FINDINGS AND DECISION

of the
Director, Division of Oil and Gas
approving the

FIRST EXPANSION of the TRADING BAY UNIT

EXPANSION of the HEMLOCK OIL POOL PARTICIPATING AREA

and

EXPANSION of the GRAYLING GAS SANDS PARTICIPATING AREA

Under Delegation of Authority
From the Commissioner State Of Alaska,
Department of Natural Resources

June 25, 2003

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I. SUMMARY OF DECISION

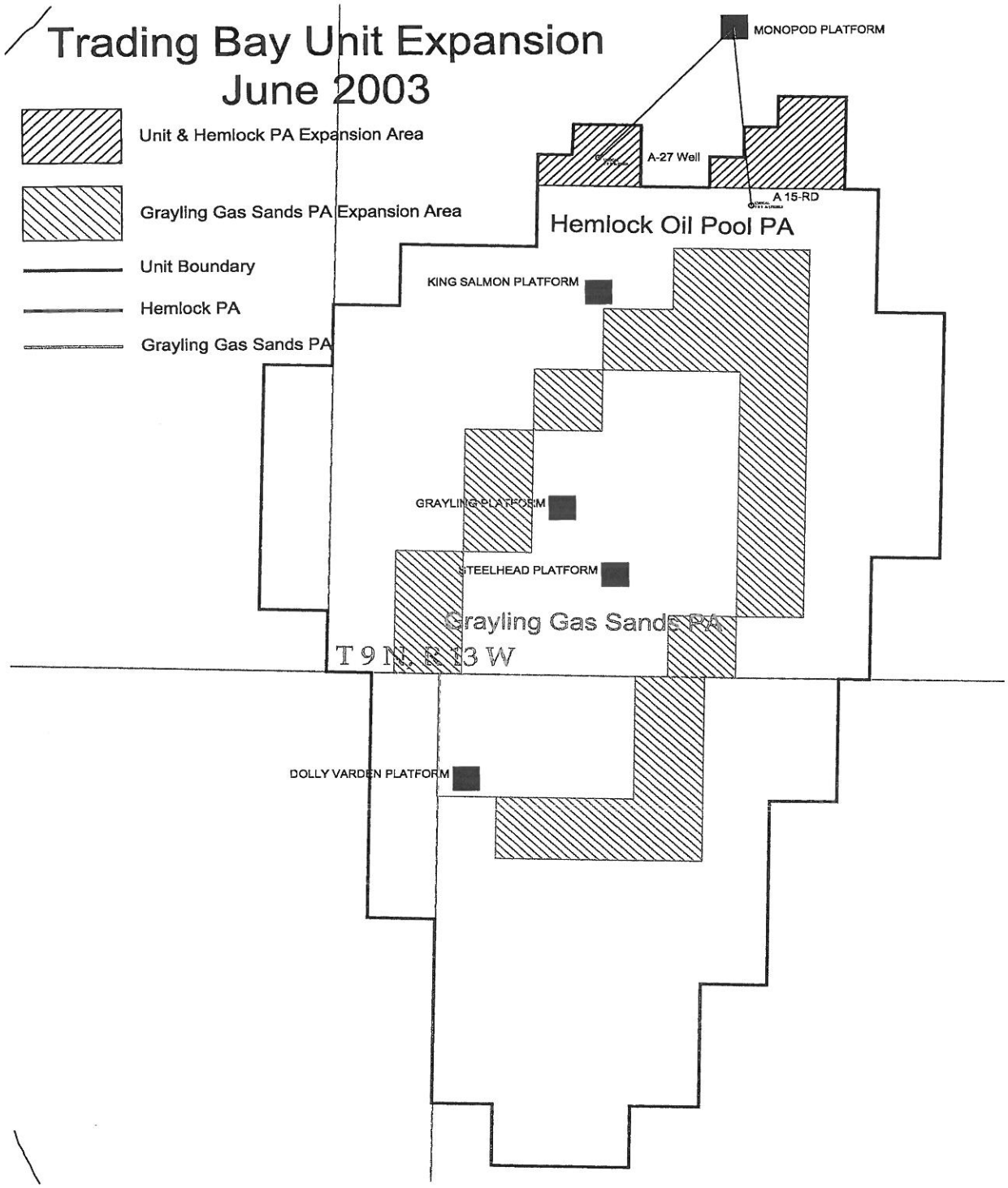
The Trading Bay Unit includes four participating areas: the Hemlock Oil Pool Participating Area (Hemlock PA), the West Foreland Oil Pool Participating Area (West Foreland PA), the Middle Kenai "G" Oil Pool Participating Area (Middle Kenai PA), and the Grayling Gas Sands Participating Area (Grayling PA). On November 4, 2002, Union Oil Company of California (Unocal), the Trading Bay Unit Operator, submitted an application to expand the Trading Bay Unit and Hemlock PA within the expanded unit area, and on December 31, 2002, Unocal also included a proposal to expand the Grayling PA (the Application). Unocal submitted the Application on behalf of itself, Forest Oil Corporation (Forest), and Marathon Oil Company (Marathon), the Working Interest Owners in the Trading Bay Unit.

The proposed Trading Bay Unit and Hemlock PA expansion area includes approximately 560 acres of submerged lands within one oil and gas lease, ADL 18731, designated Tract 12 of the Trading Bay Unit. The Application proposes to conform and modify the lease agreement so that the unit operator can conduct exploration and development on a unit-wide basis instead of on a lease basis. The Application also proposed a 3,200-acre expansion of the Grayling PA and approval of an alternate allocation formula for the Grayling PA. Unocal supplied geological, geophysical, and engineering data supporting the proposed expansions of the Trading Bay Unit, the Hemlock PA, and the Grayling PA.

The Department of Natural Resources, Division of Oil and Gas (DNR or the Division as appropriate) reviewed the statutes, oil and gas unitization regulations, the Trading Bay Unit Agreement, and materials supplied by Unocal in support of the Application. The Division finds that the Application meets the criteria set out in 11 AAC 83.303. Approval of the Application is necessary and advisable in the public interest to conserve natural resources, avoid waste, and protect the interest of all interested persons including the State and the public.

The expanded Trading Bay Unit and Hemlock PA encompass 17,859.50 acres within eleven oil and gas leases, and the expanded Grayling PA includes a total of 6,520 acres within four oil and gas leases. (See Figure 1) The Division also approves a volume-based allocation formula for the Grayling PA as an alternative to the gross acreage-basis allocation formula prescribed in Article 12 of the Trading Bay Unit Agreement.

Figure 1: Trading Bay Unit, Hemlock Pa, and Grayling PA Expansion Areas



II. BACKGROUND

A. Trading Bay Unit History

Unocal discovered the McArthur River Field, which is located in Cook Inlet northeast of the West Forelands, in 1965. The McArthur River Field contains multiple oil reservoirs in each of three formations, the Middle Kenai G reservoir in the Tyonek Formation (below 8,850 feet subsea), the Hemlock reservoir in the Hemlock Conglomerate (below 9,350 feet subsea), and the West Foreland reservoir in the West Foreland Formation(below 9,650 feet subsea). The McArthur River Field also produces gas from the upper portion of the Tyonek Formation (below 4,500 feet subsea), which AOGCC refers to as the Middle Kenai Gas pool and the Division refers to as the Grayling Gas Sands reservoir (See attached generalized Cook Inlet stratigraphic column). DNR approved the formation of the Trading Bay Unit effective February 27, 1967. The initial unit area encompassed approximately 39,573.43 acres within 18 leases, including all 3,840 acres within ADL 18731, Tract 12.

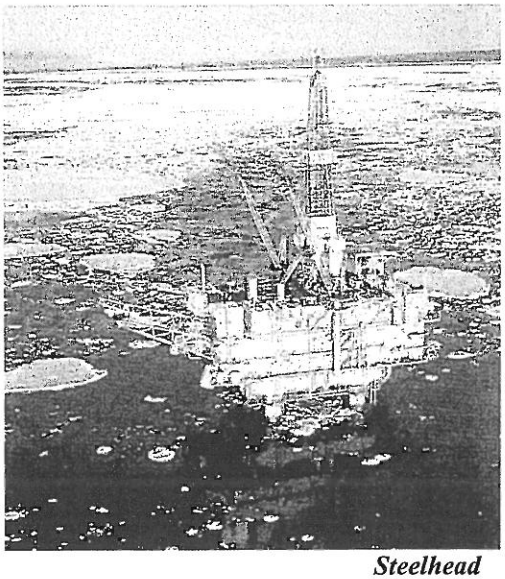
On May 8, 1967, the Division approved the formation of the initial 800-acre Hemlock PA, effective February 27, 1967, to develop oil in the Hemlock Conglomerate within the McArthur River Field. In a decision dated April 14, 1970, the Division approved the formation of the Middle Kenai PA (160 acres) and the West Foreland PA (640 acres), effective July 20, 1969, to develop oil in the Middle Kenai G reservoir and the West Foreland reservoir respectively.

Effective May 28, 1970, the First Contraction of the Trading Bay Unit reduced the unitized area by 160 acres within ADL 18731, Tract 12. The Second Contraction of the Trading Bay Unit deleted ADL 18777, Tract 16, from the unit area in its entirety, effective July 1, 1971. All three participating areas expanded with numerous revisions between 1967 and 1972, when they encompassed the following: Hemlock PA, 17,299.50 acres; the Middle Kenai PA, 5,400 acres; and the West Foreland PA, 3,680 acres. The boundaries of the Middle Kenai PA and the West Foreland PA are both totally contained within the area covered by the Hemlock PA, and lie stratigraphically above and below the Hemlock PA, respectively.

In accordance with Article 2(e) of the Trading Bay Unit Agreement, five years after the formation of the initial participating area, the Hemlock PA, the Trading Bay Unit automatically contracted down to exclude all legal subdivisions of unitized land, which were not entitled to be in a participating area. Effective March 1, 1972, the automatic contraction excluded all or portions of sixteen leases (21,154 acres) from the Trading Bay Unit. ADL 18731, Tract 12, which is the subject of the current Application, was one of seven leases deleted from the Trading Bay Unit in its entirety thirty years ago.

There are four offshore platforms located within the Trading Bay Unit: King Salmon, Grayling, Steelhead, and Dolly Varden. Before installation of the Steelhead platform in 1987, the operator completed wells in the Grayling Gas Sands reservoir to provide gas for gas lift and power generation. On February 13, 1987, the Division approved the formation of the Grayling PA, effective October 1, 1986, to develop the Grayling Gas Sands reservoir in the upper portion of the Tyonek Formation. The initial Grayling PA included 3,320 acres in three Trading Bay Unit

leases. Production of Grayling PA gas from the Steelhead platform began on September 30, 1988. In 1990, Marathon, as sub-operator of the Steelhead platform, drilled additional wells to test the extent of the Grayling Gas Sands reservoir. The Alaska Oil and Gas Conservation Commission (AOGCC) approved an expansion of the Middle Kenai Gas pool area, which encompasses the Graying Gas Sands reservoir, and the Working Interest Owners began allocating production to the larger area in 1991. However, Unocal did not apply for or receive approval from the Division to expand the Grayling PA until the current Application.



Steelhead
Cook Inlet Regional Citizens Advisory Council

In addition to the four platforms in the Trading Bay Unit, Unocal also operates the Monopod platform, located on the non-unitized lease, ADL 18731, north of the Trading Bay Unit, to produce oil and gas from the Trading Bay Field. In 2002, Unocal drilled several sidetracks of the A-15 well from the Monopod platform. One sidetrack, A-15RD2L2 (API# 507332010561), extended south into lease ADL 18772, Tract 14 of the Trading Bay Unit. This sidetrack crossed the lease line and produced oil from the Hemlock reservoir both inside and outside of the existing unit boundary (Figure 1). On March 29, 2002, the Division approved Unocal's request to allocate test production from the A-15 well based on the proportion of the productive portion of the wellbore on each side of the lease line. On June 1, 2002, Unocal submitted completion reports and directional surveys for the original A-15 borehole and several sidetracks to support its allocation methodology. On June 19, 2002, the Division conditionally approved Unocal's proposal to allocate 15.73% of the production from the A-15 well to ADL 18731 and 84.27% to ADL 18772. The Division required that Unocal submit an application to expand the Trading Bay Unit and the Hemlock PA to encompass the portion of ADL 18731 that produces from the Hemlock reservoir in the McArthur River Field.

B. The Application

On November 4, 2002, Unocal submitted an application to expand the Trading Bay Unit and the Hemlock PA. The Application included the following exhibits to the Trading Bay Unit Agreement: Exhibit A, a map of the proposed unit expansion area; Exhibit B, a schedule describing the Trading Bay Unit leases and ownership; and Schedule 1 and Schedule 2 for each of the four participating areas in the Trading Bay Unit. Schedule 1 is a map of the participating area and Schedule 2 describes the acreage within the participating area and the tract participation percentage allocated to each lease. Unocal also submitted Appendix A and B to the Unit Operating Agreement for each participating area. Appendix A is a map of the participating area and Appendix B describes the acreage within the participating area and the percentage of expenses allocated to each lease. The Application also included Unocal's revised Thirty-Eighth Plan of Development (38th POD) and supporting geological, geophysical, and engineering data.

The Division determined that the Application was incomplete and requested additional information on December 11, 2002. The Division also recognized that AOGCC had approved an expansion of the Middle Kenai Gas Pool in 1991, and requested that Unocal supplement the Application with a proposal to expand the Grayling PA. Unocal resubmitted the Application on December 31, 2002, which included a proposed expansion of the Grayling PA, and a request to allocate gas produced from the Grayling PA based on the volume of gas underlying each tract in the participating area rather than on a surface-acreage basis. On January 23, 2003, Unocal replaced Attachments B and C to the Application. Attachment B is a Geologic and Engineering Report with appendices "A" and "B" containing detailed reservoir data and selected well data pertinent to the expansion. Attachment C is a color copy of a PowerPoint presentation entitled "Trading Bay Unit" to be used in conjunction with Attachment B, the Geologic and Engineering report.

The Division published a public notice under 11 AAC 83.311 on January 27, 2003, requesting comments on the complete Application. The Division received one response to the public notice, on February 20, 2003; the Kenai Peninsula Borough reviewed the Application for consistency with the borough's Coastal Management Program and had no objection to the described project. On May 27, 2003, the Division received a proposed Thirty-Ninth Plan of Development (39th POD), which replaces the proposed revision to the 38th POD that Unocal initially submitted with the Application in November 2002.

III. ANALYSIS OF THE APPLICATION

A. Unit Agreement Standard for Expansion

Article 2 of the Trading Bay Unit Agreement provides for expansion of the unit area, and Article 11 provides for expansion of a participating area:

> The above-described unit area shall, when practicable, be expanded to include therein any additional tract or tracts regarded as reasonably necessary or advisable for the purposes of this agreement, … (Article 2)
>
> The participating area or areas so established shall be revised from time to time, subject to like approval, whenever such action appears proper as a result of further drilling operations or otherwise, to include additional land then regarded as reasonably proved to be productive in paying quantities, … (Article 11)

B. DNR Regulations and Statute

State statute and regulations set out the standards and criteria for unitization and inclusion in a participating area. To be included in a unit, property must include part of one or more oil or gas reservoirs, or potential hydrocarbon accumulations. 11 AAC 83.356(a) "A participating area must be expanded to include acreage reasonably estimated through use of geological, geophysical, or engineering data to be capable of producing or contributing to the production of hydrocarbons in paying quantities …" 11 AAC 83.351(c)

The DNR Commissioner, or designee,[1] may approve a unit expansion or contraction if he determines it is necessary or advisable in the public interest.[2] The Division approves the Application upon finding that it 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. 11 AAC 83.303(a). Subsection 303(b) sets out six factors that the Division considered in evaluating the Application.

1. Prior Exploration Activities and the Geological and Engineering Characteristics of the Trading Bay Unit Area

Onshore oil and gas potential of the Cook Inlet basin was realized in the late 1950s, with the discovery of the Swanson River and Kenai Fields. Subsequently, the search for drilling prospects moved offshore and mapping of much of Cook Inlet took place using seismic survey tools that were available at the time. Cook Inlet area-wide geology maps from the 1960s and 1970s identify the anticlinal trend that is the basis of the Trading Bay Unit.

Production from the Trading Bay Unit comes from the McArthur River Field.[3] The main structural features of the area are the McArthur River anticline and the Trading Bay fault, a major bounding fault on the northwest that separates the McArthur River Field from the Trading Bay Field. The McArthur River anticline is a broad asymmetrical fold with 1,000 feet of closure that plunges both north and south from its crest at about 9,000 feet subsea.

Unocal discovered oil at the McArthur River Field by drilling the *Unocal Grayling #1A* well in 1965. Unocal's primary exploration objective with the *Grayling #1A* well was oil in the Hemlock Conglomerate, with oil and gas in the Tyonek Formation as a secondary target. The discovery well was the second well drilled to test the Hemlock Conglomerate on this structure (Table 1). The Hemlock Conglomerate contains the thickest and most prolific of the three oil reservoirs in the McArthur River Field, with initial individual well production rates over 2,000 barrels of oil per day. It is predominantly composed of sandstone and conglomerate 600-700 feet thick with 290 feet of net pay. The average porosity is 10.5%, and the average permeability is 53 millidarcies, with an average oil gravity of 33.1° API. Further delineation and appraisal wells drilled in 1966, including the *Arco McArthur State #1* and the *Pan Am North Redoubt State #1,* established the northern and eastern limits of the Hemlock reservoir. A third well, the *Arco West Foreland Unit #3*, also drilled in 1966, established the producibility of the accumulation on the northwest. In 1967, Unocal installed three offshore platforms; King Salmon, Grayling, and Dolly Varden, and formed the Trading Bay Unit and the Hemlock PA to optimize development of the Hemlock reservoir in the McArthur River Field. As of December 2002, there were 45 production wells in the Hemlock PA.

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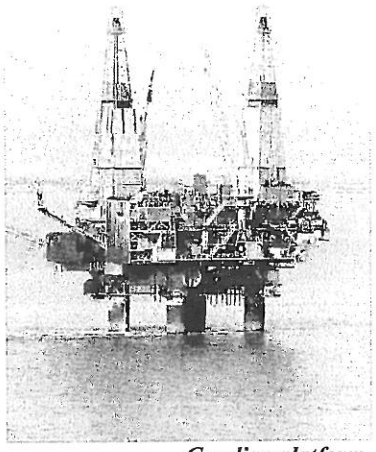
[1] By memorandum dated September 30, 1999, the Commissioner approved a revision of Department Order 003 that delegated this authority to the Director of the Division of Oil and Gas.

[2] "To conserve the natural resources of all or part of an oil or gas pool, field, or like area, the lessees and their representatives may unite with each other, or jointly or separately with others, in collectively adopting or operating under a cooperative or unit plan of development or operation of the pool, field, or like area, or part of it, when determined and certified by the commissioner to be necessary or advisable in the public interest." AS 38.05.180(p)

[3] Note that the McArthur River Field is within the Trading Bay Unit, while the Trading Bay Field is located on non-unitized acreage to the northwest and *not* within the Trading Bay Unit.

The Middle Kenai PA, formed in 1970, produces oil from the lower portion of the Tyonek Formation, which is predominantly composed of conglomeratic sandstone interbedded with significant amounts of siltstone and claystone, and thick and expansive coal beds. The gross reservoir interval in the Middle Kenai G reservoir is about 600 feet thick with 100 feet of net pay. The average porosity is 18.1%, and the average permeability is 65 millidarcies. The average oil gravity in the Middle Kenai G reservoir is 34° API. As of December 2002, there were 32 wells in the Middle Kenai PA producing oil from the Middle Kenai G reservoir in the McArthur River Field.

The West Foreland reservoir is predominantly composed of conglomerate, sandstone, siltstone and interbedded volcanic tuffs. The gross reservoir interval, found in the upper part of the West Foreland Formation, is 500-600 feet thick, with 100 feet of net pay. The porosity averages 15.7% permeability averages 102 millidarcies, and the average oil gravity is 30.3° API in the West Foreland reservoir. As of December 2002, there were five oil wells producing from the West Foreland PA in the McArthur River Field.



Grayling platform
D. Colley

Unocal drilled the *Trading Bay Unit #G-18* well from the Grayling platform in 1968, and confirmed the presence of commercial quantities of natural gas and natural gas liquids in an upper Tyonek Formation reservoir, commonly known as the Grayling Gas Sands reservoir. The Grayling Gas Sands reservoir is predominantly composed of fine sandstone, with siltstone and claystone, and thick expansive coal beds. The gross reservoir interval is 500-600 feet thick with 375 feet of net pay. Porosity in the Grayling Gas Sands reservoir averages 22%, and permeability is about 900 millidarcies. Unocal formed the Grayling PA in 1987, and as of December 2002, the Grayling Gas Sands reservoir produced gas from 14 wells in the upper portion of the Tyonek Formation in the McArthur River Field.

Table 1. Exploration wells drilled on the McArthur River anticline.

Operator	Well Name & No.	Completion Date	Status	TD	Location	API Number
Pan Am	West Foreland Unit #1	05/27/65	P&A	11,017	03-T8N-R14W SM	507331002600
Unocal	Grayling #1	09/07/65	P&A	817	29-T9N-R13W SM	507331004300
Unocal	Grayling #1A	11/10/65	P&A-O	10,227	29-T9N-R13W SM	507331004400
Pan Am	North Redoubt State #1	06/10/66	P&A-O	11,271	04-T8N-R13W SM	507331005000
Unocal	Kustatan #1	06/12/66	P&A	11,852	18-T8N-R13W SM	507331004500
Shell	Foreland Channel State #1	06/16/66	P&A	11,786	30-T8N-R13W SM	507331004900
Unocal	Kustatan #1A	08/07/66	P&A-O	10,857	18-T8N-R13W SM	507331004501
Shell	Foreland Channel State #1A	08/22/66	P&A	12,951	30-T8N-R13W SM	507331004901
Unocal	West Foreland Unit #3	08/27/66	P&A-O	9,786	19-T9N-R13W SM	507331004600
Pan Am	West Foreland Unit #2	09/12/66	P&A	11,948	15-T8N-R14W SM	501331002700
Arco	McArthur State #1	09/14/66	P&A-O	10,255	15-T9N-R13W SM	507331004700
Shell	West Foreland Unit #4	11/07/66	P&A	11,160	36-T9N-R14W SM	507331003500
Unocal	East Trading Bay State #1	11/10/66	P&A	10,364	11-T9N-R13W SM	507331003400

Drilling technology, well log analysis, and seismic acquisition and processing have evolved greatly since the early wells were drilled in the McArthur River Field. Unocal now uses technology that is more advanced in its Cook Inlet exploration. With new seismic data and improved well log analysis tools, Unocal believes it has a greater ability to identify and refine potential oil and gas exploration prospects within the McArthur River Field.

Unocal's recent delineation activity included using new 3D seismic, engineering, and log analysis to re-examine the area north of the Trading Bay Unit. Subsequent drilling programs extended the northern limits of the McArthur River Field, as two wells established oil production outside of the unit boundary. In 1997, Unocal drilled the *Trading Bay Unit #A27RD* well from the Monopod platform, to appraise an area in the northwest portion of the McArthur River Field, along the Trading Bay fault, and produced oil from the Hemlock reservoir (Figure 1). In 2002, the *Trading Bay Unit #A-15RD2L2* well, appraised Hemlock reservoir oil production from the "Northern Nose" of the McArthur River Field. This well produced at initial gas-lift test rates of over 3,000 barrels of oil per day.

Unocal submitted the following technical data in support of the Application: a history of oil and gas exploration in the area, Unocal's geological justification for the expansion of the unit, a cross-section through the "northern nose" structure, a cross-section through the northwest portion of the McArthur River Field adjacent to the Trading Bay fault, representative strike and dip seismic cross sections across the McArthur River Field anticline structure, and a structure-contour map on the top of the Hemlock Conglomerate.

The history of the area, the data presented by Unocal, and oil production from the exploration wells, indicates that the proposed unit expansion acreage contributes to production from the Hemlock Conglomerate. The Division cannot disclose confidential data, but the well and geophysical data provided with the Application, and otherwise available to the Division, supports inclusion of the proposed unit expansion acreage in the Trading Bay Unit and the Hemlock PA.

The geological, geophysical, and engineering data provided with the Application and available to the Division also indicate that the proposed Grayling PA expansion area is underlain by hydrocarbons, which contribute to production from the Grayling Gas Sands reservoir. The Division requested that the proposed expansion of the Grayling PA be consistent with the expanded Middle Kenai Gas pool area approved by AOGCC in 1991, and that it include all of the acreage contributing to the production of gas in paying quantities from the Grayling Gas Sands reservoir.

Prior exploration activities and the geological and engineering characteristics of the unit and participating area expansion areas fulfill the criteria in 11 AAC 83.303(b)(2) and .303(b)(3), and support approval of the Application.

2. Plans for Exploration or Development of the Unit Area

On June 19, 2002, the Division approved the 38th POD for the Trading Bay Unit with a one-year term beginning August 27, 2002. The Division's June 19, 2002 decision also approved the A-15

Lease Operation, pending approval of an application for expansion of the Trading Bay Unit and the Hemlock PA.

The 39th POD, submitted by Unocal on May 27, 2003, includes a review of activities performed during the 38th POD and development planned for all four Trading Bay Unit participating areas during the next plan year beginning August 27, 2003. During the 39th POD, Unocal will optimize oil recovery from the Hemlock PA, the Middle Kenai PA, and the West Foreland PA within completed wells and study potential workover or redrill opportunities. Unocal is also considering rig projects on the Steelhead and Grayling platforms to improve deliverability and recovery of gas reserves from the Grayling PA. Under the 39th POD Unocal will continue to evaluate the possibility that oil reservoirs exist within the Jurassic section within the Trading Bay Unit.

Unocal's plans for exploration and development of the unit area fulfill the criteria in 11 AAC 83.303(b)(4) and support approval of the Application.

3. Environmental Costs and Benefits of Unitized Development

The open waters of Cook Inlet support a variety of marine mammals, waterfowl and fish. Residents use this area for recreation, sport and commercial fishing, and subsistence hunting and fishing. However, since Unocal performs all exploration and development activities within the Trading Bay Unit from existing offshore platforms, oil and gas activity in the proposed expansion area will have little if any incremental effect on day-to-day human and animal activities. The Division considered environmental issues during the lease sale process and attached mitigation measures to the leases. Mitigation measures, including seasonal restrictions on specific activities, reduce the impact of oil and gas development on fish, wildlife, and human populations. Mitigation measures specifically address potential impacts to subsistence access and harvesting. Unitization does not waive or reduce the effectiveness of the mitigating measures that condition the lessee's right to conduct operations on the leases.

Expanding the unit area will optimize drilling operations thereby minimizing surface impacts by consolidating facilities and reducing activity in the field. Unitization allows the unit operator to explore for and develop the resources under a single unit plan rather than on a lease-by-lease basis. Unitization is the most efficient method for maximizing oil and gas recovery, while minimizing negative impacts on other resources.

All exploration or development activity in the Trading Bay Unit is subject to an Alaska Coastal Management Program (ACMP) consistency determination, unless categorically approved under the ACMP ABC (General Concurrence) list, and must comply with both the State and the Kenai Peninsula Borough Coastal Zone Management plans. The Kenai Peninsula Borough Coastal District staff reviewed the Application and found it to be consistent with the enforceable policies of the Kenai Peninsula Borough Coastal Management Program.[4]

The Application includes a commitment to fully develop the Trading Bay Unit using existing infrastructure. Unitization of the expansion acreage minimizes the environmental impacts and

[4] Letter from Daniel Bevington, Coastal District Coordinator, KPB, to ADNR, DO&G, February 20, 2003.

costs of exploration and development of the unit area, which meets the section 11 AAC 83.303(b)(1) criteria and supports approval of the Application.

4. Economic Costs and Benefits

The cost to the State and the public of approving the proposed expansion of the Trading Bay Unit, Hemlock PA, and Grayling PA is negligible. The increase in production attributed to the new wells in the expanded Trading Bay Unit will have no affect on royalties already paid to the state because the Working Interest Owners would have paid the same royalty if the expansion area had continued to produce on a lease basis. However, in addition to the State treasury, unitized production will continue to contribute to the regional Cook Inlet economy and be a source of stable employment for the remaining life of the field.

As of December 2002, the McArthur River Field, underlying the Trading Bay Unit, produced 620 million barrels of oil and 1,178 billion cubic feet of gas. The field produced 5.5 million barrels of oil in 2002; an increase of more than one-half million barrels compared to the 4.82 million barrels produced in 2000. The Division estimates that the Trading Bay Unit contains remaining reserves totaling 46 million barrels of oil and 216.4 billion cubic feet gas.

Article 12 of the Trading Bay Unit Agreement requires that the Working Interest Owners allocate production to each lease included in a participating area based on surface acreage. However, the Trading Bay Unit Operating Agreement provides for a volumetric allocation of production between the Working Interest Owners. Contrary to the Unit Agreement, the Working Interest Owners relied on the Unit Operating Agreement when submitting royalty payments to the State. For many years, Unocal submitted two allocation schedules for each participating area, one based on surface acreage and the other on the volume of hydrocarbons underlying each tract.

In 2002, the Working Interest Owners executed an alignment agreement and submitted assignment applications to the Division to align their interest within the oil participating areas. With their interests aligned across the unit, the allocation methodology became irrelevant, and Unocal agreed to submit a single surface acreage based allocation schedule for each of the three oil participating areas. However, since the alignment agreement did not include the Grayling Gas Sands reservoir, the Working Interest Owners wanted to continue to submit royalty reports based on the volumetric basis outlined in the Unit Operating Agreement for gas production from the Grayling PA.

Unocal requested approval to allocate production from the Grayling PA on a volumetric basis, and submitted geological, geophysical, and engineering data to support its proposed allocation formula. Volumetric basis is a more technically accurate method of allocating production than surface acreage where reservoir thickness varies across the participating area. All of the leases in the Grayling PA provide for a 12.5% royalty to the State, and therefore approval of the alternate allocation method will have little impact on State revenue. While there may be some variation in the value of the gas allocated to each working interest owner in the Grayling PA that could effect the royalty payments due to the State, the impact is minimal.

On August 27, 1965, the Division certified the *Trading Bay #1A* well, located on oil and gas lease ADL 18731, to the north as capable of producing in paying quantities from the Kenai Group in the Trading Bay Field, which placed the lease on minimum royalty in accordance with Paragraph 10 of the lease agreement.

> Minimum Royalty. Commencing with the lease year beginning on or after completion on said land of a well capable of producing oil or gas in paying quantities, Lessee shall pay Lessor, at the expiration of each lease year, in lieu of rental a minimum royalty equal to $1.00 per acre, or fraction thereof then included in this lease, or the difference between the actual royalty paid on production during the year if less than $1.00 per acre and the prescribed minimum royalty.

A portion of oil and gas lease ADL 18731 is included in the Trading Bay Unit and allocated production from the Hemlock PA. Not withstanding Paragraph 10 of the lease, Article 18(g) of the Trading Bay Unit Agreement places the non-unitized acreage in ADL 18731 on rental status.

> The entire lease shall continue in force and effect so long thereafter as production is allocated to a portion of said lease and so long as annual rentals are paid on the portion not within the participating area. The first rental payment is due and payable on the first day after the expiration of the above mentioned 90 day period with allowance for proration of rentals. Thereafter, annual rentals are due and payable on the anniversary date of the lease.

In addition, Paragraph 9 of the lease agreement provides that "any rental paid for any one lease year shall be credited on any royalty for that year."

The State and the public's primary interest in oil and gas leases is in the royalty and taxes received on production. Economic benefits to the State and local economy from oil and gas development are also relevant. The Division's evaluation of the economic criteria in section 11 AAC 83.303(b)(5) supports approval of the Application.

5. Other Relevant Factors to Protect the Public Interest

DNR issued all of the Trading Bay Unit leases on lease form DL-1 (Revised April 1961). The Division believes that it is appropriate to revise the Trading Bay Unit lease agreements by deleting Paragraph 10 to eliminate the Minimum Royalty provision. This amendment applies to all ten of the Trading Bay Unit leases: ADL 17579, ADL 17574, ADL 17602, ADL 18716, ADL 18730, ADL 18731, ADL 18758, ADL 18772, ADL 18777, and ADL 21068. The Working Interest Owners will submit rental payments at the beginning of the lease year rather than calculating whether a minimum royalty is due at the end of the year. Paragraph 9 of the lease agreements provides that "any rental paid for any one lease year shall be credited on any royalty for that year." Therefore, this amendment to the lease agreements is not financially detrimental to the Working Interest Owners.

Deleting the Minimum Royalty provision in the leases will require adjustments to the Working Interest Owners' accounting processes; however, the benefit to the State outweighs the initial

inconvenience to the Working Interest Owners. This change will help bring the affected leases into conformance with recent State leases, and thus aid in the administration of State leases in general. While the State would need the Working Interest Owners' concurrence to make additional changes to bring the leases into complete conformance with the State's most recent lease form, the State chose not to seek more substantive revisions in negotiating approval of the Application.

Amending the Trading Bay Unit leases by deleting Paragraph 10 protects the public interest, meets the section 11 AAC 83.303(b)(6) criteria, and supports approval of the Application.

IV. FINDINGS

The Application, meets the criteria in 11 AAC 83.303(a) as follows.

A. Promote the Conservation of All Natural Resources.

Further development of the McArthur River Field may affect natural resources other than petroleum hydrocarbons including marine waters, marine mammals, waterfowl, and fish. The Application to expand the unit and participating area boundaries facilitates conservation all natural resources, including hydrocarbons. Drilling high departure wells from existing platforms to extract natural gas and oil from beneath the seafloor should have little or no impact on the abundance, quality, and value of other natural resources.

All unit development must proceed according to an approved plan of development. Additionally, before undertaking any specific operations, the unit operator must submit a unit plan of operations to the Division and other appropriate state and local agencies for review and approval, and the lessees may not commence exploration or development operations until all agencies have granted the required permits. The Division may condition its approval of a unit plan of operations and other permits on performance of mitigation measures in addition to those in the leases, if necessary or appropriate. Compliance with the mitigation measures will minimize, reduce, or completely avoid adverse environmental impacts.

B. Promote the Prevention of Economic and Physical Waste.

Unit expansion will prevent economic and physical waste because the unit operator must have a plan to share future costs, a coordinated exploration plan, and a comprehensive reservoir depletion plan. A cost-sharing agreement promotes efficient development of common surface facilities and operating strategies. With a cost-sharing agreement, the Working Interest Owners can rationally decide well spacing requirements, injection plans, and the proper joint-use of surface facilities. Unitization prevents economic and physical waste by eliminating redundant expenditures for a given level of production, and by avoiding loss of ultimate recovery with the adoption of a unified reservoir management plan.

Unitized operations improve development of reservoirs beneath leases that may have variable or unknown productivity. Marginally economic reserves, which otherwise would not be produced on a lease-by-lease basis, can be produced through unitized operations in combination with more

productive leases. Facility consolidation lowers capital costs and promotes optimal reservoir management. Pressure maintenance and other field recovery procedures are easier to design and achieve through joint, unitized efforts than would otherwise be possible. In combination, these factors allow the operator to develop and produce less profitable areas of a reservoir in the interest of all parties, including the State.

The total cost of developing Trading Bay Unit reserves would be higher on a lease-by-lease basis than it would be under unitization terms. The unit operator can locate individual wells to optimize ultimate oil and gas recovery, while minimizing impacts to the environment. Reducing costs and environmental impacts through unitized operations will expedite development of reserves and will promote greater ultimate recovery of oil, natural gas, and gas condensate from the unit area.

The application provides for payment of royalties to the State on all acreage within the Trading Bay Unit. Unitization means reduced costs and increased benefits to all interested parties. It benefits the local and State economy, and provides revenues to the State's general, school, and permanent funds.

Unocal submitted geological, geophysical, and engineering data supporting the Application. The available data indicates the expansion acreage encompasses all or part of one or more potential hydrocarbon accumulations and justifies including the proposed lands in the Trading Bay Unit and expansion of the Grayling PA. The Application along with the 39th POD meets the requirements of 11 AAC 83.303 and .343.

C. Provide for the Protection of All Parties of Interest, Including the State

Unitization protects the economic interests of the Working Interest Owners as well as State. Combining interests, and operating under the terms of the Trading Bay Unit Operating Agreement, ensures each individual working interest owner an acceptable allocation of costs and revenues. Approval of the volumetric-based allocation method for the Graying PA protects the interests of all parties.

The Unit Agreement provides for expansions and contractions of the unit area in the future, as warranted by data obtained by exploration or otherwise. The Unit Agreement thereby protects the public interest, the rights of the parties, and the correlative rights of adjacent landowners. Approval of this unit expansion will not diminish access to public and navigable waters beyond those limitations (if any) imposed by law or already contained in the unitized oil and gas leases.

All potential parties to the Unit Agreement were given an opportunity to respond to the Application through the 30-day public comment period provided under 11 AAC 83.311. The Application adequately and equitably protects the public interest. The Application is in the State's best interest, and it protects the State's interests through reasonable assurances that the lessees will develop and produce the hydrocarbons underlying the unit area. The Application meets the requirements of AS 38.05.180(p) and 11 AAC 83.303.

V. DECISION

1. The Division approves the Trading Bay Unit and the Hemlock PA expansion Application effective retroactive to March 30, 2002, when production from the A-15 Lease Operation began. The expanded Trading Bay Unit and Hemlock PA encompass 17,859,50 acres within eleven oil and gas leases, which are depicted in Exhibit A and described in Exhibit B to the Agreement. The Division approves Exhibits A and B to the Trading Bay Unit Agreement; Schedule 1, a map of the Hemlock PA; and Schedule 2, the Tract Participation Schedule for the Hemlock PA; submitted on December 31, 2002, effective March 30, 2002 (See Attached).

2. The Trading Bay Unit and the Hemlock PA expansion area is described as follows:

   Trading Bay Unit, Hemlock PA, Tract 12, ADL 18731

   Township 9 North, Range 13 West, Seward Meridian, Alaska
   Section 8: S1/2SE1/4, NE1/4SE1/4;
   Section 9: SE1/4SE1/4, W1/2SW1/4;
   Section 10: SW1/4NE1/4, SE1/4NW1/4, SW1/4, W1/2SE1/4;

   Containing approximately 560.00 acres.

3. The A-15 well is now within the Hemlock PA, and beginning with June 2003 production, Unocal shall allocate all future production from the well under Accounting Unit Code HEML rather than TB01. In addition, the operator and Working Interest Owners shall submit revised operator and royalty reports reallocating prior production from Accounting Unit Code TB01 to Accounting Unit Code HEML under the approved allocation in Schedule 2 for the Hemlock PA for the period March 2002 through May 2003. Please contact the Division's Royalty Section at 269-8796, if there are any questions concerning royalty reporting.

4. In accordance with Article 18(g) of the Trading Bay Unit Agreement, the non-unitized portion of ADL 18731 went from minimum royalty to rental status upon commitment of a portion of the lease to the unit, and the first annual rental payment was due within 90 days of the March 30, 2002 effective date. The Division waives the annual rental due for the period March 30, 2002 through May 31, 2003.

5. The Division also approves the proposed 3,200-acre expansion of the Grayling PA as depicted on Schedule 1 and described in Schedule 2 dated December 31, 2002, effective June 1, 2003. Schedule 1, a map of the expanded Grayling PA; and Schedule 2, showing the legal descriptions and the allocation factors assigned to each tract in the expanded Grayling PA; are attachments to this decision. The Division approves the alternate allocation method and the participation percentages in Schedule 2 for the Grayling PA under 11 AAC 83.371(a), effective June 1, 2003.

6. The Division approves Schedule 1, a map; and Schedule 2, tract participation schedule for the Middle Kenai PA and West Foreland PA received December 31, 2003, effective June 1, 2003.

7. The Division amends the Trading Bay Unit lease agreements by deleting Paragraph 10 and eliminating the Minimum Royalty provision, effective June 1, 2003, for all of the Trading Bay Unit leases. Annual rental at the rate of $1.00 per acre or fraction of an acre will be due on the lease anniversary date each year. The first annual rental payment, prorated for the period from June 1, 2003 until the next anniversary date for each lease is due within 90 days of this decision. This amendment to the lease agreements will remain in effect after the Trading Bay Unit terminates or the leases contract out of the unit area.

8. Annual rental payments, at the rate of $1.00 per acre or fraction thereof, will be due on the Trading Bay Unit leases anniversary dates each year as specified in Paragraph 9 of the lease agreements.

9. The proposed plan of development satisfies the requirements of 11 AAC 83.301 and protects the public interest. The Division approves the 39th POD for the period August 27, 2003 through August 26, 2004. Under 11 AAC 83.343, the Thirtieth Plan of Development for the Trading Bay Unit will be due in this office on or before May 28, 2004, 90 days before the 39th POD expires. All specific field operations require separate approval under 11 AAC 83.346, Unit Plan of Operations.

A person affected by this decision may appeal it, in accordance with 11 AAC 02. Any appeal must be received within 20 calendar days after the date of "issuance" of this decision, as defined in 11 AAC 02.040 (c) and (d), and may be mailed or delivered to Thomas Irwin, Commissioner, Department of Natural Resources, 550 W. 7th Avenue, Suite 1400, Anchorage, Alaska 99501; faxed to 1-907-269-8918; or sent by electronic mail to dnr_appeals@dnr.state.ak.us. This decision takes effect immediately. If no appeal is filed by the appeal deadline, this decision becomes a final administrative order and decision of the department on the 31st day after issuance. An eligible person must first appeal this decision in accordance with 11 AAC 02 before appealing this decision to Superior Court. A copy of 11 AAC 02 may be obtained from any regional information office of the Department of Natural Resources.

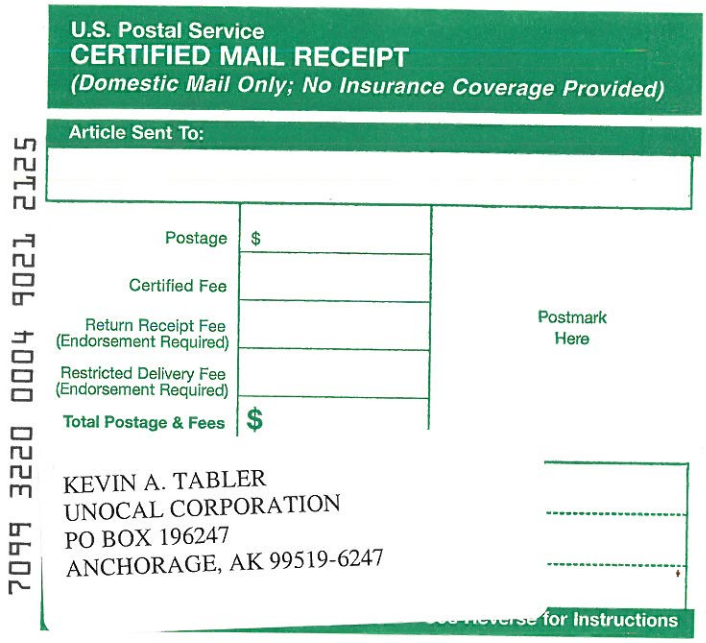
for Mark D. Myers
Division of Oil and Gas

6-25-03
Date

cc: Thomas E. Irwin, Commissioner DNR
Dan Seamount, Commissioner AOGCC
Jeff Landry, Department of Law

VI. ATTACHMENTS:

Generalized Cook Inlet Stratigraphic Column
Trading Bay unit Exhibit A
Trading bay Unit Exhibit B
Trading Bay Unit, Hemlock PA, Schedule 1, Map of Expanded PA
Trading Bay Unit, Hemlock PA, Schedule 2, Allocation Schedule
Trading Bay Unit, Grayling Gas Sands PA, Schedule 1, Map of Expanded PA
Trading Bay Unit, Grayling Gas Sands PA, Schedule 2, Allocation Schedule



Generalized Cook Inlet Stratigraphic Column
Displaying the Reservoirs of the McArthur River Field

Age	Formation	Reservoir	Formation Composition	Gross Reservoir Thickness	True Vertical Depth Sub-Sea (TVDss)*
Quat	Alluvium			'	'
Tertiary	Sterling Formation		Conglomerate/Sandstone/ Siltstone	'	'
	Beluga Formation		Conglomerate/Sandstone	'	'
	Tyonek Formation	Grayling Gas Sands	Sandstone/Siltstone/Coal	500'-600'	4,500'
		Middle Kenai G	Sandstone/Siltstone/Coal	600'	8,850'
	Hemlock Conglomerate	Hemlock	Sandstone/Conglomerate	600'-700'	9,350'
	West Foreland Formation	West Foreland	Volcaniclastic rocks/ Sandstone/Siltstone/Coal	500'-600'	9,650'
Cretaceous/ Jurassic	Undifferentiated		Undifferentiated Marine Sedimentary & Volcaniclastic Rocks		

* Based on the *Grayling #1A (API#* 507331004400*)* type log.

Cook Inlet
Trading Bay Unit
Exhibit A

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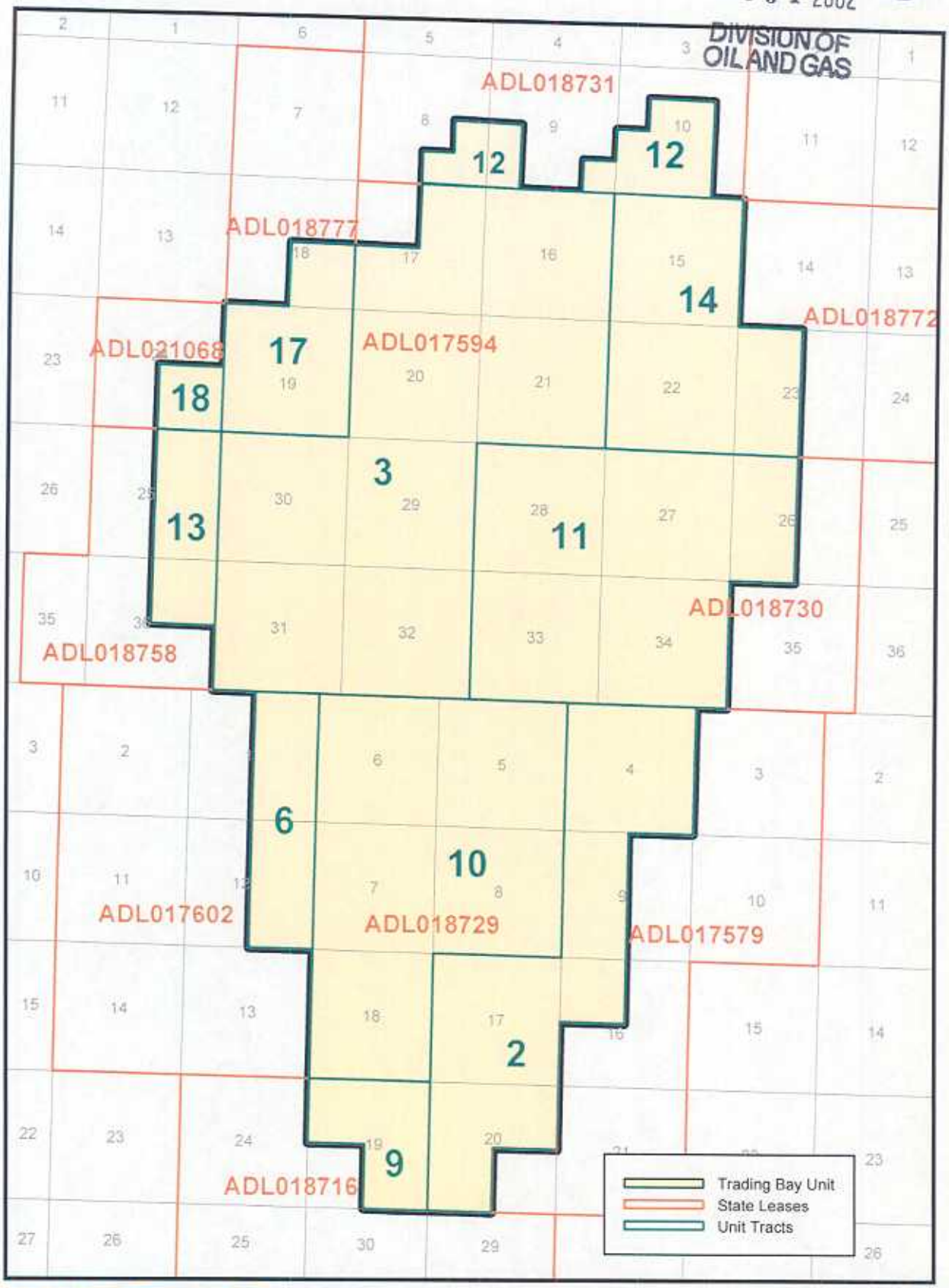

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EXHIBIT "B"
TRADING BAY UNIT EXPANSION
Effective January 1, 2002

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Tract Number	Legal Description	Acreage	Lease Number	Royalty Owner Percentage	Overriding Royalty Interest Owners	Formation	Working Interest Owners	Working Interest Percentage
2	T8N, R13W, SM, AK Section 04: All Section 09: W1/2 Section 16: NW1/4 Section 17: All Section 20: N1/2, SW1/4	2,240.00	ADL-17579	State of Alaska 12.5%	None	All Depth excluding the Grayling Gas Sands Formation	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%
						Grayling Gas Sands Formation	Union Oil Company of California	100.00%
3	T9N, R13W, SM, AK Section 16: All Section 17: S1/2, NE1/4 Section 20: All Section 21: All Section 29: All Section 30: All Section 31: All Section 32: All	4,956.00	ADL-17594	State of Alaska 12.5%	None	All Depth excluding the Grayling Gas Sands Formation	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%
						Grayling Gas Sands PA	Union Oil Company of California Marathon Oil Company	50.00% 50.00%
						Grayling Gas Sands Formation outside the PA	Union Oil Company of California Forest Oil Corporation	50.00% 50.00%
6	T8N, R14W, SM, AK Section 01: E1/2 Section 12: E1/2	640.00	ADL-17602	State of Alaska 12.5%	None	All Depth excluding the Grayling Gas Sands Formation	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%
						Grayling Gas Sands Formation	Union Oil Company of California	100%
9	T8N, R13W, S.M. Sec 19: N/2, SE/4	462.50	ADL-18716	State of Alaska 12.5%	Lloyd Powers 2.250% Raymond M. Thompson .375% Frank L. Shogrin .375%	All Depth excluding the Grayling Gas Sands Formation	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%
						Grayling Gas Sands Formation	Union Oil Company of California	100%

Tract Number	Legal Description	Acreage	Lease Number	Royalty Owner Percentage	Overriding Royalty Interest Owners	Formation	Working Interest Owners	Working Interest Percentage
10	T8N, R13W, S.M. AK Sec 5: All Sec 6: All Sec 7: All Sec 8: All Sec 18: All	3,085.00	ADL-18729	State of Alaska 12.5%	None	All Depth excluding the Grayling Gas Sands Formation	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%
						Grayling Gas Sands PA	Union Oil Company of California Marathon Oil Company	50.00% 50.00%
						Grayling Gas Sands Formation outside the PA	Union Oil Company of California Forest Oil Corporation	50.00% 50.00%
11	T9N, R13W, S.M. Sec 26: W1/2 Sec 27: All Sec 28: All Sec 33: All Sec 34: All	2,880.00	ADL-18730	State of Alaska 12.5%	None	All Depth excluding the Grayling Gas Sands Formation	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%
						Grayling Gas Sands PA	Union Oil Company of California Marathon Oil Company	50.00% 50.00%
						Grayling Gas Sands Formation outside the PA	Union Oil Company of California Forest Oil Corporation	50.00% 50.00%
12	T9N, R13W, SM, AK Section 08: S1/2SE1/4, NE1/4SE1/4 Section 09: SE1/4SE1/4, W1/2SW1/4 Section 10: SW1/4NE1/4, SE1/4NW1/4, SW1/4, W1/2SE1/4	560.00	ADL-18731	State of Alaska 12.5%	None	All Depth excluding the Grayling Gas Sands Formation	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%
						Grayling Gas Sands Formation	Union Oil Company of California Forest Oil Corporation	50.00% 50.00%
13	T9N, R14W, S.M. Sec 25: E1/2 Sec 36: NE1/4	480.00	ADL-18758	State of Alaska 12.5%	None	All Depth excluding the Grayling Gas Sands Formation	Union Oil Company of California Forest Oil Corporation	53.2% 46.80
						Grayling Gas Sands Formation	Union Oil Company of California	100.00%

Tract Number	Legal Description	Acreage	Lease Number	Royalty Owner Percentage	Overriding Royalty Interest Owners	Formation	Working Interest Owners	Working Interest Percentage
14	T9N, R13W, S.M. Sec 15: All Sec 22: All Sec 23: W1/2	1,600.00	ADL-18772	State of Alaska 12.5%	None	All Depth excluding the Grayling Gas Sands Formation	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%
						Grayling Gas Sands PA	Marathon Oil Company	100%
						Grayling Gas Sands Formation outside the PA	Union Oil Company of California	100%
17	T9N, R13W, S.M. Sec 18: SE1/4 Sec 19: All	796.00	ADL-18777	State of Alaska 12.5%	None	All Depth excluding the Grayling Gas Sands Formation	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%
						Grayling Gas Sands Formation	Union Oil Company of California Forest Oil Corporation	50.00% 50.00%
18	T9N, R14W, S.M. Sec 24: SE1/4	160.00	ADL-21068	State of Alaska 12.5%	None	All Depth excluding the Grayling Gas Sands Formation	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%
						Grayling Gas Sands Formation	Union Oil Company of California	100%

State Land: **17,859.50** Acres

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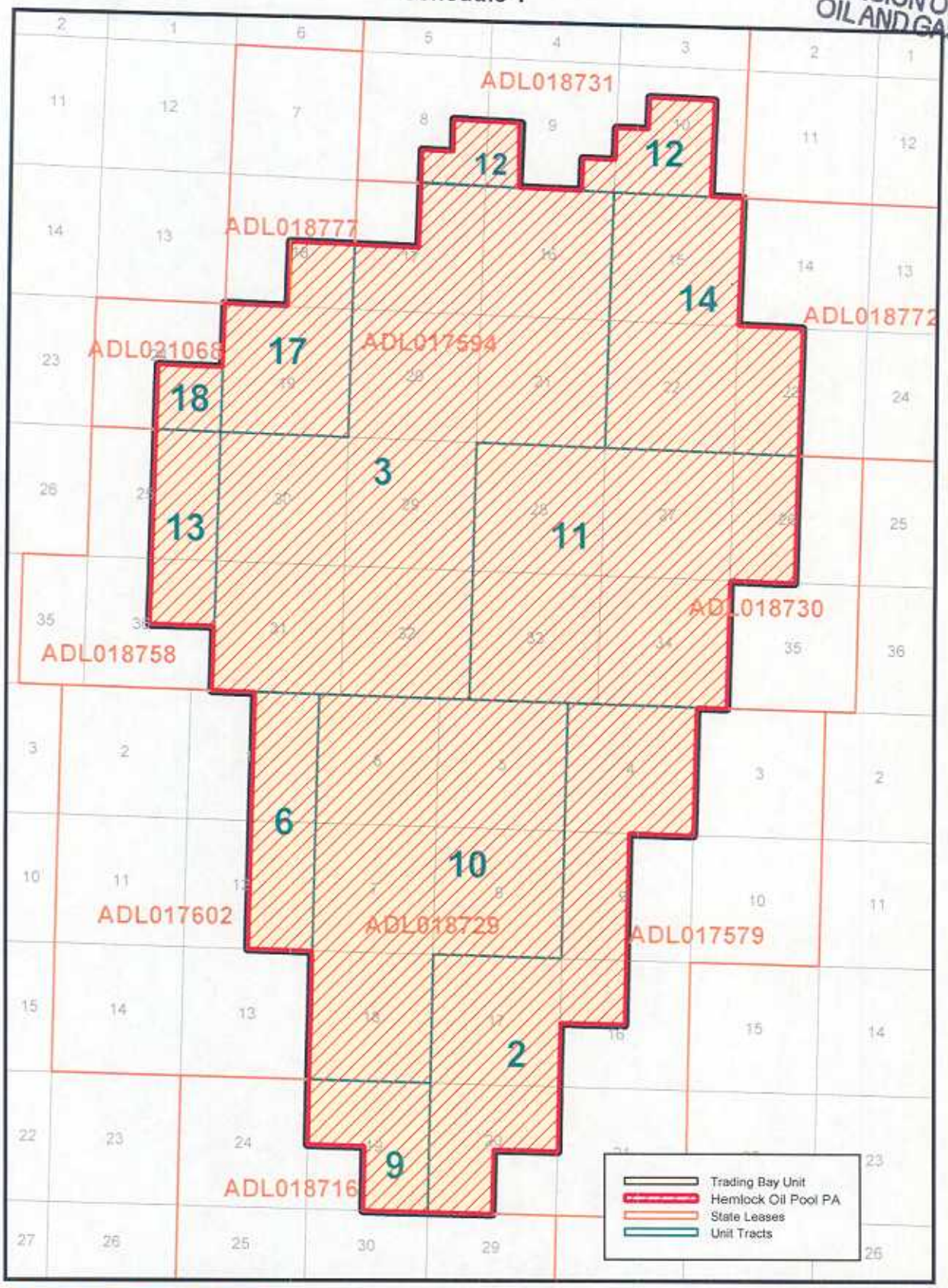
Cook Inlet
Trading Bay Unit
McArthur River Hemlock Oil Pool Participating Area
Schedule 1



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SCHEDULE 2
McARTHUR RIVER HEMLOCK OIL POOL PARTICIPATING AREA
TRADING BAY UNIT
Effective January 1, 2002

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Tract Number	Legal Description	Acreage	Lease Number	Tract Percentage	Royalty Owner Percentage	Overriding Royalty Interest Owners	Working Interest Owners	Working Interest Percentage
2	T8N, R13W, SM, AK Section 04: All Section 09: W1/2 Section 16: NW1/4 Section 17: All Section 20: N1/2, SW1/4	2,240.00	ADL-17579	12.54234%	State of Alaska 12.5%	None	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%
3	T9N, R13W, SM, AK Section 16: All Section 17: S1/2, NE1/4 Section 20: All Section 21: All Section 29: All Section 30: All Section 31: All Section 32: All	4,956.00	ADL-17594	27.74994%	State of Alaska 12.5%	None	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%
6	T8N, R14W, SM, AK Section 01: E1/2 Section 12: E1/2.	640.00	ADL-17602	3.58353%	State of Alaska 12.5%	None	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%

Tract Number	Legal Description	Acreage	Lease Number	Tract Percentage	Royalty Owner Percentage	Overriding Royalty Interest Owners	Working Interest Owners	Working Interest Percentage
9	T8N, R13W, S.M. Sec 19: N/2, SE/4	462.50	ADL-18716	2.58966%	State of Alaska 12.5%	Lloyd Powers 2.250% Raymond M. Thompson .375% Frank L. Shogin .375%	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%
10	T8N, R13W, S.M. AK Sec 5: All Sec 6: All Sec 7: All Sec 8: All Sec 18: All	3,085.00	ADL-18729	17.27372%	State of Alaska 12.5%	None	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%
11	T9N, R13W, S.M. Sec 26: W1/2 Sec 27: All Sec 28: All Sec 33: All Sec 34: All	2,880.00	ADL-18730	16.12587%	State of Alaska 12.5%	None	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%
12	T9N, R13W, SM, AK Section 08: S1/2SE1/4, NE1/4SE1/4 Section 09: SE1/4SE1/4, W1/2SW1/4 Section 10: SW1/4NE1/4, SE1/4NW1/4, SW1/4, W1/2SE1/4	560.00	ADL-18731	3.13559%	State of Alaska 12.5%	None	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%

Tract Number	Legal Description	Acreage	Lease Number	Tract Percentage	Royalty Owner Percentage	Overriding Royalty Interest Owners	Working Interest Owners	Working Interest Percentage
13	T9N, R14W, S.M. Sec 25: E1/2 Sec 36: NE1/4	480.00	ADL-18758	2.68765%	State of Alaska 12.5%	None	Union Oil Company of California Forest Oil Corporation	53.2% 46.80
14	T9N, R13W, S.M. Sec 15: All Sec 22: All Sec 23: W1/2	1,600.00	ADL-18772	8.95882%	State of Alaska 12.5%	None	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%
17	T9N, R13W, S.M. Sec 18: SE1/4 Sec 19: All	796.00	ADL-18777	4.45701%	State of Alaska 12.5%	None	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%
18	T9N, R14W, S.M. Sec 24: SE1/4	160.00	ADL-21068	0.89588%	State of Alaska 12.5%	None	Union Oil Company of California Forest Oil Corporation	53.20% 46.80%
			Total Allocation:	100.00000%				

State Land: **17,859.50** Acres

Total acreage in Participating Area: **17,859.50** Acres

Cook Inlet
Trading Bay Unit
Grayling Gas Sands Participating Area
Schedule 1

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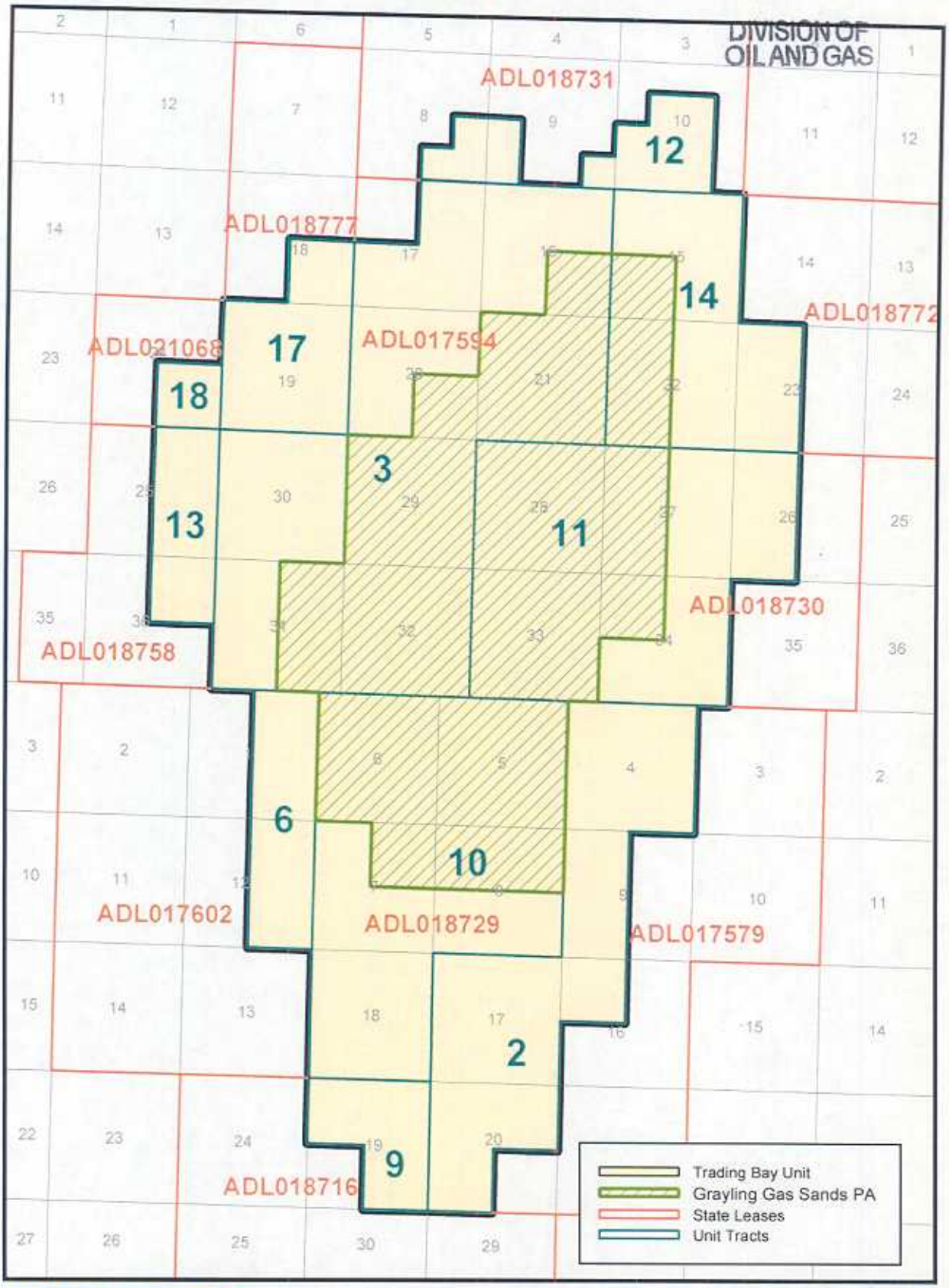

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SCHEDULE 2
GRAYING GAS SANDS PARTICIPATING AREA
TRADING BAY UNIT
Effective January 1, 2002

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Tract Number	Legal Description	Acreage	Lease Number	Tract Percentage	Royalty Owner Percentage	Overriding Royalty Interest Owners	Working Interest Owners	Working Interest Percentage
3	T9N, R13W, SM, AK Section 16: SE1/4 Section 20: SE1/4 Section 21: All Section 29: All Section 31: E1/2 Section 32: All	2,560.00	ADL-17594	39.26380%	State of Alaska 12.5%	None	Union Oil Company of California Marathon Oil Company	50.00% 50.00%
10	T8N, R13W, S.M. AK Section 5: All Section 6: All Section 7: NE1/4 Section 8: N1/2	1,720.00	ADL-18729	26.38037%	State of Alaska 12.5%	None	Union Oil Company of California Marathon Oil Company	50.00% 50.00%
11	T9N, R13W, S.M. Section 27: W1/2 Section 28: All Section 33: All Section 34: NW1/4	1,760.00	ADL-18730	26.99387%	State of Alaska 12.5%	None	Union Oil Company of California Marathon Oil Company	50.00% 50.00%
14	T9N, R13W, S.M. Sec 15: SW1/4 Sec 22: W1/2	480.00	ADL-18772	7.36196%	State of Alaska 12.5%	None	Marathon Oil Company	100%
			Total Allocation:	100.00000%				

State Land: **6,520.00** Acres
Total acreage in Participating Area: **6,520.00** Acres

Working Interest Ownership particpation is based on the terms of the Unit Operating Agreement as follows:
Union Oil Company of California 48.80%
Marathon Oil Company 51.20%

Revised October 15, 2002