held in large part or entirely by Savant.

**Cultural Resources:** The State Historic Preservation Office has previously reviewed the lands under this application and determined that the area encompassed by this amendment, lands within the Badami Utility Pipeline Operations ROW, were not affected by historical properties in 2012. Cultural resources located near the BSOP ROW, were discussed in the July 17, 2012 Analysis and Recommendation for the BSOP Construction ROW Release of Interest, specifically stating that those resources in the area were outside the BSOP and Badami Utility Pipeline ROWs. The proposed amendment project lies outside the existing BSOP ROW, but within the Badami Utility Pipeline ROW. No cultural resources have been identified within the Badami Utility Pipeline ROW and pipeline activities have been authorized for the Badami Utility Pipeline within the lands encompassed by this application.
**Project Description:** The project site is located close to where the PTEP terminates at the 401 metering skid which is adjacent to the Badami Central Production Facility pad; PTEP custody would end at a flange on the northeast end of the metering skid.

The construction project will include installing new piping to this flange using approximately 55 feet of pipe, a 12-inch full-port ball valve and a piggable wye. Construction is planned to start July 2015 with the construction of two small temporary gravel pads, covering less than 0.1 acres. Construction will comply with Alaska Department of Environmental Conservation and US Army Corps of Engineers regulations and will entail cover of a 30-mil oil resistant liner, a geofabric then placement of gravel, and HDPE-composite (or similar) rig mats. The pads are designed to protect the tundra, and provide construction stability and support.

Installation of the additional pipe, valve and piggable wye will occur September 1 through 15, 2015, with personnel and equipment demobilization, and removal of gravel pads occurring September 15 through 30, 2015. Post construction monitoring of the temporary gravel pad footprint will continue through summer 2016, to determine if re-vegetation measures are necessary.

**Status of Business in State of Alaska:** The SPCO conducted a licensing search on the Alaska Department of Commerce, Community & Economic Development website on May 11, 2015, and found that Nutaaq Pipeline, LLC was a limited liability corporation in good standing and licensed to do business in Alaska. The Nutaaq Pipeline, LLC business license is current through December 31, 2016.

**Title:** All uplands lands contained within Township 9 North, Range 20 East, Umiat Meridian were selected under general selection (GS) 1365, and subsequently patented to the State of Alaska on March 27, 1974, under Patent No. 50-74-0092.

**Planning and Classification:** The lands encompassed by this application are classified Resource Management (RMG) under classification order, CL 618. A land classification identifies the primary use for which land will be managed, subject to existing rights and to multiple uses. The Department of Natural Resources may authorize other uses that do not conflict with the primary use. According to 11 AAC 55.200, land which is classified resource management may have a number of important resources that lack adequate information and/or accessibility which limits the likelihood of development within 10 year of classification, or the land may have one or more resource values none of which are sufficient to warrant designation as the primary use.
Pipeline ROW leases have already been identified as compatible in this area as shown by the three pipeline ROW leases in the area, of which BSOP would be modified as a result of this amendment. The expansion of the BSOP ROW lease through this amendment will not hinder management of other resources and enhances resource development of the broader area by allowing the PTEP to tie into the existing BSOP. This proposed action is compatible with the classification (CL 618).

The North Slope Area Special Use Lands (ADL 50666) designation requires that in addition to permitting requirements under 11 AAC 96.010, a permit is required for motorized vehicle use, unless that use is for subsistence purposes or is on a graveled road. The requirement for a permit or authorization would be fulfilled through the issuance of this proposed right-of-way lease amendment. This requirement does not prohibit the development of lands within the Umiat Meridian.

**Public Notice:** Notice of this Analysis and Proposed Decision will be published in the Arctic Sounder, and the Alaska Dispatch News on Thursday, May 28, 2015. It also will be sent for posting in the Barrow, Kaktovik, and Prudhoe Bay post offices and posted on the State of Alaska Public Notices and the State Pipeline Coordinator’s Office websites.

If public comment indicates the need for significant changes in the proposed decision, additional public notice will be given on or after June 29, 2015. If no significant changes are required, then the proposed decision, including any minor changes, will be issued without further notice as the final decision of the Department of Natural Resources after June 26, 2015.

**Technical Analysis:** A technical review of the Design Basis, Savant Piggable Wye Tie-In, PTEP to BSOP, Document No. 144029-MBJ-DC-001, Rev. B, Issued for Approval, dated, February 15, 2014, was completed by the SPCO Engineering Section.

Savant, as majority holder of Nutaaq Pipeline, LLC, lessee, is planning to install a wye connection between the new PTEP line and the existing BSOP line. Principal components for the project include the wye, a valve, new pipeline, a pig signal, associated supporting electrical supply and instrumentation, and pipeline shoes on previously constructed Vertical and Horizontal Support Members (VSMs and HSMs).

**General Information:** Savant is planning to install a Y-shaped (wye) connection between the new PTEP and the existing BSOP. The purpose of the wye is to allow pigs from both the Badami Central Facilities Pad and the Point Thomson oilfield to pass through to an existing pig receiver located at a site near the BSOP connection to the Endicott Pipeline. The wye can handle both maintenance cleaning pigs and In-Line Instruments, such as smart pigs. According to the SPCO Engineering Section review, the design documents provided by Savant conform to the BSOP ROW Lease.
The use of a piggable wye instead of a standard receiver at the junction of the PTEP and the BSOP pipelines has advantages. The primary one is that the Badami area does not have good facilities to handle or transport a received pig. Pigs will arrive coated in substances such as crude oil, wax, and asphaltenes. The Badami field is a roadless area and moving a received pig in an area without roads presents obvious logistical problems.

The wye will allow pigs launched from Point Thomson to be received near the BSOP connection to the Endicott pipeline. This receiver is accessible from the North Slope road system. Pigs received can be handled by crews that are used for many other pigging operations. The location, the Greater Prudhoe area, is connected to the main road system and has the specialized technicians, crews and facilities that can handle, transport, clean, and repair pigs. Another advantage is that the wye provides for 100% pigging coverage of the pipeline between the terminus of the PTEP and the beginning of the BSOP. A standard receiver at this location would leave a short gap in ILI coverage.

**Scope:** The principal items in the project are the wye, a valve, new pipeline pipe, a pig signal, and supporting electrical supply and instrumentation. The lessee previously added two Vertical Support Members (VSMs) for this modification. The wye is heavy and cannot be supported between existing VSMs. Horizontal Support Members (HSMs) and pipeline shoes will complete the new supports.

The wye is precision machined to close tolerances. It must pass a variety of pipeline pigs, using momentum to steer the pigs into one pipeline or another, with no chance of the pig unintentionally diverting down the other pipeline.

The lessee plans to install temporary gravel pads to facilitate construction without permanently damaging the tundra. In addition, the lessee will protect the permafrost from damage by laying a geotextile fabric and installing a standard construction raft under the gravel.

To allow continued production from Badami during the construction, the lessee will install a hot tap, bypass line, and stoppel. This will allow continued production from Badami during construction. The hot tap fittings employ a split tee, the strongest type of branch reinforcement. It will be a LOCK-O-RING design, a proprietary and unique fitting that allows a hot tap to have internal bars that prevents a pig from travelling into the branch pipe.

A full-port ball valve will also be installed and will be procured to conform to the fire-resistant API 6D standard, as required by federal pipeline regulations. The valve will allow the pipelines to be isolated from one another so that servicing can be performed on each segment without affecting the other segment. The full-port design allows passage of a pig and a pig signal provides the capability for both the Badami and Point Thomson control rooms to monitor passage from one pipeline to the other.
In selecting weld locations, the lessee will use the most recent ILI data and confirm wall thickness using ultrasonic testing (UT). This is important because BSOP has been in service for approximately 15 years. These precautions should prevent inadvertently welding on thin spots, which would create heat problems during welding and consequent hardness and corrosion issues.

**Technical Lease Requirements:** The primary technical requirement that must be satisfied for this work is Stipulation 1.3.1 in ADL 415472, which requires a construction plan for certain pipeline activities. However, other requirements apply, such as: Exhibit A, Stipulations 3.1 to 3.2.1 require conformance to design criteria; and meeting or exceeding federal pipeline regulations; meeting the standard of sound engineering practice; minimizing disturbance to permafrost; and early detection of corrosion.

Stipulation 1.2 requires good communications; Stipulation 1.4 requires a quality program; and Stipulation 1.5 requires maintenance of the pipeline system to approved design criteria.

Based upon the SPCO engineering review, the project conforms to the technical requirements of the lease or to applicable codes, standards, and regulations.

**Codes, Regulations and Standards:** The Design Basis for this project establishes minimum engineering requirements for a safe and environmentally sound installation under the AS 38.35 lease. It references codes, regulations, and standards under which the pipeline will be designed and operated. The most important ones are listed below. For a full list, refer to the Construction Plan, which includes the Design Basis.

- Code of Federal Regulations, Title 49, Part 195, "Transportation of Hazardous Liquids by Pipeline"
- ASME B31.4, 2006 “Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids”
- API 5L, “Specification for Line Pipe”
- API 6D, “Specifications for Pipeline Valves”
- API 1104, “Welding Pipelines and Related Facilities”
- ASME B 16.5, 2003 “Pipe Flanges and Flanged Fittings”
- 2008 NFPA70, NEC, “National Electrical Code”
- ASTM 572, “High-Strength, Low-Alloy, Columbium-Vanadium Structural Steel”

The project will be regulated by local, state, and federal authorities. For contingency, it will incorporate shut-off capability to the location of the wye, emergency access to critical valves, and instrumentation and communications. It will be jurisdictional to the Code of Federal Regulations, Title 49, Part 195, which is the principal authority for transportation of hazardous
liquids in pipelines. The regulations are implemented by the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA).

The project uses Savant North Slope specifications, which are derived from BP Exploration Alaska's specifications. Roughly similar specifications have been used by major oil companies working on the North Slope, and have evolved over 45 years of use. They have been demonstrated to be fit for purpose by their successful use over many projects and decades.

**Transported Product (Fluid and Flow):** The BSOP will transport sales oil from Badami and natural-gas liquid condensate from Point Thomson. The Badami sales oil is moderately viscous, compared to other North Slope oils, about 25-28 degrees API. The fluid produced from Point Thomson is very light because it is "stripped" off of a gas-cycling process, rather than produced from an oil well. For this reason, it is classified as a natural-gas condensate or natural-gas liquid (NGL), but for practical purposes it is transported, stored, and processed as a light crude oil. It has an average viscosity of approximately 37 degrees API, similar to a light crude oil. Another reason why NGLs from Point Thomson are best classified like light crude oils under the lease is that federal pipeline regulations classify crude oils, processed oil, sales oil and NGLs under the same regulation, 49 CFR 195, for liquid hydrocarbons. Similarly, all of these fluids are classified similarly under the design/construction code ASME B31.4. Under the technical work performed for the PTEP, the two different fluids were shown to be compatible. This is important because mixing incompatible crude oils in a pipeline can initiate chemical reactions that can corrode downstream pipe or produce other undesirable effects.

Currently, the flow from Badami is less than 1,000 barrels of oil per day (bopd). The estimated initial production from Point Thomson will be 10,000 barrels of oil equivalent per day (boepd). The design maximum flow rating for each pipeline is: 35,000 bopd and 70,000 boepd, respectively.

**Geotechnical:** The project area is underlain by "cold" permafrost. The terrain consists of arctic tundra, with an organic layer that is underlain primarily by gravel and silts. The area is treeless wetland where sedges and grasses are the predominant vegetation. The depth of the top of the permafrost (the active layer thickness) under the undisturbed tundra surface in the area typically is about three to five feet. The VSM design allows for the active layer by adding VSM depth. Each VSM is frozen in a hole drilled in permafrost using sand/water slurry, to a depth sufficiently below the ground surface to minimize the likelihood of heave or settlement.

**Pipe Physical Characteristics:** The wye and associated new pipe will be externally coated and constructed of low-temperature, high-yield steel, with good ductility properties, making them suitable for arctic installations. The metallurgy will be Charpy-impact tested to -50°F, per

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1 This is a reference to the American Petroleum Institute gravity measure, API gravity. API gravity is a measure of how heavy or light a petroleum liquid is compared to water. A petroleum product with an API gravity higher than 10 floats on water, whereas a petroleum product with an API gravity lower than 10 sinks. An API gravity measure is referred to as a degree measure. Most values fall between 10 and 70 API gravity degrees.
standard North-Slope practice. Selection of materials (metallurgy, strength and thickness) that is fit for purpose and suitable for service is regulated under the requirements of 49 CFR 195.

The pipe and fittings will be externally coated, insulated, and have a metal jacket as a weather barrier. Standard North Slope pipeline saddles that clamp around the insulation are to be used. The 900 lb. rating of the wye and the pressure rating of the pipe meets or exceeds the Maximum Operating Pressure of the associated pipelines, as does the stoppel and bypass. All pipes and components used in the project appear suitable for purpose and conform to North Slope practices and standards.

**Seismic:** A full seismic analysis is typically not performed for a minor modification, as is proposed. Gravity loads govern any increase in seismic response of the structures and pipe. The designers have compensated for the additional weight of the pipe and wye by adding in two VSMs. Supports of this design typically are capable of resisting gravity loads of 25,000 lbs. or more. The capacity of the new supports greatly exceeds the additional weight. Although much less than gravity loads, lateral loads have also been accommodated in the design.

**Design Life:** The design and construction of the installation adheres to standard North Slope practices and therefore its expected design life appears to meet or exceed the current BSOP ROW Lease. An estimated design life does not indicate that the pipeline and associated structures will be requiring replacement at its end. Design life is established from a combination of technical, regulatory, economic, and commercial considerations. At the end of the lease, the installation will be evaluated remaining useful life, should the applicant apply to renew the right-of-way lease.

**Analysis:** AS 38.35, the Alaska Right-of-Way Leasing Act, sets forth the procedures by which certain right-of-way leases are granted by the State of Alaska and the conditions under which they can be amended. As set out in AS 38.35.010, it is the policy of the state that development, use, and control of a pipeline transportation system make the maximum contribution to the development of the human resources of this state, increase the standard of living for all its residents, advance existing and potential sectors of its economy, strengthen free competition in its private enterprise system, and carefully protect its incomparable natural environment.

Pursuant to AS 38.35.015, the Commissioner has the power to grant leases on state land for pipeline right-of-way purposes. On December 15, 1997, the Commissioner found it to be in the best interests of the residents of the State of Alaska to issue the BSOP ROW Lease, ADL 415472, and subsequently on October 31, 2012, the PTEP ROW Lease ADL 418975, which was anticipated to connect with BSOP.

BSOP ROW Lease Section 8(a) states that the BSOP must operate as a common carrier pipeline and accept, convey, and transport without discrimination Crude Oil delivered to it for transportation from the fields in the vicinity of the Pipeline. Under Lease Section 1(b) the ROW lease is issued for the transportation of Crude Oil only, unless the lessee has received written
approval from the Commissioner for any other purposes. As discussed in this decision, the
PTEP NGLs are considered to be light crude oil and have been determined to be compatible to
the BSOP sales oil.

The amendment and associated tie-in would provide for the use of the BSOP, an existing facility,
for the transportation of Point Thomson Unit product, which will reduce disturbance of
undisturbed state lands, promote the development and transportation of new oil resources in the
area, and will not adversely affect existing uses in the area.

Through this amendment the BSOP ROW Lease would be increased to encompass the 0.22
additional state lands which would be subject to and managed under the BSOP ROW Lease. The
additional land would encompass new infrastructure and allow the intertie between BSOP and
PTEP. No adverse impacts are anticipated to the BSOP through this connection, while the
connection will greatly enhance the production and delivery of Point Thomson product.

**Findings:** The proposed amendment which would connect PTEP with BSOP is consistent with
the BSOP ROW Lease, AS 38.35, and state policy. The BSOP ROW Lease directs the lessee to
accept and transport oil from fields in the vicinity of the pipeline. A technical review
determined that the proposed project would be consistent with and compatible with the existing
BSOP infrastructure.

The additional pipe segment, valve and piggable wye, will become part of the Pipeline System as
defined in the lease, and will be managed under the lease. The proposal to add the above-
described lands to the BSOP ROW Lease, ADL 415472, is consistent with the lease, and will be
subject to the terms, conditions, and stipulations contained in the BSOP ROW Lease, ADL
415472, which will adequately address and protect the interests of the State of Alaska. The
lessee is required to secure all necessary permits or authorizations required by other state and
federal agencies.

The SPCO will examine the project area upon completion of the construction activities to ensure
all lands are in a condition acceptable to the Commissioner. Pursuant to Section 25(e) of the
BSOP ROW Lease, the ROW Amendment will require an as-built survey that ties the
amendment and added facility to the BSOP ROW, for review and acceptance by the
Commissioner.

The addition of these lands to the lease does not constitutes a significant amendment to the lease
since the impact on State resources will be negligible and the project does not conflict with or
significantly change existing use of the land. Approval of the request for amendment and
addition of the described lands is a function of the lease, and is consistent with state statutes and
terms of the lease.
Proposed Decision:  I find that the application to amend the BSOP ROW Lease, ADL 415472, to include the lands described in this proposed decision is in the best interest of the State and does not constitute a significant amendment to the lease. The applicant is not authorized to begin construction activities until the final decision of the Department of Natural Resources is issued and the lease amendment is signed by the Commissioner.

If no significant change is required as a result of public comment or objection, then this proposed decision, including any minor changes, will be issued as a final decision of the Department of Natural Resources after June 26, 2015, without further notice.

Tammas Brown
Natural Resource Specialist III

Approved:
Don Perrin
Acting State Pipeline Coordinator

Attachment A: Figure 1, PTEP to BSOP Connection, Construction Area (1 Page)
Attachment B: Figure 2, Proposed Amended BSOP O&M, ROW Boundary (1 Page)
Attachment C: Figure 3, Proposed ROW Parcel 415472 (1 Page)
Attachment A
PROPOSED ROW PARCEL 415472
BADAMI PRODUCTION FACILITY
Existing Features
PROPOSED ROW PARCEL 415472
BADAMI PAD EXPANSION
PROPOSED ROW PARCEL 415472
Attachment C