

PRUDHOE BAY UNIT

APPLICATION FOR THE
FORMATION OF THE NIAKUK
PARTICIPATING AREA

DECISION AND FINDINGS OF THE COMMISSIONER
ALASKA DEPARTMENT OF NATURAL RESOURCES

MARCH 2, 1994

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I. INTRODUCTION AND BACKGROUND

This matter concerns the formation of the Niakuk Participating Area (NPA) to be located within the current boundary of the Prudhoe Bay Unit (PBU) and what lands should be included in the proposed NPA. BP Exploration (Alaska), Inc. (BPX) applied to form the NPA within the existing boundaries of the PBU. The acreage proposed for inclusion in the NPA overlies an oil reservoir known as the "Niakuk Reservoir". Thereafter, ARCO Alaska, Inc. (ARCO) notified the Division that it could "not at this time support the formation of the [NPA] as proposed by BPX." ARCO contended that the Niakuk Reservoir extended farther west than BPX had shown and the NPA should include leases which were jointly held by ARCO and the Exxon Corporation (Exxon).

An oil and gas "unit" is comprised of a group of leases which cover all or part of one or more potential or known reservoirs and which are subject to a "unit agreement." The "unit agreement" is the instrument which is typically executed by those with an interest in the leases, including the royalty owner, and which specifies how unit operations will be conducted, and how costs and benefits will be allocated among the various leases. A second agreement called a "unit operating agreement" controls the relationship between parties which share the costs of unit development. Unitization generally allows a potential or known reservoir to be more efficiently explored, developed, or produced than on a lease by lease basis.

A "participating area" (PA) is usually limited to that part of the unit area which has been shown to be productive of oil or gas in "paying quantities." A PA may consist of less, but not more, area than the unit area. If the unit area encompasses more than one reservoir, a separate PA must generally be established for each delineated reservoir. Additionally, if the same reservoir contains both oil and gas, separate PAs may be established to distinguish between the oil rim and the gas cap. For example, the PBU now consists of five PAs overlying several reservoirs all located within the PBU area: the oil rim and gas gap PAs (collectively the initial participating areas or IPAs) for the Prudhoe Bay or Permo-Triassic Reservoir; the Lisburne PA for the Lisburne Reservoir; the West Beach PA for the West Beach Reservoir; and the Pt. McIntyre PA for the Pt. McIntyre and Stump Island Reservoirs.

The boundaries of PAs can be continually revised as more wells are drilled and more data are obtained. The regulations governing unitization expressly provide for the expansion and contraction of a PA. Only those parties who own interests within the designated PA will share in the costs of production and revenues from the sale of the oil or gas from the PA.

The Division concludes that BPX's application to form the NPA should be granted. It further concludes that the NPA should be limited to the area proposed by BPX because only that area has been shown to be "reasonably known to be underlain by hydrocarbons and known or reasonably estimated...to be capable of producing or contributing to production of hydrocarbons in paying quantities." 11 AAC 83.351(a) (emphasis added). Of course, if additional data are obtained or submitted in the future, the boundaries of the NPA may be revised.

II. APPLICATION FOR THE FORMATION OF THE NIAKUK PARTICIPATING AREA

BPX's application was submitted pursuant to 11 AAC 83.351 and Section 5.3 of the PBU Agreement. BPX submitted materials in support of its application on February 14, August 10, and August 17, 1993. The NPA application included a proposed plan of development and operations; geological data supporting the proposed PA; a proposed methodology for allocating production from all the producing reservoirs that will share the Lisburne Production Center (LPC); a copy of the Niakuk Special Provisions to the PBU Operating Agreement; a copy of the Third Amendment to the Lisburne Special Supplemental Provisions to the PBU Operating Agreement; and proposed methods for reporting the allocated production and gas reserve/gas debits from each PA sharing the LPC. BPX requested that the Division approve the NPA effective October 1, 1993.

The acreage proposed for the NPA encompasses the Niakuk Reservoir within the Kuparuk River Formation. The reservoir contains hydrocarbons and is purported to be capable of producing hydrocarbons in paying quantities. The Niakuk Reservoir is referenced on Attachment 5 of the NPA application. The leases proposed for inclusion in the NPA (ADLs 34625, 34630, 34634, and 34635) and the proposed tract allocation schedule for the leases are listed in Attachment 1. The leases reserve a 12.5% royalty share to the state. The royalty rate, however, was reduced from 12.5% to a discovery royalty rate of 5 percent on lease ADL 34635. The discovery royalty rate is effective through March 31, 1995.

BPX has notified the Division that BPX will be the sub-operator of the NPA in accordance with Section 21.009 of the PBU Operating Agreement. BPX will act in place and instead of ARCO, the unit operator of the eastern operating area of the PBU. BPX has in turn authorized ARCO, as the operator of the Lisburne PA and the LPC, to perform certain field facility and maintenance operations in the NPA on BPX's behalf. Although ARCO will perform NPA field operations, BPX will be responsible for the overall management and oversight of the NPA.

On October 30, 1993, ARCO notified the Division that it could not "support the formation of the [NPA] as proposed by BPX" and stated that ARCO believed BPX should operate the Niakuk Reservoir "as a Tract Operation." ARCO maintained that two ARCO/Exxon leases (ADL 34626 and ADL 34629) located directly west of the acreage proposed by BPX met the applicable standards for inclusion within the NPA. ARCO expressed concern that approval of the NPA as proposed by BPX might cause waste and drainage on the ARCO/Exxon leases. ARCO requested an opportunity to meet with the Division to discuss its concerns regarding the BPX application.

ARCO also presented its concern regarding the extent of the Niakuk Reservoir to the Alaska Oil and Gas Conservation Commission (AOGCC). The AOGCC, however, rejected ARCO's evidence that the Niakuk Reservoir was demonstrated to extend under the ARCO/Exxon leases. Furthermore, the AOGCC found that imposing the statewide spacing rules on BPX's Niakuk Reservoir production protected correlative rights, prevented waste, and insured the greatest ultimate recovery.¹

¹ The AOGCC held several hearings on the Niakuk pool rules. BPX presented geology, descriptive reservoir data, development and production plans, as well as a proposed methodology for allocating production among the Niakuk, Lisburne, Pt. McIntyre, and West Beach PAs through the shared LPC. ARCO, then opined that its geological and geophysical data supported an interpretation that reservoir quality sandstones are reasonably estimated to extend updip to the west beneath Section 22 and Section 27 of T12N, R15E, UM. These lands, directly to the west of the proposed NPA, are included within the Arco/Exxon leases.

Before the AOGCC, BPX wanted the Niakuk pool rules to apply only to the same area it proposed for the NPA; Arco wanted the rules to apply to the two Arco/Exxon leases located to the west.

On November 24, 1993, the Division heard from representatives of ARCO and BPX. The parties were invited to provide data supporting their positions regarding the lands appropriate, at this time, for inclusion in the NPA under the existing statutes and regulations. (Exxon was invited, but chose not to attend.) At the hearing, ARCO and BPX provided evidence pertinent to the BPX application and the proper areal extent of the NPA. Both also relied upon the evidence and materials presented to the AOGCC during the Niakuk pool rules hearing. Following the hearing, ARCO and BPX presented additional materials in support of their respective positions.

III. GEOLOGICAL AND ENGINEERING CHARACTERISTICS DATA IN SUPPORT OF THE APPLICATION

The entire area proposed for the NPA is already included within the boundaries of the PBU Area. The Niakuk Reservoir encompasses the Kuparuk River Formation, which is a younger stratigraphic interval than the major productive intervals in the Prudhoe Bay and Lisburne Reservoirs. BPX estimates that the reservoir contains 54 million barrels of recoverable reserves.

BPX's attached geological, petrophysical and well information to support its proposed NPA. These data include geologic logs of the Niakuk #6 Well, and structure and gross oil sand maps of the Kuparuk River Formation. Six wells have penetrated the Kuparuk River Formation within the proposed NPA boundary. BPX and the Division staff met to discuss additional, significant data, and interpretations. These meetings thoroughly reviewed pertinent confidential information including proprietary BPX 3-D seismic data, well logs, core and core descriptions from the Niakuk #1A, #5 and #6 wells, interpreted structure maps, isochore maps, geological cross-sections, internal stratigraphic divisions of the Niakuk Reservoir, and volumetric calculations of the hydrocarbons in-place within the proposed NPA. The Division staff also reviewed confidential data from an ARCO/Exxon well (Gull Island #3) adjacent to the proposed NPA. The data and interpretations are discussed later in this Decision and Findings.

Like here, Arco claimed that its geophysical evidence (seismic data) suggested that the Niakuk Reservoir extended under the western leases. BPX, on the other hand, submitted evidence to suggest that the presence of oil-bearing strata cannot be correlated with seismic amplitude variations. BPX asserted that in a field as geologically complex as Niakuk, the presence of reservoir quality rock could not be reasonably extrapolated from seismic data to the extent proposed by Arco. Exxon represented that it recognized that the western boundary of the Niakuk Reservoir was uncertain.

BPX objected to including the Arco/Exxon leases in the Niakuk pool rules unless drilling confirmed the presence of oil-bearing strata underlying that acreage. Although Arco represented to the AOGCC that Arco was committed to drill a confirmation well, Exxon stated that its final corporate approval was pending evaluation of the economic and technical merits of such a well. (To date, neither Arco nor Exxon have permitted a confirmation well, much less commenced drilling one.)

The AOGCC concluded that Arco had failed to show that the Niakuk Reservoir extended into the Arco/Exxon leases. The AOGCC stated: "Without the benefit of well data in close proximity, seismic character and structural dip do not demonstrate the presence of reservoir quality rock capable of commercial hydrocarbon production." Accordingly, the AOGCC denied Arco's request to include the Arco/Exxon leases within the Niakuk pool rules.

IV. DISCUSSION OF THE PARTICIPATING AREA DECISION CRITERIA

11 AAC 83.351(a) provides that a PA may include “only land reasonably known to be underlain by hydrocarbons and known or reasonably estimated through use of geological, geophysical, or engineering data to be capable of producing or contributing to the production of hydrocarbons in paying quantities.” “Paying quantities” means:

quantities sufficient to yield a return in excess of operating costs, even if drilling and equipment costs may never be repaid and the undertaking as a whole may ultimately result in a loss; quantities are insufficient to yield a return in excess of operating costs unless those quantities, not considering the costs of transportation and marketing, will produce sufficient revenue to induce a prudent operator to produce those quantities.

11 AAC 83.395(4). A PA application must be evaluated under these standards, as well as those of 11 AAC 83.303.

Under 11 AAC 83.303, a proposed PA will be approved if the commissioner finds that the PA is necessary or advisable to protect the public interest. To make such a finding, the commissioner must determine that the proposed PA will: (1) conserve natural resources; (2) prevent economic and physical waste; and (3) protect all parties of interest, including the state.

In evaluating the above criteria, the commissioner will consider: (1) the environmental costs and benefits; (2) the geological and engineering characteristics of the potential hydrocarbon accumulation or reservoir proposed for inclusion in the PA; (3) prior exploration activities in the proposed PA; (4) the applicant’s plans for exploration or development of the proposed PA; (5) the economic costs and benefits to the state; and (6) any other relevant factors (including mitigation measures) the commissioner determines necessary or advisable to protect the public interest. The following evaluates the NPA under these criteria and considerations.

(A) Conservation of Natural Resources

The formation of oil and gas units and PAs within unit areas to develop hydrocarbon-bearing reservoirs generally conserves hydrocarbons. A single PA will provide for more efficient, integrated development of the Niakuk Reservoir. A comprehensive operating agreement and plan of development governing that production will help avoid duplicative development efforts.

Furthermore, producing hydrocarbon liquids from a new PA through the existing production and processing facilities, specifically the LPC, generally reduces the incremental environmental impact of the additional production. Using the existing facilities, gravel pads, and infrastructure eliminates the need for new ones. Forming a NPA will maximize oil and gas recovery, while minimizing negative impacts on other resources within the area.

(B) Prevention of Economic and Physical Waste

Generally, forming a PA facilitates the equitable division of costs and allocation of hydrocarbon shares, and provides for a diligent development plan which maximizes physical and economic benefit from a reservoir. Further, the formation of the PA and facility sharing opportunities may allow economically marginal hydrocarbon accumulations to be developed. BPX has represented that the Niakuk Reservoir could not have been developed as a stand-alone project. BPX stated that Niakuk development economically required facility sharing.

The LPC owners have negotiated agreements among themselves to share the existing production capacity of the Lisburne facilities and the PBU infrastructure. Using this infrastructure and facilities eliminates the need to construct stand-alone facilities to process the relatively small volume of recoverable hydrocarbons in the NPA. The state has participated in attempts to reduce the need for additional major processing facilities and thus to minimize any additional surface impacts and costs. The state has agreed to allow commingled production through the existing LPC and has worked to provide for a well test-based production allocation methodology for current and future reservoirs sharing the LPC. The adoption of that methodology is subject to periodic review and reconsideration to assure that the state's royalty and tax interests are protected.

Further, facility consolidation will save capital and promote better reservoir management through pressure maintenance and enhanced recovery procedures. In combination, these factors allow the Niakuk Reservoir to be developed and produced in the interest of all parties.

(C) Protection of All Parties

Forming separate PAs seeks to protect the economic interests of all working interest owners of the reservoirs in the PAs, as well as the royalty owner. By combining interests and operating under the terms of a unit agreement and unit operating agreement, such as the PBU Agreement and PBU Operating Agreement, as amended to account for any special PA provisions, the owners may be assured that costs and revenues will be fairly allocated.

Because hydrocarbon recovery will be maximized and additional production-based revenue will be derived from NPA production, the state's economic interest is furthered. Additional recovery of hydrocarbons, however, in and of itself may not always be determinative of the state's best interest. Production must occur under suitable terms and conditions to assure that the economic interests of both the working interest owners and the state, as the royalty owner, are protected. Moreover, although not required here, amendments to an existing unit agreement or oil and gas lease may be necessary to protect the state's interest. In particular, amendments may be necessary where an application seeks to include leases which are not already within unit boundaries or leases, which contain different terms and conditions, or which through their commitment to an existing unit agreement, by virtue of the terms of that agreement, its operating agreement or applicable settlement agreements, would prejudice the state's economic interests.

In a letter dated October 30, 1993, ARCO objected to the BPX's application² arguing that approval would not protect ARCO's interests. ARCO's argument was premised upon its factual assertion that Niakuk Reservoir quality sandstones extended underneath the ARCO/Exxon leases. ARCO concluded that BPX's production of the NPA might cause waste and drainage of the ARCO/Exxon leases.

At the hearing held by the Division, ARCO seemed to retreat from its objection, stating it "do[es] not presently object to the formation of the [NPA] as outlined by BPX, subject to the issues and concerns that [ARCO] will be addressing in [its] remarks today." Nevertheless, at the hearing,

² ARCO has stated several times since its initial objection that it "does not object to the formation of the [NPA] at this time, in accordance with the boundaries proposed by BPX..." Its withdrawal of its objection, however, has always been conditional. Given that ARCO has continually maintained that the ARCO/Exxon leases should be included within the NPA and my obligation to uphold the law, the issue of what should be properly included within the NPA should be decided.

ARCO maintained its position that it was "appropriate that the [Niakuk] PA include our acreage."³ In its remarks, ARCO took the same position that it has previously taken that under 11 AAC 83.351, a PA "must include all 'acreage reasonably estimated through the use of geological, geophysical or engineering data [sic] to be capable of producing or contributing to the production of hydrocarbons in paying quantities.'" Relying on this language, ARCO concluded that "seismic data alone can be a sufficient basis for [PA] formation." Using this standard, ARCO argued that, based on seismic extrapolation, the ARCO/Exxon leases may be reasonably estimated to be capable of contributing to production in paying quantities, and therefore should be included in the NPA.

As BPX noted at the hearing, ARCO misreads the regulation. Only acreage which meets two criteria may be included in a PA. First, the acreage must be "reasonably known to be underlain by hydrocarbons." If it meets the first criteria, the acreage must also be "known or reasonably estimated through the use of geological, geophysical, or engineering data to be" either (A) "capable of producing hydrocarbons in paying quantities" or (B) "capable of contributing to production of hydrocarbons in paying quantities."⁴ ARCO would read the first requirement out of existence.⁵

³ In a letter dated February 16, 1994, ARCO reaffirmed that it "believe(d) that the ARCO/Exxon leases at this time meet the standards . . . for inclusion in the NPA."

⁴ The Alaska regulation regarding PAs is significantly different from its federal counterpart. The federal regulations define PA as, "[t]hat part of a unit area which is considered reasonably proven to be productive of unitized substances in paying quantities or which is necessary for unit operations and to which production is allocated in the manner prescribed in the unit agreement." 43 C.F.R. § 3180.0-5 (1988). In contrast to the state regulations, the federal regulations allow lands "which are necessary for unit operations" to be included in a participating area even if they are not reasonably proved to be productive of unitized substance. See L. Lindley, Participating Areas, Federal Onshore Oil and Gas Pooling and Unitization, Paper No. 13A, Page No. 13A-15. (Rocky Mtn. L. Fdn. 1990) (hereinafter "Lindley"). For example, lands containing injection wells for secondary recovery operations may be included within the participating area even if those lands might not be regarded as reasonably proved to be productive of unitized substance. Id. Under the Alaska regulation, however, lands which are not capable of production in pay quantities, but which contribute to that production because of surface facilities located on them, can be included in a PA only if the lands are also reasonably known to be underlain by hydrocarbons.

⁵ Article 5.3 of the PBU Agreement sets forth a more restrictive standard regarding what land may be included in a PA within the PBU. It states that the lands to be included in a PA are "lands which are reasonably proved [as opposed to reasonably estimated] to be within the Reservoir Limits...." It further states that the working interest owners shall establish a PA for a reservoir "which shall have been reasonably proven to be capable of commercial production of Unitized Substances...." (*emphasis added*) "Reasonably proven" connotes a higher level of certainty than "reasonably estimated." Arco has argued in the past that to the extent the PBU Agreement conflicts with later adopted regulations, the PBU Agreement controls. Arco cannot have it both ways. If ARCO's conflict argument is correct then Arco is bound by the more restrictive standard in the PBU.

Of course, if ARCO asserted that the Niakuk Reservoir should be outside of the PBU, it would not be bound by the PBU Agreement. Such an assertion, however, would run afoul of Exxon's position that if any portion of a newly discovered reservoir underlies the PBU area, the PBU area must be expanded to include the new reservoir. BPX disagrees with Exxon's position and represents that it believes that in such a situation the commissioner would have discretion to determine whether the PBU area should be expanded to include the new reservoir.

The determination whether acreage is reasonably known to be underlain by hydrocarbons, or whether acreage is known or reasonably estimated to be capable of producing or contributing to production in paying quantities such that the land should be included within a PA is within the commissioner's discretion. See Davis Oil Co., 53 IBLA 62, 67 (1981) (the "determination by [the agency] to include certain land within the [PA]...will not be set aside where it is not arbitrary or capricious"); Lindley, *supra*, at 13A-15.

ARCO's primary argument to include its acreage in the NPA rests on extrapolations related to a qualitative comparison of similar seismic character identified beneath the ARCO/Exxon leases and the adjacent BPX lease (ADL 34630) to the east. Based on the available evidence, confidential data, opinions, interpretations, and presentations provided by ARCO and BPX to the AOGCC during the Niakuk field rules hearings and to the Division during the NPA application review, the Division concludes that the ARCO/Exxon acreage does not meet the criteria of 11 AAC 83.351(a).⁶ The ARCO/Exxon lands are not reasonably known to be underlain by hydrocarbons and known or reasonably estimated through use of geological, geophysical, or engineering data to be capable of producing or contributing to the production of hydrocarbons in paying quantities. ARCO's extrapolations from its interpretation of seismic character, absent any significant calibrating information is, in this instance, insufficient to satisfy the criteria of 11 AAC 83.351(a).

This conclusion is based on a number of determinations by Division staff. First, no correlation has been demonstrated between any specific seismic character and oil-bearing reservoir in the Kuparuk Formation interval. For example, a high amplitude anomaly, although reasonably estimated to be present beneath ADLs 34630, 34629, and 34626, can neither confirm nor deny the existence of a specific lithology or the presence of oil-bearing reservoir (net pay sand). Second, productive reservoir in the Kuparuk Formation interval that can produce or contribute to production in paying quantities may or may not be present beneath a portion of the ARCO/Exxon leases. However, the seismic character and structural dip information are insufficient to answer this question. Simply put, without the benefit of well data in close proximity, seismic character and structural dip do not prove that the acreage is "reasonably known" to be underlain by hydrocarbons or can even be "reasonably estimated" to be capable of producing or contributing to production.

ARCO has asserted that well control should not be "required" to support reasonable estimates based on geological or geophysical data. Although it may be within the realm of possibility that a reasonable estimate could be made without well control, undeniably the less well control, the less reasonable an estimate becomes. In affirming a decision denying a request to include certain acreage in a participating area, the Interior Board of Land Appeals noted the decreasing reliability of extrapolations at increasing distances from a well.

While Exxon's and Amoco's submissions contain seemingly definite structure maps, in actuality, the contour lines on the maps merely reflect their extrapolations based on available data. The reliability of these extrapolations decreases to the extent that maps purport to depict contours at increasing distances from the wells from which the data was derived.

Amoco Production Co., 41 IBLA 348 (1979). ARCO committed in November to drill a well on the ARCO/Exxon leases (although as yet it has not even applied for a permit). When it does, the situation can be revisited. Moreover, given the extensive BPX data set on the Niakuk Reservoir reviewed by the Division, it reasonably appears that the Niakuk Reservoir western limit is constrained to the area within ADL 34630.

⁶ It follows that the Division concludes that the ARCO/Exxon acreage does not meet the stricter Article 5.3 standard, if it is applicable.

Forming the NPA boundary as BPX proposes protects all parties interests, including ARCO. The PA boundary may be expanded at any time in the future based on the applicable provisions of the PBU Agreement, the state statutes and regulations, and additional information and findings. See Lindley, supra, at 13A-15, quoting, BLM Manual Handbook, H-3180-1, II.F.2 (Release 32132, 10/28/84). ("any doubts as to whether or not a tract should be placed in a participating area should be resolved against participation since a participating area can be enlarged easier than it can be contracted"). In the meantime, the AOGCC's recent Niakuk pool rules for that portion of the Niakuk Reservoir proposed for development by BPX, the proposed NPA, will prevent waste and protect the correlative rights of ARCO and Exxon. If ARCO presents additional evidence that the PA should be expanded, interests could be integrated either voluntarily or otherwise, thereby protecting correlative rights and protecting all parties interests, including the state.

The proposed production allocation methodology further protects the interest of all parties by allocating production between the reservoirs that produce through the LPC. This methodology intends to accurately and fairly allocate production. It may be revised if it does not meet those goals. Also, a new gas disposition/reserves volume accounting procedure accounts for and tracks gas that is either produced, used, sold, or reinjected.

In reviewing the above criteria, the following factors were considered:

(1) The Environmental Costs and Benefits

As discussed above, the sharing of the existing facilities eliminates duplication and reduces the surface area altered by development. The Niakuk Development Project consists of constructing a new drillsite at the tip of Heald Point, installing production facilities at the drillsite, constructing a gravel road to Lisburne Drillsite L5 (DS-L5), and routing new pipelines along the new and existing road corridors to DS-L5, DS-L3, and the LPC.

Also, surface drilling locations have been provided at the Niakuk drillsite for potential Alapah wells. The Alapah is a small accumulation east of the proposed Niakuk Heald Point drillsite, the full areal extent of which is unconfirmed at this time. Additional drilling locations have been provided to delineate and test potential accumulations north of the currently proposed NPA. These activities will not significantly alter the existing gravel pads, roads or surface facilities. Further, no significant additional impacts to nearshore habitat or biological resources are anticipated because of the additional Niakuk production, or production from other accumulations near Heald Point.

(2) The Geological and Engineering Characteristics of the Reservoir

In addition to the previous discussion, log and core data from six wells drilled within the Kuparuk River Formation show that the Niakuk Reservoir consist of two separate fault bounded segments/accumulations. Also, zonal stratigraphies of the Kuparuk River Formation in each Segment have been developed from well, conventional core and seismic data. Both the Niakuk 5 and the Niakuk 6 wells were drilled and production tested in Segment 2. Niakuk 5 was tested from Zones D and F separately, and Niakuk 6 was tested from Zone F. Oil rates from these tests ranged from 1,800 to 4,800 BOPD. The core and log data acquired from Niakuk 1A indicate the well contains hydrocarbons and is estimated to be capable of production rates within the range demonstrated by the wells in Segment 2.

Given the geological setting of the Niakuk Segment 1 area, the Division recognizes that the western boundary of the area beyond a reasonable distance from existing well control is uncertain. The structural setting of the Segment 1 area is dominated by an easterly dipping, fault-bounded graben. This structure has been penetrated by two downdip wells (Niakuk #1 and #1A) which contain oil-bearing reservoir sands within the Kuparuk interval, and by an updip dry hole (Gull Island #1) containing no reservoir sands. The Kuparuk River Formation along the Niakuk/Pt. McIntyre Fault

Zone has a highly variable and complex internal stratigraphy characterized by rapid lateral facies changes which directly control the extent and continuity of reservoir quality sandstone. BPX has satisfied the Division that, given the geological setting of the Niakuk, and in the absence of borehole and test data from any structurally updip exploratory well, the western boundary is constrained to the area within ADL 34630.

(3) Prior Exploration and Development Activities

Six wells initially penetrated the Niakuk Reservoir in the proposed PA: Niakuk 1, Niakuk 1A, Niakuk 2, Niakuk 2A, Niakuk 5, and Niakuk 6. The Division certified the Niakuk 5 as capable of producing in paying quantities on February 28, 1986. This well was also determined to be the Niakuk discovery well on September 2, 1988. Four wells have been drilled near or adjacent to the PA: Sag Delta 8, Niakuk 3, Gull Island 1, and Gull Island 3.

In addition to the well data, 2-D and proprietary 3-D seismic surveys, acquired over the proposed PA, have assisted the evaluation of the lands appropriate for inclusion within the NPA.

(4) The Applicant's Plan for Exploration or Development of the Participating Area

The initial development plan for the Niakuk Reservoir has been established and will include waterflood operations to achieve optimal oil recovery. The initial plans do not call for reinjection of produced gas into the reservoir. Reinjection, as well as other recovery enhancement techniques, will be periodically evaluated based on evolving reservoir description and field performance data. Development drilling plans include 5 wells in Segment 1 (3 producers updip to the west and 2 injectors downstructure to the east) and 9 wells in Segment 2 (6 producers and 3 injectors). Since receipt of the NPA application, eight of the proposed development wells have been permitted with the AOGCC and development drilling is on-going within the Niakuk area. Development drilling plans may be modified as information from prior drilling and field performance data become available.

Initial plans call for the reinjection of gas produced from the Niakuk Reservoir, less gas sold or used for lease purposes, into the Lisburne Reservoir. Primary production is scheduled from April 1994 to April 1995 from approximately five to seven wells. After April 1995 (a one-year primary production period), plans are to have permanent drillsite facilities available and waterflood operations are scheduled to begin. The recovery for the NPA under the initial plan of development is estimated to be 54 million barrels.

(5) The Economic Costs and Benefits to the State

As discussed in Article IV (C) above, increased production and revenues, in and of themselves and without consideration of other relevant factors, may not always be in the state's best interest. Here, however, the gain in economic benefits outweigh any perceived costs to the state.

As required by 11 AAC 83.371, BPX submitted an allocation of production and cost for the leases in the proposed NPA (Exhibit C-3 of the application). The proposed allocation distributes working interest equity among the leases according to the original oil-in-place (OOIP). Because the Division staff agrees with BPX's estimate of OOIP and the tract allocation schedule is a technically based (a standard that has, in the past, been acceptable to the Division for imputing tract allocations), the Division finds BPX allocations acceptable for allocating production and costs among the leases within the NPA.

(6) Any other relevant factors (including mitigation measures) the commissioner determines necessary or advisable to protect the public interest

The factors are discussed in Article V below.

V. OTHER ISSUES PERTINENT TO THE NIAKUK PARTICIPATING AREA APPLICATION

In a letter dated October 13, 1993 to BPX, the Division noted a number of concerns related to the NPA application including: facility sharing agreements, how production allocation would be performed, who would submit the gas disposition and reserve debit report to the Division, where Niakuk produced gas would be reinjected, and a request for a copy of the signed Niakuk Special Supplemental Provisions to the PBU Operating Agreement.

BPX responded to those concerns on October 19, 1993. BPX later clarified that it would give gas disposition and reserve debit reports to the Division as Niakuk sub-operator. The format of the gas disposition and reserve debit report will be similar to that in Attachment 2. As with the approval of the West Beach Participating Area (WBPA) and noted in Attachment 2, the Division approves a fuel gas allocation methodology which allocates flare and fuel gas in proportion to the NPA's share of total produced gas through the LPC.

Finally, the same royalty related issues that the Division raised in its review of the WBPA application apply to this application. The attached letters dated January 13, 1993 and March 1, 1993 set forth the issues and the agreements between the parties in the WBPA regarding the royalty issues. These same royalty-related concerns were raised with BPX. Regarding the formation of the NPA, BPX and the Division agree that these royalty-related issues are subject to the final resolution of the ANS Royalty Litigation.

VI. FINDINGS AND DECISION

Considering the facts discussed in this document and the administrative record, I hereby make findings and impose conditions as follows:

1. The proposed PA, the NPA, meets the requirements of 11 AAC 83.303.
2. The available geological, and engineering data submitted demonstrate that a paying quantities certification is appropriate for the wells in the Niakuk Reservoir, in particular, for the Niakuk #5 and #6 Wells, and that the acreage is known to be underlain by hydrocarbons and known or reasonably estimated to be capable of production or contributing to production in sufficient quantities to justify the formation of the NPA within the PBU.
3. The geological and engineering data supporting the PA justify the inclusion of all of BPX's proposed tracts within the NPA at this time. The entire PA is wholly contained within the boundaries of the current PBU. Under the terms of the applicable regulations governing formation and operation of oil and gas units (11 AAC 83.301 - 11 AAC 83.395) and the terms and conditions under which these lands were leased from the state, the following lands are to be included in the NPA:
 - T.12.N., R.15.E., U.M., Sec. 23: S/2, and Sec. 24: SW/4 (ADL 34625 (Tract 4));
 - T.12.N., R.15.E., U.M., Sec. 25 and Sec. 26 (ADL 34630 (Tract 31));
 - T.12.N., R.16.E., U.M., Sec. 29, Sec. 30, Sec. 31: N/2, and Sec. 32: N/2 (ADL 34635 (Tract 32));
 - T.12.N., R.16.E., U.M., Sec. 28 (ADL 34634 (Tract 33)).
4. The PBU Agreement and the Alaska statutes and regulations governing oil and gas units provide for further expansions of a PA in the future as warranted by additional information and findings. Therefore, the public interest and the correlative rights of all parties, including the state, are protected.
5. Formation of the PA equitably divides costs and allocates produced hydrocarbons, and sets forth a development plan designed to maximize physical and economic recovery from the Niakuk Reservoir within the approved PA.
6. The production of NPA hydrocarbon liquids through the existing production and processing facilities within the PBU reduces the environmental impact of the additional production. Utilization of existing facilities will avoid unnecessary duplication of development efforts on and beneath the surface.

7. The proposed well test allocation methodology is acceptable for royalty allocation purposes and for allocating the commingled gas and hydrocarbon liquids production between the NPA and the Lisburne PA as those streams are processed through the LPC.

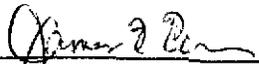
BPX shall provide the Division with the monthly production allocation reports and well test data for the Niakuk wells producing through the LPC by the 20th of the following month. This data will be supplied in advance of that date to BP by ARCO as LPC operator, who will be responsible for determining the accurate allocation of Niakuk production along with all other fields within the Greater Pt. McIntyre Area producing through the LPC. The Division reserves the right to request any information it deems pertinent to the review of those reports from either ARCO as LPC operator or BPX as Niakuk sub-operator. Moreover, this approval of the allocation methodology is conditioned upon the sub-operator's agreement to promptly and fully reply to any such requests.

The monthly allocation report shall include a monthly oil, gas, and water allocation factor to be applied uniformly to the commingled production, a summary of monthly allocation by well, and specific well test data for all tests which have been conducted.

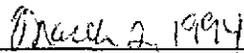
8. The Division reserves the right to review the well test allocations to insure compliance with the methodology prescribed in this decision. Such review may include, but is not limited to, inspection of facilities, equipment, well test data, and separator back-pressure adjustments.
9. During the first year in which commingled production from the NPA is allocated, quarterly reviews of the allocation methodology will be scheduled with the Division. Following its review, the Division, in its discretion, may require revision of the allocation procedure. Subsequent reviews may be requested by either the Division or the operator. The allocation procedure may only be revised with the written consent of, or upon the written direction of, the Division.
10. To account for the gas produced from each participating area, the gas volume disposition and gas reserves debited from or credited to each PA using the shared LPC, the Niakuk sub-operator shall submit a monthly gas disposition and reserves debit report using the form indicated in Attachment 2. The gas disposition report shall be submitted with the monthly production allocation reports.
11. The field cost allowance for the state's royalty share of oil produced from the approved NPA is governed by the 1980 Prudhoe Bay Settlement Agreement. Whether the state bears any deductions of any kind whatsoever (whether called allowances, deductions or fees) for the state's royalty share of "NGLs" and dry gas, and if so, what those deductions may be, are part of the Severed Issues in the ANS Royalty Litigation. These deductions, if any, are subject to the final resolution of this litigation.
12. Regarding the production allocated from the NPA and the state's taking of any royalty oil in-kind from the NPA, it continues to be the state's position that it has only nominated the taking of royalty oil in kind and has never nominated gas for in-kind taking.

13. Diligent exploration and delineation of the Niakuk Reservoir underlying the approved participating area is to be conducted by the BPX under the PBU plans of development and operation approved by the state.
14. The plan of development for the NPA meets the requirements of 11 AAC 83.303 and 11 AAC 83.343. The plan is approved for a period of two years from the effective date of this Decision and Finding. Annual updates to the plan of development which describe the status of projects undertaken and the work completed, any changes or expected changes to the plan, and a further plan of development, must be submitted in accordance with 11 AAC 83.343.
15. Approval of the NPA within the PBU is effective this date.

For these reasons and subject to the conditions and limitations noted, I hereby approve the Niakuk Participating Area within the Prudhoe Bay Unit.



James E. Eason, Director
Division of Oil and Gas



Date

For: Harry A. Noah, Commissioner
Alaska Department of Natural Resources

Attachments: Delegation of Authority
NPA Tracts and Tract Allocation Schedule
Example Gas Disposition and Reserve Debit Report
Correspondence dated January 13, 1993 and March 1, 1993

PBU.NiakukPA.Appv.txt

DELEGATIONS OF AUTHORITY FOR THE DIVISION OF OIL AND GAS

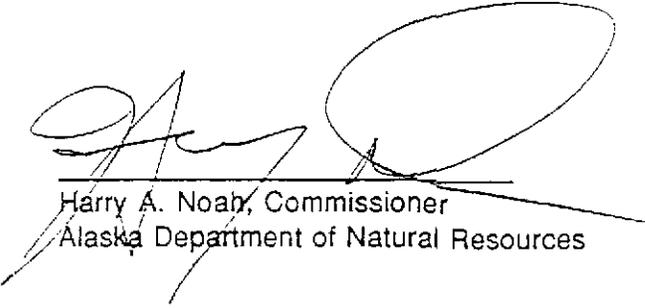
<u>Regulatory Citation</u>	<u>Purpose or Action</u>	<u>Authority Vested in</u>	<u>Authority Delegated to</u>
11 AAC 82.400	Parcels Offered for Competitive Lease	Commissioner	No Delegation
11 AAC 82.405	Method of Bidding	Commissioner	No Delegation
11 AAC 82.410	Minimum Bid	Commissioner	No Delegation
11 AAC 82.445	Incomplete Bids	Commissioner	No Delegation
11 AAC 82.450	Rejection of Bids	Commissioner	No Delegation
11 AAC 82.455	Tie Bids	Commissioner	No Delegation
11 AAC 82.460	Additional Information	Commissioner	No Delegation
11 AAC82.465	Award Leases	Commissioner	Director, Div. of Oil & Gas (DOG)
11 AAC 82.470	Issue Leases	Commissioner	Director, DOG
11 AAC 82.475	Bid Deposit Return	Commissioner	Director, DOG
11 AAC 82.600	Required Bonds	Commissioner	Director, DOG
11 AAC 82.605	Approve/Deny Assignments of Oil and Gas Leases	Commissioner	Director, DOG
11 AAC 82.610	Segregate Leases	Commissioner	Director, DOG
11 AAC 82.620	Transfer of a Lease, Permit or Interest as a Result of Death	Commissioner	Director, DOG
11 AAC 82.625	Eff. Date of Assignments	Commissioner	Director, DOG
11 AAC 82.635	Surrenders	Commissioner	Director, DOG
11 AAC 82.640	Survey Requirement	Commissioner	No Delegation
11 AAC 82.645	Conforming Protracted Description to Official Surveys	Commissioner	No Delegation

<u>Regulatory Citation</u>	<u>Purpose or Action</u>	<u>Authority Vested in</u>	<u>Authority Delegated to</u>
11 AAC 82.650	Control of Lease Boundaries	Commissioner	No Delegation
11 AAC 82.660	Excess Area; Partial Termination	Commissioner	No Delegation
11 AAC 82.665	Rental and Royalty Relief	Commissioner	No Delegation
11 AAC 82.700	Taking Royalty in Kind	Commissioner	No Delegation
11 AAC 82.705	Bidding Method	Commissioner	No Delegation
11 AAC 82.710	Notice of Sale	Commissioner	No Delegation
11 AAC 82.800	Production Records	Commissioner	Director, DOG
11 AAC 82.805	Test Results	Commissioner	Director, DOG
11 AAC 83.153	Well Confidentiality	Commissioner	Director, DOG
11 AAC 83.158	Approve/Deny Lease Plan of Operations	Commissioner	Director, DOG
11 AAC 83.303	Unit Agreement Approval	Commissioner	Director, DOG
11 AAC 83.306	Accept Application for Unit Agreement Approval	Commissioner	Director, DOG
11 AAC 83.311	Publish Public Notice of Unit Agreement Application	Commissioner	Director, DOG
11 AAC 83.316	Approve/Deny Unit Agreement	Commissioner	Director, DOG
11 AAC 83.326	Require or Accept Nonstandard Unit Agreement Language	Commissioner	Director, DOG
11 AAC 83.328	Mandate Unitization (Involuntary Unitization)	Commissioner	No Delegation
11 AAC 83.331	Approve/Deny Change in	Commissioner	Director, DOG Unit Operator
11 AAC 83.336	Grant Extension of Unit Term; Grant Suspension of Operations (Force Majeure); Terminate Unit	Commissioner	No Delegation

Delegations of Authority
Page 3

<u>Regulatory Citation</u>	<u>Purpose of Action</u>	<u>Authority Vested in</u>	<u>Authority Delegated to</u>
11 AAC 83.341	Approve/Deny Plan of Exploration	Commissioner	Director, DOG
11 AAC 83.343	Approve/Deny Plan of Development	Commissioner	Director, DOG
11 AAC 83.346	Approve/Deny Plan of Operations	Commissioner	Director, DOG
11 AAC 83.351	Approve/Deny Participating Area	Commissioner	Director, DOG
11 AAC 83.356	Expand/Contract Unit Area	Commissioner	Director, DOG
11 AAC 83.361	Certify Wells as Capable of Production in Paying Quantities	Commissioner	Director, DOG
11 AAC 83.371	Approve/Deny Allocation of Cost and Production Formulas	Commissioner	Director, DOG
11 AAC 83.373	Sever Leases	Commissioner	Director, DOG
11 AAC 83.374	Declare Unit in Default	Commissioner	No Delegation
11 AAC 83.383	Notation of Approval on Joinder	Commissioner	Director, DOG
11 AAC 83.385	Modification of Unit Agreement	Commissioner	Director, DOG
11 AAC 83.393	Approval of Federal or Private Party Unit Agreements	Commissioner	No Delegation

I hereby delegate the authority vested in me through AS 38.05.180 to the Director of the Division of Oil and Gas as noted above. This delegation of authority is effective until revoked by me.



Harry A. Noah, Commissioner
Alaska Department of Natural Resources

7/21/93
Date

**Description of Leases within
the Niakuk Participating Area**

ADL No.	Unit Tract No.	Section Description	No. of Acres	Lessee of Record	Working	
					Interest Ownership	Tract Participation
34625	4	T12N, R15E UM • Sec. 23 S/2	320	BPX Alaska	100%	5.07%
34630	31	• Sec. 24 SW/4 • Sec. 25 • Sec. 26	640	BPX Alaska	100%	40.57%
34635	32	T12N, R16E UM • Sec. 29 • Sec. 30	640	BPX Alaska	100%	48.90%
34634	33	• Sec. 31 N/2 • Sec. 32 N/2 • Sec. 28	588 295.5 320 640	BPX Alaska BPX Alaska BPX Alaska BPX Alaska	100% 100% 100% 100%	5.46%

Total Niakuk Participating Area

4243.5

100.00%

SAMPLE AREA GAS DISPOSITION AND RESERVE DEBIT REPORT

ARCO ALASKA, INC.
 VOLUMES ARE IN MCF AT 14.65 PSIA
 PRODUCTION MONTH _____

LISBURNE PRODUCTION CENTER

	AAI	BFX	EXXON	TOTAL
--	-----	-----	-------	-------

OWNERSHIP PERCENTAGES

Lisburne
 West Beach

TOTAL HYDROCARBON LIQUIDS PRODUCED (STB)

Lisburne
 West Beach

LPC SYSTEM SUMMARY TOTALS

TOTAL SOG GAS PRODUCED

LESS TOTAL FUEL GAS USED

Power generation fuel
 Lease fuel
 LPC fuel
 Total

LESS POWER GENERATION SALES

LESS FLARE GAS

Flare within AOGCC Allowable
 Excess Flare Subject to Tax
 Excess Flare Subj. to Tax/Pnly
 Total

LESS NGLS (MCF equivalent)

TOTAL SOG RESERVE GAS DEBITS

GAS INJECTED

PARTICIPATING AREA SHARE BREAKOUTS

TOTAL SOG GAS PRODUCED

Lisburne
 West Beach

LESS TOTAL FUEL GAS USED

Lisburne
 Power generation fuel
 Lease fuel
 LPC fuel
 LPA Total
 West Beach
 Power generation fuel
 Lease fuel
 LPC fuel
 WBPA Total

LESS POWER GENERATION SALES

Lisburne
 West Beach

SAMPLE AREA GAS DISPOSITION AND RESERVE DEBIT REPORT

ARCO ALASKA, INC.
 VOLUMES ARE IN MCF AT 14.65 PSIA
 PRODUCTION MONTH _____

LISBURNE PRODUCTION CENTER

	AAI	BPX	EXXON	TOTAL
LESS FLARE GAS				
Lisburne				
Flare within AOGCC Allowable				
Excess Flare Subject to Tax				
Excess Flare Subj. to Tax/Pnlty				
LPA Total				
West Beach				
Flare within AOGCC Allowable				
Excess Flare Subject to Tax				
Excess Flare Subj. to Tax/Pnlty				
WBPA Total				
LESS NGLS (MCF equivalent)				
Lisburne				
West Beach				
TOTAL SOG RESERVE GAS DEBITS				
Lisburne				
Current month				
YTD				
ITD				
West Beach				
Current month				
YTD				
ITD				
GAS AVAILABLE FOR INJECTION				
Lisburne				
Current month				
YTD				
ITD				
West Beach				
Current month				
YTD				
ITD				
TOTAL SOG RESERVES INJECTED INTO LPA RESERVOIR				
From Lisburne				
Current month				
YTD				
ITD				
From West Beach				
Current month				
YTD				
ITD				
TOTAL SOG RESERVES INJECTED INTO WBPA RESERVOIR				
From Lisburne				
Current month				
YTD				
ITD				
From West Beach				
Current month				
YTD				
ITD				

NOTE: Each participating area's apportioned share of fuel gas utilized in the LPC and flare gas in any month is based on its apportioned share of total produced gas.

ARCO Alaska, Inc.
Post Office Box 100360
Anchorage, Alaska 99510-0360
Telephone 907 263 4275

Andrew D. Simon
Manager
Lisburne/Point McIntyre



March 1, 1993

RECEIVED
MAR 2 1993
DIV. OF OIL & GAS

Mr. James E. Eason
Division of Oil and Gas
Alaska Department of Natural Resources
P.O. Box 107034
Anchorage, Alaska 99510-7034

RE: West Beach Participating Area Meeting

Dear Mr. Eason:

Our February 23 meeting to discuss the West Beach Participating Area (WBPA) issues raised by the DNR in its January 14 letter was very useful in allowing both parties to better understand each other's positions. A clear path forward for the approval of the WBPA appears to have been established. ARCO and Exxon's understanding of the outcome of each issue is noted below.

1. The issue of a paying quantities determination for the proposed (WBPA) was resolved. The DNR acknowledged that West Beach #3B, located within the proposed WBPA boundary, was certified as being capable of producing in paying quantities in February, 1977 and that data supplied for WB-4 established additional certification.
2. Concerning the proposed boundary of the WBPA, ARCO and Exxon agreed to present to members of the DNR technical staff geologic and geophysical data in support of Attachments 6 and 7 of the WBPA. This meeting is scheduled for March 1 at the DNR's office.

In the WBPA application, ARCO and Exxon proposed to include within the WBPA "any other producing reservoirs from the surface to the base of the Kuparuk Formation which may be discovered within the boundaries of the West Beach Participating Area". While this proposal was made to facilitate and encourage the development of any minor reservoirs that may be encountered while drilling the Kuparuk, which are by their nature vulnerable to additional costs, the DNR's alternative proposal to consider including any such reservoir in the WBPA at the time they are actually encountered is acceptable to ARCO and Exxon. Therefore the WBPA will be limited to the Kuparuk as referenced on Attachment 4 (type log) of the WBPA Application (attached).

Mr. James E. Eason
March 1, 1993
Page 2

3. Concerning the gas accounting procedures and fuel gas allocation, all parties agreed to the use of ARCO and Exxon's proposed gas disposition and reserve debit report, as well as a fuel gas allocation methodology which allocates flare and fuel gas in proportion to each participating area's share of total produced gas.
4. With regard to the proposed production allocation methodology, ARCO and Exxon agreed to submit to the DNR a "statement of intent" for the proposed production allocation methodology. Please find attached public testimony given to the State of Alaska Oil and Gas Conservation Commission during the January 13, 1993 Field Rules Hearing which we believe should satisfy this request.

The DNR agreed that the "wedge effect" is no longer an issue assuming the operator is allowed to submit the allocated data by the 20th of the following month.

- 5a. With regard to the reference to Niakuk in Exhibit 5 of Attachment 8 to the WBPA, ARCO and Exxon agreed that in the actual allocation report Niakuk will be replaced by West Beach.
- 5b,6,7. Each of the remaining issues are tied to the ANS Royalty Litigation. All parties agreed that it is inappropriate to address these issues outside of the context of ANS Royalty Litigation. All parties agreed that the resolution reached in the ANS Royalty Litigation will apply to the WBPA.

This letter outlines ARCO and Exxon's understanding of the DNR's position on these issues. If the DNR's position is different than noted above, please let me know as soon as possible so that any outstanding issue can be quickly resolved.

Sincerely,



A. D. Simon
Manager Lisburne/Point McIntyre

SMR:ADS:tg

Attachments

cc:	G. Baker	Exxon
	S. M. Bennett	BPX
	W. D. Morgan	Exxon
	J. Reeder	BPX

DEPT. OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

P.O. BOX 107034
ANCHORAGE, ALASKA 99510-7034
PHONE: (907) 762-2553

(907) 762-2547

January 13, 1993

ARCO Alaska, Inc.
P.O.Box 100360
Anchorage, Alaska 99510-0360

Attn: Keith Weiser
Lisburne/Pt. McIntyre

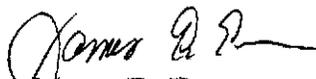
Subject: West Beach Participating Area Application

Dear Mr. Weiser:

A number of issues have been raised in the Division of Oil and Gas' review of the application for the formation of the West Beach Participating Area within the Prudhoe Bay Unit. The issues are attached to this letter. I suggest the State and ARCO meet to discuss these issues.

Please call Bill Van Dyke or Mike Kotowski at your earliest convenience to arrange the meeting. If you have any questions on any of the items, please contact them at 762-2547.

Sincerely,


James E. Eason
Director

Attachments

cc: Gary E. Baker - Exxon
Patrick Coughlin - ADOL
Deborah Williams - Condon, Partnow & Sharrock

PBU.WBRESP.Txt