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March 15, 2016

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Mr. Wayne Svejnoha U.S. Department of the Interior Bureau of Land Management 222 West 7<sup>th</sup> Avenue #13 Anchorage, AK 99513 Mr. Rex Rock Sr., President Arctic Slope Regional Corporation 1230 Agvik Street P. O. Box 129 Barrow, AK 99723-0129



MAR 1 5 2016

DIVISION OF OIL AND GAS

RE: Eighteenth Annual Status Update to the Unit Plan, Colville River Unit Agreement

Dear Ms. Feige, Mr. Rock, and Mr. Svejnoha:

Attached for your review is the 18th Annual Status Update to the Unit Plan, Colville River Unit Agreement. These updates are submitted pursuant to 11 AAC 83.341(d), 11 AAC 83.343(d), and articles 3.9.7, 3.9.8 and 3.9.9 of the Colville River Unit Agreement, and 5 U.S.C. 552(b)(4) and (b)(9).

As always, these plans are subject to change based upon business conditions. ConocoPhillips Alaska, Inc. submits this update as Operator of the Colville River Unit.

Sincerely,

Misty Aléxa Manager

WNS Development



# EIGHTEENTH ANNUAL STATUS UPDATE TO THE UNIT PLAN

# **COLVILLE RIVER UNIT AGREEMENT**

**NON-CONFIDENTIAL VERSION** 

**MARCH 15, 2016** 

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18<sup>th</sup> Annual Update Colville River Unit

#### Introduction

ConocoPhillips Alaska, Inc., (CPAI) as Operator on behalf of the working interest owners of the Colville River Unit (CRU), submits this eighteenth annual status update for the CRU Unit Plan, pursuant to 11 AAC 83.341(d), 11 AAC 83.343(d) and Article 8 of the Colville River Unit Agreement (CRUA).

The information provided hereunder by CPAI, is confidential and proprietary to CPAI and is not subject to disclosure because it contains information or data that is (1) trade secret information as defined in AS 45.50.940(3) and <u>State v. Arctic Slope Regional Corp.</u>, 834 P.2d 134 (Alaska 1991); (2) required to be held confidential under AS 38.05.035(a)(8); (3) exempted from disclosure under 5 U.S.C. 552(b)(4) and (b) (9) and/or (4) required to be held confidential pursuant to Article 3.9.7, 3.9.8 and 3.9.9 of the CRUA, as amended.

This update reports on the CRU status as of January 1, 2016. See *Figure 1* for a map of the current CRU Boundaries and the current participating areas (PA's) as of January 1, 2016.

The State has requested certain marketing information, but ConocoPhillips Alaska as unit operator is not involved in marketing of hydrocarbons from the unit. Each individual lessee markets its own hydrocarbons and, due to competition and anti-trust concerns, the unit operator does not solicit, accept or receive proprietary marketing information from lessees.

DNR has requested that we provide information regarding access and sharing of Unit facilities. ConocoPhillips Alaska has entered and continues to enter into these types of agreements with multiple parties for the benefit of the Unit and greater good. Below is a general description of facility sharing agreements and potential future requests.

- 1) The Alpine Participating Area (APA) of the Colville River Unit has entered into infrastructure sharing agreements, commonly known as Ballot 9, with third parties. This agreement includes the following services that are provided on an ad hoc basis, if and when excess capacity may be available: mobile and non-mobile equipment, emergency response, waste management, camp room and board, warehouse materials, and labor. CRU has also entered into temporary ice road use agreements with third parties that cover single winter season construction periods.
- 2) There are currently no APA oil or gas processing facility sharing agreements in place with third parties. While we expect future requests to the APA for an oil or gas processing facility sharing agreement, none have been formally submitted. One request has been received to tie-in and use the CRU's seawater pipeline system; however, the timing for potential completion of such an agreement has been delayed due to deferrals in the third party's planned activities.

## **Unit Plan of Development**

The CRU consists of six PA's, four oil pools, and eight distinct reservoir areas defined by sands within pools. The following is a discussion organized by pool and PA. See *Table 1* for a list of wells by PA drilled in 2015 and proposed for 2016 and Q1 2017. See *Table 2* for a list of all wells drilled in the CRU that are active as of January 1, 2016.

The Alpine Satellites Development Project, now in the development and production phase, includes satellite oil pools at three drillsites: (1) Qannik Pool at CD2, (2) Fiord Pool at CD3, and (3) Nanuq Pool at CD4. The oil pools have separate and distinct PA agreements: Qannik Pool has the Qannik PA, Fiord Pool has the Fiord Nechelik PA and Fiord Kuparuk PA, and Nanuq Oil Pool has the Nanuq PA. The Nanuq Kuparuk Pool has been incorporated into the Alpine Pool

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by order of the AOGCC, and is no longer recognized as a separate pool; all allocation goes to the Alpine Pool, but wells in the Kuparuk sand are under order of the Nanuq Kuparuk PA.

All CRU oil pools are developed primarily with horizontal well technology. The Qannik and Nanuq PA's are being waterflooded only, while Fiord Nechelik, Fiord Kuparuk, and Nanuq Kuparuk employ MWAG injection for enhanced oil recovery, similar to the Alpine field. In this Unit Plan, MWAG refers to a gas-alternating-water flood using either a miscible gas or submiscible enriched gas.

Development of these satellites has strategic value as they maximize the use of the existing Alpine infrastructure.

## Alpine Pool Plan of Development

The Alpine PA is within the Alpine Pool. Production from the Alpine PA is sent to the Alpine Central Facility (ACF) where it is combined with the Fiord, Nanuq, and Qannik Pools. This maximizes the overall oil rate from the combined development and more fully utilizes ACF capacity.

Reservoir management of the Alpine PA in 2016 will attempt to maximize oil rate and partially offset field decline by:

- 1. Targeting a minimum pattern level injection/withdrawal ratio of one
- 2. Managing MWAG injection to maximize recovery
- 3. Updating and ranking workover and peripheral development opportunities for optimum drilling rig utilization
- 4. Identifying well stimulation candidates

Total CRU water production averaged 46,152 BWPD in 2015 and is expected to increase in 2016. Total water handling (including seawater imports from the Greater Kuparuk Area) averaged 111,500 BWPD in 2015.

All Alpine wells planned for initial development from drillsites CD1 and CD2 were completed by November 2005. Since that time, peripheral opportunities have been pursued in conjunction with satellite wells. Development of the Alpine A and C sands from CD4 commenced in 2006. Construction at CD5 was completed in 2015 with completion of the Nigliq Bridge and installation of pipelines and drillsite facilities. The rig was mobilized to the drillsite in late April and drilling operations commenced. Production startup was achieved in late October 2015.

The list of drilling opportunities for 2016 through the first quarter of 2017 is composed entirely of CD5 targets. The CD5 program continues into 2016 with plans to drill eight Alpine A sand wells (2 producers, 6 injectors) between Q1 2016 and Q1 2017: CD5-11, CD5-10, CD5-01, CD5-02, CD5-06, CD5-07, CD5-08, and CD5-12. Eight additional wells (6 producers, 2 injectors) are planned for this development targeting either the A or C sand. Any of these eight wells may be moved into the 2016 – Q1 2017 schedule as rig optimization/utilization dictates.

See *Figure 2* to view the planned, existing, and opportunity well locations of wells in the Alpine PA as of January 1, 2016.

Development of the Alpine reservoir continues to focus on the expansion of the existing MWAG flood and the use of line-drive horizontal well patterns. There are a few slant completions at Alpine, but use of this well design will primarily remain limited to injectors due to the relatively low productivity and limited pattern size associated with producers of this type. Continued implementation of the enhanced oil recovery (EOR) process is an integral part of the Alpine

development. Performance to date has indicated significant EOR is achievable in the Alpine reservoir.

#### **Reserve Estimate Revisions and Participating Area Expansions**

The next Reserves Estimate Revision submission date is October 29, 2016 for the Nanuq Kuparuk PA, and November 15, 2016 for the Alpine PA. As part of the Reserves Estimate Revision submission, CPAI will submit a PA expansion that incorporates existing and planned CD5 development for concurrent approval. Prior to the approval of the Reserves Estimate Revisions and PA expansions, the CD5 wells will be identified and production will be allocated as follows:

Location of Producing Lateral	Production Allocation Method
Within an existing PA	Production will be allocated to the existing PA ownership
Outside an existing PA	Production will be allocated as a tract operation (wells that traverse tracts with diverse ownership will be allocated based on proportionate share of total open feet of production in the wellbore)
Traversing an existing PA boundary	Production will be allocated on proportionate share of total open feet of production in the wellbore allocated between the existing PA ownership and tract operation ownership

A well specific notification and breakdown of allocated ownership will be provided to the working and royalty interest owners for all wells that include lands outside the existing PA boundaries.

#### **Fracture Stimulation Operations**

Two fracture stimulations were performed on Alpine wells in 2015, resulting in an appreciable production rate increase. Six Alpine fracture stimulations are planned for 2016, however, the final number could change depending on the opportunities available.

#### **Alpine Pool Tract Operations**

CD1-04, CD1-17, and CD1-47 were initially completed and produced in the Alpine PA. CD1-04 was recompleted in the Kuparuk sands interval and began production in August 2008, and CD1-17 was recompleted in the Kuparuk sands interval and began producing in June 2008. The CD1-47 completion in the Kuparuk sand was opened in July 2014. The rates and cumulative volumes are accounted for in the average Alpine PA metrics for 2015.

CPAI will consider producing the Kuparuk formation, if encountered, in future wells whose primary target is the Alpine A or Alpine C formation.

#### Nanug Kuparuk Sand

Performance from the Nanuq Kuparuk PA continues to exceed expectations. Production started in November 2006. Current production is approximately 10,500 BOPD and 400 BWPD. As of December 2015, the cumulative injection/withdrawal ratio was just under 1.0.

The CD4-96 well was completed in the Nanuq Kuparuk PA in 2013. The CD4-96 well was targeting the Alpine reservoir, but due to drilling problems the well was completed in the Kuparuk instead. In 2014, CD4-96 was successfully sidetracked to the original Alpine target; however, the Kuparuk sand was not completed in the new well (CD4-96A).

Under the CD5 program two Nanuq Kuparuk wells were drilled in 2015: CD5-313 (horizontal producer – previously CD5-314) and CD5-315 (horizontal injector). In December 2015 CD5-313 accounted for the majority of Nanuq Kuparuk production. Based on CD5-313 and CD5-315 results, plans are in place to drill CD5-SUN3 in the latter half of 2016. Pending results from CD5-SUN3, an additional well, CD5-SUN4, may be drilled between mid-2016 and Q1 2017.

See *Figure 3* for a map of planned and existing wells in the Nanuq Kuparuk PA as of January 1, 2016.

## **Fiord Pool Plan of Development**

Twenty-three wells, 13 producers and 10 injectors, have been completed in the Fiord Nechelik PA. The CD3-130 well was originally planned to be an injector in the Nechelik, but drilling challenges led to the completion of the well as a producer in the Kuparuk reservoir. The Fiord Nechelik plan of development does not include any wells in 2016 – Q1 2017.

The Fiord Kuparuk PA had five active wells in 2015: 2 producers and 3 injectors. There are currently no plans to drill any additional Fiord Kuparuk wells in the 2016 – Q1 2017 timeframe.

See *Figures 4 and 5* for a map of existing and opportunity wells in the Fiord Kuparuk and Fiord Nechelik PA's as of January 1, 2016.

#### **Drillsite CD3 Tract Operations**

CD3-118 was drilled and completed within the Kuparuk sand in April 2008, and produced until January 2009. CD3-118 was converted to water injection and continues injection into the Kuparuk sand. CD3-128 was completed in the Kuparuk sand in 2011 and produced through year-end 2012. CD3-127 was drilled and completed within the Kuparuk sand in April 2013. CD3-130K was completed in the Kuparuk sand in March 2015. The rates and cumulative volumes are accounted for in the average Fiord Kuparuk PA metrics and cumulative volumes for 2015.

#### **Fracture Stimulation Operations**

There was one fracture stimulation on a Fiord well in 2015.

## Nanuq Pool Plan of Development

The Nanuq Pool has been developed primarily from CD4 and includes wells in the Nanuq PA. Currently, there are five active producers and four active injectors in the pool.

The CD4-289 well began drilling in mid-December 2014, and started pre-production in January 2015. The well was converted to an injector in July 2015.

See *Figure 6* for a map of existing and opportunity wells in the Nanuq PA as of January 1, 2016.

#### CD1-229

The State and ASRC, by letters dated February 7, 2013 and January 2, 2013, respectively, granted CPAI approval to test and produce the CD1-229 Well ("Well") and allocate the Well production to the then current Nanuq Nanuq Participating area until the well could be

determined to be a Qualified Well. The Well was drilled in 2001, flowed 57 days and produced 21 MBO. It was flowed again in 2004 for 0.5 days in order to obtain an oil sample. A seawater injectivity test was conducted in 2007. Production was again attempted in 2013 with two freezing incidents occurring, and the Well produced about 1 MBO over 15 days. Despite all the production attempts, the well was not established as a Qualified Well and was shut-in in December 2013.

In 2015, a methanol injection system was installed to mitigate against the formation of hydrate downhole, and CD1-229 was flowed again. However, this well required frequent treatment for paraffin deposition and was shut-in in January 2016, after producing 14 MBO in 2015.

## **Qannik Pool Plan of Development**

The Qannik Pool has been developed from CD2 including nine wells: six outboard producers and three inboard water injectors. The ongoing recovery scheme involves waterflood from inboard injection wells supplemented with a natural gas cap expansion drive from the east.

No Qannik wells were drilled in 2015 and none are planned in 2016.

See Figure 7 for a map of existing wells in the Qannik PA as of January 1, 2016.

## **Reservoir Management Summary**

#### **MWAG Management**

Significant oil production rate benefits and increased ultimate recovery estimates have been observed in the unit due to enhanced oil recovery processes. Alpine PA, Fiord Nechelik PA, Fiord Kuparuk PA, and Nanuq Kuparuk PA are all currently managed using an MWAG approach to voidage replacement. Qannik and Nanuq areas are on waterflood only. Water and gas injection placement is constantly being optimized in order to maximize rate and recovery for the unit. Thus, all CRU wells compete for available injection water, and all wells that are under MWAG injection compete for available gas injection.

#### **Water Injection**

The Alpine Central Facility (ACF) water injection system consists of three 50 MBWPD centrifugal pumps and two 17 MBWPD electric submersible pumps (nominal capacities). Current injection includes 40-50 MBPD produced water and 60-80 MBPD seawater. The need to mitigate against corrosion in the water injection lines prevents long term mixing of produced water and seawater at Alpine and thus reduces system flexibility. Currently, one of the centrifugal pumps and one electric submersible pump take produced water while the rest are on seawater imported from the Kuparuk River Unit Seawater Treatment Plant. Pump configurations are modified as needed to optimize placement of injection fluids. The demand for imported seawater decreases as the field continues to mature.

#### **Gas Injection**

In March of 2009, regulatory approval was received to inject enriched, sub-miscible gas in the WAG process. Currently, all CRU wells on gas injection service use enriched gas with the exception of CD1-06 and CD1-14. These two wells inject lean gas and serve as black-start dry gas source wells for plant startups.

#### **Flood Status**

Several Alpine injection patterns at CD1 and CD2, as well as Nanuq Kuparuk patterns at CD4, have reached the target maturity of 30% HCPVI (hydrocarbon pore volume injected) and no longer receive gas injection. Such patterns are managed as waterflood only. Overall MWAG and waterflood field response remains excellent. See *Table 3* for a detailed list of estimated pattern maturity and flood status.

#### **Scale Squeeze Program**

A scale squeeze program has been ongoing since 2008 to treat wells with downhole scaling tendencies. Thirty scale inhibition treatments were performed in Alpine, Nechelik, and Kuparuk wells in 2015. Performance evaluation of these and other wells in the program is ongoing, and it is expected that a similar treatment scope will be implemented in 2016 as part of the ongoing scale management process.

#### **Reservoir Pressure Monitoring**

An extensive reservoir pressure monitoring program was completed in 2015 in each CRU oil pool. A total of 39 static reservoir pressure surveys were recorded in 2015, and 20 permanent down-hole gauges were in use for continuous monitoring. The Annual Reservoir Pressure Report for Alpine will be issued to the AOGCC in late March 2016, and will contain all reservoir pressure data gathered during 2015.

Reservoir pressure is continuously managed to optimize CRU flood performance and prepare for drilling operations. Static pressure monitoring will continue during 2016, especially during sheltering opportunities. In addition, installation of new permanent down-hole gauges is planned for all new producers that will be drilled during 2016.

#### **Key Meetings**

The CRUA Section 3.9.8 Review was held on December 15, 2015, pursuant to the CRUA. The next CRUA Section 3.9.8 Review will be held in December of 2016.

## **Facilities Expansion Update**

No major process expansions are currently planned for the Alpine Central Facility (ACF). Major turbine maintenance will occur on the C1 compressor and E1 generator during summer 2016, and will include upgrades to the control systems on both machines, as well as the E2 secondary generator.

There are no expansions planned for the CD1, CD2, CD3, and CD4 drillsites. An expansion is planned for CD5, which will bring the drillsite up to the originally premised 33 slots. Placement of vertical support members will occur in 2016 with the remainder of the work execution in 2017.

The Alpine Operations Center will be upgraded with a new electrical switchgear module in 2016. No other major infrastructure upgrades are planned for 2016.

A workover of the currently suspended CD1-15 well is planned for Q1 2016 to allow for perforating of the shallow "Halo" gas reservoir to provide the ACF a reliable backup black-start fuel gas source well. The Alpine black-start system provides fuel gas for power generation and startup when the plant is down for maintenance or due to an unexpected outage. It originally consisted of two gas source wells, however, one of the wells (CD1-06) is no longer producible due to hydrate formation, and the second well (CD1-14) is operated under a waiver.

## Status Update by Pool and PA

The following is a summary of the status of each pool as of January 1, 2016:

- Alpine Pool (Alpine PA and Nanuq Kuparuk PA; includes wells and metrics that are anticipated to be included within the next expansion for these two PA's)
- Fiord Pool (Fiord Kuparuk PA and Fiord Nechelik PA)
- Nanuq Pool (Nanuq PA)
- Qannik Pool (Qannik PA)

#### **Alpine Pool**

#### **Development Drilling**

Alpine PA: 135 wells drilled (excluding sidetracks and re-drills)

- 71 Producers
- 62 Injectors
- 2 Disposal Wells (completed in the Ivishak)

Nanuq Kuparuk PA: 11 wells drilled (excluding sidetracks and re-drills)

- 5 Producers
- o 6 Injectors

#### Alpine PA Average Metrics for 2015

Average oil production rate	33.3 MBOPD
Average gas production rate	39.9 MMSCFD
Average water production rate	32.1 MBWPD
Average gas injection rate	26.6 MMSCFD
Average water injection rate	79.7 MBWPD

#### Nanug Kuparuk PA Average Metrics for 2015

Average oil production rate	2.3 MBOPD
Average gas production rate	1.6 MMSCFD
Average water production rate	1.3 MBWPD
Average gas injection rate	0.0 MMSCFD
Average water injection rate	5.5 MBWPD

#### Alpine PA Cumulative Volumes Produced and Injected Since Start-Up

Cumulative oil production through December 2015	401.2 MMSTBO
Cumulative gas production through December 2015	479.9 BSCF
Cumulative water production through December 2015	. 99.7 MMSTBW

Cumulative gas injection through December 2015 402.2 BSCF
Cumulative water injection through December 2015 545.0 MMSTBW
Nanuq Kuparuk PA Cumulative Volumes Produced and Injected Since Start-Up
Cumulative oil production through December 2015 26.3 MMSTBO
Cumulative gas production through December 2015 28.3 BSCF
Cumulative water production through December 2015
Cumulative gas injection through December 2015 25.0 BSCF
Cumulative water injection through December 2015 42.9 MMSTBW

#### **Fiord Pool**

#### **Development Drilling**

Fiord Kuparuk PA: 5 wells drilled (excluding sidetracks and re-drills)

- o 2 Producers (does not include CD3-130K tract operation)
- o 3 Injectors

Fiord Nechelik PA: 23 wells drilled (excluding sidetracks and re-drills)

- 13 Producers
- o 10 Injectors

#### Fiord Kuparuk PA Average Metrics for 2015

Average oil production rate	1.1 MBOPD
Average gas production rate	6.0 MMSCFD
Average water production rate	4.0 MBWPD
Average gas injection rate	3.7 MMSCFD
Average water injection rate	2.5 MBWPD

#### Fiord-Nechelik PA Average Metrics for 2015

Average oil production rate	10.6 MBOPD
Average gas production rate	9.9 MMSCFD
Average water production rate	. 7.3 MBWPD
Average gas injection rate	14.6 MMSCFD
Average water injection rate	17.6 MBWPD

# Fiord Kuparuk PA Cumulative Volumes Produced and Injected Since Start-Up

Cumulative gas production through December 2015 17.4 BSCF	
Cumulative water production through December 2015 15.1 MMSTBW	
Cumulative gas injection through December 2015	
Cumulative water injection through December 2015 24.4 MMSTBW	
Fiord Nechelik PA Cumulative Volumes Produced and Injected Since Start-Up	
Cumulative oil production through December 2015 50.0 MMSTBO	1
Cumulative gas production through December 2015 36.7 BSCF	
Cumulative water production through December 2015 8.9 MMSTBW	•
Cumulative gas injection through December 2015 40.9 BSCF	
Cumulative water injection through December 2015 61.6 MMSTBW	1

## **Nanuq Pool**

## **Development Drilling**

Nanuq PA: 9 wells drilled (excluding sidetracks and re-drills)

- 5 Producers (does not include CD1-229 tract operation)
- 4 Injectors

## Nanuq PA Average Metrics for 2015

Average oil production rate	1.6 MBOPD
Average gas production rate	2.7 MMSCFD
Average water production rate	0.1 MBWPD
Average gas injection rate	0.0 MMSCFD
Average water injection rate	4.2 MBWPD

#### Nanuq PA Cumulative Volumes Produced and Injected Since Start-Up

Cumulative oil production through December 2015	3.2 MMSTBO
Cumulative gas production through December 2015	5.2 BSCF
Cumulative water production through December 2015	0.3 MMSTBW
Cumulative gas injection through December 2015	0.3 BSCF
Cumulative water injection through December 2015	7.2 MMSTBW

#### **Qannik Pool**

#### **Development Drilling**

Qannik PA: 9 wells drilled (excluding sidetracks and re-drills)

- o 6 Producers
- o 3 Injectors

## Qannik PA Average Metrics for 2015

Average oil production rate	1.6 MBOPD
Average gas production rate	1.0 MMSCFD
Average water production rate	0.2 MBWPD
Average gas injection rate	0.0 MMSCFD
Average water injection rate	1.9 MBWPD
Qannik PA Cumulative Volumes Produced and Injected Since Start-Up	<u>0</u>
Cumulative oil production through December 2015	5.4 MMSTBO
Cumulative gas production through December 2015	3.5 BSCF
Cumulative water production through December 2015	0.3 MSTBW
Cumulative gas injection through December 2015	0.0 BSCF

Cumulative water injection through December 2015 ...... 7.4 MMSTBW

TABLE 2: Colville River Unit Active Wells Drilled as of January 1, 2016

	CASING					<b>TOTAL</b>
WELL_NAME	SHOE	SURF X LOC	SURF Y LOC	TD X LOC	TD Y LOC	<u>DEPTH</u>
CD1-01A	8705.4	1526032.77	5975652.46	1524952.14	5975910.64	9908
CD1-02	8201.1	1526025.63	5975645.25	1526805.92	5981831.74	12773
CD1-03A	11629.7	1526018.63	5975638.4	1525929.19	5984381.94	11896
CD1-04	9444.8	1526011.62	5975631.18	1532420.61	5974946.44	13977
CD1-05	10632.6	1526004.36	5975623.97	1533843.02	5975392.81	14515
CD1-06	13500	1525997.61	5975617.49	1536983.89	5975744.3	16024
CD1-07	13477	1525990.1	5975609.92	1537797.55	5967803.87	17590
CD1-08	12515	1525983.44	5975601.97	1536123.79	5967745.72	15837
CD1-09	11894	1525975.46	5975595.5	1535185.49	5976061.76	15350
CD1-10	7908.6	1525968.94	5975588.28	1529672.04	5973708.99	11693
CD1-11	12293.2	1525962.05	5975581.06	1534769.48	5967103.11	15057
CD1-12	11656.3	1525955.17	5975574.21	1532970.62	5967262.12	13812
CD1-12L1	11656.3	1525955.17	5975574.21	1532640.21	5968053.55	12954
CD1-13	8841.2	1525947.79	5975567	1531068.26	5974270.5	11300
CD1-14	14073	1525940.78	5975560.16	1539784.98	5970229.55	18939
CD1-16	9595.9	1525926.89	5975546.09	1532851.37	5970781.89	12600
CD1-17	13181	1525919.63	5975538.88	1538265.02	5970439.71	18590
CD1-18	11381.7	1525912.75	5975532.03	1530960.21	5964743.12	15056
CD1-20	10634	1525898.48	5975517.61	1532531.15	5964455.73	16114
CD1-21	9049	1525891.23	5975510.77	1521109.85	5980851.22	11087
CD1-229	11309	1525834.91	5975454.16	1524052.98	5963454.99	16118
CD1-22B	13159	1525883.97	5975503.56	1527394.95	5984658.76	13500
CD1-23	11473	1525877.21	5975496.34	1535536.15	5972052.57	14477
CD1-24	10771	1525870.08	5975489.49	1534365.76	5971283.98	13706
CD1-25	8886.7	1525863.07	5975482.64	1531646.34	5969913.78	12147
CD1-26	8553.8	1525855.08	5975475.45	1529961.62	5969806.37	11134
CD1-27	8500	1525848.81	5975468.22	1528801.98	5968765.16	11492
CD1-28	7448.7	1525841.92	5975461.37	1527261.9	5971877.83	10468
CD1-30	9520	1525826.9	5975446.23	1519105.92	5981194.07	12850
CD1-31	10387.7	1525819.05	5975440.12	1517562.86	5980982.02	14364
CD1-32	11128	1525813.39	5975432.89	1516499.05	5979588.97	14353
CD1-33	7878.3	1525806	5975424.95	1525878.91	5971231.29	10854
CD1-34	8410.3	1525798.14	5975418.48	1524480.51	5970723.86	11190
CD1-35	8158	1525792.37	5975411.98	1522198.21	5981582.21	13450
CD1-36	7654.2	1525785.23	5975404.77	1522280.63	5978348.33	10654
CD1-37	9095.4	1525778.22	5975397.56	1527721.09	5967738.81	12134
CD1-38	9170	1525771.22	5975391.07	1526171.49	5967419.78	12240
CD1-39	10288.9	1525762.72	5975382.78	1524853.54	5966538.86	13289
CD1-40	12042	1525757.07	5975376.28	1524220.34	5964694.93	15438

	<b>CASING</b>					<b>TOTAL</b>
WELL_NAME	<u>SHOE</u>	SURF X LOC	SURF Y LOC	TD X LOC	TD Y LOC	<u>DEPTH</u>
CD1-41	8332.5	1525750.19	5975369.43	1520980.44	5977491.93	11170
CD1-42	9054	1525742.93	5975362.22	1519762.12	5976596.78	11608
CD1-43	10065	1525735.79	5975354.65	1521855.47	5969340.97	12921
CD1-44	10070	1525727.42	5975347.45	1518365.24	5976030.68	12811
CD1-45	9032	1525721.78	5975340.95	1523171.09	5969916.22	11950
CD1-46	11334.5	1525714.53	5975334.11	1529629.84	5963921.01	15187
CD1-47	10960	1525707.76	5975326.89	1520473.64	5984934.79	14120
CD1-48A	13080	1525700.38	5975319.68	1529618.80	5960958.73	18112
CD1-49	13433	1525693.49	5975312.47	1526906.55	5962975.67	15348
CD2-01	12953	1511714.6	5974527.67	1516113.35	5985941.23	17513
CD2-02	16048	1511715.66	5974517.41	1497367.58	5986125.01	21178
CD2-03	13774	1511717.47	5974508.22	1506224.28	5986405.03	15682
CD2-03L1	13774	1511717.47	5974508.22	1506388.64	5986123.85	15356
CD2-05	13712.3	1511718.1	5974487.35	1502373.24	5972114.12	16350
CD2-05L1	13712.3	1511718.1	5974487.35	1501772.23	5973448.61	17816
CD2-06	9672	1511719.54	5974477.81	1507849.15	5986580.48	16680
CD2-07	10857.1	1511720.98	5974468.26	1511819.22	5985502.17	14977
CD2-08	12241.5	1511721.54	5974458	1514598.12	5986489.87	18050
CD2-09	12617	1511722.97	5974448.1	1503443.88	5985256.38	16409
CD2-09L1	12617	1511722.97	5974448.1	1503599.52	5984981.9	16094
CD2-10	10702	1511723.79	5974438.2	1510317.36	5985108.48	14475
CD2-11	13809	1511724.85	5974428.3	1501634.09	5985603.12	18186
CD2-12	8676	1511725.79	5974418.4	1506669.8	5982458.99	13632
CD2-13	10595	1511726.98	5974408.49	1514371.77	5983741.94	14575
CD2-14	7671	1511727.79	5974398.23	1510442.4	5978323.38	11056
CD2-15	9829	1511728.97	5974388.33	1504190.26	5980628.59	14161
CD2-16	9529	1511730.17	5974378.79	1514815.26	5979759.58	12500
CD2-17A	8184	1511731.23	5974368.89	1511559.07	5979620.74	11819
CD2-18	12112	1511732.16	5974358.62	1500241.84	5980903.06	18019
CD2-19	8769.4	1511733.24	5974349.45	1516929.06	5972219.67	11714
CD2-20	9163	1511734.53	5974338.81	1507484.19	5984108.07	14570
CD2-21	13382.2	1511735.23	5974328.92	1500090.29	5985294.14	19359
CD2-22	7845	1511736.91	5974319.37	1509083.42	5977748.89	11134
CD2-23	9676	1511737.23	5974309.12	1505478.45	5981446.52	13438
CD2-24	10810.4	1511738.54	5974299.21	1503244.63	5979249.14	14302
CD2-25	8721.7	1511739.6	5974289.31	1507821.89	5976892.05	11995
CD2-26	8618.6	1511740.53	5974279.04	1515438.79	5971827.79	11238
CD2-27	12530	1511741.84	5974268.77	1520669.18	5961711.55	18250

	CASING					TOTAL
WELL NAME	SHOE	SURF X LOC	SURF Y LOC	TD X LOC	TD Y LOC	<u>DEPTH</u>
CD2-28	8694.5	1511742.66	5974259.24	1512832.17	5980249.12	13200
CD2-29	9556.3	1511744.09	5974249.33	1518266.85	5972913.18	12560
CD2-30	11481	1511744.78	5974239.44	1503338.68	5974808.99	15700
CD2-31	13811	1511745.85	5974229.53	1498979.84	5978713.01	18131
CD2-32	8722.7	1511746.9	5974219.27	1506611.69	5975965.05	11720
CD2-33B	9979.9	1511747.98	5974210.10	1505255.50	5975221.84	13078
CD2-34	7802	1511748.9	5974199.1	1513399.11	5972637.71	8755
CD2-35A	9063	1511750.21	5974189.56	1517705.77	5967564.52	13500
CD2-36	13523	1511751.15	5974179.66	1514665.91	5960145.16	17663
CD2-37	14162	1511752.22	5974169.76	1513070.38	5960238.16	17085
CD2-38	9209	1511753.41	5974160.22	1515195.84	5965766.05	13010
CD2-39	9122.5	1511754.59	5974149.95	1516401.1	5966833.82	12651
CD2-40	11207	1511755.4	5974140.05	1507148.89	5967231.41	14250
CD2-404	5559	1511718.77	5974497.59	1509053.25	5982386.72	11540
CD2-41	9532	1511756.59	5974130.15	1513669.62	5965488.95	13024
CD2-42	9633	1511757.54	5974120.62	1509203.74	5967631.06	13138
CD2-43	13106	1511758.34	5974109.99	1507228.19	5962744.81	19040
CD2-44	11319	1511759.65	5974100.08	1520370.66	5968943.9	14555
CD2-45	9972	1511760.85	5974090.91	1519021.61	5968237.25	13402
CD2-46	7878.5	1511761.77	5974080.28	1513002.44	5970066.92	11000
CD2-463	5146.5	1511461.89	5973923.27	1512255.80	5981083.33	10886
CD2-464	5039.6	1511442.13	5973921.04	1514048.78	5966583.16	10776
CD2-465	9639.4	1511422.00	5973919.19	1512669.23	5985823.08	13733
CD2-466	10773	1511402.48	5973916.60	1510927.71	5990288.24	18286
CD2-467	5396.9	1511382.24	5973914.75	1510658.44	5964830.59	13836
CD2-468	4510.7	1511362.48	5973912.53	1508364.32	5988066.62	17850
CD2-469	7394.1	1511342.72	5973910.31	1506669.23	5980062.70	14297
CD2-47	10839.5	1511762.45	5974069.65	1511287.67	5963763.49	14580
CD2-470	7938.1	1511322.84	5973908.46	1506977.23	5965275.31	15233
CD2-48	10074	1511763.9	5974060.47	1512336.58	5964804.87	13622
CD2-49	8890.8	1511764.84	5974050.57	1510232.52	5968841.22	11874
CD2-50	7906.3	1511765.78	5974040.67	1511826.31	5968954.01	11624
CD2-51	13246	1511767.08	5974030.4	1522503.45	5964731.39	17320
CD2-52	12897	1511767.9	5974020.87	1521158.82	5964034.98	16881
CD2-53	12394	1511769.08	5974010.6	1518991.96	5961782.89	16985
CD2-54	14378	1511770.27	5974000.7	1500220.45	5972319.01	16617
CD2-54L1	14378	1511770.27	5974000.7	1499495.45	5973780.11	18250
CD2-55	12210.2	1511771.21	5973990.8	1509008.21	5963635.28	15238

WELL NAME	CASING	SUDE V LOC	SUDE V LOC	TD V LOC	TD V LOC	TOTAL
WELL NAME CD2-56	<u>SHOE</u> 14391	SURF X LOC 1511772.15	SURF Y LOC 5973980.90	TD X LOC 1504595.73	TD Y LOC 5963808.85	<u>DEPTH</u> 18027
CD2-56L1	14895	1511772.15	5973980.90	1505249.23	5962430.47	19554
CD2-50L1	12642.4	1511772.13	5973970.26	1517353.5	5961495.9	16433
CD2-57 CD2-58	12042.4	1511773.69	5973960.73	1517353.5	5961215.1	16389
CD2-58 CD2-58L1	12129	1511774.39	5973960.73	1514586.36	5963741.24	
CD2-56L1 CD2-59	15743	1511774.39	5973951.19	1497111.04	5978173.58	13550
CD2-59 CD2-60A		1511775.56			5956625.47	20027 21001
CD2-60A CD2-72	14328.9 16781	1511776.65	5973941.29 5973904.02	1512294.48 1496355.11	5983852.49	21001
_			5973904.02			
CD2-73	17173	1511263.06		1494819.4	5982551.12	21810
CD2-74	19595.8	1511243.06	5973899.58	1492314.63	5983181.40	25007
CD2-75	21198.2	1511223.3	5973897.72	1495463.56	5976901.1	23539
CD2-76	15498	1511203.42	5973895.50	1503057.03	5984373.03	15769
CD2-77	17735	1511183.29	5973893.29	1518144.03	5955001.67	22658
CD2-78	17444.5	1511163.9	5973891.43	1493466.09	5976267.53	23786
CD3-106	13390	1528298.41	6003599.20	1524947.97	6017019.47	17664
CD3-106L1	12987.9	1528298.41	6003599.20	1526340.53	6016257.05	16193
CD3-107	11874	1528278.94	6003594.36	1532779.03	6012673.17	18315
CD3-107L1	11874	1528278.94	6003594.36	1532520.94	6013796.55	19482
CD3-108	11075	1528259.72	6003589.53	1528396.56	6016492.82	18915
CD3-109	9685	1528239.88	6003585.07	1525890.53	6017704.91	20321
CD3-110	8958.8	1528220.42	6003580.97	1523565.64	6015579.09	17991
CD3-111	8657.9	1528201.20	6003576.13	1522862.00	6013216.73	15073
CD3-111L1	8657.9	1528201.20	6003576.13	1521802.25	6014417.60	16645
CD3-112	8572.6	1528181.26	6003572.4	1520503.73	6012560.67	16021
CD3-113	9362	1528161.42	6003567.58	1518479.94	6011618.64	17338
CD3-114	10627	1528142.32	6003562.74	1516918.71	6010336.3	18042
CD3-115	12268	1528122.61	6003558.28	1515886.74	6008531.70	19564
CD3-117	15710	1528084.04	6003549.34	1512407.57	6006986.69	21597
CD3-118	13694	1528064.46	6003544.88	1513809.64	6008329.97	21228
CD3-119	15810	1528044.86	6003540.05	1530452.16	6018297.38	19375
CD3-121	8876	1528005.93	6003531.12	1529467.41	5999572.58	15081
CD3-122	9127.9	1527986.72	6003526.65	1527997.60	5998039.55	15409
CD3-123	11059	1527967.13	6003522.19	1525609.61	5997324.29	17142
CD3-124	21000	1527947.67	6003518.09	1509769.69	6006633.57	23981
CD3-125	11817	1527927.95	6003513.26	1523786.60	5996710.86	16529
CD3-127	14429	1527889.37	6003503.22	1519845.86	5995844.75	20033
CD3-128	18685	1527869.93	6003499.86	1522865.91	5994312.11	20387
CD3-130	14310	1527831.11	6003490.56	1536060.65	6012974.65	15757
CD3-198	8726.5	1528434.41	6003630.10	1532750.30	6002456.29	13228
CD3-199	8867.9	1528415.44	6003625.99	1531563.54	6000249.70	15742
CD3-301A	10583.5	1528395.60	6003621.16	1528063.86	6013303.95	13047
CD3-302A	12590.7	1528376.38	6003616.69	1533221.10	6011788.84	12603
CD3-303	14289	1528356.80	6003612.23	1540543.80	6003919.19	14654
CD3-304	17408	1528337.09	6003607.77	1543596.40	5999915.62	17843

14/ELL NAB4E	CASING	OUDE V LOO	CURE V LOC	TD V 100	TD V 100	TOTAL
WELL_NAME	<u>SHOE</u>	SURF_X_LOC	SURF_Y_LOC	TD_X_LOC	TD_Y_LOC	DEPTH 10050
CD3-305	15491.9	1528317.62	6003603.30	1541372.80	5997688.67	16859
CD3-316B	10995.2	1528103.02	6003553.82	1530029.47	6011105.26	17492
CD4-03	15747.6	1518169.28	5957263.72	1519373.17	5942275.46	18524
CD4-05	14350	1518130.34	5957254.11	1503666.18	5961085.34	21142
CD4-07	17826	1518091.53	5957245.22	1500062.85	5968120.45	25040
CD4-12	11497	1517994.42	5957221.91	1517326.95	5946819.95	16004
CD4-16	13894	1517916.53	5957203.05	1507435.83	5962261.51	16850
CD4-17	13334	1517897.19	5957198.97	1505965.84	5961150.46	17975
CD4-208A	14408	1518071.8	5957240.05	1520866.92	5942499.65	19289
CD4-209	6992.4	1518052.21	5957235.61	1520599.70	5949481.66	13215
CD4-210A	18503.1	1518032.98	5957230.8	1517815.06	5941125.91	20683
CD4-211	7725.4	1518013.77	5957226.72	1519009.07	5949550.07	14379
CD4-214	14814.3	1517955.59	5957212.3	1518099.96	5947883.27	15072
CD4-215	9512.4	1517935.51	5957207.86	1516241.56	5948389.83	14761
CD4-23	12640	1517780.48	5957170.49	1514698.29	5947773.39	17280
CD4-24	13565	1517760.89	5957166.05	1509106.91	5954690.94	19530
CD4-25	17566	1517741.42	5957161.25	1507171.45	5954120.50	21168
CD4-25L1	17978	1517741.42	5957161.25	1507330.83	5953707.23	20725
CD4-26	16559	1517722.07	5957156.8	1501983.23	5960052.09	24749
CD4-27	15179	1517697.52	5957150.98	1513617.41	5944695.14	16878
CD4-213B	12203.5	1517974.70	5957217.11	1509521.73	5954253.45	12420
CD4-289	8161	1518421.9	5957323.68	1525378.07	5950601.6	14513
CD4-290	7660.3	1518402.55	5957319.23	1523804.84	5951079.12	12955
CD4-291	7207.5	1518382.96	5957314.43	1522632.41	5950839.17	12595
CD4-292	7064.7	1518363.61	5957309.98	1521580.50	5950112.82	12867
CD4-298	10826	1518247.53	5957282.22	1529812.26	5953165.94	16025
CD4-301B	15051	1518208.35	5957272.97	1526455.73	5961831.58	18806
CD4-302	9613.3	1518188.75	5957268.17	1524237.98	5956595.75	9626
CD4-304	14605	1518149.93	5957258.91	1506328.98	5962105.04	17300
CD4-306	10113	1518110.87	5957249.67	1512052.87	5960436.66	10346
CD4-318A	15719	1517877.46	5957193.44	1506475.37	5956850.33	20612
CD4-319	12190	1517858.00	5957189.36	1512400.81	5958189.08	18684
CD4-320	8143	1517839.01	5957183.81	1519937.49	5951326.66	14471
CD4-321	18434	1517819.25	5957176.82	1501408.34	5953240.29	19337
CD4-322	18538	1517799.95	5957174.93	1500861.02	5958794.03	19452
CD4-93A	12348	1518344.13	5957304.81	1514030.64	5948518.27	22059
CD4-96A	13260	1518286.47	5957291.10	1511545.66	5944475.29	19293
CD5-03	14341	1489534.6	5965650.98	1488606.52	5982796.57	20999
CD5-04	11837	1489514.86	5965645.15	1492311.28	5975127.19	18878
CD5-05	11177	1489495.49	5965639.69	1499655.72	5961339.52	17900
CD5-313	13422	1489341.46	5965596.29	1496384.43	5949930.29	20835
CD5-315	12651	1489303.12	5965586.08	1491077.98	5945837.57	23053
WD-02	9459	1526693.97	5976307.86	1528565.81	5975898.53	10255

# **TABLE 3: CRU Flood Status Update by PA**

Pattern maturity is shown by percent of hydrocarbon pore volume injected (HCPVI) for water and MI. MI refers to miscible injectant or enriched gas.

<u>PA</u>	<u>Well</u>	<b>Current Flood Status</b>	Water HCPVI	MI HCPVI
Alpine	CD1-01	P&A	52%	21%
Alpine	CD1-02	Waterflood Only	60%	27%
Alpine	CD1-03	Waterflood Only	84%	34%
Alpine	CD1-03A	MWAG	21%	0%
Alpine	CD1-05	Waterflood Only	62%	49%
Alpine	CD1-06	Lean Gas Only	0%	0%
Alpine	CD1-07	Waterflood Only	119%	32%
Alpine	CD1-11	Waterflood Only	131%	34%
Alpine	CD1-13	Waterflood Only	50%	29%
Alpine	CD1-14	Lean Gas Only	117%	45%
Alpine	CD1-16	Waterflood Only	54%	29%
Alpine	CD1-20	Waterflood Only	72%	18%
Alpine	CD1-21	Waterflood Only	54%	33%
Alpine	CD1-23	Waterflood Only	100%	35%
Alpine	CD1-26	Waterflood Only	66%	33%
Alpine	CD1-31	Waterflood Only	53%	28%
Alpine	CD1-33	Waterflood Only	34%	24%
Alpine	CD1-36	Waterflood Only	46%	25%
Alpine	CD1-37	Waterflood Only	49%	26%
Alpine	CD1-39	Waterflood Only	75%	39%
Alpine	CD1-42	Waterflood Only	62%	32%
Alpine	CD1-45	Waterflood Only	38%	25%
Alpine	CD1-46	Waterflood Only	69%	21%
Alpine	CD1-49	Waterflood Only	1%	0%
Alpine	CD2-02	Waterflood Only	187%	33%
Alpine	CD2-06	Waterflood Only	83%	24%
Alpine	CD2-08	Waterflood Only	69%	32%
Alpine	CD2-12	Waterflood Only	126%	38%
Alpine	CD2-15	MWAG	56%	25%

**TABLE 3: CRU Flood Status Update by PA (continued)** 

<u>PA</u>	<u>Well</u>	<b>Current Flood Status</b>	Water HCPVI	MI HCPVI
Alpine	CD2-16	MWAG	48%	26%
Alpine	CD2-17	MWAG	53%	32%
Alpine	CD2-18	MWAG	43%	15%
Alpine	CD2-22	Waterflood Only	61%	37%
Alpine	CD2-26	Waterflood Only	59%	40%
Alpine	CD2-27	MWAG	40%	14%
Alpine	CD2-29	Waterflood Only	83%	32%
Alpine	CD2-30	MWAG	22%	7%
Alpine	CD2-32	Waterflood Only	44%	17%
Alpine	CD2-35	MWAG	45%	25%
Alpine	CD2-36	MWAG	52%	19%
Alpine	CD2-38	MWAG	34%	21%
Alpine	CD2-40	MWAG	20%	6%
Alpine	CD2-44	Waterflood Only	92%	38%
Alpine	CD2-46	MWAG	38%	23%
Alpine	CD2-48	MWAG	30%	13%
Alpine	CD2-49	MWAG	27%	10%
Alpine	CD2-51	MWAG	55%	24%
Alpine	CD2-54	MWAG	69%	26%
Alpine	CD2-55	MWAG	19%	5%
Alpine	CD2-56	MWAG	51%	11%
Alpine	CD2-57	MWAG	33%	15%
Alpine	CD2-59	MWAG	47%	17%
Alpine	CD2-60	MWAG	20%	5%
Alpine	CD2-73	MWAG	59%	28%
Alpine	CD2-78	MWAG	24%	2%
Alpine	CD4-03	MWAG	49%	11%
Alpine	CD4-12	MWAG	66%	25%
Alpine	CD4-17	MWAG	26%	6%
Alpine	CD4-24	MWAG	24%	3%
Alpine	CD4-26	MWAG	21%	1%
Alpine	CD4-27	MWAG	17%	1%
Alpine	CD4-208	MWAG	1%	0%

TABLE 3: CRU Flood Status Update by PA (continued)

<u>PA</u>	<u>Well</u>	<b>Current Flood Status</b>	Water HCPVI	MI HCPVI
Alpine	CD4-213	MWAG	14%	4%
Fiord Kuparuk	CD3-302	MWAG	90%	34%
Fiord Kuparuk	CD3-303	MWAG	10%	6%
Fiord Kuparuk	CD3-305	MWAG	49%	25%
Fiord Kuparuk	CD3-316	P&A	74%	27%
Fiord Nechelik	CD3-108	MWAG	36%	16%
Fiord Nechelik	CD3-110	MWAG	31%	19%
Fiord Nechelik	CD3-112	MWAG	34%	21%
Fiord Nechelik	CD3-114	MWAG	41%	20%
Fiord Nechelik	CD3-118	MWAG	30%	16%
Fiord Nechelik	CD3-121	MWAG	5%	6%
Fiord Nechelik	CD3-123	Waterflood Only	20%	1%
Fiord Nechelik	CD3-124	MWAG	23%	11%
Fiord Nechelik	CD3-128	MWAG	19%	1%
Fiord Nechelik	CD3-198	Waterflood Only	24%	5%
Nanuq Kuparuk	CD4-302	Waterflood Only	69%	31%
Nanuq Kuparuk	CD4-306	Waterflood Only	87%	54%
Nanuq Kuparuk	CD4-319	Waterflood Only	70%	29%
Nanuq Kuparuk	CD4-321	MWAG	40%	17%
Nanuq Kuparuk	CD4-322	MWAG	30%	12%
Nanuq Kuparuk	CD5-315	MWAG	9%	0%
Nanuq	CD4-209	Waterflood Only	28%	0%
Nanuq	CD4-214	Waterflood Only	29%	2%
Nanuq	CD4-289	Waterflood Only	6%	0%
Nanuq	CD4-291	Waterflood Only	9%	0%
Qannik	CD2-404	Waterflood Only	32%	0%
Qannik	CD2-466	Waterflood Only	19%	0%
Qannik	CD2-467	Waterflood Only	24%	0%