

Findings and Decision of the Director  
of the Division of Oil and Gas

APPROVING THE FORMATION OF THE  
HAPPY VALLEY PARTICIPATING AREA  
WITHIN THE DEEP CREEK UNIT

Under a Delegation of Authority  
from the Commissioner of the State Of Alaska  
Department of Natural Resources

November 4, 2004

## TABLE OF CONTENTS

<b>I.</b>	<b>APPLICATION FOR THE FORMATION OF THE HAPPY VALLEY PARTICIPATING AREA .....</b>	<b>1</b>
<b>II.</b>	<b>ANALYSIS OF THE APPLICATION FOR THE FORMATION OF THE HAPPY VALLEY PA.....</b>	<b>2</b>
1.	PRIOR EXPLORATION AND DEVELOPMENT ACTIVITIES AND THE GEOLOGICAL AND ENGINEERING CHARACTERISTICS OF THE RESERVOIR .....	2
2.	THE APPLICANT'S PLAN OF DEVELOPMENT FOR THE DEEP CREEK UNIT .....	6
3.	THE ECONOMIC COSTS AND BENEFITS TO THE STATE.....	6
4.	THE ENVIRONMENTAL COSTS AND BENEFITS .....	7
5.	OTHER RELEVANT FACTORS.....	8
<b>III.</b>	<b>FINDINGS.....</b>	<b>8</b>
1.	PROMOTE THE CONSERVATION OF ALL NATURAL RESOURCES .....	8
2.	PROMOTE THE PREVENTION OF ECONOMIC AND PHYSICAL WASTE.....	9
3.	PROVIDE FOR THE PROTECTION OF ALL PARTIES OF INTEREST, INCLUDING THE STATE .....	9
<b>IV.</b>	<b>DECISION.....</b>	<b>10</b>
<i>Attachment 1.</i>	<i>Exhibit A, Unit Tract Description and Ownership Schedule</i>	
<i>Attachment 2.</i>	<i>Exhibit B, Map of the Deep Creek Unit Boundary</i>	
<i>Attachment 3.</i>	<i>Exhibit C, Happy Valley PA Production Allocation Schedule</i>	
<i>Attachment 4.</i>	<i>Exhibit D, Map of the Happy Valley PA</i>	
<i>Attachment 5.</i>	<i>Exhibit E, Happy Valley PA Expense Allocation Schedule</i>	
<i>Attachment 6.</i>	<i>Exhibit F, Deep Creek Unit Expense Allocation Schedule</i>	
<i>Attachment 7.</i>	<i>Exhibit G, Deep Creek Unit First Plan of Development</i>	

## **I. Application for the Formation of the Happy Valley Participating Area**

The Deep Creek Unit is located on the Kenai Peninsula, approximately five miles inland from the nearest communities of Ninilchik and Happy Valley. The State of Alaska, Department of Natural Resources, Division of Oil and Gas (the State, the DNR, or the Division, as appropriate) and Cook Inlet Region Inc. (CIRI) approved the formation of the Deep Creek Unit and the initial plan of exploration effective December 31, 2001. The unit area encompasses 22,656.90 acres. Approximately 40.37% of the unit area, lies within three State leases and 59.45% of the unit area, lies within five CIRI leases. The remaining .18% of the Deep Creek Unit (39.99 acres) is unleased federal acreage managed by the Bureau of Land Management (BLM). The State and CIRI jointly administer the Deep Creek Unit Agreement (the Agreement).

On September 1, 2004, Union Oil Company of California (Unocal), the Deep Creek Unit Operator, applied to form the Happy Valley Participating Area (Happy Valley PA) within the unit area. Unocal submitted the Deep Creek Unit Happy Valley PA Application (the Application) in accordance with 11 AAC 83.351 and Article 9 of the Deep Creek Unit Agreement (the Agreement).

The Application included the following exhibits to the Unit Agreement: Exhibit A, a schedule describing the Deep Creek Unit; Exhibit B, a map of the Deep Creek Unit; Exhibit C, a schedule allocating unitized substances within the Happy Valley PA; Exhibit D, a map of the Happy Valley PA; Exhibit E, Happy Valley Allocation of Participating Area Expense; Exhibit F, Allocation of Unit Expense; and Exhibit G, First Unit Plan of Development and Operations (First POD). On September 23, 2004, the Division received a revised First POD that addressed exploration within the unit area and outside of the proposed Happy Valley PA.

Unocal originally proposed that the Happy Valley PA include portions of four leases encompassing a total of 1,410 acres. Unocal corrected the legal descriptions and submitted revised Exhibits A and F on September 10, 2004, and revised Exhibits C and E on September 16, 2004. Unocal reduced the area proposed for inclusion in the Happy Valley PA and submitted revised Exhibits C, D, and E on October 12, 2004. On November 2, 2004, the Division received final version of Exhibits C and E with corrected legal descriptions, tract acreages, and allocation percentages. The final versions of Exhibits A, B, C, D, E, F, and G are Attachments 1 through 7 to this Findings and Decision, respectively. Unocal also provided geological, geophysical, and well data to support the Application.

The proposed Happy Valley PA contains a portion of one State lease, ADL 384380, and portions of three CIRI leases in the north half of the Deep Creek Unit. DNR issued oil and gas lease ADL 384380 following Cook Inlet Sale 78 held on October 31, 1994, on State lease form DOG 9208. With an effective date of January 1, 1995, the seven-year primary term of ADL 384380 expired on December 31, 2001. A portion of ADL 384380 was committed to the Deep Creek Unit as Tract 2, effective December 31, 2001. The lease was severed, the non-unitized portion of the lease expired, and the unitized portion is extended indefinitely by the Agreement. Unocal proposed including portions of the following three CIRI leases in the Happy Valley PA: C-061588 (Tract 3); C-061589 (Tract 4); and C-061590 (Tract 5). The primary terms of the all three of these leases expired on December 17, 2003, but the lease terms were extended

indefinitely by commitment to the Deep Creek Unit, effective December 31, 2001. Unocal is the only working interest owner in the Deep Creek Unit and the Happy Valley PA. ConocoPhillips Alaska, Inc has 1.5% overriding royalty interest in Happy Valley PA and CIRC Production Company has a 3.5% overriding royalty interest in the State lease.

The proposed Happy Valley PA encompasses approximately 1,239.99 acres, including 145.84 acres within the State lease and 1,094.15 acres within the three CIRC leases. Production from the Happy Valley PA will be allocated to the individual leases based on their surface acreage within the participating area as a percentage of the total acreage in the Happy Valley PA. Therefore, 11.76% of the production from the Happy Valley PA will be allocated to the State lease and 88.24% to the CIRC leases. The State retains a 12.5% royalty on production from the State lease while the three CIRC leases specify an 18% royalty rate. The Division's evaluation of the Application is set out in this Findings and Decision.

## **II. Analysis of the Application for the Formation of the Happy Valley PA**

The Commissioner of DNR (the Commissioner) reviews unit-related applications, including unit expansions and the formation of participating areas, under AS 38.05.180(p) and 11 AAC 83.301—11 AAC 83.395. The State statute and DNR regulations set out the standards and criteria for formation of a participating area. The Commissioner or his designee<sup>1</sup> may approve the formation of a participating area if he determines it is necessary or advisable in the public interest<sup>2</sup>. This Finding and Decision evaluates the Application based on the six factors set out in 11 AAC 83.303 (b).

### **1. Prior Exploration and Development Activities and the Geological and Engineering Characteristics of the Reservoir**

A participating area 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.”<sup>3</sup>

The Division received the following technical data in support of the Application: a history of oil and gas exploration in the area; a description of the stratigraphy, structure, trapping mechanisms and hydrocarbon generation; a stratigraphic column for Cook Inlet; seven depth structure maps of

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<sup>1</sup> 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.

<sup>2</sup> The proposed unit action must be necessary or advisable in the public interest: “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).

<sup>3</sup> 11 AAC 83.351(a). Paying Quantities is defined in 11 AAC 83.395(4) and in the Agreement. The exact wording of the two definitions differ slightly, but they are essentially the same. In Article 1.14 of the Agreement: “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 considered 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.



Tyonek and Beluga horizons; a seismic coverage map of the north half of the Deep Creek Unit; four interpreted seismic lines; and four structural well cross sections. The Division will hold these data confidential under AS 38.05.035(a)(9)(C) and 11 AAC 96.220.

The Deep Creek anticline is the main feature in the Deep Creek Unit area, and a structural saddle separates it from the Happy Valley anticline. The Happy Valley reservoir consists of Tertiary (Kenai Group) Tyonek and Beluga formation sandstones and interbedded coals. The reservoir is defined by a four-way dip closure along a northeast-southwest trending anticline, with possible fault containment on the east.

In 1958, Standard Oil of California (SOCAL) drilled the first well drilled to test the Deep Creek anticlinal trend, the SOCAL Deep Creek 1 well (SDC 1). SOCAL's primary exploration objective was oil in the Hemlock Formation, with gas in the Tyonek Formation as a secondary target. Subsequent to logging the initial borehole, problems forced the operator to re-drill the hole before testing the Hemlock Formation (SDC 1-RD). SOCAL completed two drill stem tests (DSTs), one in the Tyonek Formation and one in the Hemlock Formation that showed minor indications of gas. SOCAL plugged and abandoned the SDC 1-RD as a dry hole.

In 1963, Superior Oil Company drilled the Happy Valley Unit #31-22 well (HVV 31-22) approximately one mile south of SDC 1-RD and within the proposed Happy Valley PA. Superior did not perform any reservoir tests on HVV 31-22 before plugging and abandoning it as a dry hole.

The State and CIRI approved Unocal's application to form the Deep Creek Unit effective December 31, 2001. The initial Plan of Exploration contained a commitment to drill one exploratory well in the first year, and if successful, Unocal was prepared to drill a second well in the unit area. The State and federal agencies approved the necessary permits to spud the first well prior to formation of the Deep Creek Unit, and Unocal drilled the NNA #1 well as a straight hole on CIRI acreage north of the SDC 1-RD. Unocal completed NNA #1 on January 27, 2002, and tested several intervals which were wet or tight.

Subsequent to drilling the NNA #1 well, Unocal constructed a gravel pad nearly two miles south of the first well location and drilled the Happy Valley #1 well (HV-1) to a bottom-hole location about a mile west of the pad. HV-1 produced gas from two Lower Tyonek intervals at test rates of 4.1 million cubic feet per day (MMCFPD) at 1,122 pounds per square inch gage fluid tubing pressure (psig FTP). Encouraged by the success of the HV-1 well, Unocal continued to drill delineation wells in 2003 and 2004.

Unocal drilled six more wells in the Deep Creek Unit and converted NNA #1 to a disposal well prior to submitting the Application. Unocal tested the HV-1 and HV-2 wells in the Tyonek formation and the HV-8 well in both the Tyonek and Beluga formations. No test rate was established for HV-3, HV-4, HV-6, or HV-7. Unocal drilled the HV-5 well to the target objective, but it was unproductive. The well information is summarized in Table 1 below.

**Table 1. Wells Drilled by Unocal in the Deep Creek Unit**

Well	MD	TVD	Rate	Pressure	Formation	Location	API Number
NNA #1	10,590'	10,590'			Tyonek	11-T2S-R13W SM	501332050700
HV-1	1,872'	9,700'	4.1	1,122	Tyonek	21-T2S-R13W SM	502312001300
HV-2	10,225'	9,812'	2.6	695	Tyonek	22-T2S-R13W SM	502312001400
HV-3	11,345'	10,772'				22-T2S-R13W SM	502312001600
HV-4	10,625'	10,515'				22-T2S-R13W SM	502312001700
HV-5	n/a	n/a				14-T2S-R13W SM	502312001800
HV-6	11,798'	10,400'				28-T2S-R13W SM	502312001900
HV-7	9,118'	7,140'				15-T2S-R13W SM	502312002200
HV-8	8,900	6,734'	.6 1.2	902 865	Tyonek Beluga	21-T2S-R13W SM	502312002300

MD: Measured Depth

TVD: Total Vertical Depth

Rate: Million Cubic Feet Per Day (MMCFPD)

Pressure: Fluid Tubing Pressure per Square Inch Gage (psig FTP)

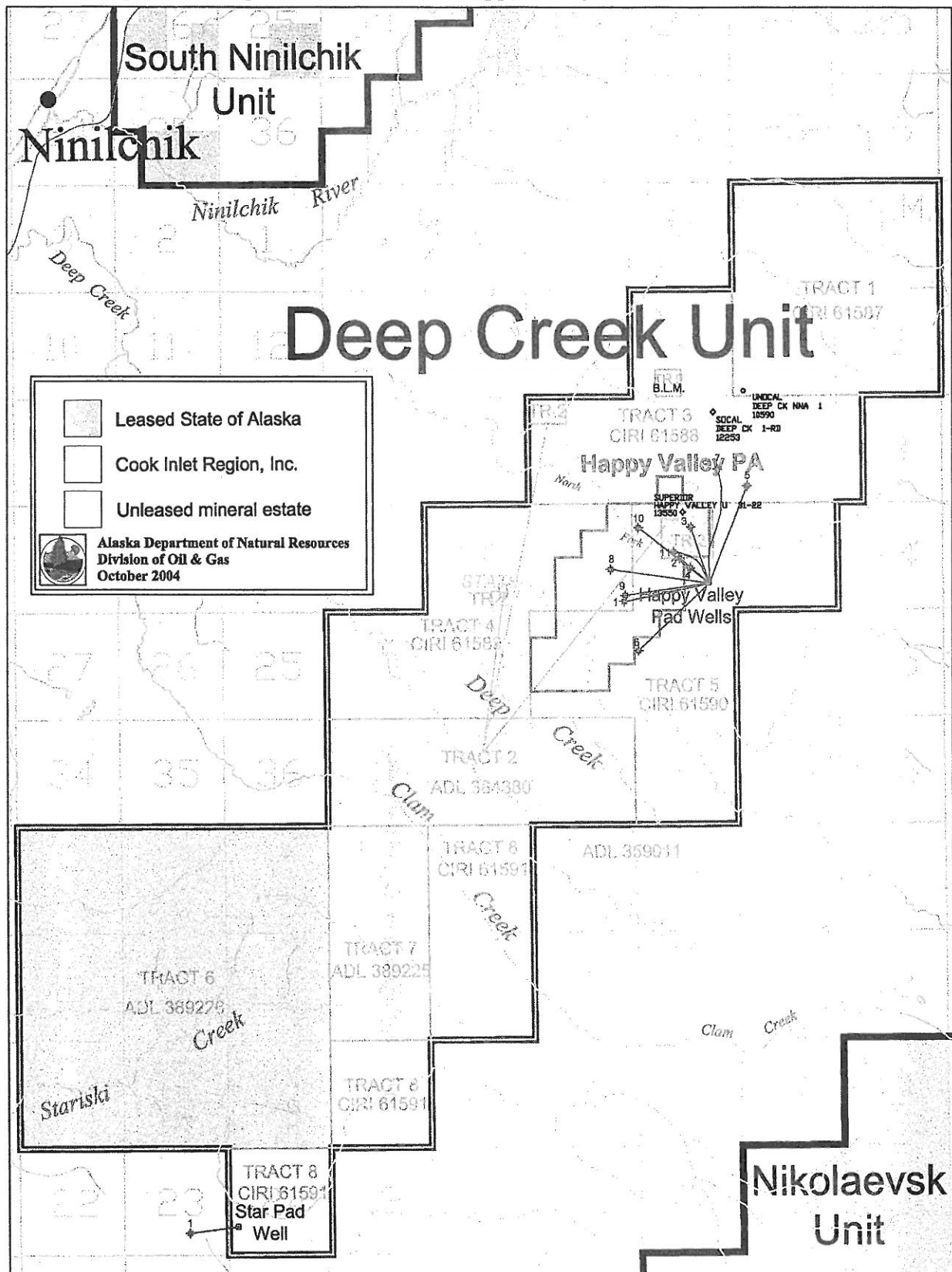
Unocal also committed to acquire new proprietary 2D and/or 3D seismic data within the proposed unit area to enable mapping of the adjacent structures during the second year of the Initial POE. Failure to acquire the seismic data as specified would have resulted in contraction of the unit area to exclude the two southern State leases (Tracts 6 and 7). Unocal fulfilled the commitment by acquiring 105 line miles of 2D seismic over the Deep Creek Unit area.

The Happy Valley PA is stratigraphically limited to the Beluga and Tyonek Formation Sands from -1,547 feet True Vertical Depth Sub Sea (TVDSS) (2,176 feet Measured Depth) in the Happy Valley Unit No. 31-22 well to -9,368 feet TVDSS (10,678 feet Measured Depth) in the HV-3 well. Unocal mapped the depth of the lowest known gas for each producible interval based on seismic and well control and overlaid them on an aliquot part map grid to determine the Happy Valley PA boundary, which is based on 40-acre aliquot parts as defined by 11 AAC 88.185(11).<sup>4</sup> The unit boundary, the Happy Valley PA boundary, and well locations are depicted on Figure 1 below.

The well and geophysical data provided in support of the Application, and otherwise available to DNR, indicate that the land proposed for inclusion in the Happy Valley PA is capable of producing or contributing to production of Unitized Substances in Paying Quantities from the Happy Valley Reservoir. The Applicants' prior exploration activities and the geological and engineering characteristics of the Happy Valley PA support approval of the Application under 11 AAC 83.303(b)(2) and (3).

<sup>4</sup> 11 AAC 88.185(11) "legal subdivision" means an aliquot part of a section of land according to the public land rectangular survey system, not smaller than one-quarter of one-quarter of one section of land, containing approximately 40 acres; where a section of land contains section lots, "legal subdivision" also means those section lots; "legal subdivision" also means a protracted legal subdivision according to any protracted public land rectangular survey prepared by the division or Bureau of Land Management of the Department of the Interior, and made available to prospective applicants for leases;

Figure 1, Map of the Deep Creek Unit and the Happy Valley PA



## 2. The Applicant's Plan of Development for the Deep Creek Unit

Unocal proposed a one-year term for the First POD, September 1, 2004 to August 31, 2005, which supersedes the last quarter of the current Deep Creek Unit Plan of Exploration. The First POD includes plans to develop the reserves underlying the Happy Valley PA and plans to explore the unit area outside of the participating area. Unocal will complete construction of gas handling facilities on the Happy Valley pad and gathering lines that will connect it to the Kenai Peninsula pipeline network. Sustained production from the Happy Valley PA is scheduled for November 2004. Unocal plans to commingle production from multiple zones in the Tyonek and Beluga sandstones, process the hydrocarbon stream in the gas processing facility located on the Happy Valley pad, and ship pipeline quality gas through the pipeline that connects the Deep Creek Unit to the Kenai-Kachemak Pipeline.

Unocal's First POD also includes plans to drill two or more additional development wells in the Deep Creek Unit from the Happy Valley pad. Unocal has approved permits and is currently drilling HV-9 and HV-10. Unocal may establish another pad to develop the reserves in the western portion of the Happy Valley PA. Primary gas treatment facilities may be located on the second development pad and a gathering line installed to ship the gas to the Happy Valley pad where it will be processed for sale.

Exploration activities outside of the Happy Valley PA include both exploration drilling and seismic evaluation. Unocal installed the Star pad in the southern end of the Deep Creek Unit in 2004, and drilled the Star #1 well, which bottom-holed outside of the unit area. A flow test of the Star #1 well produced gas from the Tyonek formation at a rate of 0.5 MMCFPD at 413 psig FTP. Unocal plans to recompleat and test uphole zones in the Star #1 well during the term of the First POD. Further delineation of this southern accumulation may justify forming another participating area and expanding the unit area.

During the term of the First POD, Unocal will process and evaluate the seismic data acquired over the Deep Creek Unit area, which should improve Unocal's understanding of the underlying hydrocarbon accumulations.

The Application, along with the First POD, contains sufficient plans and commitments to explore and develop the Deep Creek Unit to support forming the Happy Valley PA. It protects the interests of the public, CIRI, and the State by committing the Applicants to drill delineation and production wells in the Happy Valley Reservoir, and to explore additional prospects outside of the participating area. Therefore, Unocal's plans for development of the Happy Valley Reservoir and exploration of the unit area support approval of the Application under the section .303(b)(4) criteria.

## 3. The Economic Costs and Benefits to the State

Approval of the proposed Happy Valley PA and the First POD will result in both short-term and long-term economic benefits to the State. Happy Valley PA production will generate construction jobs in the short-term and some long-term employment in the Kenai Peninsula Borough. The long-term goal is to maximize the physical and economic recovery of



hydrocarbons from the Happy Valley PA. Development and production from the Happy Valley PA will provide royalty and tax revenues to the State over the life of the field. The lessees may reinvest revenues in new exploration and development in the State. Additionally, the Happy Valley PA will deliver new natural gas supplies and help stabilize the local and regional economy. Royalty, tax, and employment benefits derived from production and economic development will far exceed any additional administrative burdens associated with permitting Happy Valley PA facilities, administering the unit leases or collecting royalties on production.

In summary, the economic benefits outweigh the costs. The working interest owners made meaningful commitments to explore and develop the unit area and the State will receive taxes, royalties, and increased economic activity. Moreover, the discovery of additional gas reserves in Cook Inlet may help to maintain stable, low cost energy supplies for the surrounding area. Therefore, DNR's evaluation of the section .303(b)(5) economic criteria supports approval of the Application.

#### 4. The Environmental Costs and Benefits

Approval of the Happy Valley PA in itself has no environmental impact. Formation of the Happy Valley PA is an administrative action and does not authorize any on-the-ground activity. State and federal agencies will analyze the potential effects on the environment when they review applications for permits to conduct exploration and development in the unit area.

Unitization allows the unit operator to explore and develop the resources under a single unit plan rather than on a lease-by-lease basis. The unit operator will consolidate facilities and space gas wells as close together as possible to minimize environmental impacts of development. Future exploration and development will also utilize existing logging roads. Additionally, Unocal expects to develop this proposed participating area in concert with unitized exploration and development of other known and potential natural gas resources on the Kenai Peninsula via a common carrier pipeline, which will allow for further consolidation of facilities and pipelines.

Article 8.2 of the Agreement requires that a Unit Plan of Operations must be consistent with the leases, mitigation measures, and lessee advisories developed by DNR for the State's most recent Cook Inlet Areawide lease sale. Cook Inlet 2004 Areawide Mitigation Measures were developed specifically for this region and include habitat and wildlife protection such as stream and waterbody setbacks and seasonal use restrictions to protect sensitive birds and animals. Unitization does not waive or reduce the effectiveness of the mitigating measures that condition the lessee's right to conduct operations on these leases. Exploration and development within the Deep Creek Unit is subject to these provisions, if proposed operations involve State surface or subsurface. When the unit operator submits a Unit Plan of Operations for approval, the Division will apply the current mitigation measures uniformly across the unit, ensuring environmental protections that might not otherwise occur on private lands. However, for operations solely on CIRI lands, the Division does not have the authority to approve a plan of operations or impose the State's mitigation measures.

The Deep Creek Unit is within the Alaska Coastal Zone, and therefore it is subject to the Alaska Coastal Management Program (ACMP), whether the activity is on State or CIRI land. The

appropriate federal, State, and local agencies must determine if the Unit Operator's exploration or development plan is consistent with ACMP, and the lessees may not commence drilling or development operations until all agencies have granted the required permits.

Unocal will develop the Happy Valley PA from a gravel pad and an existing road on private surface lands. The Unit Operator designed the Happy Valley pad to minimize impacts to the surrounding natural environment, specifically wetlands and riparian habitat, and no wetlands fill or fish stream permits were necessary. Unocal acquired the necessary air emission and drilling waste disposal permits.

The benefits of consolidated exploration and development, application of the State's Areawide mitigation measures, and the use of existing roads, balance the potential costs to the surrounding environment. Forming the Happy Valley PA minimizes the environmental impacts and costs of exploration and development of the unit area supports approval of the Application under the section .303(b)(1) criteria.

#### 5. Other Relevant Factors

The Agreement requires joint approval of the Application by the DNR and CIRC because the Happy Valley Reservoir lies within both State and CIRC leases. The Happy Valley PA will be the first participating area jointly managed by the DNR and CIRC. Unocal constructed the Happy Valley pad on CIRC acreage and directionally drilled to the adjacent State lease. The Division and CIRC agreed to Unocal's proposal to allocate production from the Happy Valley PA based on surface acreage. With joint management of the Happy Valley PA, the State and CIRC will review Unocal's plans to delineate and develop the reservoir. The Deep Creek Unit Plans of Development must be consistent with State regulations and include plans to explore the area outside of the Happy Valley PA. Although the majority of production from the Happy Valley PA will be allocated to the CIRC leases, the Division will have an equal say in the approval of those plans.

Reaching agreement on an acceptable development plan and an equitable allocation of production required the cooperation of all parties. Joint management of the Deep Creek Unit and the Happy Valley PA provides for development of State and private lands under a unified plan that reduces environmental impacts, conserves resources, and protects the interests of all parties. Joint management of the Happy Valley PA supports approval of the Application under 11 AAC 83.303(b)(6).

### III. Findings

#### 1. Promote the Conservation of all Natural Resources

The Happy Valley PA will promote the conservation of both surface and subsurface resources through unitized (rather than lease-by-lease) development. Approval of the Application will reduce both the number of facilities required to explore for and develop reserves and the aerial extent or the footprint required to accommodate those facilities.

The formation of oil and gas units, as well as the formation of participating areas within units, generally conserves hydrocarbons. Formation of the Happy Valley PA will provide for efficient, integrated development of the Tyonek and Beluga reservoirs within the Deep Creek Unit. A comprehensive operating agreement and plan of development governing the area will help avoid duplicative development efforts on and beneath the surface.

There will be environmental impacts associated with reservoir development. However, all unit development must proceed according to an approved plan of development. Additionally, before undertaking any specific operations on State land, the Division must approve a Unit Plan of Operations. DNR may condition its approval of a Unit Plan of Operations and other permits on performance of the mitigation measures developed for the most recent Cook Inlet Areawide lease sale in addition to those in the leases. Compliance with mitigation measures will minimize, reduce or avoid adverse environmental impacts.

Creating the Happy Valley PA will help maximize oil and gas recovery, while minimizing negative impacts on other natural resources. This reduction in environmental impacts and conservation of hydrocarbon resources is in the public interest.

## 2. Promote the Prevention of Economic and Physical Waste

Forming a participating area 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. Marginally economic reserves, which otherwise would not be produced on a lease-by-lease basis, can be produced from the Happy Valley PA in combination with more productive leases. Facility consolidation lowers capital costs and promotes optimal reservoir management. Pressure maintenance and secondary recovery procedures are easier to design and achieve through joint, unitized efforts than would otherwise be possible. In combination, these factors allow the unit operator to develop and produce less profitable areas of a reservoir in the interest of all parties, including the State.

Reducing costs and environmental impacts through unitized operations will expedite development of reserves and will promote greater ultimate recovery of oil and gas from the unit area. This may increase and extend the State's income stream from production taxes and royalties.

Formation of the Happy Valley PA will facilitate the equitable division of costs and allocation of the hydrocarbon shares, and provide for a diligent development plan that helps to maximize hydrocarbon recovery from the reservoir. Further, the formation of a participating area, which enables commingled production, facility sharing opportunities, and adoption of a unified reservoir management strategy, may allow for the development of economically marginal hydrocarbon accumulations.

## 3. Provide for the Protection of all Parties of Interest, Including the State

Because hydrocarbon recovery will more likely be maximized under a unified plan, the Happy Valley PA protects the economic interests of the State, CIRI, and the overriding royalty interest owners. Formation of the Happy Valley PA advances the efficient evaluation and development



of the hydrocarbon resources while minimizing impacts to the area's cultural, biological, and environmental resources.

Formation of the Happy Valley PA protects the economic interests of the working interest owners and royalty owners of a common reservoir. The approved production allocation schedule ensures an equitable allocation of revenue to the lessors commensurate with the value of their leases.

The Happy Valley PA will not diminish access to public and navigable waters beyond those limitations imposed by law or already contained in the oil and gas leases covered by the Agreement.

The Agreement provides for future expansions and contractions of the participating area, as warranted by data obtained by exploration or otherwise. The Happy Valley PA and the Agreement thereby protect the public interest, the rights of the parties, and the correlative rights of adjacent landowners.

#### **IV. Decision**

The Division reviewed the statutes, oil and gas unitization regulations, the Deep Creek Unit Agreement, and materials supplied by Unocal in support of the Application. I find that formation of the Happy Valley PA within the Deep Creek Unit will promote the conservation of all natural resources, promote the prevention of economic and physical waste, and provide for the protection of all parties in interest including the State, as discussed above. The Application adequately and equitably protects the public interest, is in the State's best interest, and it meets the requirements of AS 38.05.180(p) and 11 AAC 83.303. Therefore, I approve the Application under 11 AAC 83.351(b).

Unocal requested that approval of the Happy Valley PA be effective September 1, 2004, which is consistent with the proposed term of the First POD. "The Proper Authority will establish the effective date of the initial Participating Area. That effective date shall be no later than the date of the first Sustained Unit Production."<sup>5</sup> Subject to concurrent approval by CIRI, the effective date of the Happy Valley PA will be September 1, 2004, and Unocal may commence production.

The Happy Valley PA is limited to the 1,239.99 acres described in Exhibit C and depicted in Exhibit D. The Happy Valley PA encompasses approximately 5.5% of the Deep Creek Unit, including a portion of one State lease, and portions of three CIRI leases. The Happy Valley PA encompasses all unitized substances in the Beluga and Tyonek Formation Sands from -1,547 feet TVDSS to -9,368 feet TVDSS within the boundary of the approved participating area. DNR accepts Exhibits A, B, C, D, E, F, and G to be true and correct as submitted; those exhibits are attached hereto as Attachments 1 through 7, respectively.

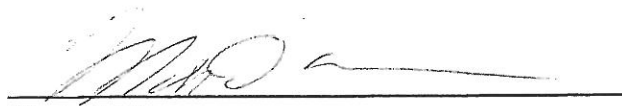
I approve the allocations of production and costs for the tracts within the Happy Valley PA shown on Exhibits C and E dated November 1, 2004. DNR assigned Accounting Code "DCHV" to the Happy Valley PA for royalty accounting purposes, which Unocal shall reference on monthly operator and royalty reports.

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<sup>5</sup> Article 9.5 of the Agreement

I approve the First POD set forth in Exhibit G for the period from September 1, 2004 through August 31, 2005. In accordance with Article 8.1.1 of the Agreement and State regulation 11 AAC 83.343, the unit operator must submit a Second Plan of Development (Second POD) to the Commissioner and the President at least 90 days before the First POD expires, by June 2, 2005. Before submitting its proposed Second POD, Unocal shall schedule a meeting with the Division and CIRI to present its current interpretation of the reservoirs underlying the Deep Creek Unit.

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 E. 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](mailto: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 31<sup>st</sup> 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.

  
Mark D Myers  
Division of Oil and Gas

11-04-04  
Date

cc: Thomas E. Irwin, DNR Commissioner  
Kirk McGee, CIRI  
John Norman, Chairman AOGCC  
Jeff Landry, Assistant Attorney General

Attachments:

- Attachment 1. Exhibit A, Unit Tract Description and Ownership Schedule
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# HVPA Decision Attachment 1

## Deep Creek Unit Exhibit A

Tract	Tract Legal Description	Tract Acreage	Lease #	Mineral Owner	Mineral Interest	Royalty Percent	ORRI Owner	ORRI Percent	Working Interest Ownership	Working Interest Owner %	
01	Township 2 South, Range 13 West, Seward Meridian, Alaska  Sec. 1: All, 647.08 acres; Sec. 2: All, 642.88 acres; Sec. 11: All, 640 acres; Sec. 12: All, 640 acres;	2,569.96	UOC # CIRI #	1029392 C-061587	Cook Inlet Region, Inc.	100.00%	18.00%	ConocoPhillips Alaska, Inc.	1.50%	Union Oil Company of California	100.00%
02	Township 2 South, Range 13 West, Seward Meridian, Alaska  Section 16: Surveyed, W1/2 NE1/4 NW1/4, NW1/4 NW1/4, 60 acres; Section 31: Surveyed, All, 623.72 acres; Section 32: Surveyed, All, 640 acres; Section 33: Surveyed, All, 640 acres;  Special Surveys: U.S. Survey 9469, Lots 3 and 4 (formerly known as Lot 2), 159.96 acres  Alaska State Land Surveys: A.S.L.S. 80-72, Tracts A and B, 9.99 acres;	2,133.67	UOC # ADL #	1050902 384380	State of Alaska, Department of Natural Resources	100.00%	12.50%	ConocoPhillips Alaska, Inc. CIRI Production Company	1.50% 3.50%	Union Oil Company of California	100.00%
03	Township 2 South, Range 13 West, Seward Meridian, Alaska  Section 10: All, Excluding Lot 1 of U.S. Survey 9469, 600.01 acres; Section 13: W1/2, 320 acres; Section 14: All, 640 acres; Section 15: All, 640 acres; Section 16: NE1/4, E1/2NE1/4NW1/4, S1/2NW1/4, S1/2, 580 acres;	2,780.01	UOC # CIRI #	1029393 C-061588	Cook Inlet Region, Inc.	100.00%	18.00%	ConocoPhillips Alaska, Inc.	1.50%	Union Oil Company of California	100.00%

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Tract	Tract Legal Description	Tract Acreage	Lease #	Mineral Owner	Mineral Interest	Royalty Percent	ORRI Owner	ORRI Percent	Working Interest Ownership	Working Interest Owner %	
04	Township 2 South, Range 13 West, Seward Meridian, Alaska  Section 20: All, Excluding Tracts A and B of ASLS 80-72, 632.99 acres; Section 21: All, 640 acres; Section 29: All, 640 acres; Section 30: All, 621.44 acres;	2,534.43	UOC # CIRI #	1829394 C-061589	Cook Inlet Region, Inc.	100.00%	18.00%	ConocoPhillips Alaska, Inc.	1.50%	Union Oil Company of California	100.00%
05	Township 2 South, Range 13 West, Seward Meridian, Alaska  Section 22: All, Excluding Lots 3 and 4 (formerly known as Lot 2) of USS 9-469, 380.04 acres; Section 23: All, 640 acres; Section 27: All, 640 acres; Section 28: All, 640 acres; Section 34: All, 640 acres;	3,040.04	UOC # CIRI #	1829395 C-061590	Cook Inlet Region, Inc.	100.00%	18.00%	ConocoPhillips Alaska, Inc.	1.50%	Union Oil Company of California	100.00%
06	Township 3 South, Range 14 West, Seward Meridian, Alaska  Section 1: Surveyed, All, 641.94 acres; Section 2: Surveyed, All, 640.70 acres; Section 3: Surveyed, All, 640.04 acres; Section 10: Surveyed, All, 640.0 acres; Section 11: Surveyed, All, 640.0 acres; Section 12: Surveyed, All, 640.0 acres; Section 13: Surveyed, All, 640.0 acres; Section 14: Surveyed, All, excluding U.S. Survey 4717, 637.26 acres; Section 15: Surveyed, All, excluding U.S. Survey 4717, 637.74 acres;  Special Surveys: U.S. Survey 4717, 5.00 acres;	5,762.68	UOC # ADE #	1830906 389226	State of Alaska, Department of Natural Resources	100.00%	12.50%	ConocoPhillips Alaska, Inc.	1.50%	Union Oil Company of California	100.00%
07	Township 3 South, Range 13 West, Seward Meridian, Alaska  Section 6: Surveyed, All, 625.22 acres; Section 7: Surveyed, All, 624.90 acres;	1,250.12	UOC # ADE #	1830905 389225	State of Alaska, Department of Natural Resources	100.00%	12.50%	ConocoPhillips Alaska, Inc.	1.50%	Union Oil Company of California	100.00%

Tract	Tract Legal Description	Tract Acreage	Lease #	Mineral Owner	Mineral Interest	Royalty Percent	ORRI Owner	ORRI Percent	Working Interest Ownership	Working Interest Owner %
08	Township 3 South, Range 13 West, Seward Meridian, Alaska  Section 5: Lots 1 to 4 inclusive, S1/2 N1/2, SE1/4, SW1/4; Section 8: All; Section 18: All;  Township 3 South, Range 14 West, Seward Meridian  Section 24: All;	2,546.00	UOC # 1029396 CIRI # C-061591	Cook Inlet Region, Inc.	100.00%	18.00%	ConocoPhillips Alaska, Inc.	1.50%	Union Oil Company of California	100.00%
09	Township 2 South, Range 13 West, Seward Meridian, Alaska  Special Survey: U.S. Survey 9469, Lot 1, 39.99 acres	39.99	unleased	BLM						

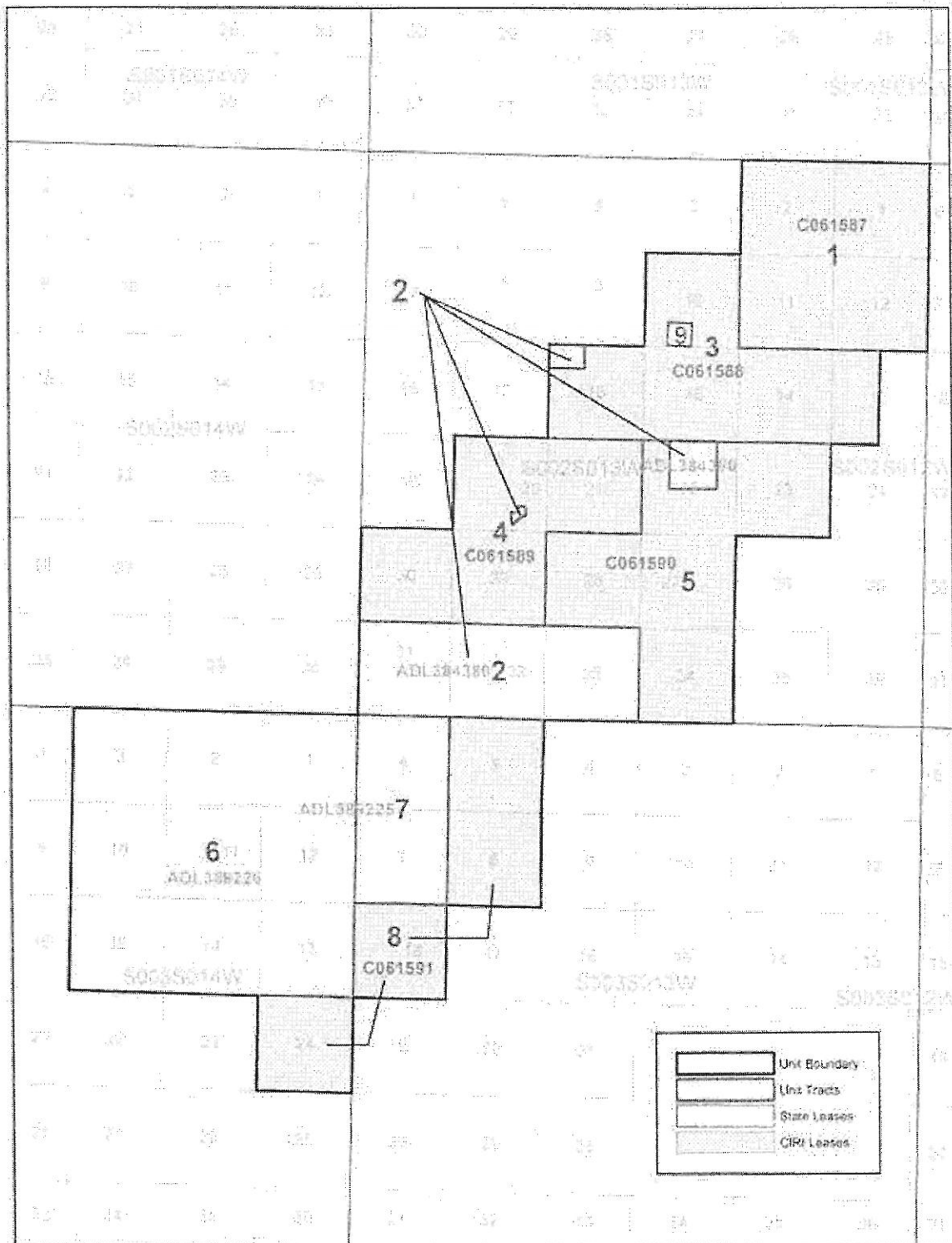
Total Unit Acreage	Working Interest Owner	Net Acres	Unit %
22,656.90	Uncommitted	39.99	0.18%
	Union Oil Company of California	22,616.91	99.82%

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# HVPA Decision Attachment 2

## Cook Inlet Deep Creek Unit Exhibit B



# **HVPA Decision Attachment 3**

## **Deep Creek Unit Exhibit C Happy Valley Participating Area**

Effective 9/1/2004

Tract	Tract Legal Description	Tract Acreage	Lease #	Tract Percentage	Mineral Owner	Mineral Interest	Royalty Percent	ORRI Owner	ORRI Percent	Working Interest Ownership	Working Interest Owner %
02	Township 2 South, Range 13 West, Seward Meridian, Alaska  Special Surveys; that portion of U.S. Survey 9469, Lots 3 & 4 within Section 22, W1/2 and the W1/2NE1/4, containing 143.84 acres.	143.84	UOC # 1030902 ADL # 384380	11.761400%	State of Alaska, Department of Natural Resources	100.00%	12.5000%	CIRI Production Company ConocoPhillips Alaska, Inc.	3.50% 1.50%	Union Oil Company of California	100.00%
03	Township 2 South, Range 13 West, Seward Meridian, Alaska  Section 15: SE1/4SW1/4	40.00	UOC # 1029393 CIRI # C-061588	3.225800%	Cook Inlet Region, Inc.	100.00%	18.0000%	ConocoPhillips Alaska, Inc.	1.50%	Union Oil Company of California	100.00%
04	Township 2 South, Range 13 West, Seward Meridian, Alaska  Section 21: E1/2NE1/4, SW1/4NE1/4, E1/2SW1/4, SE1/4	360.00	UOC # 1029394 CIRI # C-061589	29.032500%	Cook Inlet Region, Inc.	100.00%	18.0000%	ConocoPhillips Alaska, Inc.	1.50%	Union Oil Company of California	100.00%
05	Township 2 South, Range 13 West, Seward Meridian, Alaska  Section 22: W1/2 and NW1/4NE1/4 excluding Lots 3 and 4 of U.S. Survey 9469, 254.15 acres; Section 27: NW1/4NW1/4, 40 acres; Section 28: NE1/4, NE1/4NW1/4, S1/2NW1/4, N1/2SW1/4, NW1/4SE1/4, 400 acres; containing 694.15 acres.	694.15	UOC # 1029395 CIRI # C-061590	55.950300%	Cook Inlet Region, Inc.	100.00%	18.0000%	ConocoPhillips Alaska, Inc.	1.50%	Union Oil Company of California	100.00%
		Total PA Acreage			Total Tract Percentage			Working Interest Owners	PA %		
		1,239.99			100.000000%			Uncommitted Union Oil Company of California	0.0000% 100.0000%		

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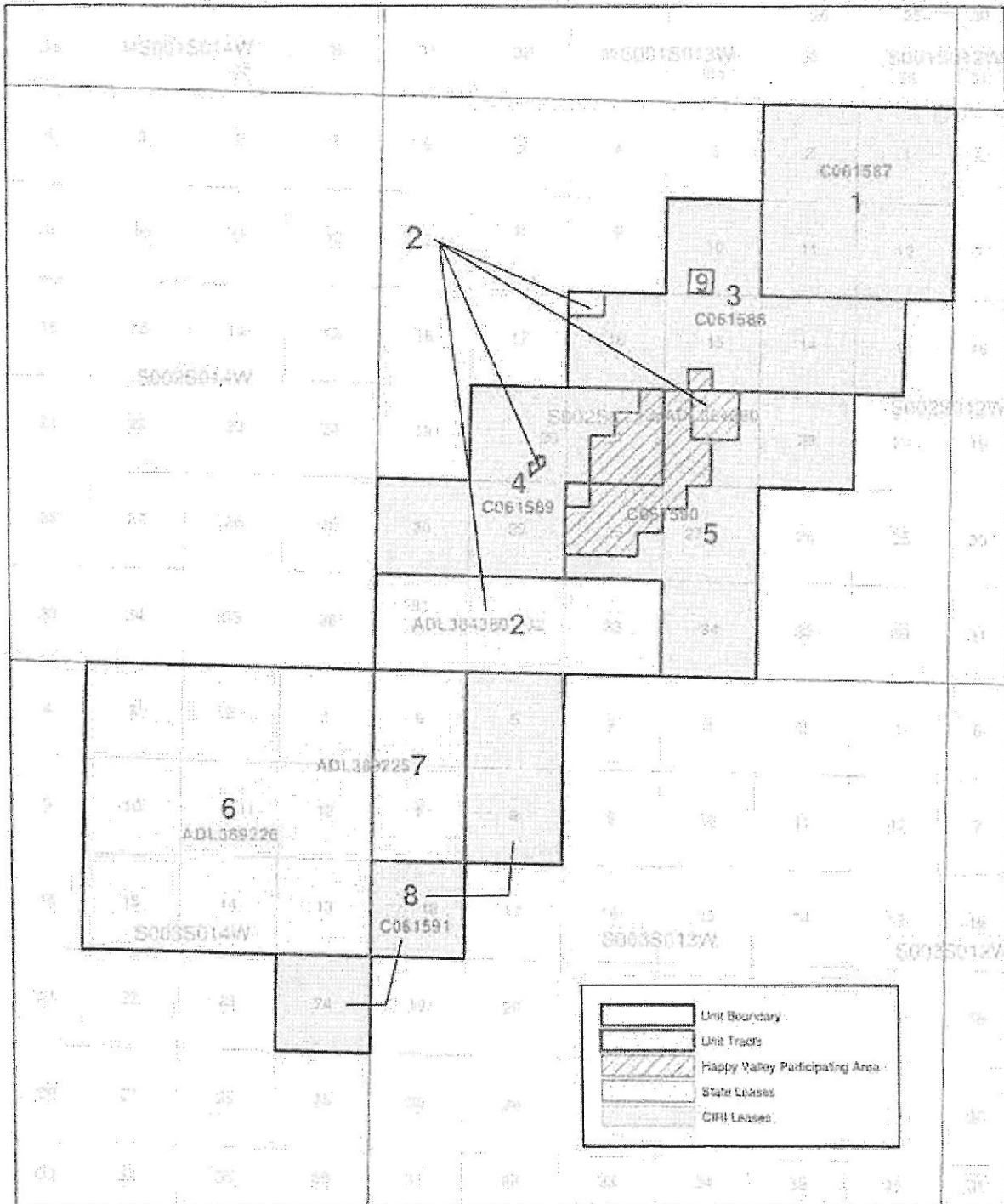
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Page 1 of 1



# HVPA Decision Attachment 4

## Deep Creek Unit Exhibit D Happy Valley Participating Area



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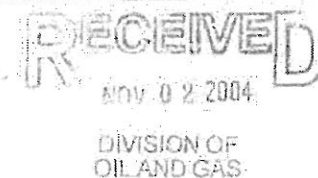
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OIL AND GAS

Effective September 1, 2004  
Scale: 1:100,000

# HVPA Decision Attachment 5

## Deep Creek Unit Exhibit E Happy Valley Allocation of Participating Area Expense Effective: 9/1/2004

Tract	Tract Legal Description	Tract Acreage	Lease #	Tract Percentage	Mineral Owner	Mineral Interest	Royalty Percent	ORRI Owner	ORRI Percent	Working Interest Ownership	Working Interest Owner %
02	Township 2 South, Range 13 West, Seward Meridian, Alaska  Special Surveys, that portion of U.S. Survey 9469, Lots 3 & 4 within Section 22, W1/2 and the W1/2NE1/4, containing 145.84 acres.	145.84	UOC # 1030902 ADL # 384380	11.761400%	State of Alaska, Department of Natural Resources	100.00%	12.5000%	CIRJ Production Company ConocoPhillips Alaska, Inc.	3.50% 1.50%	Union Oil Company of California	100.00%
03	Township 2 South, Range 13 West, Seward Meridian, Alaska  Section 15: SE1/4SW1/4	40.00	UOC # 1029393 CIRI # C-061588	3.225800%	Cook Inlet Region, Inc.	100.00%	18.0000%	ConocoPhillips Alaska, Inc.	1.50%	Union Oil Company of California	100.00%
04	Township 2 South, Range 13 West, Seward Meridian, Alaska  Section 21: E1/2NE1/4, SW1/4NE1/4, E1/2SW1/4, SE1/4	360.00	UOC # 1029394 CIRI # C-061589	29.032500%	Cook Inlet Region, Inc.	100.00%	18.0000%	ConocoPhillips Alaska, Inc.	1.50%	Union Oil Company of California	100.00%
05	Township 2 South, Range 13 West, Seward Meridian, Alaska  Section 22: W1/2 and NW1/4NE1/4 excluding Lots 3 and 4 of U.S. Survey 9469, 254.15 acres; Section 27: NW1/4NW1/4, 40 acres; Section 28: NE1/4, NE1/4NW1/4, S1/2NW1/4, NE1/2SW1/4, NW1/4SE1/4, 400 acres, containing 694.15 acres.	694.15	UOC # 1029395 CIRI # C-061590	55.980300%	Cook Inlet Region, Inc.	100.00%	18.0000%	ConocoPhillips Alaska, Inc.	1.50%	Union Oil Company of California	100.00%
		Total PA Acreage			Total Tract Percentage			Working Interest Owners	PA %		
		1,239.99			100.000000%			Uncommitted Union Oil Company of California	0.0000% 100.0000%		



# **HVPA Decision Attachment 6**

## **Deep Creek Unit**

### **Exhibit F**

#### **Allocation of Unit Expense**

Tract	Tract Legal Description	Tract Acreage	Lease #	Mineral Owner	Mineral Interest	Royalty Percent	ORRI Owner	ORRI Percent	Working Interest Ownership	Working Interest Owner %	
01	Township 2 South, Range 13 West, Seward Meridian, Alaska  Sec. 1: All, 647.08 acres; Sec. 2: All, 642.88 acres; Sec. 11: All, 640 acres; Sec. 12: All, 640 acres	2,569.96	UOC # CIRI #	1029392 C-061587	Cook Inlet Region, Inc.	100.00%	18.00%	ConocoPhillips Alaska, Inc.	1.50%	Union Oil Company of California	100.00%
02	Township 2 South, Range 13 West, Seward Meridian, Alaska  Section 16: Surveyed, W1/2 NE1/4 NW1/4, NW1/4 NW1/4, 60 acres; Section 31: Surveyed, All, 623.72 acres; Section 32: Surveyed, All, 640 acres; Section 33: Surveyed, All, 640 acres;  Special Surveys: U.S. Survey 9469, Lots 3 and 4 (formerly known as Lot 2), 159.96 acres  Alaska State Land Surveys: A.S.L.S. 80-72, Tracts A and B, 9.99 acres;	2,133.67	UOC # ADL #	1030902 384380	State of Alaska, Department of Natural Resources	100.00%	12.50%	ConocoPhillips Alaska, Inc. CIRI Production Company	1.50% 3.50%	Union Oil Company of California	100.00%
03	Township 2 South, Range 13 West, Seward Meridian, Alaska  Section 10: All, Excluding Lot 1 of U.S. Survey 9469, 600.01 acres; Section 13: W1/2, 320 acres; Section 14: All, 640 acres; Section 15: All, 640 acres; Section 16: NE1/4, E1/2NE1/4NW1/4, S1/2NW1/4, S1/2, 580 acres;	2,780.01	UOC # CIRI #	1029393 C-061588	Cook Inlet Region, Inc.	100.00%	18.00%	ConocoPhillips Alaska, Inc.	1.50%	Union Oil Company of California	100.00%

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Tract	Tract Legal Description	Tract Acreage	Lease #	Mineral Owner	Mineral Interest	Royalty Percent	ORRI Owner	ORRI Percent	Working Interest Ownership	Working Interest Owner %	
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05	Township 2 South, Range 13 West, Seward Meridian, Alaska  Section 22: All, Excluding Lots 3 and 4 (formerly known as Lot 2) of USS 9469, 480.04 acres; Section 23: All, 640 acres; Section 27: All, 640 acres; Section 28: All, 640 acres; Section 34: All, 640 acres;	3,040.04	UOC # CIRI #	1029395 C-061590	Cook Inlet Region, Inc.	100.00%	18.00%	ConocoPhillips Alaska, Inc.	1.50%	Union Oil Company of California	100.00%
06	Township 3 South, Range 14 West, Seward Meridian, Alaska  Section 1: Surveyed, All, 641.94 acres; Section 2: Surveyed, All, 640.70 acres; Section 3: Surveyed, All, 640.04 acres; Section 10: Surveyed, All, 640.0 acres; Section 11: Surveyed, All, 640.0 acres; Section 12: Surveyed, All, 640.0 acres; Section 13: Surveyed, All, 640.0 acres; Section 14: Surveyed, All, excluding U.S. Survey 4717, 637.26 acres; Section 15: Surveyed, All, excluding U.S. Survey 4717, 637.34 acres;  Special Surveys: U.S. Survey 4717, 5.00 acres;	5,762.68	UOC # ADL #	1030906 389226	State of Alaska, Department of Natural Resources	100.00%	12.50%	ConocoPhillips Alaska, Inc.	1.50%	Union Oil Company of California	100.00%
07	Township 3 South, Range 13 West, Seward Meridian, Alaska  Section 6: Surveyed, All, 625.22 acres; Section 7: Surveyed, All, 624.90 acres;	1,250.12	UOC # ADL #	1030905 389225	State of Alaska, Department of Natural Resources	100.00%	12.50%	ConocoPhillips Alaska, Inc.	1.50%	Union Oil Company of California	100.00%

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Tract	Tract Legal Description	Tract Acreage	Lease #	Mineral Owner	Mineral Interest	Royalty Percent	ORRI Owner	ORRI Percent	Working Interest Ownership	Working Interest Owner %
08	Township 3 South, Range 13 West, Seward Meridian, Alaska  Section 5: Lots 1 to 4 inclusive, S1/2 N1/2, SE1/4, SW1/4; Section 8: All; Section 18: All;  Township 3 South, Range 14 West, Seward Meridian  Section 24: All;	2,586.00	UOC # 1029396 CIRI # C-061591	Cook Inlet Region, Inc.	100.00%	18.00%	ConocoPhillips Alaska, Inc.	1.50%	Union Oil Company of California	100.00%
09	Township 2 South, Range 13 West, Seward Meridian, Alaska  Special Survey U.S. Survey 9469, Lot 1, 39.99 acres.	39.99	unleased	BLM						
		Total Unit Acreage								
		22,656.90								

Unit Expense - Union Oil Company of California 100%

Unocal Alaska  
Union Oil Company of California  
909 West 9th Avenue, P.O. Box 1  
Anchorage, Alaska 99519-5247  
Telephone (907) 276-7600  
Fax (907) 263-7698

## HVPA Decision Attachment 7

# UNOCAL 76

Kevin A. Tabler, Manager  
Land/Government Affairs

September 23, 2004

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DIVISION OF  
OIL AND GAS

Mr. Tom Irwin, Commissioner  
Alaska Department of Natural Resources  
Division of Oil and Gas  
550 W. 7<sup>th</sup> Avenue, Suite 800  
Anchorage, Alaska 99501-3560

Mr. Carl Marrs, President  
Cook Inlet Region Inc.  
2525 C Street, Suite 500  
Anchorage, Alaska 99509-3330

**DEEP CREEK UNIT**  
State of Alaska  
**First Unit Plan of Development and  
Operation Revised 9-23-04**

Gentlemen:

In accordance with Article 8 of the Deep Creek Unit Agreement and 11AAC 83.343, Union Oil Company of California (Unocal), as Unit Operator, respectfully submits the following Revised Plan of Development and Operations. This Plan contains revisions to the First Unit Plan of Development submitted to you on August 31, 2004, per the request of Department of Natural Resources (DNR) personnel.

### I. PERIOD

This Plan shall cover the period from September 1, 2004 to August 31, 2005.

## II. DRILLING/REMEDIAL PROGRAM

### A. Plan of Exploration Review

1. Remedial Work – The NNA #1 wellbore was tested in additional intervals with no commercial gas tests. Operations to convert the NNA #1 to a disposal well were completed such as performing a MIT.
2. During the Exploration plan, nine (9) wells were drilled in the Deep Creek Unit.
  - a. **HV-1** – Drilled in 2003 to 10,872' MD / 9,700' TVD. Completed in the Tyonek formation. Test rate was 4.1 MMCFGPD at 1,122 psig FTP.
  - b. **HV-2** – Drilled in 2003 to 10,225' MD / 9,812' TVD. Completed in the Tyonek formation. Test rate was 2.6 MMCFGPD at 695 psig FTP.
  - c. **HV-3** – Drilled in 2004 to 11,345' MD / 10,772' TVD. No test rate established at this time.
  - d. **HV-4** – Drilled in 2004 to 10,625' MD / 10,515' TVD. No test rate established at this time.
  - e. **HV-5** – Unsuccessfully drilled in 2004 to objective. No test rate established at this time.
  - f. **HV-6** – Drilled in 2004 to 11,798' MD / 10,400' TVD. No test rate established at this time.
  - g. **HV-7** – Drilled in 2004 to 9,118 MD / 7,140' TVD. No test rate established at this time.
  - h. **HV-8** – Drilled in 2004 to 8,900 MD / 6,734' TVD. Tested in the Tyonek formation at 0.6 MMCFGPD at 902 psig FTP. . Tested in the Beluga formation at 1.2 MMCFGPD at 865 psig FTP.
  - i. **Star #1** – Drilled in 2004 to 9,130' MD / 8,640' TVD. Tested in the Tyonek formation at 0.5 MMCFGPD at 413 psig FTP.

### B. First Plan Potential Work

1. Drill two (2) development wells in the Deep Creek Unit.
  - a. Two (2) or more development wells in the Happy Valley Development area depending on results.



- b. Additional development wells may be drilled in the Star Development area depending on the results of the recompletion work and uphole zone testing in the Star #1 well. The Star Well was drilled from a surface location within the Unit boundary to a location outside of the southern portion of the Unit. If testing is successful and additional wells are drilled to delineate a new accumulation, the Unit will be expanded, if necessary, to encompass the areal extent of the newly defined reservoir and a Participating Area will be established.
2. Workover of the existing wells.
  - a. Star #1 - Recomplete and test uphole zones.
  - b. Possible recompletion candidates will be identified from the existing Happy Valley Development area as necessary.
3. As required under the Plan of Exploration, Unocal acquired approximately 105 miles of 2D seismic data over the Unit area. About half of the data collected was over the Happy Valley PA area and will be the first data worked by our staff. The balance of seismic data over the southern area of the Unit has now been processed and will be evaluated over the plan period.

All required Sundries and Permits will be obtained for this work

### III. OPERATING-PRODUCING PROGRAM

#### A. Plan of Exploration Review

1. No Production occurred during the Exploration Plan as the facilities and pipelines were not in operation.
2. During the Exploration Plan – an Aquifer Exemption and Disposal Injection Application were submitted to the AOGCC for the NNA#1 wellbore within the Deep Creek Unit. Pending approval of these applications, the NNA #1 will be utilized as a water disposal / cuttings disposal well.

#### B. Potential Work

1. An application for a Beluga / Tyonek Participating area is being submitted for the Happy Valley Portion of the Deep Creek Unit.
2. Production is estimated to commence during November, 2004.

C. Well Production Summary

1. No production occurred during the Exploration Plan.

IV. SURFACE AND FACILITY OPERATIONS

A. Plan of Exploration Review

1. During the Exploration Plan a gas pipeline installation commenced connecting the Happy Valley Pad to the KKPL line. This installation is ongoing and is scheduled to be completed by November, 2004.
2. Installation of a gas processing facility commenced on the main Happy Valley pad. Gas will be sold via the newly installed pipeline connecting the Deep Creek Unit to KKPL. Facility Start up is scheduled for November, with minor fuel gas use in October to run generators prior to start up.

B. Potential Work

1. A new pad may be established in the Deep Creek Unit. This pad will be approximately 4,000 feet west of the existing main Happy Valley pad. All required permits will be secured prior to construction of this new pad.
2. Primary gas treating may occur on the new pad with final gas processing for sales occurring on the main Happy Valley pad.
3. A water disposal facility may be established adjacent to the NNA#1 wellbore.
4. Installation of gas compression facilities may occur at the main Happy Valley Pad.

The Unit Operator respectfully requests approval of the foregoing First Plan of Development and Operations for the Deep Creek Unit.

Unocal reserves the right to propose modifications to this Plan should conditions so warrant; however, no modifications will be made without first obtaining permission from the appropriate governmental agencies.

First Plan of Development Revised  
September 23, 2004  
Page 5

Please direct any questions regarding this plan to Ralph Affinito, Reservoir Engineer, at 263-7947 or Mark Lynch, Geologist at 263-7851.

Sincerely,

UNION OIL COMPANY OF CALIFORNIA  
Unit Operator

By

  
Kevin A. Tabler

cc: Alaska Oil and Gas  
Conservation Commission