

*Original*

CANNERY LOOP UNIT

FORMATION OF THE STERLING SANDS  
PARTICIPATING AREA

FINDINGS AND DECISION OF THE DIRECTOR,  
DIVISION OF OIL AND GAS,  
UNDER DELEGATION OF AUTHORITY FROM THE COMMISSIONER  
STATE OF ALASKA  
DEPARTMENT OF NATURAL RESOURCES

August 29, 2001

## **I. INTRODUCTION AND BACKGROUND**

The Cannery Loop Unit (CLU) is oil and gas unit located on the Kenai Peninsula near the mouth of the Kenai River. The Alaska Department of Natural Resources (DNR) and the U. S. Geological Survey approved the unit on June 29, 1978.

The Cannery Loop Unit Agreement was modeled after the Joint Federal-State Unit Agreement form, which provides for operation of the leases within the unit area as a single entity without regard to lease boundaries and diverse ownership of the leases. The unit is operated in conformance with annual plans of development approved by the Division of Oil and Gas (Division) and the U.S. Department of the Interior, Bureau of Land Management (BLM). Marathon Oil Company (MOC) is the Unit Operator of the Cannery Loop Unit (CLU).

The CLU currently includes three participating areas. The Division approved the Tyonek "D" Zone Gas Sands Participating Area and the Upper Tyonek Formation Undifferentiated Gas Sands Participating Area on January 7, 1986, effective retroactive to October 15, 1985. The Tyonek "D" Zone Participating Area encompasses 800 acres, while the Upper Tyonek Participating Area contains 880 acres. Cumulative production from the Tyonek Formation as of December 31, 2000, is over 59 BCF of sales gas. The Division approved the Beluga Formation Undifferentiated Gas Sands Participating Area on June 17, 1986, effective retroactive to April 1, 1986. The Beluga Formation Gas Sands Participating Area encompasses approximately 2,640 acres. The Beluga Formation has produced 33.7 BCF of sales gas through December 31, 2000.

The CLU is currently operating under the Twenty-second Plan of Development approved by both the Division and the BLM. The Twenty-second Plan is approved for the period December 26, 2000 through December 25, 2001.

## **II. APPLICATION FOR THE FORMATION OF THE STERLING SANDS PARTICIPATING AREA**

By letter dated June 1, 2001, MOC, the Unit Operator, on behalf of itself as the sole CLU Working Interest Owner, applied to the Division to form the Sterling Sands Participating Area (SPA) within the CLU. The proposed 560-acre SPA encompasses the Sterling Formation B4, C1 and C2 sandstones reservoirs, which are purported by MOC to be capable of producing or contributing to the production of hydrocarbons in paying quantities. The description of the tracts proposed for the SPA and the proposed tract allocation schedule for the SPA tracts, and a map depicting the proposed SPA are included as Attachments 1 and 2, respectively, to this Findings and Decision.

Under Article 12 of the CLU Agreement, all production from a participating area established within the CLU must be produced equally on an acreage basis from the tracts within the proposed participating area. MOC proposed surface acreage as the basis for the proposed SPA tract allocation schedule. Each proposed SPA tract shall have allocated to it the percentage of its acreage relative to the total SPA acreage.

Finally, Sterling Formation production commenced from the CLU#6 well on October 25, 2000. MOC's proposed effective date for the SPA is the first day of the month in which production commenced from the Sterling discovery well, CLU #6, that is, October 1, 2000.

### **III. DISCUSSION OF THE PARTICIPATING AREA DECISION CRITERIA**

The Commissioner of the Department of Natural Resources (Commissioner) reviews applications to form participating areas under AS 38.05.180(p) and 11 AAC 83.303 et. seq. By memorandum dated September 30, 1999, the Commissioner approved a revision of Department Order 003 and delegated this authority to the Director of the Division of Oil and Gas (Director). The Division's review of MOC's SPA application is based on the criteria set out in 11 AAC 83.303 (a) and (b). A discussion of the subsection (b) criteria, as they apply to the application, is set out directly below, followed by a discussion of the subsection (a) criteria.

#### **(a) Decision Criteria considered under 11 AAC 83.303(b)**

##### **(1) The Environmental Costs and Benefits of Unitized Exploration and Development**

SPA development will take place from existing CLU drill sites and infrastructure. SPA fluids will be produced into the existing CLU facilities. Sharing the existing CLU facilities eliminates duplication and reduces the surface area altered by the Sterling Formation development.

Existing CLU infrastructure, roads, pipelines and processing facilities, will support SPA drilling and production operations. No significant additional impacts to habitat or biological resources are anticipated because of the additional Sterling Formation production.

##### **(2) The Geological and Engineering Characteristics of the Sterling Participating Area and Prior Exploration Activities in the Unit Area**

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

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

11 AAC 83.395(4).

The CLU was established in 1978 as a result of the CLU #1 discovery well in the Tyonek Formation on an asymmetrical, anticlinal extension of the larger Kenai Gas Field immediately to the south of the unit. A total of seven wells have been drilled within and adjacent to the current unit area: CLU #1, CLU #2, CLU#3, CLU #4, CLU #5, CLU #6, and KU 13-8. These seven wells and the 3-D seismic survey acquired in 1995 determined the areal extent of the proposed SPA.

Three wells, CLU#1, CLU #5S and CLU#6, currently are in production from the three accumulations in the unit area, the Beluga, Tyonek and now Sterling. All production is from gas zones within structurally and stratigraphically trapped Miocene and Pliocene sandstone reservoirs.

In September-October 2000, MOC drilled and completed the CLU #6 well in the Sterling Formation. The well was based on a re-evaluation of the 3-D seismic collected in 1995 and integration of the 3-D data with actual well data from CLU #5 that was drilled in 1996. CLU #6 was tested at rates up to 9 MMCFPD with no significant water recovery. The well was drilled primarily for the purpose of increasing winter peak deliverability requirements. CLU #6 will be produced at peak production in the high demand winter months and shut-in during the lowest demand summer months to defer compression requirements and maintain high rate capacity for several winters. As of January 12, 2001, cumulative production from CLU #6 and the Sterling Formation reservoirs was approximately 542 million cubic feet of gas.

As part of the SPA application, MOC submitted a structural cross-section with correlated well logs across the zones of interest within the unit, appropriate structural contour and net pay maps of the Sterling Formation reservoirs, a seismic attribute map and an arbitrary 3-D seismic line generally along the structural axis. MOC also submitted, at the request of the Division, the 4-point deliverability test results, and the gas reserve estimates for the Sterling Formation reservoirs.

The Division's evaluation of the subsurface geology supports the configuration of the proposed 560-acre SPA. The size of the proposed SPA is consistent with the geological, geophysical, and engineering data submitted by MOC. The maps and data provided demonstrate the presence of hydrocarbons in the Sterling Formation intervals throughout the proposed SPA, and the well test data and historical production to date support the conclusion that the proposed SPA are capable of producing or contributing to the production of hydrocarbons in paying quantities

### **(3) Plans for Exploration or Development for the Unit Area**

Under Article 2(e) of the CLU Agreement, the CLU contracted to the boundary of the largest participating area within the unit, the Beluga Formation Participating Area, effective October 15, 1990. The Tyonek "D" and the Upper Tyonek Participating Areas are completely within the areal extent of the Beluga Participating Area. Furthermore, the proposed SPA is essentially within the areal extent of the Tyonek "D" and the Upper Tyonek Participating Areas. Individual plans of

development are not provided for each PA in the CLU. Instead, the plans of exploration or development for all the PAs and any other geologic horizons within the CLU are contained in the annual plan of development for the CLU approved by the Division and the BLM. Currently, the Twenty-second Plan for the CLU is effective through December 25, 2001.

The drilling and completion of CLU#6 and engineering studies regarding the upgrade of existing facilities were part of the Twenty-second Plan. A Twenty-third Plan for the CLU will be due in the Division's office in late September 2001. Continued unit and participating area operations will be contingent upon its approval.

#### **(4) The Economic Costs and Benefits to the State and Other Relevant Factors**

Approval of the SPA will provide near-term economic benefits to the state by creating or maintaining the jobs associated with the construction or maintenance of the CLU facilities and operation of the SPA, and the ongoing assessment of the hydrocarbon potential of the formations within the unit area. The state will also benefit from the CLU Plan of Development, which proposes to maximize the physical recovery of hydrocarbons from the SPA and unit area. Maximum hydrocarbon production will enhance the state's long-term royalty and tax revenues.

Any additional administrative burdens associated with the proposed SPA are far outweighed by the additional royalty and tax benefits derived from the SPA production.

#### **(b) Decision Criteria considered under 11 AAC 83.303(a)**

##### **(1) Promote the Conservation of All Natural Resources**

The formation of oil and gas units, as well as the creation of PAs within units, generally conserves hydrocarbons. Coordinated development of leases held by diverse parties maximizes total hydrocarbon recovery and minimizes waste. The concern of lessees competing for the reservoir is less evident here because MOC is now the sole working interest owner in the CLU. However, even with only one working interest owner, formation of the SPA will provide a comprehensive plan for exploring and developing all the reservoirs within the SPA and the CLU. The CLU Plan of Development provides for an efficient, integrated approach to development of all PAs and reservoirs within the unit area. A comprehensive operating agreement and plan of development governing the SPA will help avoid duplicative development efforts on and under the surface.

The number of facilities required to develop the resource and the area of land that may be required to accommodate those facilities is reduced when resources on several leases are developed as one PA. Facilities can be located to maximize recovery and to minimize environmental impacts. Producing hydrocarbons from the SPA through the existing CLU production and processing facilities will reduce the incremental environmental impact of the additional production.

## **(2) Prevention of Economic and Physical Waste**

Generally, the formation of a PA facilitates the equitable division of costs and allocation of hydrocarbon shares, and provides for a diligent development plan that maximizes physical and economic benefit from a reservoir's production. The creation of the SPA prevents economic and physical waste by eliminating redundant expenditures for a given level of production, and avoids the loss of ultimate recovery by adopting a unified reservoir management strategy. Oil and gas resources can be produced through a single facility infrastructure system. The SPA will improve the efficiency of developing the Sterling Formation, which has different producing characteristics between reservoir intervals.

Further, facility consolidation saves capital and promotes better reservoir management strategies. In combination, these factors allow the Sterling Formation reservoirs to be developed and produced in the interest of all parties, including the State, while preventing economic and physical waste.

## **(3) Protection of All Parties in Interest, Including the State**

Because hydrocarbon recovery will be maximized and additional production-based revenue will be derived from the SPA production, the State's economic interest is promoted. Diligent exploration and development under a single approved unit plan promotes the State's interest. The formation of the SPA promotes efficient evaluation and development of the State's resources, yet minimizes impacts to the area's cultural, biological, and environmental resources. Operating under the CLU Agreement provides for accurate reporting and record keeping, state concurrence with operating procedures, royalty settlement, in-kind taking, and emergency storage of oil. These all protect the state's interest.

## **IV. FINDINGS AND DECISION**

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

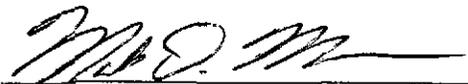
1. The proposed SPA promotes the conservation of natural resources, promotes the prevention of economic and physical waste, protects all parties of interest, and is necessary and advisable to protect the public interest. AS 38.05.180(p); 11 AAC 83.303.
2. The available geological, geophysical, and engineering data, and development plans for the CLU justify the inclusion of the proposed tracts within the SPA. Under the regulations governing formation and operation of oil and gas units (11 AAC 83.301 - 11 AAC 83.395), the CLU Agreement, and the terms and conditions under which these lands were leased from the state, the lands described in Attachment 1 to this Findings and Decision are included in the SPA.

3. The formation of the SPA provides for the equitable allocation of produced hydrocarbons and costs, and sets forth a management plan designed to maximize physical and economic recovery from the Sterling Formation reservoirs within the approved SPA. Under Article 12 of the CLU Agreement, and 11 AAC 83.351(a) and 11 AAC 83.371 (a), the allocations of production and costs for the tracts within the SPA (Attachment 1 to this Findings and Decision) are approved.
4. The production of SPA hydrocarbon liquids through the CLU production and processing facilities reduces environmental impacts. Utilization of unit facilities will avoid unnecessary duplication of development efforts on and under the surface.
5. The Working Interest Owner plans diligent exploration and delineation of the reservoirs underlying the CRU under unit plans of development and operation approved by the Division and the BLM.
6. Approval of the SPA, and the tract allocation schedule for the SPA (Attachment 1 to this Findings and Decision) are effective October 1, 2000.
7. The royalty accounting code for reporting Sterling Sands Participating Area production is CLST.

For these reasons and subject to the conditions and limitations noted, I hereby approve the Sterling Participating Area within the Cannery Loop Unit.

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

Appeal Code: OG082901CLUSPA



Mark D. Myers, Director  
Division of Oil and Gas

8-29-01

Date

Attachment 1: CLU, Sterling Gas Sands Participating Area and Tract Allocation Schedule  
Attachment 2: Map of the Sterling Participating Area

CLU, SterlingPA.doc

CANNERY LOOP UNIT  
STERLING GAS SANDS  
PARTICIPATING AREA  
(Revised May 22, 2001)

Tract Number	Description	Acreage	Lease No., Serial No. & Expiration Date	Royalty and Percentage	Percentage of Participation	Ownership & Overriding Royalty Interest	Working Interest Owners & Percentage
4	<u>T5N, R11W, S.M.</u> Sec 5: Lot 11 and Lot 10 in SE/4 (Lot 11 containing 14.88 acres, Lot 10 estimated at 14.00 acres lying within the SE/4) Sec 8: Lots 1, 5, 6, 7 & 10 & NW/4 NE/4, SE/4 SE/4 & that part of Lot 8 lying within the NE/4SW/4 (estimated 225.86 acres)	254.740	603304 ADL-60568  HBP	Marathon 12 1/2% of 100%	0.45489286	None	Marathon 100.00%
4A	<u>T5N, R11W, S.M.</u> Sec 5: Kenai River tide & submerged lands in the S/2SE/4 ( estimated at 51.12 acres) Sec 8: Kenai River tide & submerged lands in the E/2 & E/2SW/4 (estimated at 169.05 acres)	220.170	605036 ADL-324602 HBP	State of Alaska 12 1/2% of 100%	0.39318071	None	Marathon 100.00%
5A	<u>T5N, R11W, S.M.</u> Sec 17: All navigable shorelands within the exterior boundaries and/or contiguous to Federal uplands lease AA-19230 in the NE/4NW/4 (estimated at 23.23 acres)	23.230	604891 ADL-02397 HBP	State of Alaska 12 1/2% of 100%	0.04148214	Seattle First Nat'l Bank Trustee for Estate of M.B. Kirkpatrick, deceased. 1.00%	Marathon 100.00%
7	<u>T5N, R11W, S.M.</u> Sec. 9: That part of the Kenai River Tide and submerged lands lying within the NW/4NW/4 (estimated at 33.71 acres)	33.710	605133 ADL-359153 HBP	State of Alaska 12 1/2% of 100%	0.06019643	None	Marathon 100.00%
7A	<u>T5N, R11W, S.M.</u> Sec. 9: Lot #4	6.290	605069 HBP	Marathon 12 1/2% of 100% 5% Surface Use Royalty	0.01123214	None	Marathon 100.00%
73	<u>T5N, R11W, S.M.</u> Sec 8: That part of Lot #9 lying in the SE/4 SW/4 (estimated at 5.09 acres) Sec 17: Lot #11(7.16 acres)	12.250	604650 HBP	Wards Cove Packing Co. 12 1/2% of 100%	0.02187500	None	Marathon 100.00%

CANNERY LOOP UNIT  
STERLING GAS SANDS  
PARTICIPATING AREA  
(Revised May 22, 2001)

Tract Number	Description	Acreage	Lease No., Serial No. & Expiration Date	Royalty and Percentage	Percentage of Participation	Ownership & Overriding Royalty Interest	Working Interest Owners & Percentage
75	ISN, R11W, S.M. Sec 17: Lot #14	9.610	604628 HBP	Joseph A. Cochran 12 1/2% of 100%	0.01716071	None	Marathon 100.00%

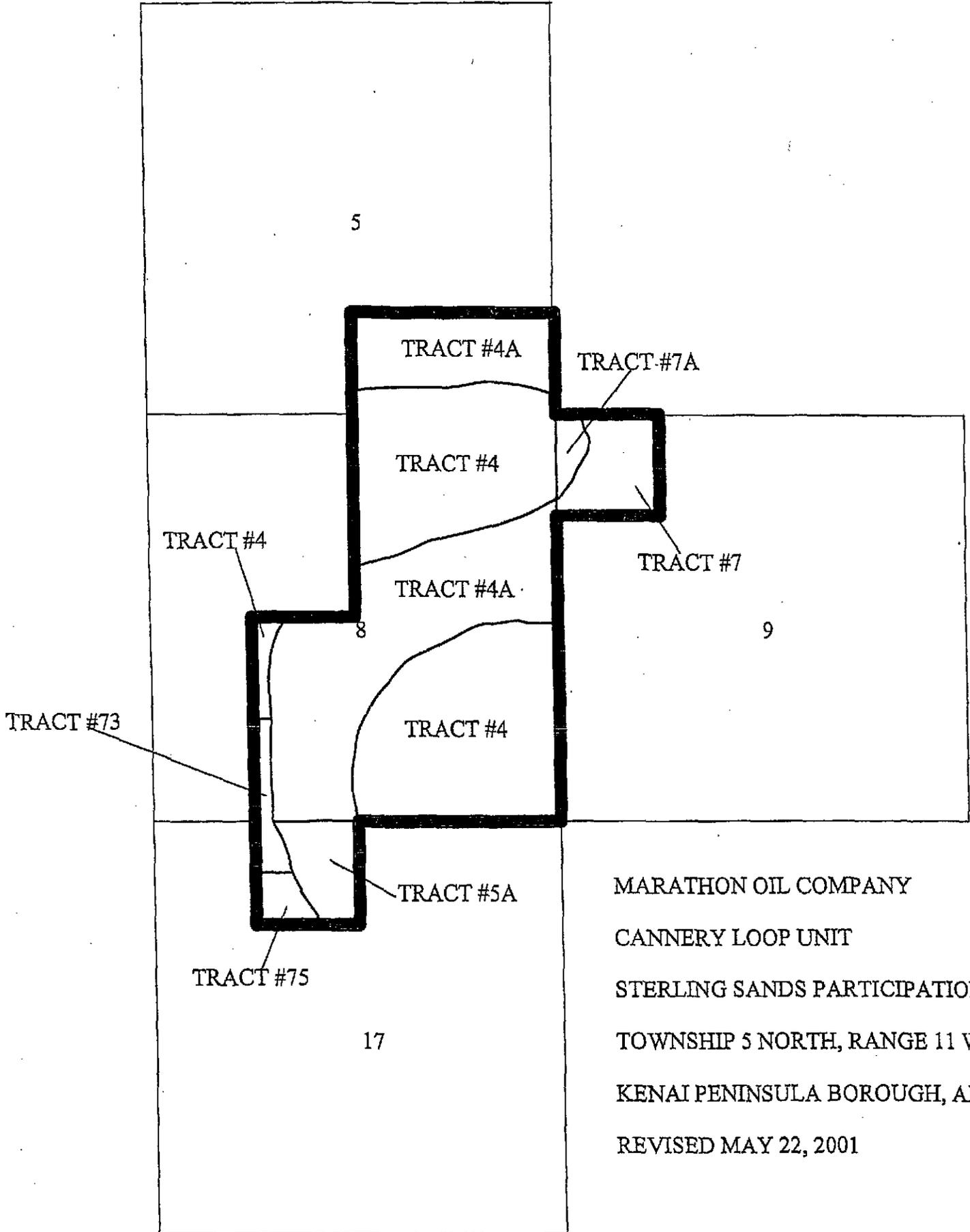
TOTAL: 560.000 1.00000000

Summary:	Committed Acres	Uncommitted Acres	Total Acres
Total State Acres	277.110	0.000	277.11000000
*Total Federal Acres	0.000	0.000	0.00000000
Total Federal Acres (Approved to convey to CIRI, now Marathon)	0.000	0.000	0.00000000
*Total Fee Acres	282.890	0.000	282.89000000
<u>Total Participating Area Acres</u>	<u>560.000</u>	<u>0.000</u>	<u>560.00000000</u>

Total State Tract Participation	0.49483930
Total Federal Tract Participation	0.00000000
Total Federal Tract Participation (Approved to convey to CIRI, now Marathon)	0.00000000
Total Fee Tract Participation	0.50516070
<u>Total Committed Tract Participation</u>	<u>1.00000000</u>

\*Note: Tract Participation Formula: Tract acreage divided by the total committed acreage = Tract Participation. Uncommitted tracts carry a 0.00000% Tract Participation

Marathon = Marathon Oil Company  
CIRI = Cook Inlet Region, Inc.



MARATHON OIL COMPANY  
 CANNERY LOOP UNIT  
 STERLING SANDS PARTICIPATION AREA  
 TOWNSHIP 5 NORTH, RANGE 11 WEST  
 KENAI PENINSULA BOROUGH, ALASKA  
 REVISED MAY 22, 2001



P.O. Box 196168  
Anchorage, AK 99519-6168  
Telephone 907/561-5311

June 8, 2001

RECEIVED  
JUN 20 2001  
DIV. OF OIL & GAS  
DIRECTOR'S OFFICE

Mr. Mike Kotowski  
DNR – Division of Oil & Gas  
550 W. 7<sup>th</sup> Avenue, Suite 800  
Anchorage, AK 99501-3560

RE: Request for Additional Information  
Sterling Sands Participation Area  
Cannery Loop Unit  
Kenai Peninsula Borough, Alaska

Dear Mike:

~~to be confidential~~  
Pursuant to our recent conversation, Marathon Oil Company would respectfully propose an effective date of October 1, 2000, for the captioned Participating Area. Date of first production was October 26, 2000.

Additionally, I have enclosed the plat you requested, the 4-point test results and information regarding reserve estimates for the three Sterling intervals. Please replace Exhibit 1 in the geology section of the PA application with the enclosed plat. Additionally, Marathon requests that the reserve estimates and geologic/engineering data and interpretations be considered confidential.

Please let me know if you need anything further.

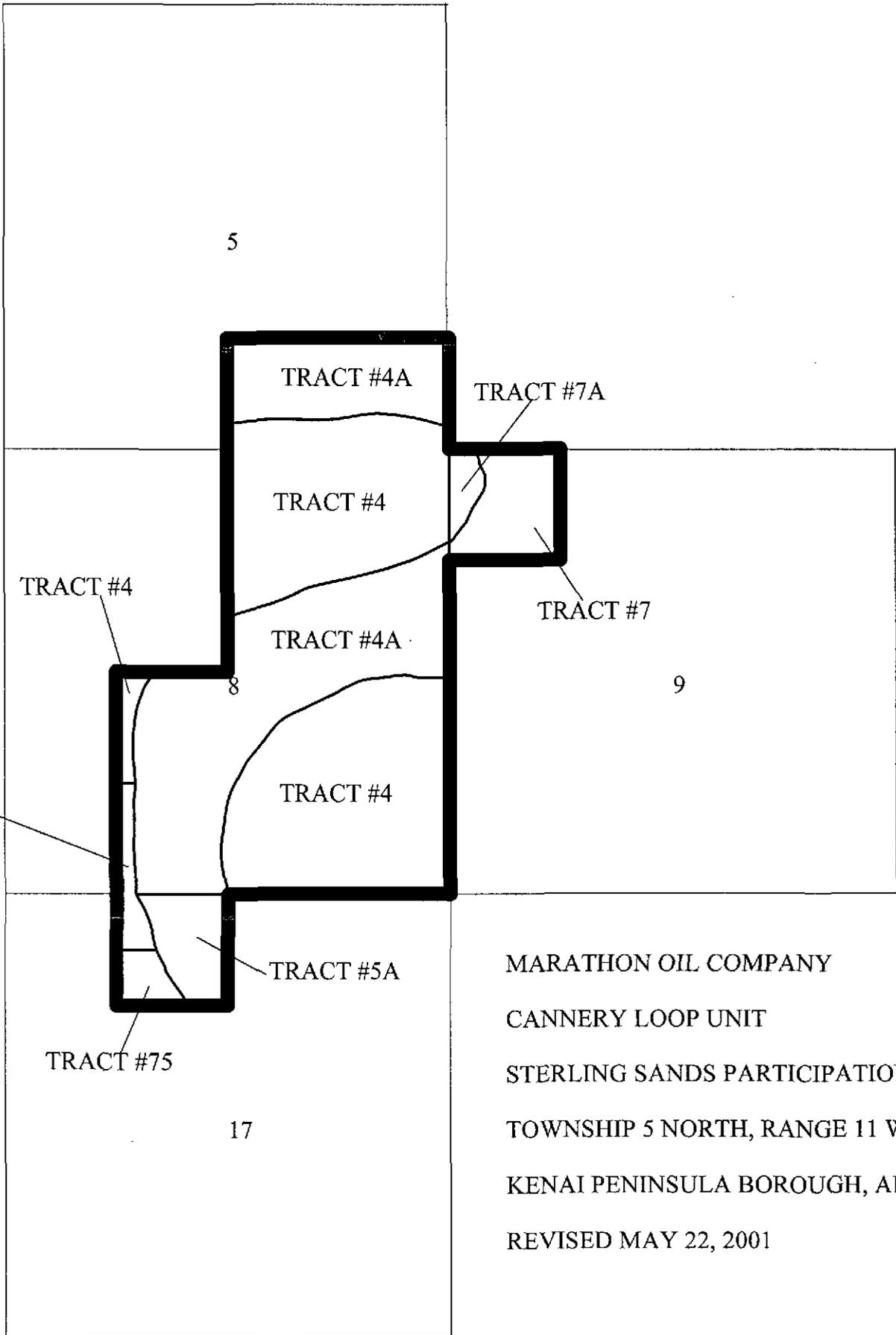
Best regards,

A handwritten signature in black ink, appearing to read 'J. Brock Riddle'.

J. Brock Riddle  
Alaska Region Landman

enclosures  
cc w/enclosures: Peter Ditton, BLM

6-20-01:  
Confidential data in vault.  
NDK



MARATHON OIL COMPANY  
 CANNERY LOOP UNIT  
 STERLING SANDS PARTICIPATION AREA  
 TOWNSHIP 5 NORTH, RANGE 11 WEST  
 KENAI PENINSULA BOROUGH, ALASKA  
 REVISED MAY 22, 2001

JUN 20 2001  
DIV. OF OIL & GASCANNERY LOOP UNIT  
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RECEIVED

JUN 20 2001  
DIV. OF OIL & GAS

CANNERY LOOP UNIT  
STERLING GAS SANDS  
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