

**APPROVAL OF THE FIRST REVISION OF THE NORTH FORK UNIT GAS  
POOL #1 PARTICIPATING AREA**

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

**July 24, 2012**

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## **I. INTRODUCTION, BACKGROUND, AND DECISION SUMMARY**

The United States Department of the Interior Bureau of Land Management (BLM) approved the formation of the North Fork Unit (NFU) effective May 27, 1965, and the Gas Pool #1 Participating Area (GPA) effective Dec 20, 1965. The North Fork #41-35 well was certified capable of producing in paying quantities on December 20, 1965, but did not produce until March 2011 when a pipeline was built.

The GPA held portions of four leases--two leased by the BLM and two leased by the State of Alaska. The unit was co-managed. Effective January 2, 1971, the NFU contracted to the boundary of the GPA. On November 1, 2006, the BLM waived administration of the federal leases, transferring them to the State of Alaska, which now manages the NFU.

The Division received the Application for the Approval of the First Expansion of the North Fork Unit, and the First Expansion of the Gas Pool #1 Participating Area on January 25, 2012 from the NFU Operator, Armstrong Cook Inlet, LLC (ACI). On June 13, 2012, the Division Director notified ACI and the other NFU working interest owners (WIOs) of his intent to contract a portion of the existing GPA. The WIOs had 10 days to be heard on the Division's proposed allocations resulting from the contracting acreage. The WIOs did not submit any comments to the notice. This decision addresses the Application to expand the participating area, a separate June 25, 2012 decision addressed the Application to expand the unit area. The relevant and consistent portions of the expansion decision are incorporated into this participating area decision by reference.

The portion of the Application pertaining to the proposed GPA expansion includes Exhibit C (Attachment 1), legally describing the proposed expanded participating area, its leases, and ownership interests; and Exhibit D (Attachment 2), a map of the proposed expanded participating area, and Exhibit E (Attachment 3), proposed participating area expense allocation. The initial GPA included 640 acres. The proposed GPA expansion area includes approximately 2,600 acres. The approved revision of the GPA includes 800 acres. Attachments 4 and 5 contain the approved revised GPA list of leases and a map of the existing, proposed, and approved boundaries.

A participating area "must be expanded to include acreage reasonably estimated through use of geological, geophysical, or engineering data to be capable of producing or contributing to the production of hydrocarbons in paying quantities, and must be contracted to exclude acreage reasonably proven through the use of geological, geophysical, and engineering data to be incapable of producing hydrocarbons in paying quantities, subject to approval by the commissioner." 11 AAC 83.351(c).

ACI submitted confidential and public information in the Application. The confidential economic, geological, geophysical, and engineering data indicate that a portion of the acreage proposed for inclusion in the GPA is producing or contributing to production of hydrocarbons in paying quantities, or is reasonably estimated to be capable of producing

or contributing to production of hydrocarbons in paying quantities, and that a portion of the acreage is reasonably proven to be incapable of producing or contributing to the production of hydrocarbons in paying quantities.

The Division finds that the revision of the GPA 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 First GPA Revision is March 1, 2011.

## II. APPLICATION

The leases proposed for the participating area expansion are summarized below and described in detail in Attachments 1 and 2.

Tract No.	Lease No.	Lease Date	Acre		Description
4A	ADL 391211	4/1/1955	640.00	Segment 1	T4S, R14W, S.M., Section 26: W/2, Section 27: E/2
8	ADL 391211	4/1/1955	160.00	Segment 4	T4S, R14W, S.M., Section 26: NE/4
9	ADL 391211	4/1/1955	80.00	Segment 6	T4S, R14W, S.M., Section 26: W/2SE/4
10	ADL 391211	4/1/1955	80.00	Segment 5	T4S, R14W, S.M., Section 26: E/2SE/4
11	ADL 2095	10/1/1954	360.00	Segment 1	T4S, R14W, S.M., Section 25: SW/4, S/2NW/4, W/2SE/4,
12A	ADL 733	2/1/1955	160.00	Segment 1	T4S, R14W, S.M., Section 36: SW/4
13	ADL 733	2/1/1955	120.00	Segment 3	T4S, R14W, S.M., Section 36: S/2NW/4, NE/4NW/4
14	ADL 733	2/1/1955	40.00	Segment 2	T4S, R14W, S.M., Section 36: NW/4 NW/4
15	ADL 391210	4/1/1955	160.00	Segment 3	T4S, R14W, S.M., Section 35: NE/4
16	ADL 391210	4/1/1955	480.00	Segment 2	T4S, R14W, S.M., Section 35: NW/4, S/2
17	ADL 391210	4/1/1955	320.00	Segment 1	T4S, R14W, S.M., Section 34: E/2
			2600.00		

## III. DISCUSSION OF DECISION CRITERIA

The DNR Commissioner (Commissioner) reviews applications related to units, including unit contractions and participating area expansions and contractions, 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 Division's review of the Application is based on the criteria set out in 11 AAC 83.303 (a) and (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**

Approval of the NFU GPA expansion and contraction has no direct environmental impact. This decision is an administrative action and does not authorize any on-the-ground activity. 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. ACI has obtained the required permits for the current GPA wells and is operating under an approved plan of operations and plan of development. DNR considers environmental issues during the lease sale process and the unit plan of operations approval process.

**2. Geologic and Engineering Characteristics and Prior Exploration and Development Activities of the Proposed North Fork Participating Area**

**Prior Exploration and Development activities**

Standard Oil Company of California (SOCAL) drilled and completed the NFU #41-35 well in December 1965. That well is the discovery well for the North Fork gas accumulation. SOCAL tested two Tyonek sands. The lower Tyonek sand, referred to as the Tyonek 8500 sand (present at depths between 8,563' to 8,602' measured depth (md)), produced at a rate of 1.77 Million Cubic Feet Per Day (MMCFPD). The upper Tyonek sand, referred to as the Tyonek 8000 sand (present at depths between 8,005' to 8045' md), tested at a rate of 4.36 MMCFPD. SOCAL conducted a short (90 minute) open hole formation test in the Hemlock formation that recovered a small amount of oil at the rate of 25 Barrels of Oil Per Day (BOPD) and a small amount of salt water at the rate of 19 barrels of water per day along with a minor amount of sand. SOCAL announced the Tyonek 8000 sand as a dry gas discovery (at a rate of 3.370 MMCFPD in the press release) on December 16, 1965. SOCAL shut in the well due to the absence of a pipeline to transport the gas to existing infrastructure. In 1970, SOCAL drilled the NFU #11-4 about six miles northeast of the NFU #41-35. Some gas shows were encountered on the mudlog and many sidewall cores were taken in the Beluga and Tyonek Formations, but no tests were conducted and log calculations did not indicate any reservoir quality sands. Ownership of the NFU has changed several times since 1970 and no additional drilling, development, or exploration activities occurred until 2007.

**Structure of the North Fork Area**

The NFU is located in the southeastern part of the upper Cook Inlet Basin on the southern Kenai Peninsula approximately ten miles north-northwest of Homer where a series of en echelon north-northeast trending folds occur between Kasilof and Homer. Dry gas

accumulations have been discovered on each of these anticlinal trends including Kasilof, Ninilchik-Falls Creek, Deep Creek-Happy Valley, and Nikolaevsk-North Fork. Other four-way closures occur along the North Fork anticlinal trend, but are isolated from the North Fork closure by small cross-faults and changes in plunge on the fold axis. ACI recently shot a 3-D seismic survey that has greatly improved the regional structural definition of the four-way anticlinal North Fork closure.

### **Characteristics of the Reservoir**

The North Fork field is currently producing gas from several sandstones within the Upper Oligocene to Miocene Tyonek formation. The Tyonek formation consists of siltstones, sandstones, conglomerates and coals, which were deposited as channel complexes that are part of braided, coarse-grained meandering, or meandering fluvial systems. As the stream meanders over time, the sandy point bar deposits also migrate creating discontinuous sand lenses that are not laterally extensive and may or may not be in communication with adjacent sands. It is difficult to correlate individual discontinuous sands between wells with confidence unless pressure data are available. ACI provided structure maps for the currently producing Tyonek zones incorporating well information for lowest known gas and gas/water contacts from the four currently producing wells. ACI has incorporated new stratigraphic and gas contact information from the new wells with a new structural interpretation mapped from their new 3-D seismic survey over the North Fork field and adjacent areas that justifies the reconfiguration of the original participating area.

### **Current Activity and Production**

ACI acquired the North Fork field in September 2007. ACI acquired a 19.59 square mile 3D seismic survey over the existing field and surrounding area and drilled three new development wells: the NFU# 34-26 well in 2008; and the NFU #14-25 and NFU #32-35 wells in 2010. ACI reentered the NFU #41-35 well in late 2010 and re-perforated both the Tyonek 8000 and 8500 sands. The Tyonek 8000 sand tested at a rate of 4.079 MMCFPD and the Tyonek 8500 sand tested at a rate of 6.100 MMCFPD. ACI began sustained Tyonek gas production from six separate Tyonek sandstones from these four wells (NFU #41-35, NFU #14-25, NFU #32-35, and NFU #34-26) in March and April 2011 following the completion of a twelve-mile gas pipeline that tied into existing infrastructure at Anchor Point. To date, the original NFU #41-35 well has produced at rates dependent on the gas needs outlined in ACI's contract with Enstar for its Southcentral Alaska customers. ACI produced up to 4.3 MMCFPD from the well during the cold winter month of February 2012. Cumulative production from all four wells as of March 2012 was 1,775 MMCF. The NFU #41-35 well has produced the most cumulative gas to date at 884 MMCF from the Tyonek 8000 and 8500 sands, the two most productive sands of the six currently producing Tyonek sands. The NFU #14-25 has produced the least amount of cumulative gas--5.900 MMCF.

## **Conclusion**

ACI submitted sufficient technical data to support a contraction and expansion of the GPA. The data submitted included depth structure maps for the producing Tyonek sands, map of lowest known gas of proven reservoirs, map of structural closures of proven reservoirs, structural and stratigraphic cross sections, and strike and dip seismic profiles with well ties, type logs, and production profiles. The GPA expansion and contraction includes all quarter-quarter sections that touch the composite outline of the structural closures of the proven reservoirs. The Division reviewed ACI's data and found that the geological, geophysical, and engineering data submitted justifies the vertical and geographic extent of the GPA.

## **3. Plans of Development**

The Division approved the 47th NFU Plan of Development (POD) effective March 7, 2012 for the period April 1, 2012 through March 31, 2013.

ACI fulfilled all of the obligations required under the approved 46<sup>th</sup> POD – the company continued to pursue and complete development activities as required under the lease, the unit agreement, and 11 AAC 83.343(a). It completed construction of a pipeline and processing facility and commenced gas sales on March 31, 2011. It brought four wells on line – the North Fork #41-35, #14-25, #32-35 and #34-26.

ACI development activity under the 47<sup>th</sup> POD includes:

- monitoring and analyzing pressures to optimize production;
- testing additional zones in the NFU #34-26 and drilling a fifth well targeting the Tyonek formation in a fault block that has not yet been drilled; and
- working with Enstar, ACI plans to enable the first delivery of natural gas to the Village of Nikolaevsk

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

The revised GPA will provide economic benefits to the State through royalty payments on production, although, because some of the acreage is already producing or contributing to production, there is no additional direct royalty benefit.

The allocation of production under the approved Exhibit C for the GPA 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**

The unitization of oil and gas reservoirs and the expansion and contraction of participating areas within unit areas to develop hydrocarbon-bearing reservoirs are well-accepted means of hydrocarbon conservation. Expansion and contraction of a participating area within an existing unit, with development occurring under the terms of a unit agreement, promotes efficient evaluation and development of the State's oil and gas, and minimizes impacts to the area's cultural, biological, and environmental resources.

**2. The Prevention of Economic and Physical Waste**

The acreage within the revised GPA already produces and contributes to the production of gas from the NFU. Approval of the Application will prevent economic and physical waste because the approval will allocate production revenue under the approved GPA tract allocations, equitably allocating production revenues among the WIOs. Approval of the revised GPA will not result in economic waste given the current well spacing, market demand, and anticipated production rates.

Annual approval of the NFU development activities as described in future PODs must also provide for the prevention of economic and physical waste. Using the NFU infrastructure and facilities eliminates the need to construct stand-alone facilities. And, increasing the volume of gas processed at NFU facilities lowers the cost for all gas processed at NFU.

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

A participating area "must be expanded to include acreage reasonably estimated through use of geological, geophysical, or engineering data to be capable of producing or contributing to the production of hydrocarbons in paying quantities and must be contracted to exclude acreage reasonably proven through the use of geological, geophysical, and engineering data to be incapable of producing hydrocarbons in paying quantities, subject to approval by the commissioner." 11 AAC 83.351(c).

The Division reviewed confidential geophysical, geological and engineering data to determine the portion of the acreage proposed for inclusion in the revised GPA. ACI has demonstrated that some of the acreage proposed for the GPA expansion is "reasonably estimated" to be capable of producing or contributing to production of hydrocarbons in paying quantities. Acreage within the initial GPA "reasonably proven" to be incapable of producing or contributing to production is hereby contracted from the GPA. 11 AAC 83.371(a) requires that the Division give notice and opportunity to be heard before disapproving an allocation formula.



The proposed or revised division of interest or formula allocating hydrocarbon production and unit operating costs among the leases in the unit area may not take effect until approved by the commissioner in writing. When requested by the commissioner, the lessees or unit operator shall promptly file with the commissioner all data that relates to the proposed or revised division of interests or allocation formula for all leases in the participating area. Before any disapproval of the proposed or revised division of interest or allocation formula, the commissioner will give the working interest and royalty owners reasonable notice and an opportunity to be heard. After the hearing, the commissioner will approve the proposed or revised division of interest or allocation formula as submitted unless the commissioner finds in writing that the formula does not equitably allocate production and costs among the leases.

Because the Division intended to contract a portion of the initial GPA, to which ACI was allocating production in its revised allocation formula, the Division gave notice to the WIOs on June 13, 2012, as required under the regulation. The WIOs did not submit any comments to the notice.

Each lease's proportionate share of acreage committed to the GPA is the percentage by which production is allocated. ADL 2095 had the following acreage committed to the initial GPA:

T 4S, R 14W, S.M., Section 25: S1/2NW1/4, SW1/4NE1/4, SW1/4, W1/2SE1/4, containing 360 acres, more or less.

Under 11 AAC 83.351(c), the GPA is contracted to exclude that portion of ADL 2095 reasonably proven through the use of geological, geophysical, and engineering data to be incapable of producing hydrocarbons in paying quantities. That acreage contracted is:

T 4S, R 14W, S.M., Section 25: S1/2NW1/4, SW1/4NE1/4, N/2SW1/4, W1/2SE1/4, containing 280 acres, more or less.

The remaining ADL 2095 acreage included within the revised GPA is:

T4S, R14W, S.M., Section 25: S/2SW/4, containing 80 acres, more or less.

Thus, the leases included in the approved, revised GPA are as follows:

Tract No.	Lease No.	Lease Date	Acres	% Allocation	Description
4	ADL 391211	4/1/1955	80.00	10%	Segment 1 T4S, R14W, S.M., Section 26: E/2SW/4
9	ADL 391211	4/1/1955	80.00	10%	Segment 6 T4S, R14W, S.M., Section 26: W/2SE/4
10	ADL 391211	4/1/1955	80.00	10%	Segment 5 T4S, R14W, S.M., Section 26: E/2SE/4
11	ADL 2095	10/1/1954	80.00	10%	Segment 1 T4S, R14W, S.M., Section 25: S/2SW/4
13	ADL 733	2/1/1955	80.00	10%	Segment 3 T4S, R14W, S.M., Section 36: SW/4NW/4, NE/4NW/4
14	ADL 733	2/1/1955	40.00	5%	Segment 2 T4S, R14W, S.M., Section 36: NW/4 NW/4
15	ADL 391210	4/1/1955	160.00	20%	Segment 3 T4S, R14W, S.M., Section 35: NE/4
16	ADL 391210	4/1/1955	200.00	25%	Segment 2 T4S, R14W, S.M., Section 35: E/2NW/4, NE/4SW/4, N/2SE/4
			800.00	100%	

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 revision under future annually updated and approved PODs will provide for continued review and approval of ACIs plans to develop the GPA and NFU in a manner which will maximize economic and physical recovery. The revised GPA equitably allocates production based on producing acreage.

#### IV. FINDINGS AND DECISION

##### A. The Conservation of All Natural Resources

1. Revision of the GPA will provide for continued development of the participating area under the NFU 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.

##### B. The Prevention of Economic and Physical Waste

1. ACI submitted geological, geophysical, and engineering data to the Division in support of the Application, as approved. Division technical staff determined that

the expanded GPA area is “reasonably estimated” to be capable of producing or contributing to production in paying quantities.

2. The available geological, geophysical and engineering data justify including the lands described in Section III. B.3. of this decision.
3. The production of hydrocarbons through the existing production and processing facilities reduces the environmental impact of the additional production. Using existing facilities will avoid unnecessary duplication of development efforts on and beneath the surface.

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

1. The economic, geological, geophysical, and engineering data that ACI provided reasonably justify the inclusion of the acreage into the revised GPA 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.
2. The GPA revision provides for the equitable division of costs and an equitable allocation of produced hydrocarbons under a POD designed to maximize physical and economic recovery from the reservoirs within the approved participating areas. The allocations of production and costs for the tracts within the revised GPA are approved.
3. Accounting Unit codes LC03, NF02, and NF03 are terminated effective June 30, 2012.
  - a. ACI shall submit revised operator reports and the lessees shall submit revised royalty reports for NF02 back to March 2011 production month and NF03 and LC03 back to April 2011, zeroing out production under those royalty accounting unit codes, which production must be allocated to GPA as set forth in the approved GPA tract allocation schedule. The GPA should be reported using royalty accounting unit code NFGP.
  - b. ACI shall submit the revised reports within 60 days after the approval of the revision of the GPA.
4. ACI shall submit revised NFUA Exhibits C, D, and E within 30 days of the issuance of this decision.

5. The approved, revised GPA contains the following lands:

Tract No.	Lease No.	Lease Date	Acres	% Allocation	Description
4	ADL 391211	4/1/1955	80.00	10%	Segment 1 T4S, R14W, S.M., Section 26: E/2SW/4
9	ADL 391211	4/1/1955	80.00	10%	Segment 6 T4S, R14W, S.M., Section 26: W/2SE/4
10	ADL 391211	4/1/1955	80.00	10%	Segment 5 T4S, R14W, S.M., Section 26: E/2SE/4
11	ADL 2095	10/1/1954	80.00	10%	Segment 1 T4S, R14W, S.M., Section 25: S/2SW/4
13	ADL 733	2/1/1955	80.00	10%	Segment 3 T4S, R14W, S.M., Section 36: SW/4NW/4, NE/4NW/4
14	ADL 733	2/1/1955	40.00	5%	Segment 2 T4S, R14W, S.M., Section 36: NW/4 NW/4
15	ADL 391210	4/1/1955	160.00	20%	Segment 3 T4S, R14W, S.M., Section 35: NE/4
16	ADL 391210	4/1/1955	200.00	25%	Segment 2 T4S, R14W, S.M., Section 35: E/2NW/4, NE/4SW/4, N/2SE/4
			800.00	100%	

For the reasons discussed in this Findings and Decision, I hereby approve the GPA revision.

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 Daniel S. Sullivan, Commissioner, Department of Natural Resources, 550 W. 7th Avenue, Suite 1400, Anchorage, Alaska 99501; faxed to 1-907-269-8918, or sent by electronic mail to [dnr.appeals@alaska.gov](mailto: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 Temple Davidson with the Division at 907-269-8784, or via email at [temple.davidson@alaska.gov](mailto:temple.davidson@alaska.gov).



W. C. Barron,  
Director  
Division of Oil and Gas  
Cc: Jeff Landry, Department of Law



Date

ATTACHMENTS:

1. North Fork Unit GPA Proposed Expansion Exhibit C  
Description of lands within the proposed expanded participating area
2. North Fork Unit GPA Proposed Expansion Exhibit D  
Map of proposed participating area
3. North Fork Unit GPA Proposed Expansion Exhibit E  
Proposed participating area expense allocation
4. North Fork Unit Revised GPA Approved List of Leases  
Description of lands within the approved revised participating area
5. North Fork Unit Revised GPA Map  
Map of current participating area, proposed, expanded participating area, and approved participating area

**ATTACHMENT ONE**

North Fork Unit GPA Proposed Expansion Exhibit C

Description of lands within the proposed expanded participating area

Exhibit C  
To the North Fork Unit Agreement

Tract No.	Lease No.	Lease Date	Acres	Description	Working Interest Owners & Percentage of Working Interest		Royalty and ORRI Owners & Percentage of Interest	
4A	ADL 301211	4/1/1955	640.00	(Segment 1) T4S, R14W, S3A Section 26, W2 Section 27, E2	Dale Resources Alaska, LLC	35.000000%	State of Alaska	12.5000000%
					GMT Exploration Company, LLC	30.000000%	Samuel Neppi	1.0601166%
					Armstrong Cook Inlet, LLC	20.000000%	William A. Hutto	1.5000000%
					Nerd Gas Company, LLC	7.500000%	Barry Focht	0.5202220%
					Jonah Gas Company, LLC	7.500000%	Robert E. Hinkel	0.5001020%
							Vernon W. Hinkel	0.5000000%
							Walter Hinkel	0.5000000%
						100.000000%	Ronald E. Dowdy	0.9374710%
							Stephen J. Easley	0.2589084%
							William H. Stevens	0.2500000%
							Daniel B. Dennis	0.1203638%
							Clyde T. Boyer, Jr.	0.1260000%
							Dale Resources Alaska, LLC	0.1203772%
							J. Lawrence Shepard	0.1203638%
							Keith G. Sumner	0.1203036%
							William A. Brown Family Partnership	0.1187214%
							GMT Exploration Company, LLC	0.1030001%
							IG Gas, LLC	0.0706675%
							Knott Acres Associates, LLC	0.0706675%
							Armstrong Cook Inlet, LLC	0.0450727%
							Jason Pascal, as custodian for Conrad Pascal	0.0526000%
							Jason Pascal, as custodian for Erik Pascal	0.0526000%
							CPB Alaska Oil & Gas, LLC	0.0508905%
							Nerd Gas Company, LLC	0.0258023%
							Jonah Gas Company, LLC	0.0258023%

**RECEIVED**  
FEB 14 2012  
DIVISION OF  
OIL AND GAS



Exhibit C  
To the North Fork Unit Agreement

Treat No.	Lease No.	Lease Date	Acre	Description	Working Interest Owners & Percentage of Working Interest		Royalty and ORRI Owners & Percentage of Interest	
B	ADL 391211	4/1/1955	163.00	(Segment 4) T&S, R14W, S4M Section 28, NE/4	Dale Resources Alaska, LLC	32.233270%	State of Alaska	12.6000000%
					GMT Exploration Company, LLC	27.628517%	William A. Hutto	1.8471040%
					Armstrong Cook Inlet, LLC	29.303655%	Samus Nappi	1.8741387%
					Nord Gas Company, LLC	6.907120%	Barry Foote	0.8246978%
					Jenah Gas Company, LLC	8.007120%	Robert E. Hickel	0.4427190%
							Vernon W. Hickel	0.4467165%
							Waller Hickel	0.4467186%
						100.000000%	Ronald E. Dowdy	0.4282058%
							Stephen J. Exsley	0.7623377%
							William H. Stevens	0.4239595%
							Daniel B. Dennis	0.1402955%
							Dale Resources Alaska, LLC	0.1719557%
							GMT Exploration Company, LLC	0.1473006%
							J. Lawrence Shead	0.1402954%
							Kath G. Sumner	0.1393638%
							William A. Brown Family Partnership	0.1116789%
							Clyce T. Boyet, Jr.	0.0982064%
							Armstrong Cook Inlet, LLC	0.0823892%
							IO Gas, LLC	0.0823892%
							Khoi Acres Associates, LLC	0.0593074%
							CPB Alaska Oil & Gas, LLC	0.0558400%
							Jason Pascal, as custodian for Conrado Pascal	0.0558400%
							Jason Pascal, as custodian for Erik Pascal	0.0558400%
							Nord Gas Company, LLC	0.0558476%

Exhibit C  
To the North Fork Unit Agreement

Tract No.	Lease No.	Lease Date	Acres	Description	Working Interest Owners & Percentage of Working Interest		Royalty and ORRI Owners & Percentage of Interest	
9	ADL 391211	4/1/1955	80.00	(Segment B) T4S, R14W, S36 Section 26, W2SE4	Dale Resources Alaska, LLC	32.233270%	State of Alaska	12.500000%
					GMT Exploration Company, LLC	27.628517%	William A. Hunko	1.6471945%
					Armstrong Cook Inlet, LLC	26.323955%	Samuel Naggi	1.6439451%
					Nerd Gas Company, LLC	9.007120%	Berry Frode	0.5155981%
					Jonah Gas Company, LLC	6.827126%	Robert E. Hickel	0.4487198%
							Vernon W. Hickel	0.4487198%
							Walter Hickel	0.4487198%
						100.000000%	Ronald F. Dawdy	0.4412671%
							Stephen J. Easley	0.3677864%
							William H. Slawinski	0.2533598%
							Daniel B. Dennis	0.1445443%
							J. Lawrence Sneed	0.1445443%
							Kelin G. Summar	0.1445443%
							William A. Brown Fr. Partnership	0.1425751%
							Clyde T. Boyer, Jr.	0.1118798%
							Dale Resources Alaska, LLC	0.1364657%
							GMT Exploration Company, LLC	0.1195421%
							IQ Gas, LLC	0.0948945%
							Knoil Acres Associates, LLC	0.0948945%
							Armstrong Cook Inlet, LLC	0.0948945%
							CPB Alaska Oil & Gas, LLC	0.0811038%
							Jason Pascal, as custodian for Conrad Pascal	0.0558400%
							Jason Pascal, as custodian for Erik Pascal	0.0558400%
							Nerd Gas Company, LLC	0.0296855%
							Jonah Gas Company, LLC	0.0296855%
							Union Oil Company of California	0.0351222%

Exhibit C  
To the North Fork Unit Agreement

Tract No.	Lease No.	Lease Date	Acres	Description	Working Interest Owners & Percentage of Working Interest		Royalty and ORRI Owners & Percentage of Interest	
10	ADL 301211	4/1/1955	80.00	(Segment 6) T4S, R14W, S4N, Section 26, E2SE1/4	Dale Resources Alaska, LLC	35.000000%	State of Alaska	12.500000%
					GMT Exploration Company, LLC	30.000000%	William A. Hutto	1.7262434%
					Armstrong Cook Inlet, LLC	20.000000%	Samuel Napp	1.5468381%
					Nero Gas Company, LLC	7.600000%	Berry Poole	0.6168008%
					Jonah Gas Company, LLC	7.600000%	Robert E. Hickel	0.4467188%
							Vernon W. Hickel	0.4467188%
							Walter Hickel	0.4467188%
						100.000000%	Ronald F. Dowdy	0.4412875%
							Dale Resources Alaska, LLC	0.2487517%
							Stephen J. Easley	0.2557792%
							Daniel B. Dennis	0.1445442%
							William H. Sievers	0.2233583%
							GMT Exploration Company, LLC	0.2132153%
							J. Lawrence Shind	0.1425442%
							Keth G. Sumner	0.1445442%
							William A. Brown Family Partnership	0.1425752%
							Armstrong Cook Inlet, LLC	0.1421488%
							Clyde T. Boyer, Jr.	0.1118749%
							ID Gas, LLC	0.0848845%
							Knot Acres Associates, LLC	0.0848845%
							CPB Alaska Oil & Gas, LLC	0.0611037%
							Jason Patsal, as custodian for Conrad Patsal	0.0558400%
							Jason Patsal, as custodian for Erik Patsal	0.0558400%
							Nero Gas Company, LLC	0.0539303%
							Jonah Gas Company, LLC	0.0539303%

Exhibit C  
To the North Fork Unit Agreement

Tract No.	Lease No.	Lease Date	Acres	Description	Working Interest Owners & Percentage of Working Interest		Royalty and ORRI Owners & Percentage of Interest	
11	ADL 2085	10/1/1954	360.00	(Segment 1) T4S, R14W, S3E5 Section 25: SW1/4, SW2/4, W1/2SE1/4, SW1/4NE1/4	Dale Resources Alaska, LLC	35.000000%	State of Alaska	12.500000%
					GMT Exploration Company, LLC	80.000000%	Prairie Oil Co.	2.069000%
					Armstrong Geoph Int'l, LLC	20.000000%	Dale Resources Alaska, LLC	0.798325%
					Nerd Gas Company, LLC	7.500000%	William A. Hult	0.726234%
					Jenah Gas Company, LLC	7.500000%	GMT Exploration Company, LLC	0.684278%
							Seamus Nappi	0.708147%
						100.000000%	Armstrong Geoph Int'l, LLC	0.456186%
							Robert E. Hiccup	0.448716%
							Vernon W. Hickel	0.446718%
							Walker Hickel	0.446718%
							Steven Muraco	0.385562%
							Finley MacLennan	0.307500%
							Ronald E. Dowdy	0.332745%
							Donald B. Dennis	0.083636%
							William H. Stevens	0.223358%
							Darryl Foote	0.256387%
							Nerd Gas Company, LLC	0.171068%
							Jenah Gas Company, LLC	0.171068%
							Clyde T. Boyer, Jr.	0.111078%
							Stephen J. Easley	0.126166%
							William A. Brown Family Partnership	0.107350%
							J. Lawrence Sward	0.083535%
							Keith G. Sumner	0.093536%
							JO Gas, LLC	0.053699%
							Kool Acres Associates, LLC	0.063890%
							Jason Pascal, as custodian for Conrad Pascal	0.058400%
							Jason Pascal, as custodian for Eric Pascal	0.058400%
							CPR Alaska Oil & Gas, LLC	0.046072%
							L.E. Grammer	0.037500%
							Union Oil Company of California	0.618548%

Exhibit C  
To the North Fork Unit Agreement

Tract No.	Lease No.	Lease Date	Acres	Description	Working Interest Owners & Percentage of Working Interest		Royalty and ORRI Owners & Percentage of Interest	
12A	ADL 733	2/1/1955	100.00	(Segment 1) T4S, R14W, S.M. Section 36, 6W/4	Dela Resources Alaska, LLC	35.000000%	State of Alaska	12.5000000%
					GMT Exploration Company, LLC	30.000000%	Locke Jacobs, Jr.	3.0000000%
					Armitage Cook, LLC	20.000000%	Samuel Nepp	2.3436227%
					Nord Gas Company, LLC	7.500000%	Barry Fode	0.766812%
					Jorah Gas Company, LLC	7.500000%	Robert E. Hinkel	0.5000000%
							Vernon W. Hinkel	0.5000000%
							Walter Hinkel	0.5000000%
						100.000000%	William A. Hutto	0.5000000%
							Stephen J. Escott	0.388840%
							Daniel B. Dennis	0.1187228%
							Steven Muraco	0.2683603%
							Ronald E. Dowdy	0.2672222%
							William H. Stevens	0.2500000%
							Clyde T. Bover, Jr.	0.1750000%
							J. Lawrence Sneed	0.1187228%
							Keith G. Sumner	0.1187228%
							William A. Brown Family Partnership	0.0863333%
							Jason Pascal, as custodian for Conrad Pascal	0.0625000%
							Jason Pascal, as custodian for Erik Pascal	0.0625000%
							IQ Gas, LLC	0.0513889%
							Kodi Acres Appalachia, LLC	0.0513889%
							CPB Alaska Oil & Gas, LLC	0.0370000%

Exhibit C  
To the North Fork Unit Agreement

Tract No.	Lease No.	Lease Date	Acres	Description	Working Interest Owners & Percentage of Working Interest		Royalty and ORRI Owners & Percentage of Interest	
13	ADL 733	2/1/1985	120.00	(Segment 3) T4S, R14W, S4E, Section 38: S/2NW1/4, NE/4NW1/4	Dave Resources Alaska, LLC	32.251270%	State of Alaska	12.5000000%
					GMT Exploration Company, LLC	27.628517%	Locke Jacob Jr.	3.0000000%
					Armstrong Cook Inlet, LLC	28.323655%	Dale Resources Alaska, LLC	0.8097010%
					Nord Gas Company, LLC	8.807126%	GMT Exploration Company, LLC	0.8040302%
					Jonah Gas Company, LLC	8.927129%	William A. Hutto	0.6471640%
							Samuel Nappi	0.6001891%
							Armstrong Cook Inlet, LLC	0.4628888%
						100.000000%	Robert E. Hinkle	0.4467106%
							Vernon W. Hinkel	0.4497190%
							Walter Hinkel	0.4487106%
							Steven Muraco	0.2685020%
							Ronald E. Dowdy	0.2722044%
							William H. Stevens	0.2233590%
							Daniel B. Dennis	0.0578262%
							Nord Gas Company, LLC	0.1785075%
							Jonah Gas Company, LLC	0.1735075%
							Barry Foote	0.2000727%
							Clyde T. Boyer, Jr.	0.1116788%
							Stephen J. Easley	0.1000436%
							William A. Brown Family Partnership	0.0830968%
							J. Lawrence Sneed	0.0848877%
							Kelth G. Summar	0.0548877%
							Jason Pascal, as custodian for Conrad Pascal	0.0558400%
							Jason Pascal, as custodian for Erik Pascal	0.0558400%
							IG Gas, LLC	0.0484824%
							Kroki Acres Associates, LLC	0.0494824%
							CPB Alaska Oil & Gas, LLC	0.0356728%

Exhibit C  
To the North Fork Unit Agreement

Tract No.	Lease No.	Lease Date	Acres	Description	Working Interest Owners & Percentage of Working Interest		Royalty and ORRI Owners & Percentage of Interest	
14	ADL 733	2/1/1955	40.00	(Segment 2) T4S, R14W, S44 Section 36; NW1/4 NW1/4	Dale Resources Alaska, LLC	35.000000%	State of Alaska	12.500000%
					GMT Exploration Company, LLC	20.000000%	Loche Jacob, Jr.	3.000000%
					Armstrong Cook Int'l, LLC	20.000000%	Dale Resources Alaska, LLC	0.862667%
					Nerd Gas Company, LLC	7.600000%	GMT Exploration Company, LLC	0.825408%
					Jonah Gas Company, LLC	7.600000%	William A. Huxid	0.726254%
							Armstrong Cook Int'l, LLC	0.852877%
							Samuel Nippel	0.614490%
					100.000000%		Robert E. Hickey	0.4467186%
							Vernon W. Hickey	0.4467186%
							Walter H. Hickey	0.4467186%
							Sтивен Мурдо	0.5080430%
							Ronald E. Downey	0.2654860%
							Daniel B. Dennis	0.0687428%
							William H. Stevens	0.2233566%
							Nerd Gas Company, LLC	0.2073102%
							Jonah Gas Company, LLC	0.2073102%
							Berry Forde	0.7048445%
							Clyde T. Boyer, Jr.	0.1110799%
							William A. Brown Family Partnership	0.0687006%
							Stephen J. Easley	0.1024928%
							J. Lawrence Sneed	0.0687427%
							Keith G. Sumner	0.0687427%
							Jason Pascal, as custodian for Conrad Pascal	0.0558400%
							Jason Pascal, as custodian for Eric Pascal	0.0558400%
							IQ Gas, LLC	0.0510517%
							Knoll Acres Associates, LLC	0.0510517%
							CPB Alaska Oil & Gas, LLC	0.0387672%



Exhibit C  
To the North Fork Unit Agreement

Tract No.	Lease No.	Lease Date	Acres	Description	Working Interest Owners & Percentage of Working Interest		Royalty and ORRI Owners & Percentage of Interest	
15	ADL 891210	4/1/1955	160.00	(Segment 3) T4S, R14W, S14E Section 35, NE1/4	Dale Resources Alaska, LLC	35.000000%	Sarte pl Alaska	12.600000%
					GMT Exploration Company, LLC	30.000000%	William A. Hutto	1.7282434%
					Armstrong Cook Inlet, LLC	20.000000%	Samuel Nappi	1.6488367%
					Nerd Gas Company, LLC	7.500000%	Barry Foote	0.6198011%
					Jonah Gas Company, LLC	7.500000%	Robert E. Hickle	0.4467195%
							Vernon W. Hickle	0.4467195%
							Walter Hickle	0.4467195%
						100.000000%	Ronnie E. Dowdy	0.4413038%
							Dale Resources Alaska, LLC	0.2487823%
							Stephen J. Easley	0.2577192%
							Daniel B. Dennis	0.1445447%
							William H. Stevens	0.2233588%
							GMT Exploration Company, LLC	0.2132162%
							J. Lawrence Sneed	0.1445447%
							Keith G. Summar	0.1445447%
							William A. Brown Family Partnership	0.1425751%
							Armstrong Cook Inlet, LLC	0.1421441%
							Clyde T. Boyer, Jr.	0.1118709%
							JO Gas, LLC	0.0948851%
							Knoll Acres Associates, LLC	0.0848661%
							CPB Alaska Oil & Gas, LLC	0.0011039%
							Jason Pascal, as custodian for Conrad Pascal	0.0559400%
							Nerd Gas Company, LLC	0.0559400%
							Jonah Gas Company, LLC	0.0533041%

Exhibit C  
To the North Fork Unit Agreement

Tract No.	Lease No.	Lease Date	Acres	Description	Working Interest Owners & Percentage of Working Interest		Royalty and ORRI Owners & Percentage of Interest	
16	ADL 391210	4/1/1955	480.00	(Segment 2) T4S, R14W, S1M Section 35: NW1/4, S/2	Dale Resources Alaska, LLC	35.000000%	State of Alaska	12.500000%
					GMT Exploration Company, LLC	30.000000%	Samuel Nappi	1.5601166%
					Armstrong Cook Int'l, LLC	20.000000%	William A. Hultc	1.5000000%
					Nerd Gas Company, LLC	7.500000%	Berry Foote	0.6203220%
					Jonah Gas Company, LLC	7.500000%	Robert E. Hinkel	0.6002900%
							Vernon W. Hinkel	0.5002900%
							Walter Hicke	0.5002900%
						100.000000%	Ronald E. Dowdy	0.3674710%
							Stephen J. Easley	0.2599948%
							William H. Stevns	0.2500000%
							Daniel B. Dennis	0.1203636%
							Clyde T. Boyer, Jr.	0.1250000%
							Dale Resources Alaska, LLC	0.1208772%
							J. Lawrence Shead	0.1203636%
							Kath G. Sumner	0.1203636%
							William A. Brown Family Partnership	0.1181214%
							GMT Exploration Company, LLC	0.1030091%
							IQ Gas, LLC	0.0706876%
							Knoll Acres Associates, LLC	0.0687277%
							Armstrong Cook Int'l, LLC	0.0675000%
							Jason Pascoe, as custodian for Conrad Pascoe	0.0675000%
							Jason Pascoe, as custodian for Eric Pascoe	0.0675000%
							CPB Alaska Oil & Gas, LLC	0.0259223%
							Nerd Gas Company, LLC	0.0259223%
							Jonah Gas Company, LLC	0.0259223%

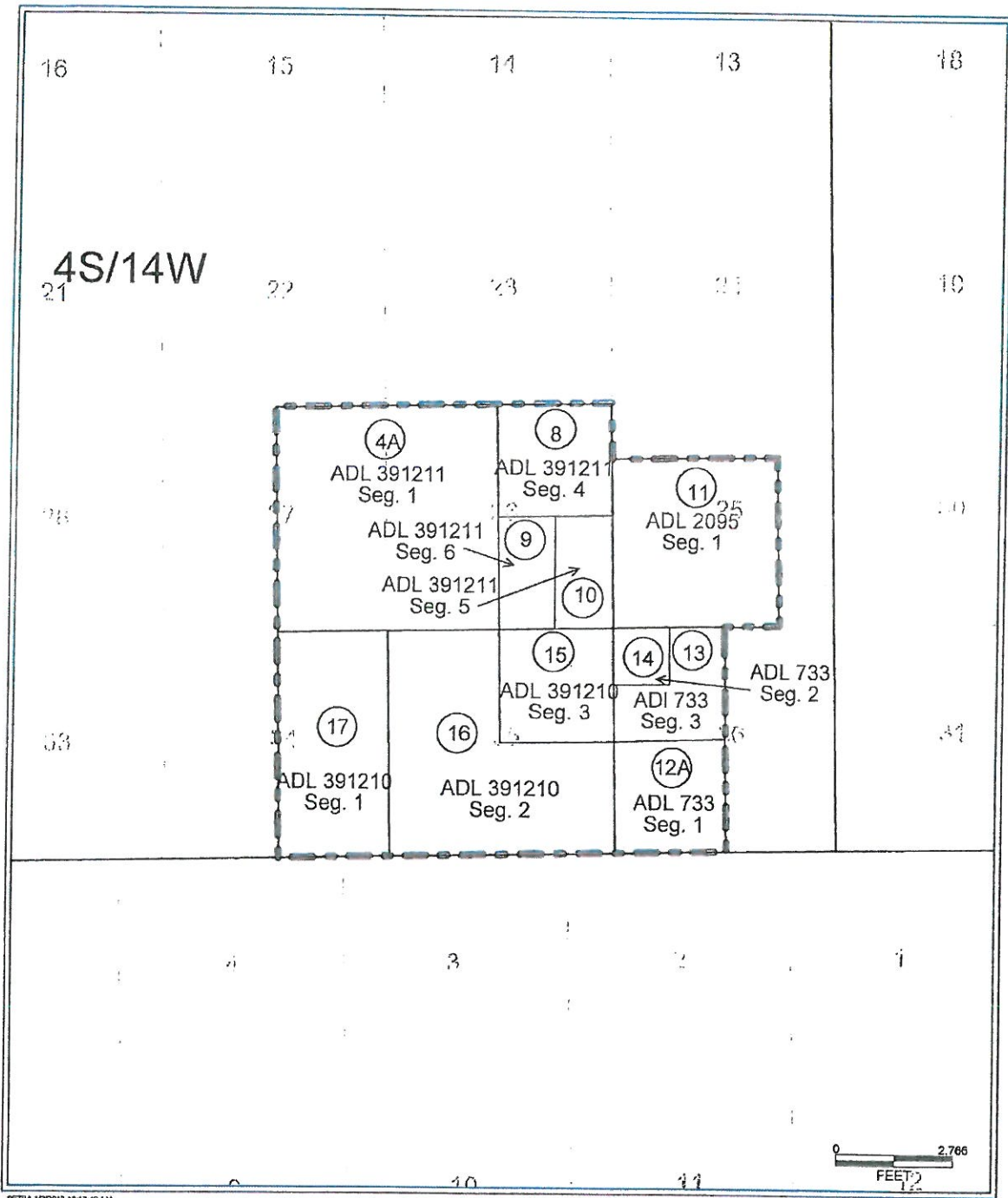
Exhibit C  
To the North Fork Unit Agreement

Tract No.	Lease No.	Lease Date	Acres	Description	Working Interest Owners & Percentage of Working Interest		Royalty and ORRI Owners & Percentage of Interest	
17	ADL 361210	4/1/1955	320.00	(Segment 1) T4S, R14W, S3M Section 34; E/2	Dale Resource Alaska, LLC	35.000000%	State of Alaska	12.600000%
					GUT Exploration Company, LLC	35.000000%	Samuel Napp	1.560118%
					Armstrong Cook Inlet, LLC	22.000000%	William A. Hutto	1.500000%
					Nerd Gas Company, LLC	7.500000%	Berry Foyle	0.520020%
					Jonah Gas Company, LLC	7.500000%	Robert E. Hickel	0.500000%
							Vernon W. Hickel	0.500000%
							Walter Hickel	0.500000%
							Ronald E. Dowdy	0.367471%
							Stephen J. Easley	0.259589%
							William H. Stevens	0.259589%
							Daniel B. Dennis	0.259589%
							Clyde T. Boyer, Jr.	0.120338%
							Dale Resource Alaska, LLC	0.120338%
							J. Lawrence Sneed	0.120338%
							Keith G. Summar	0.118721%
							William A. Brown Family Partnership	0.103608%
							QNT Exploration Company, LLC	0.070876%
							IQ Gas, LLC	0.070876%
							Knoll Acres Associates, LLC	0.068027%
							Armstrong Cook Inlet, LLC	0.062500%
							Jason Pascal, as custodian for Conrad Pascal	0.062500%
							Jason Pascal, as custodian for Erik Pascal	0.062500%
							CPB Alaska Oil & Gas, LLC	0.050806%
							Nerd Gas Company, LLC	0.025902%
							Jonah Gas Company, LLC	0.025902%

**ATTACHMENT TWO**

North Fork Unit GPA Proposed Expansion Exhibit D  
Map of proposed participating area

Exhibit D  
To the North Fork Unit Agreement



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### **ATTACHMENT THREE**

North Fork Unit GPA Proposed Expansion Exhibit E  
Proposed participating area expense allocation

To the North Fork Unit Agreement

Tract No.	Lease No.	Lease Date	Acres	Description**	Participating Area Expense Allocation
4A	ADL 391211	4/1/1955	640.00	(Segment 1) T4S, R14W, S.M. Section 26: W/2 Section 27: E/2	24.61538%
8	ADL 391211	4/1/1955	160.00	(Segment 4) T4S, R14W, S.M. Section 26: NE/4	6.15385%
9	ADL 391211	4/1/1955	80.00	(Segment 6) T4S, R14W, S.M. Section 26: W/2SE/4	3.07692%
10	ADL 391211	4/1/1955	80.00	(Segment 5) T4S, R14W, S.M. Section 26: E/2SE/4	3.07692%
11	ADL 2095	10/1/1954	360.00	(Segment 1) T4S, R14W, S.M. Section 25: SW/4, S/2NW/4, W/2SE/4, SW/4NE/4	13.84615%
12A	ADL 733	2/1/1955	160.00	(Segment 1) T4S, R14W, S.M. Section 36: SW/4	6.15385%
13	ADL 733	2/1/1955	120.00	(Segment 3) T4S, R14W, S.M. Section 36: S/2NW/4, NE/4NW/4	4.61538%
14	ADL 733	2/1/1955	40.00	(Segment 2) T4S, R14W, S.M. Section 36: NW/4 NW/4	1.53846%
15	ADL 391210	4/1/1955	160.00	(Segment 3) T4S, R14W, S.M. Section 35: NE/4	6.15385%
16	ADL 391210	4/1/1955	480.00	(Segment 2) T4S, R14W, S.M. Section 35: NW/4, S/2	18.46154%
17	ADL 391210	4/1/1955	320.00	(Segment 1) T4S, R14W, S.M. Section 34: E/2	12.30769%

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## **ATTACHMENT FOUR**

North Fork Unit Revised GPA Approved List of Leases  
Description of lands within the approved revised participating area

Tract No.	Lease No.	Lease Date	Acres	% Allocation	Description
4	ADL 391211	4/1/1955	80.00	10%	Segment 1 T4S, R14W, S.M., Section 26: E/2SW/4
9	ADL 391211	4/1/1955	80.00	10%	Segment 6 T4S, R14W, S.M., Section 26: W/2SE/4
10	ADL 391211	4/1/1955	80.00	10%	Segment 5 T4S, R14W, S.M., Section 26: E/2SE/4
11	ADL 2095	10/1/1954	80.00	10%	Segment 1 T4S, R14W, S.M., Section 25: S/2SW/4
13	ADL 733	2/1/1955	80.00	10%	Segment 3 T4S, R14W, S.M., Section 36: SW/4NW/4, NE/4NW/4
14	ADL 733	2/1/1955	40.00	5%	Segment 2 T4S, R14W, S.M., Section 36: NW/4 NW/4
15	ADL 391210	4/1/1955	160.00	20%	Segment 3 T4S, R14W, S.M., Section 35: NE/4
16	ADL 391210	4/1/1955	200.00	25%	Segment 2 T4S, R14W, S.M., Section 35: E/2NW/4, NE/4SW/4, N/2SE/4
			800.00	100%	

## **ATTACHMENT FIVE**

North Fork Unit Revised GPA Map

Map of initial participating area, proposed, expanded participating area, and approved participating area

North Fork Gas Pool PA Current Boundary  
North Fork Gas Pool PA Proposed Boundary  
North Fork Gas Pool PA Approved Boundary

