

PIKKA UNIT

APPROVAL OF THE APPLICATION TO EXPAND THE PIKKA UNIT

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

November 29, 2016

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I. INTRODUCTION AND DECISION SUMMARY

The State of Alaska, Department of Natural Resources, Division of Oil and Gas (Division) received the Application for the expansion of the Pikka Unit (Application), on September 19, 2016 from the Pikka Unit (PKU) Operator, Armstrong Energy, LLC (Armstrong). The initial PKU included 63,304 acres. The proposed PKU expansion area covers approximately 14,440 acres. Attachments 1 and 2 set out the proposed Exhibits A and B.

The proposed PKU expansion is made of State of Alaska Oil and Gas Leases (State Leases) as well as State of Alaska and Arctic Slope Regional Corporation (ASRC) Oil and Gas Leases (Joint Leases). ASRC and the Division each hold undivided executive rights with respect to interests in oil, gas, and associated substances within these Joint Leases pursuant to the 1991 Settlement Agreement Between Arctic Slope Regional Corporation and the State of Alaska. This decision only affects the interests held by the State of Alaska, ASRC will issue a separate decision.

“A unit must encompass the minimum area required to include all or part of one or more oil or gas reservoirs, or all or part of one or more potential hydrocarbon accumulations.” 11 AAC 83.356(a). Armstrong has submitted confidential geological, geophysical, and engineering data which demonstrate that the area approved for expansion includes all or part of an oil reservoir and potential hydrocarbon accumulations.

The Division finds that the expansion of the PKU, promotes conservation of all natural resources, promotes the prevention of economic and physical waste and provides for the protection of all parties of interest, including the State. AS 38.05.180(p); 11 AAC 83.303. I approve the Application under the terms and conditions of Section IV. The effective date of the PKU expansion is November 29, 2016.

II. APPLICATION AND LEASE SUMMARY

Armstrong submitted the Application on September 19, 2016, and simultaneously paid the \$500.00 unit expansion application filing fee, in accordance with 11 AAC 83.306 and 11 AAC 05.010(a)(10)(D), respectively. The Application included Exhibit A (Attachment 1), legally describing the proposed expanded unit area, its leases, and ownership interests; Exhibit B (Attachment 2), a map of the proposed expanded unit; and evidence of notice to proper parties. The Application also included confidential technical data.

The Division deemed the Application complete on September 26, 2016.

The Division Published a public notice in the *Alaska Dispatch News* and *Arctic Sounder* on September 29, 2016, under 11 AAC 83.311. Copies of the Application and the public notice were provided to interested parties. DNR provided public notice to the North Slope Borough, the City of Barrow, the City of Nuiqsut, the Kuukpik Corporation, the Arctic Slope Regional Corporation (ASRC), the Nuiqsut Postmaster, the Barrow Postmaster, the KBRW radio station in Barrow, as well as the Alaska Department of Environmental Conservation, the Alaska Department of Fish and Game, the Alaska Oil and Gas Conservation Commissioner, and the ADF&G Division of Habitat. The public notices invited interested parties and members of the public to submit comments by October 31, 2016. No comments were received.

The proposed expansion includes an additional 14,440 acres summarized below. Attachment 1 of the Application describes in detail the proposed expansion leases and Attachment 2 provides a map of the proposed boundaries.

Tract No.	Lease No.	Effective Date	Acreage	Royalty	Working Interest Owner	Working Interest
66	ADL 392968	5/1/2015	640.00	State of AK 8.33333% ASRC 8.33334%	Armstrong Energy, LLC	100.00%
67	ADL 392970	5/1/2015	640.00	State of AK 9.95167% ASRC 6.71500%	Armstrong Energy, LLC	100.00%
68	ADL 392992	5/1/2015	280.00	State of AK 16.66667%	Armstrong Energy, LLC	100.00%
69	ADL 392991	5/1/2015	600.00	State of AK 9.73667% ASRC 6.93000%	Armstrong Energy, LLC	100.00%
70	ADL 392958	5/1/2015	480.00	State of AK 10.61500% ASRC 6.05167%	Armstrong Energy, LLC	100.00%
71	ADL 392977	5/1/2015	640.00	State of AK 13.79667% ASRC 2.87000%	Armstrong Energy, LLC	100.00%
72	ADL 392959	5/1/2015	640.00	State of AK 12.91334% ASRC 3.75333%	Armstrong Energy, LLC	100.00%
73	ADL 392978	5/1/2015	600.00	State of AK 10.46500% ASRC 6.20167%	Armstrong Energy, LLC	100.00%
74	ADL 392960	5/1/2015	40.00	State of AK 8.33500% ASRC 8.33167%	Armstrong Energy, LLC	100.00%
75	ADL 392981	5/1/2015	440.00	State of AK 12.23167% ASRC 4.43500%	Armstrong Energy, LLC	100.00%
76	ADL 392979	5/1/2015	640.00	State of AK 11.39167% ASRC 5.27500%	Armstrong Energy, LLC	100.00%
77	ADL 392980	5/1/2015	640.00	State of AK 11.01834% ASRC 5.64833%	Armstrong Energy, LLC	100.00%
78	ADL 392961	5/1/2015	640.00	State of AK 11.26834% ASRC 5.39833%	Armstrong Energy, LLC	100.00%
79	ADL 392975	5/1/2015	640.00	State of AK 14.27667% ASRC 2.39000%	Armstrong Energy, LLC	100.00%
80	ADL 393166	7/1/2016	640.00	State of AK 13.45834% ASRC 3.20833%	Armstrong Energy, LLC	100.00%
81	ADL 393167	7/1/2016	640.00	State of AK 8.333335% ASRC 8.333335%	Armstrong Energy, LLC	100.00%
82	ADL 393168	7/1/2016	480.00	State of AK 8.333335% ASRC 8.333335%	Armstrong Energy, LLC	100.00%
83	ADL 392984	5/1/2015	640.00	State of AK 8.33333% ASRC 8.33334%	Armstrong Energy, LLC	100.00%
84	ADL 392963	5/1/2015	640.00	State of AK 8.33333% ASRC 8.33334%	Armstrong Energy, LLC	100.00%
85	ADL 392982	5/1/2015	640.00	State of AK 9.54334% ASRC 7.12333%	Armstrong Energy, LLC	100.00%
86	ADL 392962	5/1/2015	640.00	State of AK 8.49667% ASRC 8.17000%	Armstrong Energy, LLC	100.00%
87	ADL 392983	5/1/2015	1280.00	State of AK 16.66667%	Armstrong Energy, LLC	100.00%
88	ADL 392986	5/1/2015	640.00	State of AK 16.66667%	Armstrong Energy, LLC	100.00%
89	ADL 392985	5/1/2015	640.00	State of AK 8.36000% ASRC 8.30667%	Armstrong Energy, LLC	100.00%

III. DISCUSSION OF DECISION CRITERIA

A unit may be expanded to conserve the natural resources of all or a part of an oil or gas pool, field, or like area when determined and certified to be necessary or advisable in the public interest (AS 38.05.180(p)). Conservation of the natural resources of all or part of an oil or gas pool, field or like area means “maximizing the efficient recovery of oil and gas and minimizing the adverse impacts on the surface and other resources.” 11 AAC 83.395(1).

The DNR Commissioner (Commissioner) reviews applications related to units under 11 AAC 83.303 – 11 AAC 83.395. By memorandum dated September 30, 1999, the Commissioner approved a revision of Department Order 003 and delegated this authority to the Division Director.

The Commissioner will approve a proposed unit expansion upon a finding that it will (1) promote conservation of all natural resources, including all or part of an oil or gas pool, field, or like area; (2) promote the prevention of economic and physical waste; and (3) provide for the protection of all parties of interest including the state. 11 AAC 83.303(a).

In evaluating these three criteria, the Commissioner will consider (1) the environmental costs and benefits of unitized exploration or development; (2) the geological and engineering characteristics of the potential hydrocarbon accumulation or reservoir proposed for unitization; (3) prior exploration activities in the proposed unit area; (4) the applicant’s plans for exploration or development of the unit area; (5) the economic costs and benefits to the state; and (6) any other relevant factors, including measures to mitigate impacts identified above, the commissioner determines necessary or advisable to protect the public interest. 11 AAC 83.303(b).

A discussion of the subsection (b) criteria, as they apply to the Application, is set out directly below, followed by a discussion of the subsection (a) criteria.

A. Decision Criteria considered under 11 AAC 83.303(b)

1. Environmental Costs and Benefits

The expansion area is habitat for various mammals, waterfowl, and fish. Area residents may use this area for subsistence hunting and fishing. Oil and gas activity in the proposed unit area may affect some wildlife habitat and some subsistence activity. DNR develops lease stipulations through the lease sale process to mitigate the potential environmental impacts from oil and gas activity.

DNR also considers environmental issues during the lease sale process, and the unit Plan of Operations approval process. Alaska statutes require DNR to give public notice and issue a written finding before disposal of the state’s oil and gas resources. AS 38.05.035(e); AS 38.05.945; 11 AAC 82.415. In the written best interest finding, the Commissioner may impose additional conditions or limitations beyond those imposed by law. AS 38.05.035(e).

Approval of the PKU expansion has no direct environmental impact. This decision is an administrative action and does not authorize any on-the-ground activity. The unit expansion does not entail any environmental costs in addition to those that may occur when permits to conduct lease-by-lease exploration or development are issued. The Unit Operator must obtain approval of a plan of operations from the State and permits from various agencies on State leases before drilling a well or wells or initiating development activities to produce reservoirs within the unit area. 11 AAC 83.346. Potential effects on the environment are analyzed when permits to conduct exploration or development in the unit area are reviewed. Armstrong is operating under an approved plan of operations and plan of exploration.

2. Geological and Engineering Characteristics

a) Introduction

The original Pikka Unit was formed June 18, 2015 and encompasses approximately 63,304 acres of State Leases and Joint Leases in the central North Slope area in the vicinity of the Colville River delta. The unit lies partially adjacent to the Colville River Unit (CRU) to the west and the Oooguruk and Placer Units to the east. The proposed expansion area covers approximately 14,440 acres adjacent to both the CRU on the west side of the Pikka Unit and the Placer Unit to the southeast (Exhibits A and B).

A comprehensive review of the regional historical exploration efforts, structure, stratigraphic framework and depositional environments in the area encompassing the Pikka Unit was included as part of the 2015 Decision approving the formation of the initial PKU. That information can be reviewed in section III.A.2 of that decision. This decision will focus on the results of the more recent exploration efforts, including the drilling of 14 wells within the unit area through the joint venture between Repsol E&P USA, Inc. (Repsol) and Armstrong beginning in 2012. Review of the well data and test results will focus primarily on the hydrocarbon reservoirs and potential hydrocarbon accumulations penetrated and evaluated within the following intervals (listed from shallow to deeper); Cretaceous Nanushuk Group, Cretaceous Torok Formation, lower Cretaceous Kuparuk C sand, and the Alpine A, Alpine C, Nuiqsut, and Nechelik sandstones within the Jurassic Kingak Formation.

b) Recent Exploration

In 2012 Repsol and Armstrong drilled their initial exploration well in what would later become part of the PKU. The Qugruk 2 well was drilled in the NW quarter of Section 25, Township 13 North, Range 5 East, Umiat Meridian (Sec. 25, T13N, R5E, UM) to a depth of 2,525 feet measured depth (MD) where it blew out as the surface hole section was being drilled after encountering a shallow pocket of gas, apparently from the Schrader Bluff Formation. The wellbore was ultimately plugged and abandoned.

In 2013, Repsol and Armstrong returned and drilled four exploration wells and two side-track horizontal wells for production testing. The Qugruk 1PH well was a vertical pilot hole drilled to a total depth of 7,050 feet MD in Sec. 28, T12N, R6E, UM. The well bottomed in the Jurassic Kingak Shale. Mudlog shows were noted in the shallower Cretaceous Nanushuk interval, however based on the wire-line logs, the interval appears to consist predominantly of shale. Mudlog shows were also noted in the deeper Torok Formation from approximately 5,600 to 5,712 feet MD (-5,567 to -5,679 feet subsea). Logs indicate that this interval is a series of thin porous sands interbedded with shale. Resistivity in the interval ranges from approximately 4 to 5 ohm-meters. The well encountered an approximately 15-foot-thick, oil-bearing Cretaceous Kuparuk C sand between 6,212 to 6,228 feet MD (-6,179 to -6,194 feet subsea). Based on the density logs, the topmost 7 feet of the Kuparuk C sand appears to contain secondary siderite cement which likely occludes some of the existing primary matrix porosity. Resistivity in the sand ranges from approximately 20 to 150 ohm-meters. Samples of 25 °API oil were recovered. Approximately 210 feet of the Nuiqsut interval within the Jurassic Kingak Formation was penetrated from 6,240 to 6,451 feet MD (-6,207 to -6,417 feet subsea). The top 80 feet of the Nuiqsut penetrated by the well appears fairly blocky on the gamma ray log with measurements of approximately 50 to 60 API units with deep resistivity measurements of approximately 4 to 7 ohm-meters. A sidetrack, the Qugruk 1 well bore was then drilled off the pilot hole (Qugruk 1PH) to conduct a production test of the Nuiqsut sand. The sidetrack was drilled horizontally in the upper portion of the Nuiqsut sand for approximately 1,000 feet and was fracture stimulated with approximately 255,000 pounds of 16/20 Carbolite proppant total, in two stages. The interval was first perforated with 20 shots per foot of 0.42-inch-diameter shots. The

shut-in pressure was approximately 1,900 psi, and with a maximum treating pressure of 6,111 psi. The Nuiqsut sand was tested over a period of four days and flowed at a rate of 400 to 950 barrels of oil per day (BOPD) of 25 °API oil. At 6,226 feet MD (-6,036 feet subsea), the reservoir pressure was shown to be 3,204 pounds per square inch absolute (psia) and temperature at 157 °F. Bubble point pressure is 2,232 psia, with a viscosity of approximately 2 centipoise and an initial formation volume factor of 1.213 reservoir barrels per stock tank barrel. Core was also recovered in the well.

Additional PVT analysis was performed on a sample taken from 6,292 feet MD (-6,079 feet subsea). A single stage flash to standard conditions showed that the gas-oil ratio (GOR) to be 438 standard cubic feet per stock tank barrel (scf/STB) and a gas specific gravity of 0.8. More information can be found on Well Permit 212-033 at the Alaska Oil and Gas Conservation Commission.

The Qugruk 3 well drilled to depth of 7,500 feet MD (-7,187 feet subsea) in Sec. 6, T11N, R6E, UM and ended at the base of the Jurassic Nuiqsut sand. Over 200 feet of sand with good mudlog shows interbedded with shale was encountered in the shallower Cretaceous Nanushuk Formation between approximately 4,194 to 4,490 feet MD (-4,071 to -4,302 feet subsea). Measurements from the gamma ray log over this interval ranged from 33 to 63 API units, measurements from the deep resistivity log range from 5 to 18 ohm-meters. Porosity measured from rotary sidewall cores taken in the Nanushuk interval ranged from approximately 18 to 28% with permeability ranging from 1 to 17 millidarcys (md). Pressures measured from a Modular Dynamic Test tool (MDT) demonstrated a hydrocarbon gradient and a sample of 30.5 °API oil was recovered at 4,204 feet MD (-4,080 feet subsea), that was initially an oil-water emulsion at time of sampling. Initial reservoir pressure was at 1,890 psia, with an initial reservoir temperature at 108 °F. Saturation pressure was analyzed to be at 1,611 psia. Flash-adjusted oil formation volume factor was determined to be 1.572 reservoir barrels per stock tank barrels (RB/STB) at initial conditions, with a flash-adjusted GOR of 348.9 scf/STB. A multistage separator test was also run at saturation pressure, 215 psia, 55 psia, and standard conditions. The Alpine interval in the Jurassic Kingak Formation was encountered at 6,968 feet MD (-6,687 feet subsea) in the well. A conventional core was taken from 6,925 to 6,978 MD, but only recovered core from the upper few feet of the Alpine interval. Rotary sidewall cores taken from the Alpine provided porosity measurements ranging from 10 to 25% while permeability was low with all plugs measuring less than 1 md. Mudlog shows, including visible oil staining, were noted throughout the Alpine interval. Measurements from the gamma-ray log over the upper 80 feet of the Alpine interval range from approximately 40 to 70 API units and deep resistivity measurements from the same interval generally range 3 to 6 ohm-meters. The Jurassic Nuiqsut interval was present in the wellbore between 7,230 and 7,370 feet MD (-6,933 to -7,065 feet subsea). Gamma-ray measurements in the Nuiqsut interval range from about 40 to 75 API units while resistivity is consistently 3 to 5 ohm-meters suggesting that the interval is composed predominantly of siltstone at this location. Four rotary sidewall cores in the Nuiqsut interval in this well indicate porosity ranges from 6 to 12% with permeability less than 0.1 md. Due to time constraints on the drilling season, no production testing was attempted in this well.

The Qugruk 3 well was sidetracked to the Qugruk 3A bottom hole location in Sec. 31, T12N, R6E, UM, roughly 1.5 miles northwest of the original Qugruk 3 location. Total depth for the Qugruk 3A well was 10,546 feet MD (-7,160 feet subsea) at the base of the Nuiqsut interval. In addition to very similar (based on well logs) Nanushuk, Alpine, and Nuiqsut intervals as penetrated in the Qugruk 3 well, an approximately 13-foot thick, oil-bearing, Kuparuk C sand was penetrated in the Qugruk 3A well between 9,297 and 9,322 feet MD (-6,493 to -6,506 feet subsea). Gamma-ray measurements from well logs range from around 35 to 60 API units in the sand with resistivity measurements of 40 to 72 ohm-meters. Measurements provided by the density well log suggest that the upper and lowermost portions of the C sand likely contain secondary siderite cement which can occlude the matrix porosity of the sand. This cementation is

commonly observed in thin Kuparuk C sands but generally is not thought to be laterally extensive. Based on well logs, porosity in the middle 5- to 6-foot thick portion of the sand is estimated to be 20 to 24%. Mudlog shows were observed in the Nanushuk, Kuparuk C, and Alpine sands. The Nuiqsut interval in this location is thought to be of non-reservoir quality based on well logs and weak oil shows in the mudlog. The high borehole angle of the sidetrack and lateness in the drilling season precluded any additional wire-line open-hole logging or additional testing in Qugruk 3A.

The Qugruk 6PH well was drilled to a depth of 7,809 feet MD (-6,511 feet subsea) in Sec. 24, T13N, R5E, UM and bottomed in the Nechelik interval of the Jurassic Kingak Formation. The primary zones of interest in this well were a sand in the basal portion of the Cretaceous Torok Formation, and the Nuiqsut and Nechelik sand intervals in the Jurassic Kingak Formation. An apparent oil-bearing, porous Torok sand approximately 20 feet thick was penetrated by the wellbore between 6,232 and 6,265 feet MD (-5,941 to -5,962 feet subsea). The sand appears fairly blocky in character on the well logs with gamma-ray measurements ranging from about 72 to 58 API units. Deep resistivity measurements range from around 15 to 30 ohm-meters. Cross-over in the density and neutron log curves suggest a thin 2- to 6-foot-thick gas cap might be present at the top of the sand. This sand was likely deposited as a turbidite or other sediment gravity flow deposit in the deep water toe-of-slope or proximal basin floor environment. Based on well logs, this sand appears to be correlative to an oil-bearing Torok sand of similar thickness in the CRU Fiord 3 well located approximately 6.5 miles to the south. The basal portion of the Jurassic Nuiqsut interval is present in the well bore between 7,349 and 7,428 feet MD (-6,385 to -6,414 feet subsea), the upper portion of the interval having been eroded and truncated by the regionally extensive Upper Jurassic Unconformity (UJU). The upper 10 to 12 feet of the remaining Nuiqsut interval appears to be oil bearing with deep resistivity measurements of approximately 12 ohm-meters and good oil shows in the mudlog. The Jurassic Nechelik is present below the Nuiqsut in the well between 7,428 and 7,575 feet MD (-6,414 to -6,458 feet subsea). The Nechelik interval had strong mudlog oil shows including visible oil in the drilling mud. Deep resistivity measurements in the most prospective portions of the interval ranged from 8-11 ohm-meters. Since the plan was to drill a lateral sidetrack to do a production test of the Nechelik interval, the well was drilled at an angle of over 70 degrees to assist with kicking off the lateral. The high borehole angle precluded any additional testing of the prospective zones in the Qugruk 6PH well bore. The Qugruk 6 sidetrack was drilled as an approximately 1,000-foot horizontal lateral in the Nechelik sand. The lateral was fracture stimulated in two locations along its length with a combined total of 271,000 pounds of proppant. The well was tested over a total period of 194 hours, however, issues with surface equipment prevented the well bore from being cleaned out; still, the well was able to flow at an average rate of approximately 140 BOPD of 36 °API oil and 1.6 million standard cubic feet of gas per day from the Nechelik sand.

In 2014 Repsol drilled two wells and one sidetrack in the Pikka area. The Qugruk 5 well was drilled to a depth of 7,430 feet MD (-7,129 feet subsea) at the base of the Jurassic Nechelik interval in the SW quarter of Sec. 24, T12N, R6E, UM. The Qugruk 5 well encountered an approximately 100 feet thick interval of Jurassic Alpine C sand between 6,852 to 6,959 feet MD (-6,580 to -6,681 feet subsea). Good mudlog oil shows were recorded throughout the Alpine interval. The lower 58 feet of the Alpine interval was cored and the entire cored interval exhibited oil saturation. Porosity measurements from the core ranged from 15 to 24%, permeability ranged from less than 1 to greater than 100 md. Underlying the Alpine C, the Nuiqsut interval was encountered between 6,970 to 7,072 feet MD (-6,692 to -6,788 feet subsea). Fair mudlog oil shows were recorded in the Nuiqsut. The entire Nuiqsut interval was cored and oil-bearing. Porosity measurements from the core ranges 7 to 15%, but permeability measurements were predominantly less than 1 md. The Nechelik interval was encountered below the Nuiqsut but appeared to consist primarily of interbedded siltstone and claystone with poor mudlog oil shows. The Qugruk 5 well was then sidetracked to the Qugruk 5A bottom hole location (BHL) approximately 3,500 feet northeast of the Qugruk 5 BHL to conduct a production

test of the Nuiqsut interval in a location where the well was not expected to encounter the Alpine C sand. As expected, the Qugruk 5A well bore did not encounter Alpine C and based on the well logs, the Nuiqsut interval was similar to that in the original Qugruk 5 location. The Nuiqsut interval in Qugruk 5A was perforated and fracture stimulated, however, issues with a downhole valve prevented the well from being flowed back for ten days. After remedial work, which included pulling the original completion and re-completing the well, the Qugruk 5A well was tested but never achieved well bore clean up before the test was terminated. A total of 6 barrels of oil was produced from the Nuiqsut interval.

The Qugruk 7 well was also drilled in 2014 to a total depth of 7,176 feet MD (6,808 feet true vertical depth) to a BHL in the SE quarter of Sec. 17, T12N, R6E, UM. Armstrong requested and was granted extended confidentiality for the Qugruk 7 well beyond the twenty-five-month confidential period normally provided exploration wells drilled on state lands. Armstrong provided confidential geological, geophysical, and engineering data showing that the Qugruk 7 well data contains significant information relating to the valuation of land located more than 3 miles from the well that were considered by DNR to be unleased, thereby justifying extension of confidentiality for a reasonable time in accordance with 11 AAC 83.153(a). The “unleased lands” at issue included lands that were formerly part of the Tofkat Unit, which terminated automatically on March 31, 2016, but soon became the subject of two appeals before the commissioner of the Department of Natural Resources. With the recent resolution of those appeals in early November 2016, lease interest in those lands has been retroactively assigned to ConocoPhillips, and the Qugruk 7 well extended confidentiality decision has been vacated. It is anticipated that the Alaska Oil and Gas Conservation Commission (AOGCC) will release the related reports and information to the public soon.

In 2015 Armstrong drilled three wells plus one sidetrack (Qugruk 8, Qugruk 301, Qugruk 9, and Qugruk 9A) in the Pikka area. These wells are all still under the twenty-five-month confidentiality period granted for exploration wells by the AOGCC. However, basic information such as bottom hole location and total depth are public record and posted on the AOGCC website. In addition, Armstrong has discussed preliminary results of some of these wells in the press. The Qugruk 9 well was drilled to a BHL in the NW corner of Sec. 8, T12N, R6E, UM to a total depth of 7,140 feet MD (6,645 feet TVD). This well was then sidetracked to the Qugruk 9A BHL located in the NW quarter of Sec. 7, T12N, R6E, UM, approximately 3,500 feet west of the original Qugruk 9 BHL. Qugruk 9A was drilled to a total depth of 7,075 feet MD (6,650 feet TVD). The vertical Qugruk 8 well was drilled in the NW quarter of Sec. 18, T11N, R6E, UM to a total depth of 4,700 feet. Armstrong announced that a production test conducted over a portion of the Nanushuk Formation in the Qugruk 8 well flowed 30 °API gravity oil at rates up to 2,160 BOPD. The Qugruk 301 well was drilled to a BHL in the SE quarter of Sec. 31, T12N, R6E, UM, approximately 2 miles north of the Qugruk 8 well and tested a 2,000-foot horizontal lateral in the Nanushuk Formation. Armstrong announced the Qugruk 301 well flowed at tubing-constrained rates as high as 4,600 BOPD with minimal drawdown of bottom hole pressure (PR Newswire, June 2, 2015).

The entire unit area including the expansion acreage is covered by 3-D seismic data either acquired or licensed by Armstrong. The existing seismic data allows for detailed mapping of fault patterns, truncation of individual Jurassic sands by the Lower Cretaceous Unconformity and amplitude anomalies associated with the sands. In addition, the employment of advanced seismic processing and interpretation methods, such as simultaneous elastic inversion of the seismic volume and Amplitude Versus Offset analysis, integrated with the recently drilled wells, has allowed Armstrong to better evaluate and predict the presence, thickness, and reservoir quality of the hydrocarbon reservoirs and other potential hydrocarbon accumulations within the unit and expansion acreage.

c) Current Activity

In June 2015, Armstrong submitted an application for a permit from the U.S. Army Corps of Engineers (USACE) for a project (Nanushuk Project) to develop the discovered hydrocarbons in the Nanushuk and Alpine reservoirs within the Pikka Unit. The proposed project includes three gravel drill sites (DS1, DS2, and DS3) accommodating up to 150 total production and injection wells, and a central processing facility capable of processing up to 120,000 BOPD that will be co-located on DS1. Sales-quality oil will be transported by a constructed pipeline to Kuparuk CPF2 where it will tie-in to an existing pipeline to the Trans Alaska Pipeline System (TAPS). In February 2016, the USACE filed a notice of intent that an Environmental Impact Statement (EIS) level analysis is required for the proposed project under the National Environmental Policy Act (NEPA) process. In addition to USACE and Armstrong, other agencies cooperating in the process are; The Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service, State of Alaska Department of Natural Resources, North Slope Borough, and Native Village of Nuiqsut. The EIS process is currently ongoing and should not be expected to be completed prior to late in 2018. Simultaneous with the EIS process, Armstrong is conducting additional special core analysis including capillary pressure tests, relative permeability test, flow-assurance-critical velocity tests (fines migration), basic water flood tests, and water compatibility tests in the Nanushuk and Alpine reservoirs. Ongoing geomechanical analyses are being expanded to include studies to address wellbore stability and hydraulic fracture stimulation. Results from both the special core analysis and geomechanical studies will be incorporated into the static and dynamic reservoir models to aid prediction of development well performance, which is critical for defining facilities capacity. Armstrong has stated that once the EIS is completed and assuming no large delays, production from the Pikka Unit could begin in 2021 (Petroleum News Feb. 21, 2016).

d) Conclusion

As part of the application to expand the Pikka Unit, Armstrong provided the Division comprehensive interpretation and analysis of the available data in support of the application to expand the unit. The application included interpretations of 3-D seismic data, seismic attribute analysis, structure maps, interval isopach maps, and net pay maps integrating seismic and well data, interpreted well logs and proprietary petrophysical analyses from wells within the unit and surrounding area, well correlations, and geologic cross sections. Through careful interpretation of 3-D seismic and analyses of previously drilled wells in the area, as well as Armstrong's recent drilling activity, Armstrong has identified multiple reservoirs and potential hydrocarbon accumulations over a large area in several stratigraphic intervals. Armstrong also shared their plans and efforts underway to develop and bring multiple reservoirs in the Pikka Unit and proposed expansion area into production. After evaluating the data and participating in numerous discussions and work sessions with Armstrong's technical staff, the Division determines that Armstrong has made a sufficient showing that the proposed expansion acreage is expected to be capable of contributing to production as part of the development plan being progressed by the Nanushuk Project EIS.

3. Plans of Exploration

The Division approved the 2016 PKU Plan of Exploration (POE) effective November 5, 2015 for the period December 1, 2015 through November 30, 2016. In the 2016 POE, then-operator Repsol E&P USA, Inc. proposed acquiring seismic survey data, reprocessing of the data and conducting rock physics studies. Additionally, stratigraphic analysis and special core analysis of recovered cores from wells drilled in 2015 was proposed. After applying to expand the PKU, Armstrong submitted the 2017 POE on October 4, 2016. The 2017 POE describes successfully completing the work outlined in the 2016 POE, and plans for addition seismic, geo-mechanical, and special core analysis work to refine reservoir simulations and development plans. The

Division approved the 2017 PKU POE effective October 27, 2016 for the period December 1, 2016 through November 30, 2017.

4. The Economic Costs and Benefits to the State and Other Relevant Factors

The expanded PKU may provide economic benefits to the State through royalty and tax payments on production, although, because the unit is not currently producing, there is currently no additional direct economic benefit. Unitized development conducted under the PKU Agreement provides for development of all the unitized leases as a single lease, rather than development conducted on a lease-by-lease basis. Unitized development maximizes oil and gas recovery, promotes conservation, prevents waste, and protects all of the parties of interest.

B. Decision Criteria considered under 11 AAC 83.303(a)

1. Promote the Conservation of All Natural Resources

A unit may be formed under AS 38.05.180(p) “[t]o conserve the natural resources of all or a part of an oil or gas pool, field, or like area.” Conservation of the natural resources of all or part of an oil or gas pool, field or like area means “maximizing the efficient recovery of oil and gas and minimizing the adverse impacts on the surface and other resources.” 11 AAC 83.395(9). The unitization of oil and gas reservoirs or accumulations and the formation and expansion of unit areas to develop hydrocarbon-bearing reservoirs or accumulations are well-accepted means of hydrocarbon conservation. Unitization, with development occurring under the terms of a unit agreement, can promote efficient evaluation and development of the State’s resources, and minimize impacts to the area’s cultural, biological, and environmental resources.

Expansion of an existing unit, with exploration and development occurring under the terms of a unit agreement, promotes efficient evaluation and development of the State’s resources, and minimizes impacts to the area’s cultural, biological, and environmental resources.

2. The Prevention of Economic and Physical Waste

Unitization, as opposed to activity on a lease-by-lease basis, may prevent economic and physical waste. Economic waste is often referred to as the drilling of wells in excess of the number necessary for the efficient recovery or delineation of the oil and gas in place. Physical waste, among other things, includes the inefficient, excessive, or improper use of, or unnecessary dissipation of, reservoir energy.

Unitization may also prevent economic and physical waste by eliminating redundant expenditures for a given level of production, or by avoiding loss of ultimate recovery with the adoption of a unified reservoir management plan. Annual approval of the PKU development activities as described in the future plans of development must also provide for the prevention of economic and physical waste.

3. The Protection of All Parties of Interest, Including the State

The people of Alaska have an interest in the development of the State’s oil and gas resources to maximize the economic and physical recovery of the resources, AS 38.05.180(a). Approval of the expansion under future annually approved plans of development will provide for continued review and approval of Armstrong’s plans to develop the PKU in a manner which will maximize economic and physical recovery. Combining interests and operating under the terms of the PKU

Agreement and PKU Operating Agreement assures an equitable allocation of costs and revenues commensurate with the resources.

The PKU expansion protects the economic interests of the WIOs, the State, and ASRC. The expansion promotes the State's economic interests because hydrocarbon recovery will be maximized and additional production-based revenue will be derived from the increased production. Diligent exploration and development under a single approved unit plan without the complications of competing leasehold interests promotes the State's interest. Operating under the PKU Agreement provides for accurate reporting and record keeping, State approval of plans of exploration and development and operating procedures, royalty settlement, in-kind taking, and emergency storage of oil and gas, all of which will further the State's interest.

The State and ASRC are co-owners of Joint Leases within the unit. Because of this the PKU Agreement is different than most unit agreements in Alaska. The State is a royalty owner and charged with the protection of all parties. In contrast ASRC is a private corporation with responsibility to shareholders and the authority to contractually obligate itself. In most cases the State and ASRC have aligned interests and management decisions are united. In the event of a dispute, Article 20 of the PKU Agreement outlines the use of third party arbitration in place of the typical DNR appeal process. This article was included to place DNR and ASRC on an equal footing with regards to management of the PKU should a conflict develop. A similar agreement is used with ASRC for the Colville River Unit and has successfully provided for development and production since 1998.

ASRC will separately provide its approval or disapproval of the PKU. As set forth in the Joint Leases, the State's approval of unitization of the Joint Leases is effective only as to the State's undivided interests.

IV. FINDINGS AND DECISION

A. The Conservation of All Natural Resources

1. Expansion of the PKU will provide for continued exploration of the unitized area(s) under the PKU Agreement and will maximize the efficient recovery of oil and gas and minimize the adverse impacts on the surface and other resources, including hydrocarbons, gravel, sand, water, wetlands, and valuable habitat.
2. The unitized development and operation of the leases in this expansion will reduce the amount of land and fish and wildlife habitat that would otherwise be disrupted by individual lease development. This reduction in environmental impacts and preservation of subsistence access is in the public interest.
3. There is potential for environmental impacts associated with development. All unit development must proceed according to an approved plan of development. Additionally, before undertaking any specific operations, the Unit Operator must submit a unit Plan of Operations to the Division and other appropriate state and local agencies for review and approval. The lessees may not commence any drilling or development operations until all agencies have granted the required permits. DNR may condition its approval of a unit Plan of Operations and other permits on performance of mitigation measures in addition to those in the modified leases and the Agreement, if necessary or appropriate. Compliance with mitigation measures will minimize, reduce or completely avoid adverse environmental impacts.

B. The Prevention of Economic and Physical Waste

1. Armstrong submitted geological, geophysical and engineering data to the Division in support of the Application. Division technical staff determined that the expanded PKU area encompasses all or part of one or more oil and gas reservoir(s).
2. The available geological, geophysical and engineering data justify including the proposed lands, as described in Section III. A. 2. of this decision.

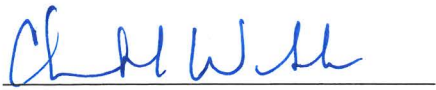
C. The Protection of All Parties in Interest, Including the State

1. The unit expansion as approved protects all parties' interests including the people of Alaska who have an interest in the development of the State's oil and gas resources to maximize the economic and physical recovery of the resources.
2. The economic, geological, geophysical, and engineering data that Armstrong provided reasonably justify the inclusion of the PKU expansion acreage under the terms of the applicable regulations governing formation, expansion, and operation of oil and gas units and participating areas (11 AAC 83.301 – 11 AAC 83.395) and the terms and conditions under which these lands were leased from the State.
3. Armstrong provided evidence of reasonable effort to obtain joinder of any proper party to the Agreement.
4. Armstrong holds sufficient interest in the unit area to give reasonably effective control of operations.
5. The unit expansion meets the requirements of 11 AAC 83.303.
6. The Division complied with the public notice requirements of 11 AAC 83.311.
7. The unit expansion will not diminish access to public and navigable waters beyond those limitations (if any) imposed by law or already contained in the oil and gas leases covered by this decision.
8. The PKU Agreement provides for additional expansions and contractions of the unit area in the future, as warranted by data obtained by exploration or otherwise. The PKU Agreement thereby protects the public interest, the rights of the parties, and the correlative rights of adjacent landowners.
9. The approved expanded unit is effective November 29, 2016.

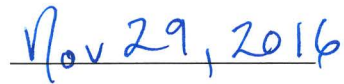
For the reasons discussed in this Findings and Decision, I hereby approve the PKU expansion.

A 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, Commissioner, Department of Natural Resources, 550 W. 7th Avenue, Suite 1400, Anchorage, Alaska 99501; faxed to 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.

If you have any questions regarding this decision, contact Kevin Pike with the Division at 907-269-8451, or by email at kevin.pike@alaska.gov.



Chantal Walsh
Director
Division of Oil and Gas



Date

cc: Teresa Imm, Arctic Slope Regional Corporation
Department of Law

V. Attachments

1. Pikka Unit Proposed and Approved Exhibit A
Description of Lands within the Expanded Unit
2. Pikka Unit Proposed and Approved Exhibit B
Map of Expanded Unit Area

1. Pikka Unit Proposed and Approved Exhibit A

Description of Lands within the Expanded Unit

Exhibit A
To the Pikka Unit Agreement dated effective June 1, 2015

Unit Tract #	Lessor & Lease No.	Working Interest Owner	Working Interest	Effective Date	Description	Acreage	Mineral Interest	Royalty	ORR Burden
1	State of AK ADL 391391	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	9/1/2009	Tract: 417 T. 014N., R. 006E., Umiat Meridian, Alaska. Section 19, Protracted, All tide and submerged lands lying shoreward of line fixed by coordinates found in Exhibit A of the Final Decree in U.S. v. Alaska, No. 84 Original, 119.16 acres; Section 30, Protracted, All, 620.00 acres; Section 31, Protracted, All, 623.00 acres; The Final Decree in U.S. v. Alaska, No. 84 Original, fixed the offshore boundary between the United States and the State of Alaska in the Chukchi and Beaufort Seas. The acreage was taken from the Alaska's Seaward Boundary diagram depicting the offshore federal/state boundary approved by the State of Alaska on April 15, 1996.	1362.16	State of AK 100%	State of AK 16.66667%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
2	State of AK ADL 391395	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	9/1/2009	Tract 426 T. 014N., R. 005E., Umiat Meridian, Alaska. Section 24, Protracted, All tide and submerged lands lying shoreward of line fixed by coordinates found in Exhibit A of the Final Decree in U.S. v. Alaska, No. 84 Original, 13.71 acres; Section 25, Protracted, All tide and submerged lands lying shoreward of line fixed by coordinates found in Exhibit A of the Final Decree in U.S. v. Alaska, No. 84 Original, 635.35 acres; Section 26, Protracted, All tide and submerged lands lying shoreward of line fixed by coordinates found in Exhibit A of the Final Decree in U.S. v. Alaska, No. 84 Original, 594.15 acres; Section 35, Protracted, All, 640.00 acres; Section 36, Protracted, All, 640.00 acres; The Final Decree in U.S. v. Alaska, No. 84 Original, fixed the offshore boundary between the United States and the State of Alaska in the Chukchi and Beaufort Seas. The acreage was taken from the Alaska's Seaward Boundary diagram depicting the offshore federal/state boundary approved by the State of Alaska on April 15, 1996.	2523.21	State of AK 100%	State of AK 16.66667%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
3	State of AK ADL 391396	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	9/1/2009	Tract: 427 T. 014N., R. 005E., Umiat Meridian, Alaska. Section 27, Protracted, All tide and submerged lands lying shoreward of line fixed by coordinates found in Exhibit A of the Final Decree in U.S. v. Alaska, No. 84 Original, 454.10 acres; Section 34, Protracted, All, 640.00 acres; The Final Decree in U.S. v. Alaska, No. 84 Original, fixed the offshore boundary between the United States and the State of Alaska in the Chukchi and Beaufort Seas. The acreage was taken from the Alaska's Seaward Boundary diagram depicting the offshore federal/state boundary approved by the State of Alaska on April 15, 1996.	1094.10	State of AK 100%	State of AK 16.66667%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%

Unit Tract #	Lessor & Lease No.	Working Interest Owner	Working Interest	Effective Date	Description	Acreage	Mineral Interest	Royalty	ORR Burden
4	State of AK ADL 391393	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	9/1/2009	Tract: 419 T. 013N., R. 005E., Umiat Meridian, Alaska. Section 3, Protracted, All, 640.00 acres;	640.00	State of AK 100%	State of AK 16.66667%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
5	State of AK ADL 391392	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	9/1/2009	Tract 418 T. 013N., R. 005E., Tract A, Umiat Meridian, Alaska. Section 11, Unsurveyed, All uplands, including the bed of the Elaktoveach Channel, 205.54 acres; Section 12, Unsurveyed, All uplands, including the bed of the Elaktoveach Channel, 426.42 acres; T. 013N., R. 005E., Umiat Meridian, Alaska. Section 1, Protracted, All, 640.00 acres; Section 2, Protracted, All, 640.00 acres; Section 11, Unsurveyed, All tide and submerged lands, 434.46 acres; Section 12, Unsurveyed, All tide and submerged lands, 213.58 acres;	2560.00	State of AK 100%	State of AK 16.66667%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
6	State of AK ADL 391387	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	9/1/2009	Tract: 413 T. 013N., R. 006E., Umiat Meridian, Alaska. Section 6, Protracted, All, 625.00 acres; Section 7, Unsurveyed, All tide and submerged lands, 151.64 acres; Section 8, Unsurveyed, All tide and submerged lands, 284.19 acres; T. 013N., R. 006E., Tract A, Umiat Meridian, Alaska. Section 7, Unsurveyed, All uplands, 476.36 acres; Section 8, Unsurveyed, All uplands, 355.81 acres;	1893.00	State of AK 100%	State of AK 16.66667%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%

Exhibit A
To the Pikka Unit Agreement dated effective June 1, 2015

Unit Tract #	Lessor & Lease No.	Working Interest Owner	Working Interest	Effective Date	Description	Acreage	Mineral Interest	Royalty	ORR Burden
7	State of AK ADL 391303	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	8/1/2008	Tract 412 T. 13N., R. 6E., Umiat Meridian, Alaska. Section 9, Unsurveyed, All tide and submerged lands, 156.70 acres; Section 10, Unsurveyed, All tide and submerged lands, 168.45 acres; T. 13N., R. 6E., Tract A, Umiat Meridian, Alaska. Section 9, Unsurveyed, All uplands, 483.30 acres; Section 10, Unsurveyed, All uplands, 471.55 acres;	1280.00	State of AK 100%	State of AK 16.66667%	William D. Armstrong 0.76808% Edgar Kerr 0.03990% Jesse V. Sommer 0.03990% Jeffery A. Lyslo 0.03990% Edward S. Smida 0.02494% Edward Y. Teng 0.02494% Colby VanDenburg 0.00998% Patricia M. Reed 0.00998% Mathew X. Furrin 0.03990% GMT Exploration Company LLC 0.33250% Andrew J Bachner 1.80000% Keith C Forsgren 0.20000%
8	State of AK ADL 391566	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	10/1/2010	Tract 411 T. 013 N., R. 006 E., Umiat Meridian, Alaska. Section 1, Unsurveyed, All tide and submerged lands, 617.37 acres; Section 2, Unsurveyed, All tide and submerged lands, 635.75 acres; Section 11, Unsurveyed, All tide and submerged lands, 150.22 acres; Section 12, Unsurveyed, All tide and submerged lands, 179.17 acres; T. 013 N., R. 006 E., Tract A, Umiat Meridian, Alaska. Section 1, Unsurveyed, All uplands, 22.63 acres; Section 2, Unsurveyed, All uplands, 4.25 acres; Section 11, Unsurveyed, All uplands, 489.78 acres; Section 12, Unsurveyed, All uplands, 460.83 acres;	2560.00	State of AK 100%	State of AK 16.66667%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
9	State of AK ADL 391388	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	9/1/2009	Tract: 414 T. 013N., R. 006E., Umiat Meridian, Alaska. Section 13, Surveyed by Protraction, All including the beds of the Colville River and the Kupiguak Channel, 640.00 acres; Section 14, Surveyed by Protraction, All including the bed of the Colville River, 640.00 acres; Section 23, Surveyed by Protraction, All including the bed of the Colville River, 640.00 acres; Section 24, Surveyed by Protraction, All including the beds of the Colville River and the Kupiguak Channel, 640.00 acres;	2560.00	State of AK 100%	State of AK 16.66667%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
10	State of AK ADL 391457	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1209 T. 013N., R. 006E., Tract A, Umiat Meridian, Alaska. Section 15, Surveyed by protraction, All, including the bed of the Colville River, 640.00 acres; Section 16, Surveyed by protraction, All, including the bed of the Colville River, 640.00 acres; Section 21, Surveyed by protraction, All, including the bed of the Colville River, 640.00 acres; Section 22, Surveyed by protraction, All, including the bed of the Colville River, 640.00 acres;	2560.00	State of AK 100%	State of AK 16.66667%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%

Exhibit A
To the Pikka Unit Agreement dated effective June 1, 2015

Unit Tract #	Lessor & Lease No.	Working Interest Owner	Working Interest	Effective Date	Description	Acreage	Mineral Interest	Royalty	ORR Burden
11	State of AK ADL 391458	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1210 T. 013N., R. 006E., Tract A, Umiat Meridian, Alaska. Section 17, Surveyed by protraction, All, 640.00 acres; Section 18, Surveyed by protraction, All, including the bed of the Elaktoveach Channel, 631.00 acres; Section 19, Surveyed by protraction, All, including the bed of the Elaktoveach Channel, 633.00 acres; Section 20, Surveyed by protraction, All, including the beds of the Elaktoveach Channel and the Colville River, 640.00 acres;	2544.00	State of AK 100%	State of AK 16.66667%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furin 0.10000% GMT Exploration Company LLC 0.83333%
12	State of AK ADL 391394	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	9/1/2009	Tract: 421 T. 013N., R. 005E., Umiat Meridian, Alaska. Section 14, Unsurveyed, All tide and submerged lands, 163.42 acres; T. 013N., R. 005E., Tract A, Umiat Meridian, Alaska. Section 13, Unsurveyed, All uplands, including the bed of the Elaktoveach Channel, 640.00 acres; Section 14, Unsurveyed, All uplands, 476.58 acres; Section 23, Unsurveyed, All, 640.00 acres; Section 24, Unsurveyed, All, 640.00 acres;	2560.00	State of AK 100%	State of AK 16.66667%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furin 0.10000% GMT Exploration Company LLC 0.83333%
13	State of AK ADL 391456	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1208 T. 013N., R. 005E., Tract A, Umiat Meridian, Alaska. Section 25, Unsurveyed, All, including the beds of all meanderable waterbodies, 640.00 acres;	640.00	State of AK 100%	State of AK 16.66667%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furin 0.10000% GMT Exploration Company LLC 0.83333%
14	State of AK ADL 391461	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1213 T. 013N., R. 006E., Tract A, Umiat Meridian, Alaska. Section 29, Surveyed by protraction, All, including the beds of the Colville River and the Elaktoveach Channel, 640.00 acres; Section 30, Surveyed by protraction, All, including the bed of the Elaktoveach Channel, 636.00 acres; Section 31, Surveyed by protraction, All, including the beds of the Elaktoveach Channel and the unnamed lake, 639.00 acres; Section 32, Surveyed by protraction, All, including the beds of the Colville River and the Elaktoveach Channel, 640.00 acres;	2555.00	State of AK 100%	State of AK 16.66667%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furin 0.10000% GMT Exploration Company LLC 0.83333%

Unit Tract #	Lessor & Lease No.	Working Interest Owner	Working Interest	Effective Date	Description	Acreage	Mineral Interest	Royalty	ORR Burden
15	State of AK ADL 391460	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1212 T. 013N., R. 006E., Tract A, Umiat Meridian, Alaska. Section 27, Surveyed by protraction, All, including the beds of the Colville River and the unnamed lake, 640.00 acres; Section 28, Surveyed by protraction, All, including the bed of the Colville River, 640.00 acres; Section 33, Surveyed by protraction, All, including the beds of the Colville River and the unnamed lake, 640.00 acres; Section 34, Surveyed by protraction, All, including the bed of the Colville River, 640.00 acres;	2560.00	State of AK 100%	State of AK 16.66667%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
16	State of AK ADL 391459	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1211 T. 013N., R. 006E., Tract B, Umiat Meridian, Alaska. Section 25, Unsurveyed, All, including that portion of ASLS 88-37 Lot 1 within Section 25 and the beds of the Colville River and Kupiguak Channel, 640.00 acres; Section 26, Unsurveyed, All, including the bed of the Colville River, 640.00 acres; Section 35, Unsurveyed, All, including the bed of the Colville River, 640.00 acres; Section 36, Unsurveyed, All, including that portion of ASLS 88-37 Lot 1 within Section 36 and the bed of the Kupiguak Channel, 640.00 acres;	2560.00	State of AK 100%	State of AK 16.66667%	
17	State of AK ADL 392111	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	12/1/2012	Tract 1145 T. 012 N., R 006E., Umiat Meridian, Alaska Section 1, Surveyed, Lots 1-3, Lots 3-5 of U.S. Survey 9999 and the bed of the Colville River, 640.00 acres	640.00	State of AK 84.52% ASRC 15.48%	State of AK 14.08667% ASRC 2.58000%	
18	State of AK ADL 392257	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	12/1/2012	Tract 1145 T. 012 N., R 006E., Umiat Meridian, Alaska Section 2, Surveyed, Lots 1 and 2, Lots 2-5 of U.S. Survey 9999 and the bed of the Colville River, 640.00 acres	640.00	State of AK 78.23% ASRC 21.77%	State of AK 13.03834% ASRC 3.62833%	
19	State of AK ADL 391450	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1146 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 3, Surveyed by protraction, All, 640.00 acres;	640.00	State of AK 62.58% ASRC 37.42%	State of AK 10.43000% ASRC 6.23667%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%

Exhibit A
To the Pikka Unit Agreement dated effective June 1, 2015

Unit Tract #	Lessor & Lease No.	Working Interest Owner	Working Interest	Effective Date	Description	Acreage	Mineral Interest	Royalty	ORR Burden
20	State of AK ADL 392998	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1146 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 4, Surveyed by protraction, All, 640.00 acres;	640.00	State of AK 69.56% ASRC 30.44%	State of AK 11.59334% ASRC 5.073333%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
21	State of AK ADL 391451	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1147 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 5, Surveyed by protraction, All, 640.00 acres;	640.00	State of AK 60.43% ASRC 39.57%	State of AK 10.07167% ASRC 6.59500%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
22	State of AK ADL 393000	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1147 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 6, Surveyed by protraction, All, 577.00 acres;	577.00	State of AK 100.00%	State of AK 16.66667%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
23	State of AK ADL 393001	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1147 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 7, Surveyed by protraction, All, 580.00 acres;	580.00	State of AK 60.88% ASRC 39.12%	State of AK 10.14667% ASRC 6.52000%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%

Unit Tract #	Lessor & Lease No.	Working Interest Owner	Working Interest	Effective Date	Description	Acreage	Mineral Interest	Royalty	ORR Burden
24	State of AK ADL 393002	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1147 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 8, Surveyed by protraction, All, 640.00 acres;	640.00	State of AK 62.13% ASRC 37.87%	State of AK 10.35500% ASRC 6.31167%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
25	State of AK ADL 392999	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1146 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 9, Surveyed by protraction, All, 640.00 acres;	640.00	State of AK 63.98% ASRC 36.02%	State of AK 10.66334% ASRC 6.00333%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
26	State of AK ADL 392112	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	12/1/2012	Tract 1146 T. 012 N., R 006E., Umiat Meridian, Alaska Section 10, Surveyed, Lots 1-4, Lot 1 of U.S. Survey 9999 and the bed of the Colville River, 640.00 acres	640.00	State of AK 71.73% ASRC 28.27%	State of AK 11.95500% ASRC 4.71167%	
27	State of AK ADL 392258	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	12/1/2012	Tract 1145 T. 012 N., R 006E., Umiat Meridian, Alaska Section 11, Surveyed, Lots 1-4, Lots 1-3 of U.S. Survey 9999 and the bed of the Colville River, 640.00 acres	640.00	State of AK 90.99% ASRC 9.01%	State of AK 15.16500% ASRC 1.50167%	
28	State of AK ADL 391449	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1145 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 12, Surveyed by protraction, All, including the beds of the Colville River and Kupiguak Channel and excluding U.S. Survey 9124, 638.13 acres; U.S. Survey. That portion of U.S. Survey 9124 located in Section 12, 1.87 acres;	640.00	State of AK 76.26% ASRC 23.74%	State of AK 12.71000% ASRC 3.95667%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%

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Unit Tract #	Lessor & Lease No.	Working Interest Owner	Working Interest	Effective Date	Description	Acreage	Mineral Interest	Royalty	ORR Burden
29	State of AK ADL 391452	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1148 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 13, Surveyed by protraction, All, 640.00 acres;	640.00	State of AK 76.78% ASRC 23.22%	State of AK 12.79667% ASRC 3.87000%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
30	State of AK ADL 393003	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1148 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 14, Surveyed by protraction, All, 640.00 acres;	640.00	State of AK 67.26% ASRC 32.74%	State of AK 11.21000% ASRC 5.45667%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
31	State of AK ADL 391453	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1149 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 15, Surveyed by protraction, All, 640.00 acres;	640.00	State of AK 77.57% ASRC 22.43%	State of AK 12.92834% ASRC 3.73833%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
32	State of AK ADL 393006	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1149 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 16, Surveyed by protraction, All, 640.00 acres;	640.00	State of AK 71.89% ASRC 28.11%	State of AK 11.98167% ASRC 4.68500%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%

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Unit Tract #	Lessor & Lease No.	Working Interest Owner	Working Interest	Effective Date	Description	Acreage	Mineral Interest	Royalty	ORR Burden
33	State of AK ADL 391454	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1150 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 17, Surveyed by protraction, All, 640.00 acres;	640.00	State of AK 63.39% ASRC 36.61%	State of AK 10.56500% ASRC 6.10167%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
34	State of AK ADL 393009	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1150 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 18, Surveyed by protraction, All, 583.00 acres;	583.00	State of AK 59.41% ASRC 40.59%	State of AK 9.90167% ASRC 6.76500%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
35	State of AK ADL 393010	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1150 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 19, Surveyed by protraction, All, 585.00 acres;	585.00	State of AK 61.46% ASRC 38.54%	State of AK 10.24334% ASRC 6.42333%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
36	State of AK ADL 393011	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1150 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 20, Surveyed by protraction, All, 640.00 acres;	640.00	State of AK 74.29% ASRC 25.71%	State of AK 12.38167% ASRC 4.28500%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%

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Unit Tract #	Lessor & Lease No.	Working Interest Owner	Working Interest	Effective Date	Description	Acreage	Mineral Interest	Royalty	ORR Burden
37	State of AK ADL 393007	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1149 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 21, Surveyed by protraction, All, 640.00 acres;	640.00	State of AK 65.65% ASRC 34.35%	State of AK 10.94167% ASRC 5.72500%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
38	State of AK ADL 393008	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1149 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 22, Surveyed by protraction, All, 640.00 acres;	640.00	State of AK 71.71% ASRC 28.29%	State of AK 11.95167% ASRC 4.71500%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
39	State of AK ADL 393004	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1148 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 23, Surveyed by protraction, All, 640.00 acres;	640.00	State of AK 77.39% ASRC 22.61%	State of AK 12.89834% ASRC 3.76833%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
40	State of AK ADL 393005	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1148 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 24, Surveyed by protraction, All, 640.00 acres;	640.00	State of AK 59.42% ASRC 40.58%	State of AK 9.90334% ASRC 6.76333%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%

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Unit Tract #	Lessor & Lease No.	Working Interest Owner	Working Interest	Effective Date	Description	Acreage	Mineral Interest	Royalty	ORR Burden
41	State of AK ADL 391553	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	7/1/2010	Tract 1151 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 25, Surveyed by Protraction, All, including the bed of the Milluveach River, 640.00 acres;	640.00	State of AK 55.42% ASRC 44.58%	State of AK 9.23667% ASRC 7.43000%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furin 0.10000% GMT Exploration Company LLC 0.83333%
42	State of AK ADL 393012	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	7/1/2010	Tract 1151 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 26, Surveyed by Protraction, All, including the bed of the Colville River, 640.00 acres;	640.00	State of AK 50.74% ASRC 49.26%	State of AK 8.45667% ASRC 8.21000%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furin 0.10000% GMT Exploration Company LLC 0.83333%
43	State of AK ADL 391322	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	8/1/2008	Tract 1152 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 27, Surveyed by Protraction, All including the bed of the Colville River, 640.00 acres;	640.00	State of AK 71.75% ASRC 28.25%	State of AK 11.95834% ASRC 4.70833%	William D. Armstrong 0.96443% Edgar Kerr 0.05010% Jesse V. Sommer 0.05010% Jeffery A. Lyslo 0.05010% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%
44	State of AK ADL 393015	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	8/1/2008	Tract 1152 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 28, Surveyed by Protraction, All including the bed of the Colville River, 640.00 acres;	640.00	State of AK 68.31% ASRC 31.69%	State of AK 11.38500% ASRC 5.28167%	William D. Armstrong 0.96443% Edgar Kerr 0.05010% Jesse V. Sommer 0.05010% Jeffery A. Lyslo 0.05010% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%

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Unit Tract #	Lessor & Lease No.	Working Interest Owner	Working Interest	Effective Date	Description	Acreage	Mineral Interest	Royalty	ORR Burden
45	State of AK ADL 391455	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1153 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 29, Surveyed by protraction, All, 640.00 acres;	640.00	State of AK 53.60% ASRC 46.40%	State of AK 8.93334% ASRC Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
46	State of AK ADL 393018	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1153 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 30, Surveyed by protraction, All, 588.00 acres;	588.00	State of AK 70.33% ASRC 29.67%	State of AK 11.72167% ASRC Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
47	State of AK ADL 393019	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1153 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 31, Surveyed by protraction, All, 591.00 acres;	591.00	State of AK 66.90% ASRC 33.10%	State of AK 11.15000% ASRC Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward Y. Teng 0.06250% Edward S. Smida 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward Y. Teng 0.06250% Edward S. Smida 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%
48	State of AK ADL 393020	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1153 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 32, Surveyed by protraction, All, 640.00 acres;	640.00	State of AK 73.41% ASRC 26.59%	State of AK 12.23500% ASRC Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lyslo 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furrin 0.10000% GMT Exploration Company LLC 0.83333%

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Unit Tract #	Lessor & Lease No.	Working Interest Owner	Working Interest	Effective Date	Description	Acreage	Mineral Interest	Royalty	ORR Burden
49	State of AK ADL 393016	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	8/1/2008	Tract 1152 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 33, Surveyed by Protraction, All including the bed of the Colville River, 640.00 acres;	640.00	State of AK 66.83% ASRC 33.17%	State of AK 11.13834% ASRC 5.52833%	William D. Armstrong 0.96443% Edgar Kerr 0.05010% Jesse V. Sommer 0.05010% Jeffery A. Lysio 0.05010% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%
50	State of AK ADL 393017	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	8/1/2008	Tract 1152 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 34, Surveyed by Protraction, All, 640.00 acres;	640.00	State of AK 50.00% ASRC 50.00%	State of AK 8.33333% ASRC 8.33334%	William D. Armstrong 0.96443% Edgar Kerr 0.05010% Jesse V. Sommer 0.05010% Jeffery A. Lysio 0.05010% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%
51	State of AK ADL 393013	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	7/1/2010	Tract 1151 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 35, Surveyed by Protraction, All, 640.00 acres;	640.00	State of AK 50.00% ASRC 50.0%	State of AK 8.33333% ASRC 8.33334%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% Jeffery A. Lysio 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furin 0.10000% GMT Exploration Company LLC 0.83333%
52	State of AK ADL 393014	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	7/1/2010	Tract 1151 T. 012N., R. 006E., Umiat Meridian, Alaska. Section 36, Surveyed by Protraction, All, including the bed of the Milluveach River, 640.00 acres;	640.00	State of AK 52.20% ASRC 47.80%	State of AK 8.70000% ASRC 7.96667%	William D. Armstrong 1.92500% Edgar Kerr 0.10000% Jesse V. Sommer 0.10000% ASRC Jeffery A. Lysio 0.10000% Edward S. Smida 0.06250% Edward Y. Teng 0.06250% Colby VanDenburg 0.02500% Patricia M. Reed 0.02500% Mathew X. Furin 0.10000% GMT Exploration Company LLC 0.83333%

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Unit Tract #	Lessor & Lease No.	Working Interest Owner	Working Interest	Effective Date	Description	Acreage	Mineral Interest	Royalty	ORR Burden
53	State of AK ADL 391445	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1048 T. 011N., R. 006E., Umiat Meridian, Alaska. Section 5, Surveyed by protraction, All, including the beds of all meanderable waterbodies, 640.00 acres;	640.00	State of AK 58.02% ASRC 41.98%	State of AK 9.67000% ASRC 6.99667% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furrin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%	William D. Armstrong 0.96443% Edgar Kerr 0.05010% Jesse V. Sommer 0.05010% Jeffery A. Lysio 0.05010% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furrin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%
54	State of AK ADL 393021	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1048 T. 011N., R. 006E., Umiat Meridian, Alaska. Section 6, Surveyed by protraction, All, including the bed of the Coville River and all meanderable waterbodies, 593.00 acres;	593.00	State of AK 80.78% ASRC 19.22%	State of AK 13.46334% ASRC 3.20333% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furrin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%	William D. Armstrong 0.96443% Edgar Kerr 0.05010% Jesse V. Sommer 0.05010% Jeffery A. Lysio 0.05010% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furrin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%
55	State of AK ADL 393022	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1048 T. 011N., R. 006E., Umiat Meridian, Alaska. Section 7, Surveyed by protraction, All, including the bed of the Coville River and all meanderable waterbodies, 596.00 acres;	596.00	State of AK 60.52% ASRC 39.48%	State of AK 10.08667% ASRC 6.58000% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furrin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%	William D. Armstrong 0.96443% Edgar Kerr 0.05010% Jesse V. Sommer 0.05010% Jeffery A. Lysio 0.05010% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furrin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%
56	State of AK ADL 393023	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	6/1/2009	Tract 1048 T. 011N., R. 006E., Umiat Meridian, Alaska. Section 8, Surveyed by protraction, All, including the beds of all meanderable waterbodies, 640.00 acres;	640.00	State of AK 55.92% ASRC 44.08%	State of AK 9.32000% ASRC 7.34667% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furrin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%	William D. Armstrong 0.96443% Edgar Kerr 0.05010% Jesse V. Sommer 0.05010% Jeffery A. Lysio 0.05010% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furrin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%

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Unit Tract #	Lessor & Lease No.	Working Interest Owner	Working Interest	Effective Date	Description	Acreage	Mineral Interest	Royalty	ORR Burden
57	State of AK ADL 391320	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	8/1/2008	Tract 1051 T. 011N., R. 006E., Umiat Meridian, Alaska. Section 17, Surveyed by Protraction, All including the bed of the Kachemach River, 640.00 acres;	640.00	State of AK 55.07% ASRC 44.93%	State of AK 9.17834% ASRC 7.488333%	William D. Armstrong 0.96443% Edgar Kerr 0.05010% Jesse V. Sommer 0.05010% Jeffery A. Lysio 0.05010% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furrin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%
58	State of AK ADL 393024	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	8/1/2008	Tract 1051 T. 011N., R. 006E., Umiat Meridian, Alaska. Section 18, Surveyed by Protraction, All including the bed of the Kachemach River, 599.00 acres;	599.00	State of AK 54.23% ASRC 45.77%	State of AK 9.04834% ASRC 7.628333%	William D. Armstrong 0.96443% Edgar Kerr 0.05010% Jesse V. Sommer 0.05010% Jeffery A. Lysio 0.05010% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furrin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%
59	State of AK ADL 393025	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	8/1/2008	Tract 1051 T. 011N., R. 006E., Umiat Meridian, Alaska. Section 19, Surveyed by Protraction, All including the bed of the Kachemach River, 601.00 acres;	601.00	State of AK 50.50% ASRC 49.50%	State of AK 8.41667% ASRC 8.25000%	William D. Armstrong 0.96443% Edgar Kerr 0.05010% Jesse V. Sommer 0.05010% Jeffery A. Lysio 0.05010% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furrin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%
60	State of AK ADL 393026	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	8/1/2008	Tract 1051 T. 011N., R. 006E., Umiat Meridian, Alaska. Section 20, Surveyed by Protraction, All including the bed of the Kachemach River, 640.00 acres;	640.00	State of AK 54.83% ASRC 45.17%	State of AK 9.13834% ASRC 7.528333%	William D. Armstrong 0.96443% Edgar Kerr 0.05010% Jesse V. Sommer 0.05010% Jeffery A. Lysio 0.05010% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furrin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%

Unit Tract #	Lessor & Lease No.	Working Interest Owner	Working Interest	Effective Date	Description	Acreage	Mineral Interest	Royalty	ORR Burden
61	State of AK ADL 391022	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	9/1/2006	Tract 1043 T. 011N., R. 005E., Umiat Meridian, Alaska. Section 25, Surveyed by Protraction, All, including the beds of the unnamed lake and the Colville River, 640.00 acres;	640.00	State of AK 50.65% ASRC 49.35%	State of AK 8.44167% ASRC Jesse V. Sommer 0.05010% Jeffery A. Lysio 0.05010% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furrin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%	William D. Armstrong 0.96443% Edgar Kerr 0.05010%
62	State of AK ADL 393027	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	9/1/2006	Tract 1043 T. 011N., R. 005E., Umiat Meridian, Alaska. Section 26, Surveyed by Protraction, All, including the bed of the Colville River, 640.00 acres;	640.00	State of AK 79.61% ASRC 20.39%	State of AK 13.26834% ASRC Jesse V. Sommer 0.05010% Jeffery A. Lysio 0.05010% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furrin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%	William D. Armstrong 0.96443% Edgar Kerr 0.05010%
63	State of AK ADL 393028	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	9/1/2006	Tract 1043 T. 011N., R. 005E., Umiat Meridian, Alaska. Section 35, Surveyed by Protraction, All, including the beds of the unnamed lake and the Colville River, 640.00 acres;	640.00	State of AK 69.63% ASRC 30.37%	State of AK 11.60500% ASRC Jesse V. Sommer 0.05010% Jeffery A. Lysio 0.05010% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furrin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%	William D. Armstrong 0.96443% Edgar Kerr 0.05010%
64	State of AK ADL 393029	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	9/1/2006	Tract 1043 T. 011N., R. 005E., Umiat Meridian, Alaska. Section 36, Surveyed, By Protraction, All, including the beds of the unnamed lakes, 640.00 acres;	640.00	State of AK 53.40% ASRC 46.60%	State of AK 8.90000% ASRC Jesse V. Sommer 0.05010% Jeffery A. Lysio 0.05010% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furrin 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%	William D. Armstrong 0.96443% Edgar Kerr 0.05010%

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Unit Tract #	Lessor & Lease No.	Working Interest Owner	Working Interest	Effective Date	Description	Acreage	Mineral Interest	Royalty	ORR Burden
65	State of AK ADL 391013	Repsol E&P USA Inc. Armstrong Energy, LLC GMT Exploration Company, LLC	49.00% 38.25% 12.75%	9/1/2006	Tract 919 T. 010N., R. 005E., Umiat Meridian, Alaska. Section 2, Surveyed by Protraction, All, including the beds of the unnamed lakes, 640.00 Acres;	640.00	State of AK 63.30% ASRC 36.70%	State of AK 10.55000% ASRC 6.11667%	William D. Armstrong 0.96443% Edgar Kerr 0.05010% Jesse V. Sommer 0.05010% Jeffery A. Lyslo 0.05010% Edward S. Smida 0.03131% Edward Y. Teng 0.03131% Colby VanDenburg 0.01253% Patricia M. Reed 0.01253% Mathew X. Furrn 0.05010% GMT Exploration Company LLC 0.41750% AVCG, LLC 1.66333%
66	State of AK ADL 392968	Armstrong Energy, LLC	100.00%	5/1/2015	Tract: 1139 T. 012N., R. 005E., Umiat Meridian, Alaska. Section 24, Surveyed by Protraction, Lots 1 and 2, portion of Tract 41, and the beds of the unnamed lakes and the unnamed creek, 640.00 acres; Tract: 1142	640.00	State of AK 50.00% ASRC 50.00%	State of AK 8.33333% ASRC 8.33334%	
67	State of AK ADL 392970	Armstrong Energy, LLC	100.00%	5/1/2015	T. 012N., R. 005E., Umiat Meridian, Alaska. Section 25, Surveyed by Protraction, All, portion of Tract 41, and the beds of the unnamed lakes, 640.00 acres; Tract: 1142	640.00	State of AK 59.71% ASRC 40.29%	State of AK 9.95167% ASRC 6.71500%	
68	State of AK ADL 392992	Armstrong Energy, LLC	100.00%	5/1/2015	T. 012N, R. 005E, Umiat Meridian, Alaska. Section 26, Surveyed by Protraction, Portion of Lots 1 and 2, and the bed of the unnamed lake in the NE1/4, NE1/4NW1/4, and E1/2SE1/4, 280.00 acres; Tract: 1142	280.00	State of AK 100%	State of AK 16.66667%	
69	State of AK ADL 392991	Armstrong Energy, LLC	100.00%	5/1/2015	T. 012N, R. 005E, Umiat Meridian, Alaska. Section 36, Surveyed by Protraction, Portion of Lots 1 through 4, Tract 41, and the beds of the unnamed lakes in the N1/2, N1/2SW1/4, SE1/4SW1/4, and SE1/4, 600.00 acres; Tract: 1037	600.00	State of AK 58.42% ASRC 41.58%	State of AK 9.73667% ASRC 6.93000%	
70	State of AK ADL 392958	Armstrong Energy, LLC	100.00%	5/1/2015	T. 011N., R. 005E., Umiat Meridian, Alaska. Section 1, Surveyed by Protraction, Portions of Lots 1 and 3, Tract 39, and the beds of the unnamed lakes in the E1/2 and E1/2W1/2, 480.00 acres; Tract: 1037	480.00	State of AK 63.69% ASRC 36.31%	State of AK 10.61500% ASRC 6.05167%	
71	State of AK ADL 392977	Armstrong Energy, LLC	100.00%	5/1/2015	T. 011N, R. 005E, Umiat Meridian, Alaska. Section 12: Surveyed by Protraction, Lots 1 through 6, portion of Tract 39, and the beds of the unnamed lakes and unnamed creeks, 640.00 acres;	640.00	State of AK 82.78% ASRC 17.22%	State of AK 13.79667% ASRC 2.87000%	

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Unit Tract #	Lessor & Lease No.	Working Interest Owner	Working Interest	Effective Date	Description	Acreage	Mineral Interest	Royalty	ORR Burden
72	State of AK ADL 392959	Armstrong Energy, LLC	100.00%	5/1/2015	Tract: 1040 T. 011N., R. 005E., Umiat Meridian, Alaska. Section 13, Surveyed by Protraction, Lots 1 and 2, portion of Tract 39, and the bed of the unnamed creek, 640.00 acres;	640.00	State of AK 77.48% ASRC 22.52%	State of AK 12.91334% ASRC 3.75333%	
73	State of AK ADL 392978	Armstrong Energy, LLC	100.00%	5/1/2015	Tract: 1040 T. 011N, R. 005E, Umiat Meridian, Alaska. Section 14, Surveyed by Protraction, Portions of Lots 1 through 4, and the beds of the unnamed lakes and unnamed creeks in the E1/2, E1/2NW1/4, SW1/4NW1/4, and SW1/4, 600.00 acres;	600.00	State of AK 62.79% ASRC 37.21%	State of AK 10.46500% ASRC 6.20167%	
74	State of AK ADL 392960	Armstrong Energy, LLC	100.00%	5/1/2015	Tract: 1041 T. 011N., R. 005E., Umiat Meridian, Alaska. Section 15, Surveyed by Protraction, Portion of Lot 1, and the beds of the unnamed lakes in the SE1/4SE1/4, 40.00 acres;	40.00	State of AK 50.01% ASRC 49.99%	State of AK 8.33500% ASRC 8.33167%	
75	State of AK ADL 392981	Armstrong Energy, LLC	100.00%	5/1/2015	Tract: 1041 T. 011N, R. 005E, Umiat Meridian, Alaska. Section 22, Surveyed by Protraction, Portions of Lots 1 and 2, and the beds of the unnamed lakes in the E1/2, E1/2SW1/4, and SW1/4SW1/4, 440.00 acres;	440.00	State of AK 73.39% ASRC 26.61%	State of AK 12.23167% ASRC 4.43500%	
76	State of AK ADL 392979	Armstrong Energy, LLC	100.00%	5/1/2015	Tract: 1040 T. 011N, R. 005E, Umiat Meridian, Alaska. Section 23, Surveyed by Protraction, Lots 1 and 2, portion of Tract 39, and the beds of the unnamed lakes, 640.00 acres;	640.00	State of AK 68.35% ASRC 31.65%	State of AK 11.39167% ASRC 5.27500%	
77	State of AK ADL 392980	Armstrong Energy, LLC	100.00%	5/1/2015	Tract: 1040 T. 011N, R. 005E, Umiat Meridian, Alaska. Section 24, Surveyed by Protraction, Lots 1 through 3, portion of Tract 39, and the bed of the Kachemach River, 640.00 acres;	640.00	State of AK 66.11% ASRC 33.89%	State of AK 11.01834% ASRC 5.64833%	
78	State of AK ADL 392961	Armstrong Energy, LLC	100.00%	5/1/2015	Tract: 1044 T. 011N., R. 005E., Umiat Meridian, Alaska. Section 27, Surveyed by Protraction, Lots 1 and 2, portion of Tract 39, and the bed of the unnamed lake, 640.00 acres;	640.00	State of AK 67.61% ASRC 32.39%	State of AK 11.26834% ASRC 5.39833%	
79	State of AK ADL 392975	Armstrong Energy, LLC	100.00%	5/1/2015	Tract: 1044 T. 011N, R. 005E, Umiat Meridian, Alaska. Section 34, Surveyed by Protraction, Lots 1 through 10, portions of Tracts 39 and 41, 640.00 acres;	640.00	State of AK 85.66% ASRC 14.34%	State of AK 14.27667% ASRC 2.39000%	

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Unit Tract #	Lessor & Lease No.	Working Interest Owner	Working Interest	Effective Date	Description	Acreage	Mineral Interest	Royalty	ORR Burden
80	State of AK ADL 393166	Armstrong Energy, LLC	100.00%	7/1/2016	Tract: NS1306J T. 010N, R. 005E, Umiat Meridian, Alaska. Section 3, Surveyed by Protraction, Lots 1 through 3, and portion of Tracts 37 and 38, 640.00 acres;	640.00	State of AK 80.75% ASRC 19.25%	State of AK 13.45834% ASRC 3.20833%	
81	State of AK ADL 393167	Armstrong Energy, LLC	100.00%	7/1/2016	Tract: NS1307J T. 010N, R. 005E, Umiat Meridian, Alaska. Section 4, Surveyed by Protraction, All, including the beds of the unnamed lakes, 640.00 acres;	640.00	State of AK 50.00% ASRC 50.00%	State of AK 8.33333% ASRC 8.33334%	
82	State of AK ADL 393168	Armstrong Energy, LLC	100.00%	7/1/2016	Tract: NS1308J T. 010N, R. 005E, Umiat Meridian, Alaska. Section 5, Surveyed by Protraction, Those portions of Lots 1 and 2, and the beds of the unnamed lakes in the E1/2, SE1/4NW1/4, E1/2SW1/4, and SW1/4SW1/4, 480.00 acres;	480.00	State of AK 50.00% ASRC 50.00%	State of AK 8.33333% ASRC 8.33334%	
83	State of AK ADL 392984	Armstrong Energy, LLC	100.00%	5/1/2015	Tract: 1047 T. 011N, R. 006E, Umiat Meridian, Alaska. Section 4, Surveyed by Protraction, Lots 1 through 4, and the bed of the unnamed lake, 640.00 acres;	640.00	State of AK 50.00% ASRC 50.00%	State of AK 8.33333% ASRC 8.33334%	
84	State of AK ADL 392963	Armstrong Energy, LLC	100.00%	5/1/2015	Tract: 1047 T. 011N, R. 006E, Umiat Meridian, Alaska. Section 3, Surveyed by Protraction, All, 640.00 acres;	640.00	State of AK 50.00% ASRC 50.00%	State of AK 8.33333% ASRC 8.33334%	
85	State of AK ADL 392982	Armstrong Energy, LLC	100.00%	5/1/2015	Tract: 1046 T. 011N, R. 006E, Umiat Meridian, Alaska. Section 2, Surveyed by Protraction, All, 640.00 acres;	640.00	State of AK 57.26% ASRC 42.74%	State of AK 9.54334% ASRC 7.12333%	
86	State of AK ADL 392962	Armstrong Energy, LLC	100.00%	5/1/2015	Tract: 1046 T. 011N, R. 006E, Umiat Meridian, Alaska. Section 1, Surveyed by Protraction, All, and the bed of Miluveach River, 640.00 acres;	640.00	State of AK 50.98% ASRC 49.02%	State of AK 8.49667% ASRC 8.17000%	
87	State of AK ADL 392983	Armstrong Energy, LLC	100.00%	5/1/2015	Tract: 1046 T. 011N, R. 006E, Umiat Meridian, Alaska. Section 11, Surveyed by Protraction, Lots 1 through 3, and the bed of the unnamed lake, 640.00 acres; Section 12, Surveyed by Protraction, Lots 1 through 4, and the bed of the unnamed lake, 640.00 acres;	1280.00	State of AK 100%	State of AK 16.66667%	

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88	State of AK ADL 392986	Armstrong Energy, LLC	100.00%	5/1/2015	Tract: 1047 T. 011N, R. 006E, Umiat Meridian, Alaska. Section 10, Surveyed by Protraction, All, and the bed of the unnamed lake, 640.00 acres;	640.00	State of AK 100%	State of AK 16.66667%	
89	State of AK ADL 392985	Armstrong Energy, LLC	100.00%	5/1/2015	Tract: 1047 T. 011N, R. 006E, Umiat Meridian, Alaska. Section 9, Surveyed by Protraction, Lots 1 and 2, and the beds of the unnamed lakes, 640.00 acres;	640.00	State of AK 50.16% ASRC 49.84%	State of AK 8.36000% ASRC 8.30667%	
						77744.47			

2. Pikka Unit Proposed and Approved Exhibit B

Map of Expanded Unit Area

Exhibit B

