

COLVILLE RIVER UNIT AGREEMENT

APPLICATION FOR THE FIRST EXPANSION OF THE UNIT AREA

FINDINGS AND DECISION OF THE COMMISSIONER

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

November 9, 2000

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## I. INTRODUCTION AND BACKGROUND

On August 1, 2000, Phillips Alaska Inc. (“Phillips”), as Operator and on behalf of the other working interest owners (WIOs), applied for approval of the First Expansion of the Colville River Unit (CRU). The CRU is the first unit formed in Alaska with a private party, rather than the state and/or federal government, as the lessor of a significant portion of the unit area. The first expansion proposes to add five leases and approximately 5830.91 acres to the current unit area. The total unit area, after the expansion, would include all or part of 42 leases and be approximately 86,271.36 acres.

DNR determined that the CRU expansion application was complete on August 9, 2000. Notice of the application was published in the Anchorage Daily News and The Arctic Sounder on August 17, 2000. Copies of the application and the public notice were also provided to interested parties under 11 AAC 83.311. DNR also provided public notice to the Alaska Departments of Environmental Conservation and Fish and Game, the North Slope Borough, the City of Nuiqsut, the City of Barrow, the Kuukpik Village Corporation, the Arctic Slope Regional Corporation (ASRC), and the Alaska Oil and Gas Conservation Commission.

The public notices invited interested parties and members of the public to submit comments by September 16, 2000. DNR received two comments. First, the North Slope Borough Planning Department (NSBPD) expressed a concern of local Nuiqsut residents for the traditional cultural uses of the land that include fishing and hunting sites within and surrounding the proposed expansion area. The concern is that development will restrict subsistence user access to the subsistence resources in the vicinity of the proposed expansion lands. The NSBPD also expressed a user access concern for the Native allotments within the expansion area. Second, a representative of some native allotment owners in the vicinity of the proposed expansion expressed concern that approval of the CRU expansion would limit or diminish access to their allotments. The two comments will be addressed in Section II. A. of this Findings and Decision.

The Agreement requires the Unit Operator to file plans of exploration, development and operations describing the activities within the unit area and expansion area. The Unit Operator must consider how it can best develop the resource underlying the entire unit area, regardless of internal lease boundaries. The initial unit plan includes a plan of exploration (POE) and a plan of development (POD). The initial POE describes plans to explore for potential prospects other than the Alpine reservoir. The initial POE emphasizes further exploration, delineation and development of the Fiord Prospect. The Plan of Exploration submitted with the expansion application outlines further plans to explore and delineate the Fiord Prospect within the expanded CRU boundary.

The Agreement provides for separate approval of the unit plan of operations by the DNR Commissioner before any operations begin within the unit area on lands managed by the state. The unit plan of operations must contain: (1) statements and maps or drawings giving the sequence and schedule of operations; (2) the projected use requirements of the proposed operations; including the location and design of well sites, material sites, water supplies, waste sites, buildings, roads and utilities; (3) plans for rehabilitating the affected area; and (4) a description of procedures designed to minimize adverse effects

on other natural resources and other uses of the area, including fish and wildlife habitat, historic and archeological sites, and public use. These plans are to be circulated to other state and local agencies for their review and comment before approval by the DNR Commissioner. The proposed plans must also be consistent with the Alaska Coastal Management Program.

Phillips proposes to expand the CRU to include all or some portions of 5 oil and gas leases jointly owned by the state and ASRC, ADL 380092, ADL 384215, ADL 388525, ADL 25526, and ADL 388901. The proposed expansion area covers approximately 5,830.91 acres of lands and tide and submerged lands adjacent to the Nechelik Channel of the Colville River Delta. Inclusion of the leases in the CRU will conform and modify the leases to the provisions of the CRU Agreement. Exhibit "A" describes the working and royalty interests in the five leases proposed for the CRU expansion. Exhibit "B" is a map showing the leases and their assigned unit tract numbers (CRU Tracts 83 through 94). Following is a summary of the history of the five expansion leases.

Lease ADL 380092 was acquired in state Lease Sale No.75, Kuparuk Uplands, held on December 8, 1992. The lease form, DOG 9208AS, reserves a 16.667% royalty share for the state and ASRC collectively. The lease became effective February 1, 1993 for a primary term of 10 years. This entire 1,516-acre lease, designated CRU Tracts 84, 85, and 87, is proposed for inclusion in the unit.

Lease ADL 384215 was sold in state Lease Sale No. 75A, Colville River Exempt: Colville River Delta onshore, held on September 21, 1993. The lease form, DOG 9208AS (Rev. 5/93), reserves a 16.667% royalty share for the state and ASRC collectively. The lease became effective November 1, 1993 for a primary term of 10 years. Only a portion, 597 acres, of this 2,071-acre lease is proposed for inclusion in the Unit (CRU Tract 83).

Lease ADL 388525 was sold in state Lease Sale 86, Central Beaufort Sea: Harrison Bay to Flaxman Island, held on November 18, 1997. The lease form, DOG 9208AS (Rev. 6/97), reserves a 16.66667% royalty share for the state and ASRC. The lease became effective January 1, 1998 with a primary term of seven years. Only a portion, 384 acres, of this 963-acre lease is proposed for inclusion in the Unit (CRU Tracts 86 and 88).

Lease ADL 25526 was sold in state Lease Sale 13, Prudhoe West, held on December 9, 1964 as a conditional lease, effective February 1, 1965. The lease originally contained Sections 10 (excluding NPR#4), 11, 12 and 13, T.12 N., R.4E., U.M., approximately 2335 acres. The lease was issued on lease form DL-1 (Rev. Oct. 1963) which reserves a 12.5% royalty to the state and which had an initial term of 10-years. On September 30, 1982, the U.S. Department of Interior, Bureau of Land Management (BLM) rescinded Tentative Approval to the state on Sections 12 and 13 of the lease. On November 12, 1982, these two sections were Interim Conveyed to ASRC pursuant to Sections 14(f) and 22(j) of the Alaska Native Claims Settlement Act of December 18, 1971. On June 3, 1983, the lease was segregated into lands which remained tentatively approved to the state and those on which tentative approval had been rescinded. The portion, sections 10 and 11, which remained tentatively approved to the state retained the original lease number, ADL 25526. The segregated portion of the lease, sections 12 and 13, on which tentative approval was rescinded, was assigned a new lease

number, ADL 356000. Since interim conveyance is considered by the BLM to be tantamount to patent, the conditional status of ADL 356000 ended on November 12, 1982 and the 10-year primary term commenced at that time. The conditional status of ADL 25526 would continue until such time as the lands were patented to the state or tentative approval was rescinded.

The BLM rescinded the tentative approval to the state for ADL 25526 when BLM recognized the existence of Nuiqsut as a village under the Alaska Native Claims Settlement Act. The village of Nuiqsut's claim to these lands superseded the state's claim to the lands under the Alaska Statehood Act. ASRC received an Interim Conveyance (IC No. 1161) to the lands under ADL 25526 on April 22, 1986 after Kuukpik Corporation selected the surface of these lands. The state jointly owned these leases with ASRC under the terms of a settlement agreement between ASRC and the state. On November 6, 1991, the Director of the Division of Oil and Gas determined that the conditional status of the lease ended with the Interim Conveyance to ASRC, and that the initial term of the lease would begin on the effective date of IC No. 1161.

On December 6, 1991, BP Exploration (Alaska) Inc. appealed the Director's decision ending the conditional status of leases in the Colville River Delta, including ADL 25526. In November 1992, the lessors and lessees settled their dispute over the removal of the conditional status of the leases. The State/ASRC/Chevron/BP Settlement Agreement provided, in part, that (1) the segregation of ADL 25526 on June 3, 1983 is null and void; (2) ADL 356000 is desegregated and recombined with ADL 25526; and (3) ADL 25526 will expire on November 11, 2000.

Following a re-survey of that portion of the NPRA boundary consisting of the left bank of the Nechelik Channel of the Colville River, the lease's legal description was amended on November 20, 1997 to exclude 40-acres of NPRA acreage located in section 10 of ADL 25526. The entire 2,295.36 acres of ADL 25526 (CRU Tracts 89 through 92) is proposed for inclusion in the CRU.

Lease ADL 388901, Sections 14 and 15 of T.12 N., R. 4 E., Umiat Meridan, Alaska, was once part of ADL 25529. ADL 25529 was sold at state Lease Sale No. 13, and was issued on lease form DL-1 (Rev. Oct. 1963) which provides for a 12.5% royalty share to the state and ASRC.

In the Decision and Findings approving the CRU, dated March 19, 1998, lease ADL 25529 was committed in part to the CRU. In accordance with paragraph 32 of the lease, the CRU Agreement and 11 AAC 83.373, the uncommitted lands were severed from ADL 25529 and assigned ADL 388901. ADL 388901 retains the same effective date and primary term as the original lease. The primary term of ADL 388901 expires on November 11, 2000. This entire 1,038.55 acre lease, designated CRU Tracts 93 and 94, is proposed for inclusion in the CRU.

The surface estate of ADL 388901 is owned entirely by Kuukpik Corporation with the exception of two Native allotments in sections 14 and 15 of the lease. One native allotment, Patent # 50-91-0534, Case # FF-11949, belongs to Joeb O. Woods, while the other native allotment, Patent # 50-92-0017, Case # FF-11951, belongs to Abraham Woods. Both allotments surround a lake on the east bank of the Nechelik Channel on the lease.

All of the leases proposed for the CRU expansion are owned jointly by the state and ASRC. The joint ownership was established by the 1991 State-ASRC Settlement Agreement, approved by the legislature in Chapter 41 SLA 1992. The ownership split between the state and ASRC varies from lease to lease as described in the Settlement Agreement. The state and ASRC administer their individual interests independently. Currently, working interest ownership is aligned for the proposed expansion leases (Phillips Alaska Inc. 56%, Phillips Alpine Alaska, Inc. 22%, and Anadarko Petroleum Corporation 22%) with the exception of ADL 384215, wherein W. H. Hunt has a 0.38% working interest.

The Kuukpik Corporation owns the surface estate of the leases in Lease Sales 75 and 75A. Under the terms of the 1987 1431(o) Consent Agreement, dated January 21, 1987, Kuukpik Corporation must consent to any oil and gas exploration, development and production activities on these lands. Kuukpik granted its consent for these lands and the other leases jointly held by ASRC and the state over which Kuukpik Corporation has surface rights, and the leases in which ASRC only has an interest, in agreements dated November 23, 1992 and August 27, 1997.

Finally, pursuant to the provisions of Section 12.1 of the CRU Agreement, the President of ASRC conditionally approved the expansion of the CRU on September 7, 2000. ASRC viewed certain language in Phillips' August 1, 2000 expansion application as inconsistent and in conflict with several provisions of the CRU Agreement. Phillips assured ASRC that the application language was not intended to amend the CRU Agreement. ASRC then approved the expansion on condition that the CRU Agreement was not being amended. ASRC's approval was also conditioned on the approval of the DNR Commissioner as required in Section 12.1 of the CRU Agreement.

## **II. DISCUSSION OF CONSIDERATIONS**

State regulations require the commissioner to consider the following six factors in evaluating a unit expansion application: (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; (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). How each of these factors applies to the proposed CRU expansion is discussed below.

### **A. The Environmental Costs and Benefits of Unitized Exploration or Development**

The lands in and surrounding the CRU are habitat for a variety of fish, waterfowl and marine mammals. Area residents occasionally use these lands and waters for subsistence hunting and fishing. Oil and gas activity in the proposed unit expansion area will impact some wildlife habitat, and may impact some

subsistence activity. The extent of these impacts depends on a number of variables. DNR can control some of the variables to minimize the impacts. The environmental impact will depend on the effectiveness of mitigation measures, the availability of alternative habitat and subsistence areas; and the ability of the fish and marine mammals to adapt to some displacement and changes in their habitat.

DNR develops lease stipulations through the lease sale process to mitigate the potential environmental impacts from oil and gas activity. 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 preparing a written finding before an oil and gas lease sale, the commissioner may impose additional conditions or limitations beyond those imposed by law. AS 38.05.035(e).

DNR considered all comments filed before holding Lease Sale 75, 75A and 86. DNR included mitigation measures in the leases issued. The proposed CRU expansion leases contain many stipulations designed to protect the environment and address any outstanding concerns regarding impacts to the area's fish and wildlife species and to habitat and subsistence activities. They address such issues as the protection of primary waterfowl areas, site restoration, construction of pipelines, seasonal restrictions on operations, public access to, or use of, the leased lands, and avoidance of seismic hazards. A decision including the five leases in the CRU need not – and in this case will not – result in additional restrictions or limitations on public access to the lands or to public and navigable waters. All lease operations before or after unitization are subject to a coastal zone consistency determination, and must comply with the terms of both the state and North Slope Borough coastal zone management plans. Lease and unit operations also require approval of a state plan of operations.

Ongoing mitigation measures such as seasonal restrictions on specific activities in certain areas can reduce the impact on bird, fish, and mammal populations. Designating primary waterfowl areas is one method of protecting the bird habitat. DNR requires consolidation of facilities to minimize surface disturbances. Regulating waste disposal is another way to limit environmental impacts. With these mitigating measures, the anticipated exploration and development related activity is not likely to significantly impact bird, fish, and mammal populations. Area residents use the unit area for subsistence hunting and fishing. Oil and gas activity may impact some wildlife habitat, and some subsistence activity. The environmental impact will depend on the level of development activity, the effectiveness of mitigation measures and the availability of alternative habitat and subsistence areas. In any case, the anticipated activity under the expanded CRU will impact habitat and subsistence activity less than if the lessees developed the leases individually. Unitized exploration, development and production will minimize surface impact.

The NSBPD and Joseph K. Akpik, a representative of the Native Allotment owners to BLM Patent # 50-92-0284, U.S. Survey 9501, Lots 1 and 2, submitted comments on the CRU expansion during the public comment period. The NSBPD comments address the concerns of native allotment owners in the vicinity of the CRU expansion and the local residents of Nuiqsut. The comments expressed concerns that development on the expansion leases should not (1) preclude reasonable substance user access to the substance resource; (2) significantly interfere with traditional activities at cultural or historic sites identified in the coastal management program; and (3) not cause surface disturbance of newly



discovered historic or cultural sites prior to archaeological investigation. Mr. Joseph Akpik was concerned that the proposed unit expansion would limit or diminish access to their native allotment.

With regard to the comments of Mr. Akpik, it should be noted that this native allotment is not within the proposed CRU expansion area. BLM Patent # 50-92-0284 is adjacent, immediately to the west, of the proposed expansion acreage. There are two native allotments in ADL 388901, which is proposed for the CRU expansion. The two allotments in ADL 388901 are BLM Patent # 50-91-0534 which belongs to Joeb O. Woods, and BLM Patent # 50-92-0017 which belongs to Abraham Woods. Joeb Woods and Abraham Woods individually did not comment to the proposed CRU expansion. It is not clear from Mr. Akpik comments whether or not he is also representing or making comments for Joeb Woods and Abraham Woods as concerns their native allotments in ADL 388901. Nevertheless, the division's response will address the issues raised by the NSBPD and Mr. Akpik.

The proposed CRU expansion leases contain many stipulations designed to protect the environment and address any outstanding concerns regarding impacts to the area's fish and wildlife species and to habitat and subsistence activities. The expansion leases address the issue of public access to, or use of, the leased lands. Additionally, when the state approves a plan of operations, it has the right to impose additional or different mitigation measures, including those used in the most recent lease sale. The mitigation measures for the most recent lease sale in the unit, in this case Sale 86, provide the following: (1) No restriction of public access to, or use of, the leased area will be permitted as a consequence of oil and gas activities except in the immediate vicinity of drill sites, buildings, and other related facilities; (2) No lease facilities or operations may be located where they would block public access to or along navigable and public waters as defined in AS 38.05.965(12) and (16). If lease facilities will be located in the vicinity of these public waters, an easement will be reserved under AS 38.05.127 and 11 AAC 53.330 to ensure the right of public access; and (3) The director, DO&G, will restrict lease-related surface use when the director determines it is necessary to prevent unreasonable conflicts with local subsistence harvests. Attachment 1 to this Findings and Decision has the specific mitigation measures that address the concerns of the NSBPD and the allotment owners. Including the leases in the CRU will not change these stipulations. The stipulations are in effect whether the leases are unitized or not.

Two additional NSBPD comments need to be addressed, that is, the NSBPD wants stipulations that the "Division of Oil and Gas shall conduct a public hearing in Nuiqsut to address the concerns on Native Allotments and subsistence uses by local residents of Nuiqsut" and "...to gain information as to the restrictions that may be caused by the expansion". Before holding Lease Sale 86, the Division of Oil and Gas held a public hearing in Nuiqsut on February 26, 1997 to take comments regarding the preliminary finding for the then upcoming proposed Lease Sale 86. The Best Interest Finding of the Director, proposed Oil and Gas Lease Sale 86, dated August 20, 1997, Volume II: Appendices, Section B, includes a summary of the comments of the Nuiqsut participants at the public hearing and DNR responses to the comments. The Nuiqsut participants included Joseph Akpik, Leonard Lampe Sr., Ruth Nukapigak, Sarah Kunakna, Thomas Napageak, and Isaac Nukapigak. As noted in Attachment 1, the concerns of these participants are addressed in the mitigating measures and lessee advisories incorporated in Lease Sale 86.

In addition to the mitigating measures in the lease, state unitization regulations require the commissioner to approve a Plan of Operations before the unit operator performs any surface operations. 11 AAC 83.346. A proposed Plan of Operations must describe the operating procedures designed to prevent or minimize adverse effects on natural resources. The unit operator must guarantee full payment for all damage sustained to the surface estate before beginning operations. The Plan of Operations must include plans for rehabilitation of the unit area. Furthermore, when the lessees propose to explore or develop the expansion area and submit a Unit Plan of Operations, the DNR may require that it comply with the lease stipulations and lessee advisories developed for the most recent lease in the CRU, the expanded CRU, or the region.

The approval of the CRU expansion itself has no environmental impact. 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 commissioner's approval of the unit expansion is an administrative action, which, by itself, does not convey any authority to conduct any operations within the unit. Unitization does not waive or reduce the effectiveness of the mitigating measures that condition the lessee's right to conduct operations on these leases. DNR's approval of the Unit POE and/or POD is only one step in the process of obtaining permission to drill a well or wells or develop the potential and known reservoirs within the unit area. The Unit Operator must still 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 known reservoirs within the unit area.

Phillips plans to drill two exploration wells within the proposed CRU expansion area, Nigliq #1 and Nigliq #2. The proposed surface locations for the wells are on Kuukpik Corporation conveyed lands, which are subject to the Phillips/Kuukpik Surface Use Agreement. Furthermore, Phillips has applied for permits and authorizations for the two Nigliq wells from the various federal, state, and local agencies. These permit requests are currently under agency review. The North Slope Borough and the allotment owners will have the opportunity to comment during the permit review process.

#### **B. Prior Exploration Activities in the Colville River Unit Area, and Proposed Expansion Area, and the Geological and Engineering Characteristics of the Reservoir.**

The CRU and surrounding areas contain multiple sandstone reservoir objectives. Lower Cretaceous Kuparuk 'C' sandstone potential exists on the down thrown sides of normal faults in the area. Three prospective sandstone sequences are locally present within the Upper Jurassic. In stratigraphic order (from oldest to youngest) they are the Nuiqsut, Nechelik, and Alpine intervals. All three of these sequences are oil-bearing. Each of the three intervals forms a 200 to 300 foot thick coarsening and cleaning upward sandstone package composed of sandstone, siltstone, and shale. Each sequence terminates abruptly with a sharp top that is overlain by marine mudstones of the Upper Jurassic Kingak (Nechelik and Nuiqsut intervals) and lower Cretaceous Miluvec formations (Alpine interval). Although all three sandstone sequences are oil-bearing, the older Nechelik and Nuiqsut sandstones have

poorer reservoir properties than the Alpine sandstone; they are slightly finer-grained, more argillaceous, more poorly sorted, and contain heavier API gravity oil.

Over 35 exploration and delineation wells have been drilled in the CRU and Colville Delta area since 1982. Several wells in the vicinity of the Colville Delta area and the proposed CRU expansion area have encountered oil-stained Nechelik sandstone. The Sohio Nechelik #1 well, drilled in 1982, was the first to encounter the Nuiqsut and Nechelik intervals. The Nechelik interval contained porous oil-stained sandstone; the Nuiqsut interval was not of reservoir quality. The upper Alpine sandstone, discovered later to the south in the Bergschrund #1 well, was absent. In the middle 1980's Texaco and Amerada Hess discovered oil-bearing Nuiqsut sandstones, to the northeast, in the Texaco Colville Delta # 1, 1A, 2, and 3 wells and Amerada Hess Colville Delta 25-13-6 well in the Colville Delta area. Although the wells tested oil, the Nuiqsut sandstone had poor permeability. Because of low flow rate tests from these wells, Texaco and Amerada Hess considered the accumulation uneconomic to develop.

During the 1990s, ARCO Alaska, Inc. (ARCO), now Phillips, experienced some unexpected success in the area while exploring for productive Kuparuk 'C' reservoirs. As a part of its exploration effort, ARCO continued to explore for economic oil-bearing Jurassic sandstones. In 1992, ARCO encountered Kuparuk 'C' sandstone pay along with poor permeability Nuiqsut pay with low flow rates in the Kalubik #1 well, situated northeast of the Texaco Colville Delta #1/1A discovery wells. ARCO also drilled the Fiord #1 well southwest of the Colville Delta wells in 1992. Both the Kuparuk 'C' sand and Nechelik sandstone were drilled and tested. The Fiord #1 well tested 1,065 barrels of oil per day (BOPD) from 24' of Kuparuk 'C' sandstone and 185 BOPD from 50' of permeable oil-bearing sandstone within the Nechelik sandstone. The Nuiqsut was tight and displayed poor reservoir properties. The northeast area of the CRU had proven Kuparuk 'C' sandstone potential of varying thickness along the down-thrown sides of the faults and unproven oil potential in the finer-grained, siltier Nechelik sandstone. The search for commercial quantities of oil within the Nuiqsut and Nechelik intervals remained elusive.

The Bergschrund #1 well was drilled in 1994 with Kuparuk 'C' sandstone as a primary target and the Upper Jurassic Nuiqsut and Nechelik sandstones as secondary objectives. The well unexpectedly discovered a slightly younger Jurassic oil-bearing sandstone, the Alpine interval, above the Nuiqsut and Nechelik sandstones. The Alpine sandstone in the Bergschrund #1 well contained about 50' of net pay of 40 degree API oil. The Alpine sandstone contained significantly less clay matrix and was slightly coarser-grained (very fine- to fine-grained) than the underlying Nuiqsut and Nechelik sandstones. The best test from the Alpine sandstone in the Bergschrund well yielded 2,280 BOPD on a 128/64" choke. ARCO, the former CRU Operator prior to Phillips, formed the Alpine Participating Area within the CRU in order to develop and produce the Alpine sandstone reservoir.

ARCO continued its exploration efforts in the vicinity of the ARCO Fiord wells. The Temptation #1/1A wells were drilled west of the Fiord area (and outside the CRU) in 1996. The Temptation #1 and #1A wells encountered 8' of oil-bearing Kuparuk sandstone and about 180' of permeable oil-bearing sandstone in the Nechelik interval. Neither well tested either interval. The wells yielded enough encouraging results for ARCO to continue to explore for commercial quantities of oil within the

Kuparuk 'C' sandstone and the three Upper Jurassic sandstone sequences. Although many wells in the vicinity encountered oil-stained Nechelik sandstone, no accumulations were considered to be commercial until ARCO conducted the 1999 Fiord exploration drilling program in the northeastern part of the Colville River Unit. During the first part of 1999, ARCO drilled the Fiord #4, #5, and #5PB1 wells. On July 6, 1999, ARCO and its partner Anadarko announced the Fiord discovery within the CRU. The announcement stated that the Fiord #5 well contained 60 vertical feet of oil-bearing sand in a Jurassic reservoir and a 15-foot vertical section of oil-bearing sand in the Kuparuk Formation. The Jurassic sand tested at a rate of 1,400 BOPD of 29 degree API gravity oil and 0.65 million standard cubic feet of gas per day (scfgpd) after fracture stimulation. A combined test of the Jurassic and Kuparuk sandstones yielded an equivalent rate of 2,500 BOPD of 30 degree API oil and 1.2 million scfgpd. ARCO estimated that the Fiord accumulation within the current CRU contained more than 50 million barrels of proven and potential reserves.

ARCO's successful test of the Fiord #5 well and further seismic work in the proposed expansion area indicate that the Kuparuk 'C' and the Nechelik sandstones have the potential to add additional reserves to the Fiord accumulation. In support of the proposed CRU expansion application, Phillips submitted the Temptation #1 well log as the type section of the Kuparuk and Nechelik intervals. The Nechelik sand is the informal name applied to the sequence of reservoir sandstones and associated mudstones within the upper Kingak Formation encountered in the ARCO Temptation #1 well in the interval between 7,330'-7,650' measured depth (-7,296' to -7,616' true vertical depth sub-sea (tvdss)) and its lateral equivalents. The sandstones are fine- to very-fine-grained with porosity ranging between 13 - 15% and permeability ranging between 1- 10 millidarcies. The Kuparuk 'C' sandstone is the formal name applied to the reservoir sandstones in the upper Kuparuk Formation encountered between 7,173' to 7,183' measured depth (-7,140 to - 7,150 tvdss) in the ARCO Temptation #1 well, and its lateral equivalents. The sandstone ranges from very fine- to coarse-grained. Porosity ranges between 19- 22% and permeability ranges between 40 - 150 millidarcies.

Several geological factors continue to contribute to exploration risk for success in the area despite recent encouraging well results. These factors include the uneven geographic distribution of the Jurassic sands and the presence and absence of parts of the sequences due to erosional truncation and non-deposition. The sandstones have locally different porosity and permeability values and contain oils of varying quality. Phillips has submitted sufficient confidential geological and geophysical data to justify the size of the proposed first CRU expansion area.

### **C. Plans for Exploration or Development of the Proposed Unit Expansion Area.**

During the 1999/2000 winter season, the WIOs acquired the Fiord West 3D seismic survey covering the prospective Fiord area both inside the CRU and over the proposed CRU expansion area. Total coverage of the survey was approximately 70 square miles. The final processed version of the survey was available during the autumn of 2000 and the final interpretation is anticipated during the 2000/2001-winter season. The WIOs plan to drill one or two exploration well(s) in the expansion area to confirm

the 3D survey interpretations during the 2000/2001 winter drilling season. The two wells are Nigliq #1 and Nigliq #2.

In particular, prior to May 31, 2001, the WIOs, in the Plan of Exploration submitted as part of the expansion application, plan to drill a well to test the Kuparuk and Nechelik intervals in the expansion area. The well(s) will be drilled as a winter operation from an ice pad at a location on one of the five leases included in the expansion area.

As a condition of including the proposed five leases into the CRU, the WIOs have further agreed to the following terms and conditions requested by the division: (1) apply to form a participating area for the Fiord prospect on or before October 1, 2004; or (2) drill a second well to test the Kuparuk and Nechelik intervals at least 500 feet horizontally from the original obligation well before May 31, 2004. A sidetrack of the original obligation well at least 500 feet from the original wellbore would satisfy this commitment.

If the original obligation well is not completed to the specified intervals by May 31, 2001, or the further terms and conditions for the expansion approval not performed by the specified time, the WIOs have agreed that the five expansion leases will automatically contract from the CRU. If the leases contract from the CRU for failure to comply with the above, the WIOs have also agreed to waive the lease extension provision of 11 AAC 83.140 and the notice and hearing provisions of 11 AAC 83.374.

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

Approval of the CRU expansion will provide near-term economic benefits to the state by creating jobs associated with the assessment of the hydrocarbon potential of the leases within the expansion area. The WIOs have provided sufficient technical data to define the prospects under consideration, have committed their diverse lease interests to the proposed unit expansion area, and have agreed to a plan of exploration which assures a timely sequence of drilling and development activities to evaluate and develop the CRU and the proposed unit expansion area.

The leases in the CRU and expansion area are written on a variety of forms, containing a variety of provisions. During the lengthy CRU Agreement negotiations, the parties bargained for amendments to the terms and conditions of the various lease contracts to harmonize them. Consistent lease provisions allow the WIOs and the state to reduce the administrative burdens of operating and regulating this unit. Conforming the terms of the older leases to the unit agreement allows the state to avoid costly and time-consuming re-litigation of the problematic lease provisions in the older forms.

By including the expansion leases under the CRU Agreement, the state will benefit economically from a number of amendments to the individual leases. Specifically, the discovery royalty provision of the DL-1 lease form was eliminated for the DL-1 leases in the CRU for any wells not already certified as a discovery well on the effective date of the Agreement. The Alaska Legislature repealed the discovery

royalty statute in 1969 and the DNR repealed the discovery royalty regulations in 1979. Although the original discovery royalty statute and regulations were repealed, there are still discovery royalty provisions in the leases issued on the DL-1 form.

Sections 11.6 and 11.8.3 of the Agreement harmonize the various lease provisions that describe the allowable deductions from the state's royalty share. The State's royalty share of production from the CRU will be free and clear of all field costs incurred on the North Slope of Alaska. Certain gas processing costs are specifically allowed.

The CRU Agreement has provisions that resolve some of the challenging issues associated with operation of an oil and gas unit. The parties agreed to the methodology for establishing and revising participating areas. The parties have agreed to the basis for allocating production to the individual tracts included in the participating area. The Agreement also describes the royalty accounting procedures and sets the deemed rate of recovery of certain outside substances injected into reservoirs within the unit. The Agreement makes consistent the dismantlement, restoration, and rehabilitation responsibilities of the WIOs when a unit terminates. The Agreement contains the dispute resolution procedures that the parties have agreed to use if any disputes arise during the operation of this unit.

There are also some potential costs associated with the proposed unit. The state agreed to allow the royalty payments for natural gas from the Fiord prospect to be delayed for ten years and for so long thereafter as approved if the Fiord gas is used for repressuring, recycling, storage, or enhanced recovery in another reservoir within the unit.

### **III. DISCUSSION OF DECISION CRITERIA**

The DNR Commissioner reviews unit expansion applications under AS 38.05.180(p) and 11 AAC 83.303. The Commissioner will approve a proposed unit expansion if the commissioner finds that it will conserve the natural resources of an oil or gas reservoir and is necessary or advisable to protect the public interest. To approve a proposed unit expansion, the commissioner must find that the proposed unit will: 1) promote the conservation of all natural resources; 2) promote the prevention of economic and physical waste; and 3) provide for the protection of all parties of interest, including the state.

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

DNR recognizes unitization of the leases overlaying a reservoir as a prudent conservation mechanism. Without unitization, the unregulated development of reservoirs can become a race for possession by competitive operators. The results can be: 1) unnecessarily dense drilling, especially along property lines; 2) rapid dissipation of reservoir pressure; and 3) irregular advance of displaced fluids, all of which contribute to the loss of ultimate recovery or economic waste. The concentration of surface activity; duplication of production, gathering, and processing facilities; and haste to get oil to the surface also increase the likelihood of environmental damage (such as spills and other surface impacts).

Conservation orders and field rules issued by the AOGCC would mitigate some of these impacts without an agreement to unitize operations. However, unitization provides the most practical method for maximizing oil and gas recovery, while minimizing negative impacts on other resources.

The concern of lessees competing for the reservoir is less evident in the proposed Colville River Unit because Phillips, Phillips Alpine Alaska, and Anadarko Petroleum have already aligned their leasehold interests unit-wide. However, even with only one primary working interest owner group, the CRU Agreement provides for a comprehensive plan for exploring all the reservoirs within the expanded CRU. The initial unit POD/POE and the POE for the expansion area provide for an efficient, integrated approach to development of the Alpine reservoir and the Fiord prospect.

Inclusion of the expansion leases in the CRU Agreement will promote the conservation of both surface and subsurface resources through the unitized (rather than lease-by-lease) development. Unitization allows the unit operator to explore the area as if it were one lease. Without the Agreement the lessee would be required to obtain permits to drill wells on each individual lease in order to extend them all beyond their 10-year primary term. As part of the unit, all of the leases are extended provided the unit operator continues to explore and develop under an approved unit plan. The number of facilities required to develop the resource and the area of land that may be required to accommodate those facilities is reduced when the resources on several leases are developed as one. Facilities can be located to maximize recovery and to minimize environmental impacts, without regard for individual lease ownership.

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

Inclusion of the expansion leases in the CRU will prevent economic and physical waste because the unit operator must have an equitable cost sharing formula and a coordinated development plan for the expanded CRU. An equitable cost-sharing agreement promotes efficient development of common surface facilities and operating strategies. An equitable cost-sharing agreement and an acceptable unit operator allow the WIOs in the unit to rationally decide well spacing requirements and injection strategies, and construct the appropriate common, joint-use surface facilities. Unitization prevents economic and physical waste by eliminating redundant expenditures for a given level of production, and avoiding loss of ultimate recovery by adopting a unified reservoir management strategy.

Unitized operations greatly improve development of reservoirs with variable productivity across adjoining leases. An operator may not produce marginal economic reserves on a lease by lease basis, but can produce them through unitized operations. Facility consolidation and sharing saves capital, and promotes better reservoir management for all WIOs through pressure maintenance and secondary recovery procedures. These factors benefit all parties, including the state, by allowing the operator to develop and produce from less profitable areas of a reservoir.

The overall costs of exploring and developing the CRU leases would probably be higher on a lease-by-lease basis than it will be under the terms of unitization. Investments in drilling and facilities costs will be

minimized as a consequence of eliminating the requirement for multiple sites within the unit area. Locations of individual wells and surface facilities will be selected to optimize recovery of the resources and to minimize costs with due regard for environmental considerations.

Reducing costs through unitized operations will expedite development of any reserves discovered and will promote greater ultimate recovery of any oil and gas in the unit area. This will accelerate and extend the state's income stream from severance taxes and royalties. The revenues to the lessee may be reinvested in new exploration and development in the state.

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

Inclusion of the expansion leases in the CRU Agreement promotes the state's economic interests because the further exploration of the Fiord prospect within the expansion area will likely occur earlier than without unitization. Diligent exploration and development under a single approved unit plan without the complications of competing operators is in the state's best interest. It promotes efficient evaluation of the state's resources, yet minimizes impacts to the region's cultural, biological, and environmental resources. The Agreement also provides for accurate reporting and record keeping, state concurrence with operating procedures, royalty settlement, in kind taking, and emergency storage of oil, all of which will further the state's interest. The modifications to the varying provisions of some of the leases that eliminate discovery royalties and field costs will economically benefit the state. These all protect the state's interest.

Their level of involvement in the unit management process and the dispute resolution procedures protects ASRC's interests. The Kuukpik Corporation's interests were protected during the process of negotiating for consent to subsurface development on their lands. They negotiated for specific limitations on surface use of the leases in which they have surface rights. Kuukpik also received overriding royalty interests in the leases which ASRC had an interest as compensation from the working interest owners and ASRC for consenting to oil and gas activities on their lands.

The state and ASRC will both be able to protect their respective economic interests in the unit management process by the use of the CRU Agreement's dispute resolution procedures, if necessary.

The proposed expansion of the CRU protects the economic interests of all WIOs and royalty owners of a common reservoir. Operating under a unit agreement and unit operating agreement assures each individual working interest owner an equitable allocation of costs and revenues commensurate with the value of their lease(s). The provisions of the CRU Agreement and state law that provide for notice and an opportunity to be heard if they disagree with a unit management decision made by the state or ASRC also protect the WIOs.

## **IV. FINDINGS AND DECISION**



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

1. Including the five leases in the CRU will conserve natural resources, including hydrocarbons, gravel, sand, water, wetlands, and other valuable habitat.
2. The unitized development and operation of the leases in this proposed expansion area 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 interference with subsistence activity is in the public interest.
3. Before undertaking any specific operations, the unit operator must submit a Plan of Operations to the DNR and other appropriate state and local agencies for review and approval. All agencies must grant the required permits before drilling or development operations may commence. DNR may condition its approval of a unit Plan of Operations and other permits on performance of mitigating measures in addition to those in the leases if necessary or appropriate. Requiring strict adherence to the mitigating measures will minimize adverse environmental impacts. However, if the exploration activities in the expansion exploration plan result in the discovery of a commercially producible reservoir, then there will be environmental impacts associated with the reservoir development. All unit development must proceed according to an approved plan of development.

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

1. Phillips submitted geological and engineering data to DNR in support of the unit expansion application. DNR technical staff determined that the expansion area encompasses all or part of one commercially viable accumulation and one or more potential hydrocarbon accumulations.
2. The plan of exploration for the expansion area - subject to the conditions of Section II. C. of this Findings and Decision - meets the requirements of 11 AAC 83.303 and 11 AAC 83.341. The plan is approved until June 1, 2004.
3. Phillips must submit an annual update to the expansion area exploration plan to the Proper Authority for approval. Section 8.1.1 of the CRU Agreement. The annual update must describe the status of projects undertaken and the work completed, and any proposed changes to the plan. Any changes to the unit plan must comply with Article 8 of the CRU Agreement. Phillips must submit a new exploration or development plan before the initial expansion area exploration plan expires.

4. For reporting convenience, the annual update to the expansion area exploration plan may be submitted simultaneously with the annual update to the initial CRU unit plan.
5. Including the expansion leases in the CRU will assure a fair and equitable return to the state from hydrocarbon production from the expanded unit area.
6. The expansion of the CRU will expedite exploration and development of the unit area. The unit expansion provides greater economic benefits to the state than the economic costs to the state of extending the primary term of the state leases committed to the unit.

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

1. The CRU expansion, conditioned upon the performance of its plan of exploration, adequately and equitably protects the public interest, and is in the state's best interest.
2. The CRU expansion meets the requirements of AS 38.05.180(p) and 11 AAC 83.303.
3. DNR complied with the public notice requirements of 11 AAC 83.311.
4. 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 Agreement.
5. The CRU Agreement provides for expansions and contractions of the unit area in the future, as warranted by data obtained by exploration. The Agreement thereby protects the public interest, the rights of the parties, and the correlative rights of adjacent landowners.
6. Phillips, as Unit Operator, has represented that all proper parties have been invited to join the Agreement.
7. The parties have sufficient interest in the unit to exercise control of unit operations. 11 AAC 83.316(c).
8. Revised Exhibits A and B to the CRU Agreement shall be submitted to the Proper Authority in accordance with Sections 2.1 and 2.2 of the CRU Agreement.

For the reasons discussed in this Findings and Decision, I hereby approve the First Expansion of the Colville River Unit. Pursuant to Section 12.1 of the CRU Agreement, this First Expansion will be effective after it has been signed by the Commissioner and the President of ASRC. Since ASRC has already conditionally approved the First Expansion of the CRU on September 7, 2000, the effective date will be date of approval of the Commissioner or the Commissioner's duly authorized representative.

A person adversely affected by this decision may appeal this decision, in accordance with 11 AAC 02, to Pat Pourchot, Commissioner, Department of Natural Resources, 550 W. 7th Avenue, Suite 1400, Anchorage, Alaska 99501-3561. Any appeal must be received at the above address, or by fax to 1-907-269-8918, within 30 calendar days after the date of "delivery" of this decision, as defined in 11 AAC 02.040. A copy of 11 AAC 02 may be obtained from any regional information office of the Department of Natural Resources.

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Kenneth A. Boyd, Director  
Division of Oil and Gas

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Date

Appeal Code: OGO111100CRUFIRSTEXP

Attachment 1: Mitigating Measures of Lease Sale 86

ATTACHMENT 1

## **Mitigation Measures of Lease Sale 86**

For every lease sale during its best interest finding process, mitigation measures are developed and adopted that reduce, minimize, or completely avoid adverse impacts to area resources and people. Measures are imposed on exploration and development projects to maintain air and water quality, avoid disturbance to wildlife, preserve habitat values, protect subsistence access to resources and historical uses, and protect archaeological sites.

Mitigation measures applied to the CRU were developed after considering stipulations and terms imposed in other oil and gas lease sales; fish and wildlife resource and harvest data; and environmental data relating to air and water quality, solid and liquid waste disposal, and oil spills. Measures were also developed or modified after considering comments submitted by the public, industry, federal and state agencies, and local government. Additional project-specific mitigation measures will be imposed when the unit operator submits exploration, development or operations plans. State and federal agencies that impose protection measures on drilling and construction projects include ADF&G, ADEC, USF&WS, NMFS, and USACE. For example, a unique set of mitigation measures for the Alpine Development project to the south of the expansion area were developed independently by agencies, environmental groups, industry, and local residents.

Lessees must obtain approval of a detailed plan of operations from the Director before conducting exploratory or development activities (11 AAC 83.158, 11 AAC 83.346). Unit and lease operations must be consistent with the Alaska Coastal Management Plan, and NSB Coastal District Plan. In addition to compliance with these mitigation measures, lessees must comply with all applicable local, state and federal codes, statutes and regulations, and any subsequent amendments. Citizen groups are formed to advise industry on how to avoid impacts to subsistence. For example, the Kuukpik Subsistence Oversight Panel provides guidance and local knowledge to Phillips Alaska Inc. on the Alpine Development Project.

The mitigation measures for the most recent lease sale in the unit, in this case Sale 86, held on November 18, 1997 may be applied to all leases in the CRU. For example, measure 12 ensures archaeological resources are protected:

Prior to any ground disturbing activity resulting from exploration, development or production activities, the lessee must conduct an inventory of prehistoric, historic and archeological sites within the area affected by activity. The inventory must include consideration of literature provided by the NSB and local residents, documentation of oral history regarding historic and prehistoric uses of such sites, evidence of consultation with the Alaska Heritage Resources Survey and the National Register of Historic Places, and site surveys. The inventory must also include a detailed analysis of the potential effects that might result from the activity.

Measure 15 protects subsistence use:

Exploration, development or production operations shall be conducted in a manner that prevents unreasonable conflicts between lease-related activities and subsistence activities. In enforcing this term the division, during review of plans of operation, will work with other agencies and the public to assure that potential conflicts are identified and avoided to the fullest extent possible. Available options include alternative site selection, requiring directional drilling, seismic and threshold depth restrictions, subsea completion techniques, seasonal drilling restrictions, and the use of other technologies deemed appropriate by the Director. The lessee shall notify the Director of all concerns expressed by subsistence hunters during operations and of steps taken to address such concerns.

Measure 17 ensures access to the area will not be infringed:

No restriction of public access to, or use of, the lease area will be permitted as a consequence of oil and gas activities except in the immediate vicinity of drill sites, buildings and other related facilities. Areas of restricted access must be identified and a rationale justifying the area restriction must be included in the plan of operations.

Sale 86 measures and advisories are clear with respect to concerns of local residents:

The NSB Assembly has adopted a comprehensive plan and land management regulations under Title 29 of the Alaska Statutes (AS 29.40.020-040). The NSB regulations require borough approval for all proposed uses, development and master plans. The NSBCMP policies are included as part of the NSB zoning regulations (19.70.060) and all NSB permit approvals will require the proposal to be substantially consistent with these policies.

Restricting access to and use of fish camps defined in the Nuiqsut Traditional Land Use Inventory may violate NSBCMP and NSBMC subsistence harvest protection and land use regulations. Lessees are advised to consult with the NSB Planning Department and city of Nuiqsut during planning of operations which may take place onshore.