

NORTHSTAR UNIT

APPROVAL OF THE
FIRST EXPANSION OF THE
HOOLIGAN PARTICIPATING AREA

Findings and Decision of the Director
of the Division of Oil and Gas
Under Delegation of Authority
from the Commissioner of the State of Alaska
Department of Natural Resources

March 1, 2017

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I. INTRODUCTION AND DECISION SUMMARY

Hilcorp Alaska, LLC (Hilcorp) applied to vertically expand the Northstar Unit (NSU) Hooligan Participating Area (HPA) to include the Kuparuk A sands within the same acreage as the existing HPA. Hilcorp subsequently provided additional information supporting the application to the Department of Natural Resources (DNR), Division of Oil and Gas (Division).

For the reasons stated below, the Director finds that the proposed expansion area is reasonably estimated to be capable of producing or contributing to production in paying quantities. The Director further finds that the expansion should be made effective as of August 1, 2016. Accordingly, the Division hereby approves expansion of the HPA to include the Kuparuk A sands. Under the NSU unit agreement, Hilcorp must also obtain approval of the HPA expansion from the Bureau of Safety and Environmental Enforcement (BSEE).

II. APPLICATION TO EXPAND THE HPA

The Division and BSEE, who jointly manage the NSU, approved formation of the HPA on February 24, 2015 and February 28, 2014, respectively. The Division and BSEE approved the HPA with an effective date of January 1, 2006 to correspond to first production. The HPA consists of 7,656.10 acres across four state and two federal leases and is limited to the Kuparuk C sands, which were recorded in the NS-08 well at a measured depth of 9,625 to 9,670 feet measured depth (MD).

Hilcorp, as unit operator and sole working interest owner, applied to expand the HPA on October 21, 2016. The proposed expansion area consists of the same acreage as the existing HPA, but expands the PA vertically to include the Kuparuk A sands. The expanded HPA would consist of hydrocarbon-bearing intervals between 12,156 and 12,446 feet MD in the NS-15 well.

Along with its application, Hilcorp submitted a confidential Geologic Report, confidential Engineering report, and an Exhibit C to the unit agreement for the expanded HPA, including tract participation for allocating production. Hilcorp provided a technical presentation to representatives from the Division and BSEE on November 3, 2016. Hilcorp has subsequently answered questions and provided additional information to the Division. The Division understands that Hilcorp has provided the same information to BSEE.

III. DECISION CRITERIA

By Department Order 003, the Commissioner has delegated authority to decide PA expansion applications to the Director.

The Director must expand a PA “to include acreage reasonably estimated through use of geological, geophysical, or engineering data to be capable of contributing to the production of hydrocarbons in paying quantities.” 11 AAC 83.351(c). The NSU unit agreement includes similar language. (NSU unit agreement, Article 9.7.) The Director also considers the criteria set forth in 11 AAC 83.303(a) and (b): (1) environmental costs and benefits; (2) geological and engineering characteristics; (3) prior exploration activities; (4) plans for exploration or

development; (5) economic costs and benefits to the State; (6) conservation of all natural resources; (7) prevention of economic and physical waste; (8) protection of all parties of interest, including the State; and (9) any other relevant factors.

The NSU unit agreement specifies that a PA expansion will be effective the first day of the month in which the information was obtained that forms the basis for the expansion unless DNR and BSEE approve a “more appropriate effective date.” (NSU unit agreement, Article 9.7.)

1. The Environmental Costs and Benefits

The proposed expansion itself should not create much, if any, environmental costs. In general, oil and gas development always poses risks to the environment. It is the State’s responsibility to balance developing its oil and gas resources with minimizing adverse impacts from development. AS 38.05.180(a)(2). One way the Division does this is by unitizing leases to facilitate joint development. The Division considered potential environmental costs and benefits when approving formation of the NSU and again when approving the HPA.

The proposed expansion is vertical only, so it adds no additional acreage to the HPA. Hilcorp’s plans also indicate that expanding the HPA will not create additional impacts. Hilcorp described several development scenarios for the Kuparuk A, all of which use the existing Northstar Island facility. Thus whether Hilcorp produces the Kuparuk A separately or commingles it with the Kuparuk C in an expanded HPA, the potential impact to the environment should be the same. And that potential impact is minimized by Hilcorp using existing facilities.

The Division will continue to consider environmental costs and benefits when reviewing Plans of Operations for the HPA, including compliance with applicable mitigation measures.

2. Geological and Engineering Characteristics and Prior Exploration and Development Activities of the Proposed Vertically Expanded HPA

A participating area “may include only the land reasonably known to be underlain by hydrocarbons and known or reasonably estimated through use of geological, geophysical, or engineering data to be capable of producing or contributing to the production of hydrocarbons in paying quantities” 11 AAC 83.351(a). As stated above, the existing HPA contains the Kuparuk C member only and Hilcorp has applied to vertically expand the HPA to include the Kuparuk A member. As proposed, the new HPA is defined as the hydrocarbon bearing intervals common to and correlating with the interval between measured depths (MD) of 12,156’ and 12,446’ in the Northstar Unit NS-15 well.

Data and information submitted by Hilcorp to the Division in support of its application to vertically expand the HPA included geologic cross sections, analyses of well log, core, and fluid data and regional structure maps. Some of the information and data Hilcorp submitted in support of its application is confidential under AS 38.05.035(a)(8)(c) and 11 AAC 96.220. The following discussion cites publicly available information, but the Division’s conclusions take into account confidential data as well. The Hilcorp data indicates the proposed expanded HPA area is underlain by hydrocarbons that will contribute to production.

2.1. Prior Exploration and Development Activities

Early exploration wells in the NSU include Shell Oil Company's Seal Island 1, Seal Island 2, Seal Island 3, and Seal Island 4 wells and Amerada Hess's Northstar 1 and Northstar 2. Additional exploration wells outside the NSU all contain Kuparuk sediments of reservoir quality, but not all wells encountered hydrocarbons.

The Seal Island wells were drilled by Shell Oil Company between 1983 and 1984. Although the target was the Ivishak Formation, some data was collected from the Kuparuk Formation. Seal Island 1 logs indicate the Kuparuk C sandstone is about 30' thick and contains hydrocarbons based on the deep resistivity log. The Kuparuk A consists of multiple individual sandstone units commonly referred to as the A3, A2, and A1 from top to bottom. The cumulative thickness of these net sand units (gamma ray < 75API) is about 25' and is interpreted to contain hydrocarbons based on the deep resistivity log. There were no cores or flow tests conducted in Seal Island 1 over the Kuparuk Formation.

Seal Island 2 was cored only in the Kuparuk A member from 10,396' to 10,508' MD. In clean sands (gamma ray < 75API), the porosity ranges from 10 to 25 percent and permeability from 20 to 200 millidarcys (md). Core descriptions available to the public describe hydrocarbons throughout the cored Kuparuk A interval. Very good to good oil shows are described in glauconitic, clayey sandstones. Well logs over the Kuparuk C are suspect as the well encountered logging problems before it was plugged and abandoned. The well was not flow tested over the Kuparuk Formation.

Seal Island 3 penetrated the Kuparuk Formation down dip and is wet. Seal Island 3 was cored in the Kuparuk A and C intervals from 11,717' to 11,819' MD. The Kuparuk C porosity ranged from 9 to 23 percent and the permeability ranged from 1 to 350 md. The Kuparuk A porosity ranged from 15 to 25 percent and the permeability ranged from 3 to 300 md. A flow test was conducted for 12 hours over the interval from 11,714' to 11,763' MD with 1,039 barrels of water and no oil recovered. Seal Island 4 penetrated the Kuparuk Formation down dip and was wet. There were no cores or flow tests conducted in this well.

Northstar 1 was drilled in 1985 and encountered elevated resistivity in the Kuparuk C sandstone. The Kuparuk A sandstones are wet based on resistivity log readings. The Kuparuk C and upper Kuparuk A sandstones were partially cored from 9,064' to 9,185' MD. Kuparuk C average core porosity and permeability in net sandstone (gamma ray < 75API) are 16 percent porosity and 200 md permeability. Kuparuk A average core porosity and permeability in net sandstone (gamma ray < 75API) are 15 percent porosity and 3 md permeability. Core descriptions for the Kuparuk C indicate dark brown sandstone with good porosity, spotty to yellow fluorescence and cut, and occasional bleeding oil. A drill stem test over both the Kuparuk C and Kuparuk A sandstones from 9,067' to 9,257' MD produced water with 2 to 3 percent oil that measured 30 °API gravity. The Northstar 2 well penetrated the Kuparuk, but upon tripping back into the hole, the drill pipe stuck. The wellbore was then plugged and abandoned. No electric logs were obtained below 6,700' MD.

The NS-08 well is only producing from the Kuparuk C member and has been on continuous production since November 2010 after being converted from an Ivishak producer. As of

December 2016, NS-08 has produced 78.07 billion standard cubic feet (BSCF) of cumulative gas. This produced gas is injected into the Ivishak formation for pressure support. Additionally, NS-08 has produced 3.063 million barrels of cumulative gas condensate through December 2016. Currently, NS-08 is producing at a rate of approximately 51.3 million standard cubic feet per day (MSFCD) of gas and 1,470 barrels a day of gas condensate.

The NS-18 well has been producing from the Kuparuk A member since August 11, 2016 after being converted from an Ivishak producer. The NS-18 well was perforated in the Kuparuk C member on December 17, 2016 and subsequently, production has been commingled from both the Kuparuk A and C members. As of December 2016, NS-18 has produced 2.25 BSCF of cumulative gas. This produced gas is injected into the Ivishak formation for pressure support. Additionally, NS-18 has produced 42 thousand barrels of cumulative gas condensate through December 2016. Currently, NS-18 is producing at a rate of approximately 39.7 MSCFD of gas, and 1,130 barrels a day of gas condensate.

2.2. Geology of the Kuparuk Interval

The Kuparuk River Formation is subdivided into four members from bottom to top: Kuparuk A, Kuparuk B, Kuparuk C, and Kuparuk D members. In general, the Kuparuk C, A, and B at Milne Point Unit are analogous to reservoir quality. The Kuparuk D is comprised of shale and shaley siltstone and typically does not contain reservoir quality sandstones.

Hydrocarbon-bearing sandstones in the Kuparuk C and Kuparuk A members within the proposed HPA were noted when running up-hole electric logs in the Northstar development wells. The hydrocarbon accumulation is bounded by faults to the north, west, and south. Structural dip limits the accumulation to the east. Over 30 exploration and development wells penetrate the Kuparuk Formation and were used to delineate the hydrocarbon accumulation.

The Kuparuk C member is the topmost reservoir in the proposed HPA. The overall gross thickness of the Kuparuk River Formation ranges from 400' at Northstar 1 in the west to less than 200' in Seal Island 3, located in the southcentral part of the NSU. The Kuparuk C member itself is much thinner and ranges from 30' thick at Seal Island 3 to 40' thick at Northstar 1 in the west, to over 100' thick at Northstar development wells NS-12 and NS-30, located in the eastern part of the NSU. Net to gross thickness within the Kuparuk C is highly variable.

The Kuparuk C consists of bioturbated to burrowed glauconitic sandstones, shaley sandstones, siltstones, and carbonaceous burrowed shales. Sandstone deposition occurred along a rift margin in an offshore to shelf depositional setting. Syn-depositional faulting most likely influenced sandstone dispersal, accumulation, and preservation. This makes correlating sandstones from well to well difficult and therefore sandstone continuity is questionable. Regional porosity and permeability are good in the Kuparuk C member except where siderite became cemented. Siderite occurs as streaks and nodules within sandstones. Oil quality in the Kuparuk is very good as evidenced by a drill stem test over both the Kuparuk C and Kuparuk A sandstones. The perforations were from 9,067' to 9,257' MD and produced water with 2 to 3 percent oil that measured 30 °API gravity.

The Kuparuk A member is also included in the proposed HPA. The overall cumulative net pay thickness (gamma ray < 75API) of the Kuparuk A ranges from 15' thick at NS-27 to 45' thick at NS-17. In addition, Kuparuk A net pay thickness in the two currently producing wells, NS-08 and NS-18, are 29' and 42' thick, respectively. Net to gross thickness within the Kuparuk A is variable.

The Kuparuk A member is interpreted to be storm deposits derived from a northerly source and deposited on a marine shelf. Hence, Kuparuk A thicknesses are more consistent than the Kuparuk C sands. Additionally, the A sands do not appear to be influenced by faults or present-day structure to the same extent as the C sands. The Kuparuk A sands consist of three to five coarsening-upward sand packages that are separated from the Kuparuk C by a shale barrier that varies in thickness from 10' to 50' TVD. Oil quality in the Kuparuk Formation is very good based on formation tests. Comingled extracted oil gravity from the Kuparuk A and C members at Northstar 1 were measured at 30 °API gravity.

Structural interpretation for the proposed HPA is based on well data and the Northstar 3D seismic survey acquired by BPXA in 1996 and 1997. The air gun sourced survey covers approximately 150 square miles and has been reprocessed since the original acquisition. BPXA used the 3-D data to plan Ivishak wells and integrate the seismic data into a reservoir model.

Interpretation of the 3-D seismic shows that the structure near the Kuparuk C reservoir is a northwest-to-southeast trending anticline. While the central segment of the structure is relatively un-faulted, a network of large normal faults (up to 100' of throw) separates the structure into three segments: the main structure, including the crest of the anticline which NS-08 and NS-18 produce from, and smaller segments to the north and south. The south segment is separated from the central segment by northwest trending faults and is structurally deeper than the main segment. It is also bounded by faults on the south, separating it from the Prudhoe Bay Unit. Fault separation between the central and the north segment is less obvious. Large faults exist, but do not appear to be laterally continuous. It is likely that the faults continue to form a boundary, but are below seismic resolution.

The existing seismic data is not of sufficient quality to determine lithology, fluid content, or fluid contacts. Well data such as mud-log reports, repeat formation test pressure measurements, and resistivity or neutron/density logs are required to map gas water contacts. Since only two wells are producing from the Kuparuk reservoir, there have been no multi-well interactions to aid understanding of pressure communication across faults segmenting the structure. The Kuparuk C reservoir mechanism is believed to be under natural pressure depletion with a possibility of aquifer support.

Based on the geological, geophysical, and engineering data Hilcorp provided, the Division finds that Hilcorp has reasonably proven that the Kuparuk A is capable of producing or contributing to production in paying quantities.

3. Plans of Exploration or Development

Hilcorp's most recent Plan of Development, for the period August 1, 2016 through July 31, 2017, includes plans to recompleting the NS-18 well in the HPA to the Kuparuk sand. Hilcorp has

indicated that this well will produce from both the Kuparuk A and C. The NS-08 well has been producing from the Kuparuk C in the HPA since November 2010.

4. The Economic Costs and Benefits to the State

Production from Kuparuk A in general provides economic benefit to the State through taxes and royalties.

Hilcorp submitted a proposed Exhibit C to the unit agreement that sets forth tract participation factors for the expanded HPA. Hilcorp has also applied to the Alaska Oil and Gas Conservation Commission for pool rules that correspond to its proposed allocations for the expanded HPA.

The proposed tract allocations distribute production among the leases by converting Original Oil in Place and Original Gas in Place into an Original Oil Equivalent in Place. These calculations result in an allocation of 97.34% for State tracts and 2.66% for federal tracts. The existing allocation for the HPA is 96.63% for the State tracts and 3.37% for federal tracts.

Combining the Kuparuk A and C sands for purposes of tract allocation may not reflect the actual balance of production from these portions of the formation — *e.g.*, Kuparuk C production is likely to dominate in the beginning. But over time, this is expected to balance out. Based on the data Hilcorp has provided, Hilcorp's proposed allocations appear to provide a reasonable and equitable allocation of production among the leases in the proposed expanded HPA.

5. Conservation of All Natural Resources

The unitization of leases and formation or expansion of participating areas within a unit facilitate hydrocarbon conservation. Unitized development further supports efficient operations which minimizes adverse impacts to natural resources. The Division anticipates that neither producing the Kuparuk A sands nor expanding the HPA to include Kuparuk A will increase the surface acreage Hilcorp is already using for development and production activities. The proposed HPA expansion thus furthers the overall efficiencies provided by the NSU and HPA in general.

6. Prevention of Economic and Physical Waste

Hilcorp anticipates that it will have three wellbores on the Northstar Island available to develop the Kuparuk sands. Hilcorp states that commingling the Kuparuk A and C sands in some or all of these wells will allow it to increase recovery and thus prevent waste. Hilcorp's use of existing facilities also avoids the cost of additional facilities.

7. Protection of All Parties of Interest, Including the State

Hilcorp asserts that expanding the HPA and commingling the Kuparuk A and C sands will lower its costs and increase recovery, which protects Hilcorp's interests in its leases.

The State and BSEE also have interests in developing the oil and gas resources. As discussed above, the proposed tract allocations appear well-supported and reasonable, thus protecting the royalty interests of both the State and BSEE. Hilcorp intends to use existing facilities and the

expansion itself adds no additional acreage to the HPA, so the expansion should not hinder the State's and BSEE's interests in minimizing adverse impacts from development.

Hilcorp has provided both DNR and BSEE with information supporting its HPA expansion application. It is DNR's understanding the BSEE has received the information DNR has received, and vice versa. DNR and BSEE have also provided Hilcorp with multiple opportunities to provide that information and to otherwise be heard on its application.

8. Effective Date

Under the NSU unit agreement, a PA expansion is effective the first day of the month in which the information was obtained that forms the basis for expanding the PA unless DNR and BSEE approve a "more appropriate effective date." (NSU unit agreement, Article 9.7.)

Hilcorp relies on information that at least in-part predates formation of the HPA itself, which was made effective January 1, 2006 to correspond with first production. Using the date information was obtained would thus result in an effective date for the expansion that predates the PA itself. DNR has determined that a more appropriate effective date would be the date of first production from the Kuparuk A. Hilcorp began producing the Kuparuk A in August 2016. Accordingly, DNR finds that the effective date for expanding the PA is August 1, 2016.

IV. FINDINGS AND DECISION

1. Based on the geological, geophysical, and engineering data Hilcorp provided in support of its application, Hilcorp has demonstrated that the Kuparuk A sands within the acreage footprint of the existing HPA is reasonably estimated to be capable of producing or contributing to the production of hydrocarbons in paying quantities.
2. The tract participation Hilcorp provided in its proposed Exhibit C to the unit agreement for an expanded HPA is supported by the data and provides a reasonable allocation of production to the tracts within the HPA.
3. In evaluating Hilcorp's HPA expansion application, the Director considered (1) environmental costs and benefits; (2) geological and engineering characteristics; (3) prior exploration activities; (4) plans for exploration or development; (5) economic costs and benefits to the State; (6) conservation of all natural resources; (7) prevention of economic and physical waste; (8) protection of all parties of interest, including the State; and (9) any other relevant factors. 11 AAC 83.303(a)-(c).
4. Having found that the Kuparuk A sands are capable of producing in paying quantities, and having considered the criteria set forth in 11 AAC 83.303(a)-(b), the Director hereby grants Hilcorp's application to expand the HPA.
5. The expanded HPA consists of the same acreage as the initial HPA, as set forth on Exhibit D to the unit agreement, but now includes both the Kuparuk A sands, defined as the hydrocarbon-bearing intervals between the measured depths of 12,156 and

12,446 feet in the NS-15 well, and the Kuparuk C sands, defined as the hydrocarbon-bearing intervals between the measured depths of 9,625 to 9,670 feet in the NS-08 well.

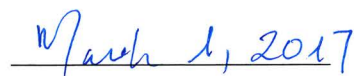
6. The Director approves the tract allocation schedule set forth in Hilcorp's Exhibit C for the expanded HPA.
7. Under the terms of the unit agreement, a PA expansion is effective the first day of the month in which the information that supports the expansion is obtained, unless DNR and BSEE determine a more appropriate effective date. For the HPA expansion, Hilcorp relies on information that the NSU operator obtained information before the HPA was formed. The Director finds that the HPA expansion should be effective August 1, 2016 to correspond to first production from Kuparuk A sands.
8. Hilcorp will report production from the HPA to royalty accounting unit code NSHO. Hilcorp will refile operator (form O1) and royalty (form A1) reports with the Division within 60 days of the date of this decision covering production from August 1, 2016 to the date of this decision. Hilcorp will zero out production from accounting unit code NS02 and include this production in the expanded Hooligan PA.

For the reasons discussed in this Findings and Decision, the HPA is hereby expanded to include the Kuparuk A sands, effective August 1, 2016.

An eligible person affected by this decision may appeal it, in accordance with 11 AAC 02. Any appeal must be received within 20 calendar days after the date of "issuance" of this decision, as defined in 11 AAC 02.040(c) and (d), and may be mailed or delivered to Andrew T. Mack, Acting Commissioner, Department of Natural Resources, 550 W. 7th Avenue, Suite 1400, Anchorage, Alaska 99501; faxed to 1-907-269-8918; or sent by electronic mail to dnr.appeals@alaska.gov. This decision takes effect immediately. An eligible person must first appeal this decision in accordance with 11 AAC 02 before appealing this decision to Superior Court. A copy of 11 AAC 02 may be obtained from any regional information office of the Department of Natural Resources.



Chantal Walsh, Director
Division of Oil and Gas



Date

V. ATTACHMENTS

1. Proposed and Approved Exhibit C for the First Expansion of Northstar Unit HPA
2. Proposed and Approved Exhibit D, Map of the HPA within the Northstar Unit Boundary

1. ATTACHMENT ONE: Exhibit C, HPA Tracts/Leases

EXHIBIT C
Hooligan Participating Area (NHPA)
NORTHSTAR UNIT AGREEMENT
Proposed October 2016

Tract No.	Lease No.	Legal Description	NSPA Tract Acreage	Tract Participation (%)	Royalty (%)	ORRI (%)	Working Interest Owner and Ownership (%)	
TR-101	ADL 312798	<p>That portion of ADL 312798, more particularly described as those lands located Easterly of the West boundary of T13N, R13E, U.M. AK and T14N, R13E, U.M. AK, being the North-South line intersecting the North and South boundary of Block 470, within the offshore Three-Mile arc lines listed as State area of Block 470 "Supplemental Official O.C.S. Block Diagram" approved 10/4/79, and those lands in Block 514 Easterly of the West boundary of T13N, R13E, U.M. AK (being identical with Line 2-3 of Block 514) and that portion of Section 16, T13N, R13E, U.M. AK within the N1/2S1/2 (being Easterly of Line 3-4 of Block 514), being a portion of the listed State area of Block 514 on the "Supplemental Official O.C.S. Block Diagram" approved 12/9/79, lying within:</p> <p><u>T14N R13E, Umiat Meridian, Alaska</u> Section 32: E 1/2 Section 33</p> <p><u>T13N R13E, Umiat Meridian, Alaska</u> Section 4 Section 5: E 1/2 Section 8: NE 1/4 Section 9: N 1/2</p> <p>As shown on Exhibit D.</p>	1,186.21	6.255085	20% + Supplemental Royalty	None	Hilcorp	100.00

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Tract No.	Lease No.	Legal Description	NSPA Tract Acreage	Tract Participation (%)	Royalty (%)	ORRI (%)	Working Interest Owner and Ownership (%)	
TR-102	ADL 312799	<p>That portion of ADL 312799, more particularly described as those lands located in Block 471 within the offshore Three-Mile arc lines, listed as State area on the "Supplemental Official O.C.S. Block Diagram", approved 10/4/79, and those lands in N1/2, N1/2S1/2 of Block 515 within the offshore Three-Mile arc lines being a portion of the listed State area on the "Supplemental Official O.C.S. Block Diagram, approved 10/4/79, lying within:</p> <p><u>T14N R13E, Umiat Meridian, Alaska</u> Section 33: S 1/2 S 1/2 OCS Block 470 Sections 34 and 35</p> <p><u>T13N R13E, Umiat Meridian, Alaska</u> Sections 1, 2, 3, 4, 9, 10, 11, 12, 13, 14 and 15</p> <p>As shown on Exhibit D.</p>	4,269.38	87.015586	20% + Supplemental Royalty	None	Hilcorp	100.00
TR-103	ADL 312808	<p>That portion of ADL 312808, more particularly described as those lands located in S1/2S1/2 of Block 514, within Sections 16 and 21, T13N, R13E, U.M. AK (being those lands lying Easterly of Line 3-4 on Block 514), a portion of the State area on the "Supplemental Official O.C.S. Block Diagram" approved 12/9/79, and those lands in S1/2S1/2 of Block 515, being a portion of the State area on the "Supplemental Official O.C.S. Block Diagram, approved 10/4/79, and those lands within Block 558 located in Section 21, T13N, R13E, U.M. AK (being the portion Easterly of Line 1-2 and Northerly of Line 2-3 Block 558), listed as State area on the "Supplemental Official O.C.S. Block Diagram" approved 12/9/79 and those lands in Block 559 lying Northerly of the South boundary of Sections 21, 22, 23 and 24, T13N, T13E, U.M. AK (being the Northerly portion of Block 559), listed as State area on the "Supplemental Official O.C.S. Block Diagram" approved 10/4/79, lying within:</p> <p><u>T13N R13E, Umiat Meridian, Alaska</u></p> <p>Sections 13 and 14 Section 15: E 1/2</p> <p>As shown on Exhibit D.</p>	732.74	3.865417	20% + Supplemental Royalty	None	Hilcorp	100.00

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Tract No.	Lease No.	Legal Description	NSPA Tract Acreage	Tract Participation (%)	Royalty (%)	ORRI (%)	Working Interest Owner and Ownership (%)
TR-104	ADL 312809	<p>That portion of ADL 312809, more particularly described as those lands located in Block 516 within the Three-Mile arc lines, listed as State area on the "Supplemental Official O.C.S. Block Diagram" approved 10/4/79, and those lands in Block 560 lying Northerly of the South boundary of Section 24, T13N, R13E, U.M. AK (being identical with Line 4-5 on Block 560), and lying Easterly of the West boundary and Northerly of the South boundary of T13N, R14E, U.M. AK (being identical with Lines 5-6 and 6-7 on Block 560), within the offshore Three-Mile arc lines, listed as State area on the "Supplemental Official O.C.S. Block Diagram" approved 12/9/79, lying within:</p> <p><u>T13N R13E, Umiat Meridian, Alaska</u> Section 13: N 1/2 S 1/2 OCS Block 516</p> <p>As shown on Exhibit D.</p>	51.66	0.200639	20% + Supplemental Royalty	None	Hilcorp 100.00
SUBTOTAL OF STATE ACREAGE			6,239.99	97.336727			

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Proposed October 2016

Tract No.	Lease No.	Legal Description	NSPA Tract Acreage	Tract Participation (%)	Royalty (%)	ORRI (%)	Working Interest Owner and Ownership (%)
TR-1	OCS-Y-0179	<p>That portion of OCS-Y-0179 -- more particularly described as that portion of block 470 shown as Federal 8(g) Area B on the Supplemental Official OCS Block Diagram, dated 10/4/79, based on Official Protraction Diagram NR 6-3, Beechey Point, approved April 29, 1975, and lying southerly of line 11-12 and line 12-13 bisecting block 470, as shown on the Supplemental Diagram of the Supplemental Official OCS Block Diagram, dated 6/4/82, based on Official Protraction Diagram NR 6-3, Beechey Point, approved April 29, 1975, and those lands lying between the two lines bisecting block 471 (further described as "disputed area"), containing approximately 611.95 hectares, as shown on the Supplemental Official OCS Block Diagram, dated 10/04/79, based on Official Protraction Diagram NR 6-3, Beechey Point, approved April 29, 1975, and those lands lying northeasterly of the line bisecting block 515, containing approximately 190.97 hectares, as shown on the Supplemental Official OCS Block Diagram, dated 10/4/79, based on Official Protraction Diagram NR 6-3, Beechey Point, approved April 29, 1975, lying south of the line commencing at Easting, Northing UTM6 Meters, NAD27 435076.08, 7825840.36 and ending at Easting, Northing UTM6 Meters, NAD27 437600.00, 7824000.00, as shown on Exhibit D (dated 9/21/01) -- of Block 515, containing approximately 190.97 hectares (471.89 acres), as shown on the Supplemental Official OCS Block Diagram, dated 10/4/79, based on Official Protection Diagram NR 6-3, Beechey Point, approved April 29, 1975;</p> <p>And that portion of Block 471 within S1/2SW1/4 and S1/2SW1/4SE1/4, containing approximately 99.83 hectares (246.68 acres), as shown on the Supplemental Official OCS Block Diagram, dated 10/4/79, based on Official Protraction Diagram NR 6-3, Beechey Point, approved April 29, 1975;</p> <p>And that portion of Block 470 lying south of the line commencing at Easting, Northing UTM6 Meters, NAD27 431762.97, 7825801.43 and ending at Easting, Northing UTM6 Meters, NAD27 432800.00, 7825812.71, containing approximately 15.01 hectares (37.09 acres), as shown on the Supplemental Diagram, dated 2/25/88, based on Supplemental Official OCS Block Diagram, dated 10/4/79, based on Official Protraction Diagram NR 6-3, Beechey Point, approved April 29, 1975.</p>	755.66	0.278997	Fixed Sliding Scale (minimum of 16.66667%)	None	Hilcorp 100.00

EXHIBIT C
Hooligan Participating Area (NHPA)
NORTHSTAR UNIT AGREEMENT
Proposed October 2016

Tract No.	Lease No.	Legal Description	NSPA Tract Acreage	Tract Participation (%)	Royalty (%)	ORRI (%)	Working Interest Owner and Ownership (%)	
TR-2	OCS-Y-0181	That portion of Block 516 within NW1/4SW1/4 and SW1/4NW1/4, containing approximately 267.28 hectares (660.45 acres), as shown on the Supplemental Official OCS Block Diagram, dated 10/4/79, based on Official Protraction Diagram NR 6-3, Beechey Point, approved April 29, 1975.	660.45	2.384276	Fixed Sliding Scale (minimum of 16.66667%)	None	Hilcorp	100.00
SUBTOTAL OF FEDERAL ACREAGE			1,416.11	2.663273				
TOTAL PARTICIPATING ACREAGE			7,656.10	100.000000				

Working Interest Owner: 100%

Hilcorp Hilcorp Alaska, LLC

2. ATTACHMENT TWO: Exhibit D, Map of the HPA



NORTHSTAR UNIT AND PARTICIPATING AREA

Northstar Unit Exhibit B and D

Hilcorp Alaska, LLC

