

**MERIDIAN OIL**

OIL CONSERVATION DIVISION  
RECEIVED

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April 21, 1994

New Mexico Oil Conservation Division  
Attn: Mr. Bill LeMay  
P.O. Box 2088  
310 Old Santa Fe Trail  
Santa Fe, New Mexico 87501

RE: San Juan 28-5 Unit #211  
Unit K, Section 13, T28N, R05W  
Rio Arriba County, New Mexico  
Downhole Commingling Request

Dear Mr. LeMay:

Meridian Oil Inc. is applying for an administrative downhole commingling order for the referenced well in the Pictured Cliffs and the Basin Fruitland Coal fields. The ownership of the zones to be commingled is common. All offsetting acreage in this case belongs to Meridian Oil Inc. A letter has been sent to the Bureau of Land Management notifying them.

The Fruitland Coal and Pictured Cliffs wells producing in this area operated by Meridian are marginally productive. Based on offset production in this area, drilling of separate wells and dual completions to produce the Fruitland Coal and Pictured Cliffs are not economically justified. The only economical way to recover the Fruitland Coal and Pictured Cliffs reserves in this drill block is to downhole commingle production from both zones in this well.

It is proposed to complete the Pictured Cliffs formation and test its production. It is then proposed to set a bridge plug above the Pictured Cliffs, perforate and stimulate the Fruitland Coal, and test its production. The bridge plug will then be removed, and both zones produced through a single string of tubing. The reservoir characteristics of each of the subject zones are such that underground waste will not be caused by the proposed commingling. Neither producing interval makes oil, and only minimal amounts of similar water are produced in the offset wells. The average shut-in pressures in the area for the Pictured Cliffs and Fruitland Coal are 1090 and 1070 psi, respectively.

The allocation of the commingled production will be calculated using the attached allocation formula. This formula is based on offset Pictured Cliffs production performance (material balance) and volumetrics, and uses accepted Reservoir Engineering methods to allocate the Pictured Cliffs reserves. This addresses the Fruitland Coal producing characteristics of early life inclining production rates.

New Mexico Oil Conservation Division  
Mr. Bill LeMay  
San Juan 28-5 Unit #211  
Downhole Commingling Request  
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Approval of this commingling application will allow for the prevention of wasted resources and protection of correlative rights. Included with this letter are plats showing ownership of offsetting leases for both the Pictured Cliffs and Fruitland Coal, a copy of the letter to the BLM and an allocation formula.

Sincerely,

A handwritten signature in black ink, appearing to read "John D. Clayton for JDC".

John D. Clayton  
Regional Engineer

SHL/rjp  
Attachments

cc: Frank T. Chavez - NMOCD/Aztec

# MERIDIAN OIL

April 21, 1994

Bureau of Land Management  
1235 La Plata Highway  
Farmington, NM 87401

RE: San Juan 28-5 Unit #211  
Unit K, Section 13, T28N, R05W  
Rio Arriba County, New Mexico  
Downhole Commingle Request

Gentlemen:

Meridian Oil Inc. is in the process of applying for a downhole commingling order from the New Mexico Oil Conservation Division (NMOCD) for the referenced well located in Rio Arriba County, New Mexico. The approved application will commingle the Pictured Cliffs and the Basin Fruitland Coal fields.

The purpose of this letter is to notify you of Meridian's application. If you have no objections to the NMOCD issuing a commingling order, we would appreciate your signing this letter and returning the original to Mr. LeMay at the following address with a copy to this office:

Mr. William LeMay  
New Mexico Oil Conservation Division  
P.O. Box 2088  
Santa Fe, NM 87501

Your prompt attention to this matter would be appreciated.

Yours truly,



John D. Clayton  
Regional Engineer

**The undersigned hereby waives objection to the referenced Downhole Commingle Request.**

**COMPANY/OWNER:** \_\_\_\_\_

**TITLE:** \_\_\_\_\_

**DATE:** \_\_\_\_\_

# S.J. 28-5 UNIT #211

## MONTHLY GAS PRODUCTION ALLOCATION FORMULA

### GENERAL EQUATION

$$Q_t = Q_{ftc} + Q_{pc}$$

WHERE:  $Q_t$  = TOTAL MONTHLY PRODUCTION (MCF/MONTH)  
 $Q_{ftc}$  = FRUITLAND COAL (FTC) MONTHLY PRODUCTION  
 $Q_{pc}$  = PICTURED CLIFFS (PC) MONTHLY PRODUCTION (MCF/MONTH)

REARRANGING THE EQUATION TO SOLVE FOR  $Q_{ftc}$ :

$$Q_{ftc} = Q_t - Q_{pc}$$

ANY PRODUCTION RATE OVER WHAT IS CALCULATED FOR THE PICTURED CLIFFS (PC) USING THE APPLIED FORMULA IS FRUITLAND COAL (FTC) PRODUCTION.

ICTURED CLIFFS (PC) FORMATION PRODUCTION FORMULA IS:

$$Q_{pc} = Q_{pci} * e^{-\{D_{pc}\}(t)}$$

WHERE:  $Q_{pci}$  = INITIAL PC MONTHLY FLOW RATE (CALCULATED FROM FLOW TEST)  
 $D_{pc}$  = PICTURED CLIFFS MONTHLY DECLINE RATE CALCULATED FROM:  
 $D_{pc} = (Q_{pci} - Q_{pcabd}) / N_{p(pc)}$   
See Determination of  $Q_{pci}$  and PC Estimated Ultimate Recovery (EUR)  
 $Q_{pcabd} = 300 \text{ MCF/M}$

WHERE:  $N_{p(pc)}$  = PICTURED CLIFFS ESTIMATED ULTIMATE RECOVERY (EUR)  
 $P * 0.81 \text{ MMCF/PSI}^{**} * R_f$   
 $P^*$  = INITIAL RESERVOIR PRESSURE (7 DAY SIBHP)  
 $R_f$  = RECOVERY (FIELD ANALOGY): = 0.95  
 $^{**}$  DETERMINED FROM MATERIAL BALANCE (FIELD ANALOGY) AND VOLUMETRIC RESERVES (LOG ANALYSIS)

By calculating PC EUR FROM SIBHP and determining PC initial flow rate,  $D_{pc}$  can then be estimated utilizing the previously described parameters

THUS:  $Q_{ftc} = Q_t - Q_{pci} * e^{-\{D_{pc}\}(t)}$

WHERE:  $(t)$  IS IN MONTHS

REFERENCE: Thompson, R. S., and Wright, J. D., "Oil Property Evaluation", pages 5-2, 5-3, 5-4.

## **S.J. 28-5 UNIT #211**

### **DETERMINATION OF $Q_{pci}$ : (INITIAL PICTURED CLIFFS MONTHLY PRODUCTION)**

$$Q_{pci} = Q_{t(1)} \times Q_{pc(p)} / \{Q_{pc(p)} + Q_{ftc(p)}\}$$

#### **WHERE:**

$Q_{t(1)}$  = FIRST MONTH TOTAL PRODUCTION (MCF)

$Q_{pc(p)}$  = FINAL PICTURED CLIFFS FLOW TEST (MCFPD)

$Q_{ftc(p)}$  = FINAL FRUITLAND COAL FLOW TEST (MCFPD)

# S.J. 28-5 UNIT #211

## EXAMPLE DETERMINATION OF:

- (a)  $N_p(pc)$
- (b)  $Q_{pci}$
- (c)  $D_{pc}$

PC EUR  
INITIAL PC MONTHLY FLOW RATE  
PC MONTHLY DECLINE RATE

### (a) DETERMINATION OF $N_p(pc)$

$$N_p(pc) = 0.81 \text{ (MMCF/PSI)} \times P^* \text{ (PSI)} \times R_f$$

$$P^* = 1090 \text{ PSI (FROM 7 DAY SIBHP)}$$

$$N_p(pc) = 0.81 \text{ MMCF/PSI} \times 1090 \text{ PSI} \times 0.95$$

$$\underline{N_p(pc) = 839 \text{ MMCF}}$$

### (b) DETERMINATION OF $Q_{pci}$

$$Q_{pci} = Q_t(1) \times \{Q_{pc}(p) / (Q_{pc}(p) + Q_{ftc}(p))\}$$

$$\begin{aligned} Q_t(1) &= 15,000 \text{ MCF} \\ Q_{pc}(p) &= 500 \text{ MCF/D} \\ Q_{ftc}(p) &= 400 \text{ MCF/D} \end{aligned}$$

1ST MONTH TOTAL PRODUCTION  
PC FLOW TEST  
FTC FLOW TEST

$$Q_{pci} = 15,000 \text{ MCF/M} \times \{500 \text{ MCF/D} / (500 \text{ MCF/D} + 400 \text{ MCF/D})\}$$

$$\underline{Q_{pci} = 8,333 \text{ MCF/M}}$$

### (c) DETERMINATION OF $D_{pc}$

$$D_{pc} = (Q_{pci} - Q_{pcabd}) / N_{pc}$$

$$Q_{pcabd} = 300 \text{ MCF/M}$$

$$D_{pc} = (8,333 \text{ MCF/M} - 300 \text{ MCF/M}) / (839,000 \text{ MCF})$$

$$\underline{D_{pc} = 0.010/\text{M}}$$

$$\underline{\text{THUS: } Q_{ftc} = Q_t(\text{MCF/M}) - 8,333(\text{MCF/M}) \times e^{\{-(0.010(1/\text{M})) \times t(\text{M})\}}}$$

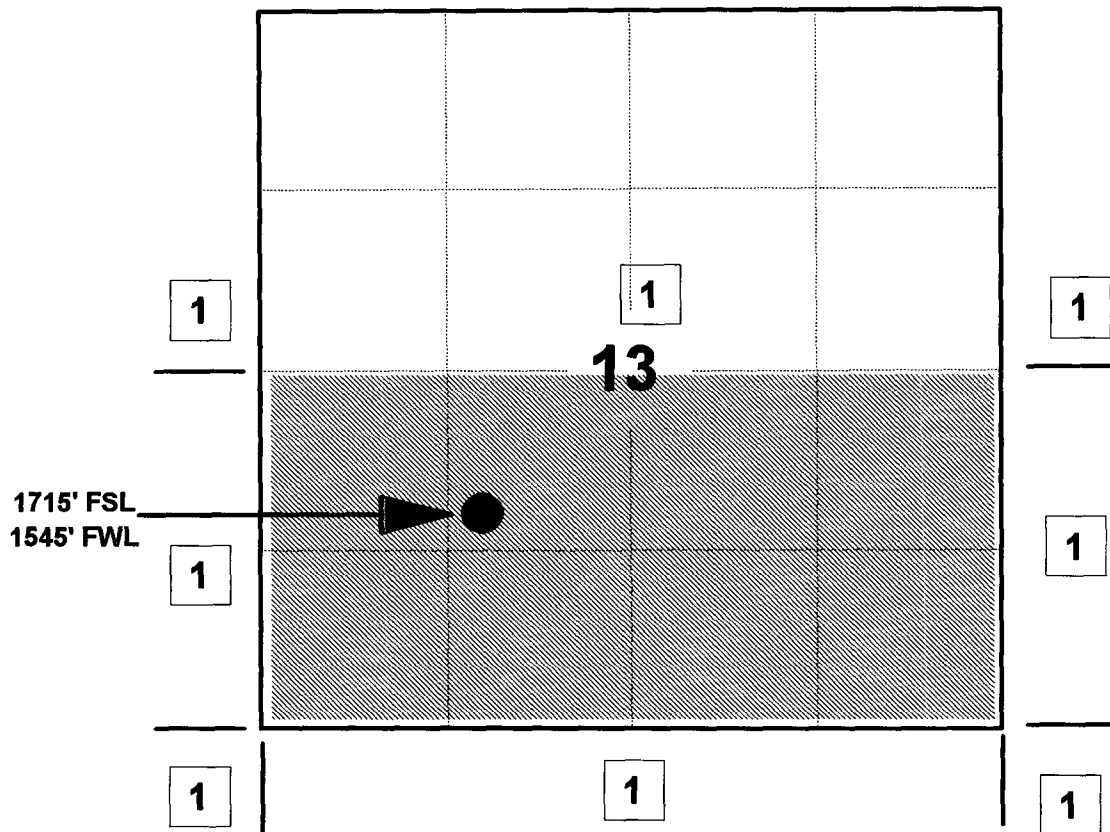
# MERIDIAN OIL INC

SAN JUAN 28-5 UNIT #211

OFFSET OPERATOR \ OWNER PLAT

Pictured Cliffs / Fruitland Coal Commingle Well

Township 28 North, Range 5 West



1) Meridian Oil Inc

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Fruitland Coal Formation

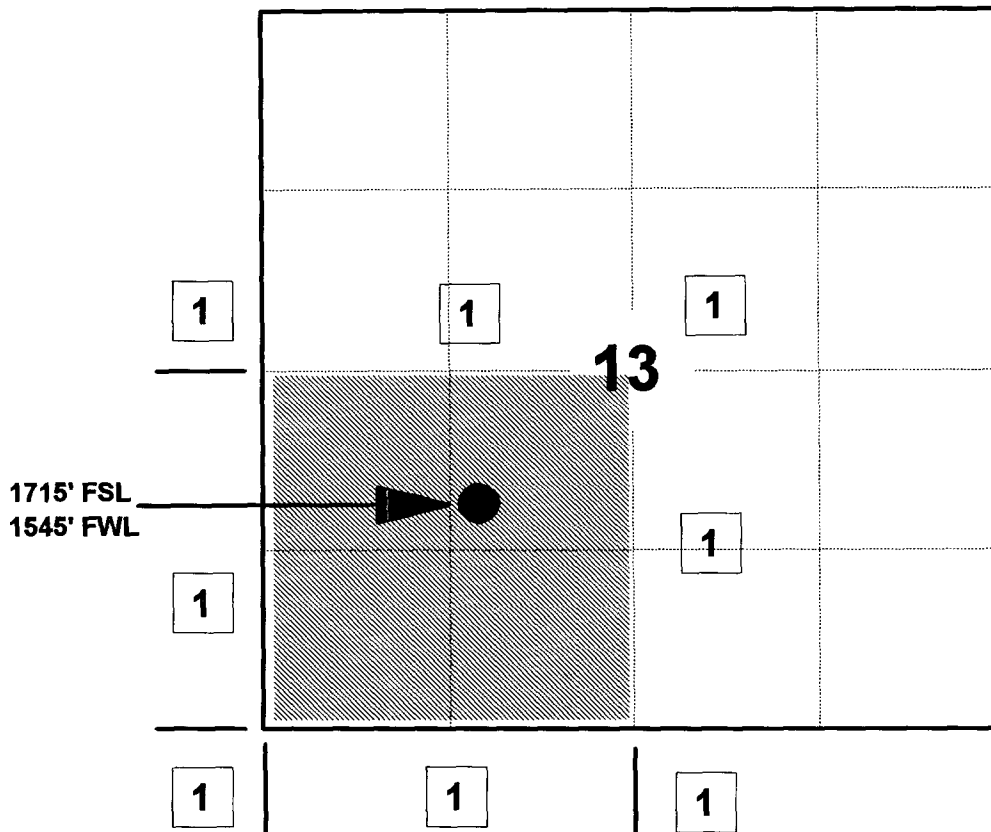
# MERIDIAN OIL INC

## SAN JUAN 28-5 UNIT #211

OFFSET OPERATOR \ OWNER PLAT

Pictured Cliffs / Fruitland Coal Commingle Well

Township 28 North, Range 5 West



1) Meridian Oil Inc

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Pictured Cliffs Formation



Microsoft Mail v3.0 IPM.Microsoft Mail.Note  
From: Ernie Busch  
To: David Catanach  
Subject: MERIDIAN OIL INC. (DHC)  
Date: 1994-05-17 07:34  
Priority: R  
Message ID: 2AD6415C  
Conversation ID: 2AD6415C

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WELL NAME & NO.            SAN JUAN 28-5 UNIT #211  
LOCATION:                    K-13-28N-05W  
RECOMMEND:                APPROVAL  
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