STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

DRUG FREE

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

ADMINISTRATIVE ORDER DHC-932

Meridian Oil Company
P.O. Box 4289
Farmington, NM 87499-4289

RECEIVED
OCT 6 1993
OIL CON. DIV.
DIST. 3

Attention: Arden L. Walker, Jr.

San Juan 28-5 Unit No. 227
Unit M, Section 11, Township 28 North, Range 5 West, NMPM,
Rio Arriba County, New Mexico.
Basin Fruitland Coal and Gobernador Pictured Cliffs Pools

Dear Mr. Walker:

Reference is made to your recent application for an exception to Rule 303-A of the Division Rules and Regulations to permit the subject well to commingle production from both pools in the wellbore.

It appearing that the subject well qualifies for approval for such exception pursuant to the provisions of Rule 303-C, and that reservoir damage or waste will not result from such downhole commingling, and correlative rights will not be violated thereby, you are hereby authorized to commingle the production as described above and any Division Order which authorized the dual completion and required separation of the two zones is hereby placed in abeyance.

In accordance with the provisions of Rule 303-C-4., total commingled oil production from the subject well shall not exceed 20 barrels per day, and total water production shall not exceed 40 barrels per day. The maximum amount of gas which may be produced daily from the well shall be determined by Division Rules and Regulations or by the gas allowable for each respective prorated pool as printed in the Division's San Juan Basin Gas Proration Schedule.

Assignment of allowable to the well and allocation of production from the well shall be in accordance with the allocation formula shown on Exhibit "A", attached hereto and made a part hereof. Any condensate production will be allocated entirely to the Gobernador Pictured Cliffs interval.

The operator is responsible for reporting the monthly gas production from the subject well to the Division utilizing the allocation formula adopted herein. An annual report shall be submitted by the operator to both the Aztec and Santa Fe offices of the Division showing the complete computations for the previous twelve-month period.

FURTHER: The operator shall notify the Aztec District Office of the Division upon implementation of the commingling process.

Pursuant to Rule 303-C-5, the commingling authority granted by the order may be rescinded by the Division Director if, in his opinion, conservation is not being best served by such commingling.

Approved at Santa Fe, New Mexico on this 28th day of September, 1993.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

WILLIAM J. LEMAY
Director

S E A L

WJL/BES/amg

cc: Oil Conservation Division - Aztec
U.S. Bureau of Land Management - Farmington

SAN JUAN 28-5 UNIT #227

MONTHLY GAS PRODUCTION ALLOCATION FORMULA

GENERAL EQUATION

Qt = Qftc + Qpc

WHERE: Qt = TOTAL MONTHLY PRODUCTION (MCF/MONTH)

Qftc = FRUITLAND COAL (ftc) MONTHLY PRODUCTION
Qpc = PICTURED CLIFFS (pc) MONTHLY PRODUCTION (MCF/MONTH)

REARRANGING THE EQUATION TO SOLVE FOR Qftc:

Qftc = Qt - Qpc

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

PICTURED CLIFFS (PC) FORMATION PRODUCTION FORMULA IS:

Qpc = Qpci X e^{-(Dpc) X (t)}

WHERE: **Qpci** = INITIAL PC MONTHLY FLOW RATE (CALCULATED FROM FLOW TEST)

Dpc = PICTURED CLIFFS MONTHLY DECLINE RATE CALCULATED FROM:
Dpc = (Qpci-Qpcabd)/Np(pc)
See Determination of Qpci and PC Estimated Ultimate Recovery (Np(pc))
Qpcabd = 300 MCF/M

WHERE: **Np(pc)** = PICTURED CLIFFS ESTIMATED ULTIMATE RECOVERY (EUR)
Np(pc) = P X 0.81 MMCF/PSI X Rf**
P* = INITIAL RESERVOIR PRESSURE (SIBHP)
RF = RECOVERY (FIELD ANALOGY): = 0.95
** DETERMINED FROM MATERIAL BALANCE (FIELD ANALOGY) AND VOLUMETRIC RESERVES (LOG ANALYSIS)

By calculating Np(pc) from SIBHP and determining Qpci, Dpc can then be calculated utilizing the previously described parameters. See derivation of Dpc, item (c) on page 4.

THUS: **Qftc = Qt - Qpci X e^{-(Dpc) X (t)}**
WHERE: **(t) IS IN MONTHS**

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

STATE OF N. MEXICO
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE

1000 RIO BRAZOS ROAD
AZTEC, NEW MEXICO 87410
(505) 334-6178

Date: 5-26-93

Attn: [illegible]

Oil Conservation Division
P.O. Box 2088
Santa Fe, NM 87504-2088

RE: Proposed MC_____
Proposed NSL_____
Proposed WFX_____
Proposed NSP_____
Proposed DHC X
Proposed SWD_____
Proposed PMX_____
Proposed DD_____

Gentlemen:

I have examined the application received on 5-7-93

for the [illegible] S.J. 28-5 #227
OPERATOR LEASE & WELL NO.

A-11-28N-5W and my recommendations are as follows:
UL-S-T-R

Yours truly,

SAN JUAN 28-5 UNIT #227

EXAMPLE DETERMINATION OF:

(a) Np(pc) — PC EUR
(b) Qpci — INITIAL PC MONTHLY FLOW RA
(c) Dpc — PC MONTHLY DECLINE RATE

(a) DETERMINATION OF Np(pc)

(see page 5 for Np(pc) derivation)

Np(pc) = 0.81 (MMCF/PSI) X P*(PSI) X Rf

P* = 1090 PSI (FROM SIBHP)

Np(pc) = 0.81 MMCF/PSI X 1090 PSI X 0.95

Np(pc) = 834 MMCF

(b) DETERMINATION OF Qpci

Qpci = Qt(1) X {Qpc(p)/(Qpc(p) + Qftc(p))}

Qt(1) =	15,000 MCF	1ST MONTH TOTAL PRODUCTION
Qpc(p) =	500 MCF/D	PC FLOW TEST
Qftc(p) =	400 MCF/D	FTC FLOW TEST

Qpci = 15,000 MCF/M X {500 MCF/D/(500 MCF/D + 400 MCF/D)}

Qpci = 8,333 MCF/M

(c) DETERMINATION OF Dpc

Dpc = (Qpci - Qpcabd)/Np(pc)

Qpcabd = 300 MCF/M

Dpc =(8,333MCF/M - 300MCF/M)/(834,000 MCF)

Dpc = 0.0096/M

THUS: Qftc = Qt(MCF/M) - 8,333(MCF/M) X e^{-(0.0096(1/M)) X t(M)}

SAN JUAN 28-5 UNIT #227

A. DETERMINATION OF PC RESERVES Np(pc)= (HCPV X Bg X Rf)

Volumetric Evaluation (averages are for subject 160 acre drill block)

a.	(t)	thickness	=	23.0	ft
b.	(phi)	porosity	=	14.0	%
c.	(Sw)	H2O saturation	=	44.0	%
d.	(Rf)	Recovery Factor	=	95.0	%
e.	(rcf)	Reservoir Cubic Feet	@ reservoir conditions		
f.	(scf)	Standard Cubic Feet	@ standard conditions		

1. HCPV = HYDROCARBON PORE VOLUME (rcf)

= t (ft) X a (ft^2) X phi X (1-Sw)

= 23 (ft) X 160 (acres) X 43,560 (ft^2/acre) X 0.14 X (1-0.44)

= 12,328,800 ft^3 1mmrcf = 1,000,000 ft^3

HCPV = 12.329 mmrcf

2. Bg = FORMATION VOLUME FACTOR (scf/rcf)

UTILIZING THE REAL GAS LAW TO DETERMINE THE FORMATION VOLUME FACTOR (Bg):

REAL GAS LAW states: $PV = ZnRT$

Rearranging to solve for n: $n = PV/ZRT$

assuming: $nr = ns$

WHERE: **nr** = NUMBER OF MOLES OF GAS AT RESERVOIR CONDITION

ns = NUMBER OF MOLES OF GAS AT SURFACE CONDITIONS

THUS: $Pr\ Vr / Zr\ Tr\ R = Ps\ Vs / Zs\ Ts\ R$

Rearranging: $Vs/Vr = Bg = Zs\ Ts\ Pr / Zr\ Tr\ Ps$

assuming:

Zs	=	1.00	
Zr	=	0.94	
Ts	=	60 °F	or 520 °R
Tr	=	100 °F	or 560 °R
Ps	=	15.025 psia	
Pr	=	Determined from build-up test	

Bg = FORMATION VOLUME FACTOR (scf/rcf)= Zs Ts Pr / Zr Tr Ps

= (scf/rcf) {1.00 X 520 (°R) X Pr (psia)}/ {0.94 X 560 (°R) X 15.025 (psia)}

Bg = 0.0657 {scf/ (rcf psia)} X Pr (psia)

3. EUR = HCPV X Bg X Rf

= 12.329 (mmrcf) X 0.0657 {scf/(rcf psia)} X Pr (psia) X 0.95

Np(pc) = 0.81 (mmscf/psia) X Pr (psia) X 0.95

SAN JUAN 28-5 UNIT #227

B. PICTURED CLIFFS DRILLING /COMPLETION COST SUMMARY

1. STAND ALONE SINGLE PC COMPLETION

ESTIMATED COSTS:	TANGIBLE (M$)	INTANGIBLE (M$)	TOTAL (M$)
	115.00	209.75	324.75

2. FTC/PC DUAL COMPLETION*

ESTIMATED COSTS:	TANGIBLE (M$)	INTANGIBLE (M$)	TOTAL (M$)
	127.20	144.34	271.54

3. FTC/PC COMMINGLE COMPLETION*

ESTIMATED COSTS:	TANGIBLE (M$)	INTANGIBLE (M$)	TOTAL (M$)
	58.90	141.45	200.35

*PICTURED CLIFFS COSTS ONLY

C. ECONOMIC SUMMARY

THE FIGURE INCLUDED DEPICTS RESERVES (EUR) VS INITIAL RATE (MC

THREE CASES PER FIGURE (FTC/PC COMMINGLE, FTC/PC DUAL, PC SINGLE) @ 15 % ROR

SAN JUAN 28-5 UNIT #227

Expected Reservoir Pressures

Pictured Cliffs - Average of the closest PC completions is 1090 psi SICP (pressures range from 1017 psi to 1065 psi). All of the completions are within 4 miles of the subject location. The initial pressure at the subject location is expected to be the offsetting PC average of 1090 psi.

Fruitland Coal - Average of the closest FTC completions is 1070 psi SICP (pressures range from 635 to 1459 psi). All of the completions are within 4-5 miles of the subject location. The pressure at the subject location is expected to be the offset FTC average of 1070 psi.

PC - 1090 psi, FTC - 1070 psi. Within limits of pressure requirements for commingling.

Fluid Compatibility

Neither producing formation makes oil or water in existing wells in the area. Both formations are very dry gas producers and no fluid production is anticipated in this well.

PC - dry gas production , FTC - dry gas production. Only natural gas will be produced so fluids are compatible.

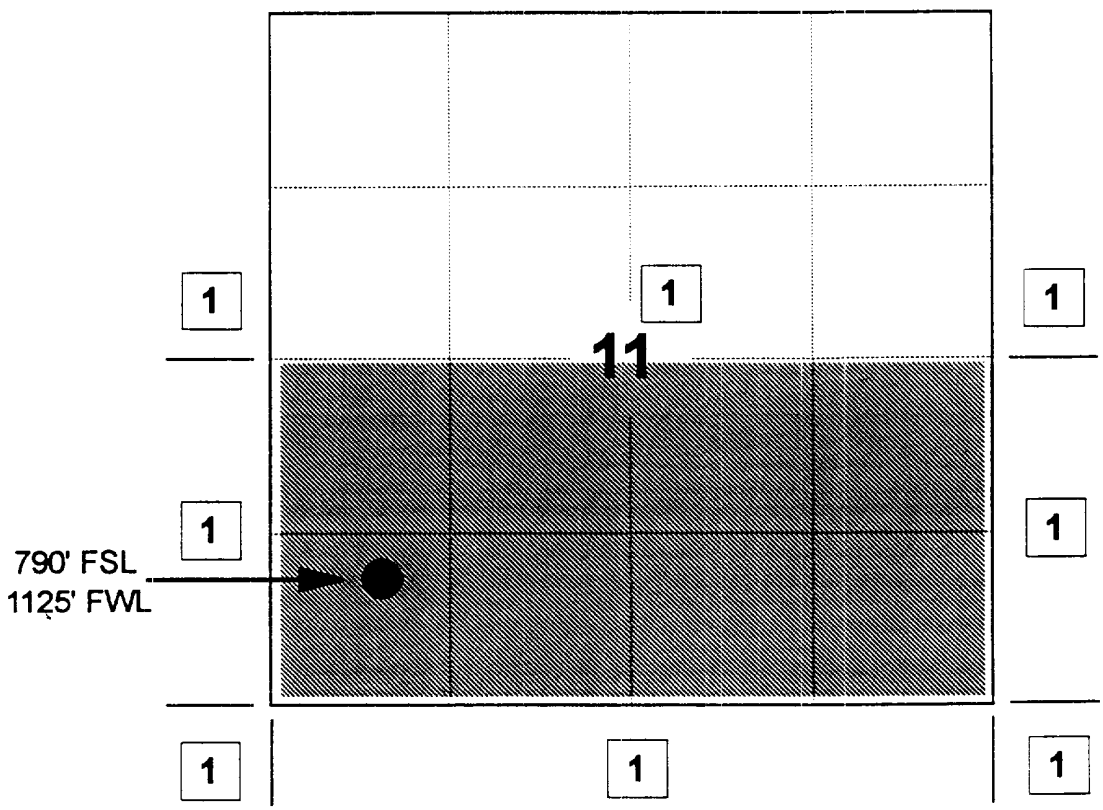
MERIDIAN OIL INC

SAN JUAN 28-5 UNIT #227

OFFSET OPERATOR \ OWNER PLAT

Fruitland Coal / Pictured Cliffs Formations Commingle

Township 28 North, Range 05 West



1) Meridian Oil Inc

submitted in lieu of Form 3160-5

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED
BLM
93 AUG -6 AM 10:15
070 FARMINGTON, NM

Sundry Notices and Reports on Wells

1. Type of Well
GAS

2. Name of Operator
MERIDIAN OIL

3. Address & Phone No. of Operator
PO Box 4289, Farmington, NM 87499 (505) 326-9700

4. Location of Well, Footage, Sec., T, R, M
935'FSL, 790'FWL Sec.11, T-28-N, R-5-W, NMPM

5. Lease Number
SF-079250

6. If Indian, All. or Tribe Name

7. Unit Agreement Name
San Juan 28-5 Unit

8. Well Name & Number
San Juan 28-5 U #227

9. API Well No.
30-039-25283

10. Field and Pool
Basin Frt Coal/
~~Choza Mesa~~ (Edmundson) PC

11. County and State
Rio Arriba Co, NM

12. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OTHER DATA

Type of Submission	Type of Action	
___ Notice of Intent	___ Abandonment	___ Change of Plans
	___ Recompletion	___ New Construction
__x Subsequent Report	___ Plugging Back	___ Non-Routine Fracturing
	___ Casing Repair	___ Water Shut off
___ Final Abandonment	___ Altering Casing	___ Conversion to Injection
	___ Other -	

13. Describe Proposed or Completed Operations

08-02-93 TD 214'. Spud @ 1:00 pm 08-02-93. Drl surface hole. Ran 5 jts of 8 5/8", 24.0#, K-55 csg, 198' set @ 214'. Cmt w/235 sx Class "B" w/3% calcium chloride and 0.25 pps celloflake (277 cu.ft.). Circ 20 sx cmt to surface.

RECEIVED
AUG 10 1993
OIL CON. DIV.
DIST. 3

14. I hereby certify that the foregoing is true and correct.

Signed Peggy Bradfield Title Regulatory Affairs Date 8/3/93

(This space for Federal or State Office use)
APPROVED BY _____ Title _____ Date _____
CONDITION OF APPROVAL, if any:

ACCEPTED FOR RECORD
AUG 1993
FARMINGTON DISTRICT OFFICE

NMOCD

submitted in lieu of Form 3160-5

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED
BLM
93 AUG 13 AM 10:22
070 FARMINGTON, NM

AUG 13 1993
OIL CON. DIV.
DIST. 3

Sundry Notices and Reports on Wells

1. Type of Well
GAS

5. Lease Number
SF-079250

6. If Indian, All. or Tribe Name

7. Unit Agreement Name
San Juan 28-5 Unit

2. Name of Operator
MERIDIAN OIL

8. Well Name & Number
San Juan 28-5 U #227

3. Address & Phone No. of Operator
PO Box 4289, Farmington, NM 87499 (505) 326-9700

9. API Well No.
30-039-25283

4. Location of Well, Footage, Sec., T, R, M
935'FSL, 790'FWL Sec.11, T-28-N, R-5-W, NMPM

10. Field and Pool
Basin Ft Coal/ Gobernador
~~Fulcher Kutz~~ PC

11. County and State
Rio Arriba Co, NM

12. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OTHER DATA

Type of Submission	Type of Action		
___ Notice of Intent	___ Abandonment	___ Change of Plans	
	___ Recompletion	___ New Construction	
_x_ Subsequent Report	___ Plugging Back	___ Non-Routine Fracturing	
	___ Casing Repair	___ Water Shut off	
___ Final Abandonment	___ Altering Casing	___ Conversion to Injection	
	_x_ Other -		

13. Describe Proposed or Completed Operations

08-10-93 TD 4139'. Ran 97 jts 4 1/2", 10.5#, K-55 csg, 4127' set @ 4139'. Stage tool @ 3623'. Cement first stage w/49 sx Class "B" 65/35 Poz w/2% calcium chloride, 0.25 pps celloflake, 5 pps gilsonite (86 cu.ft.), tail w/100 sx Class "B" neat w/2% calciumc hloride (118 cu.ft.), circ hole. Cement second stage w/798 sx Class "B" 65/35 Poz w/2% calcium chloride, 0.25 pps celloflake (1412 cu.ft.), tail w/25 sx Class "B" neat w/2% calcium chloride (30 cu.ft.). Circ 40 bbl to surface. PT 3800 psi, ok.

49
100
798
25
923

14. I hereby certify that the foregoing is true and correct.

Signed Peggy Bradfield Title Regulatory Affairs Date 8/12/93

(This space for Federal or State Office use)
APPROVED BY _____ Title _____ Date _____
CONDITION OF APPROVAL, if any:

ACCEPTED FOR RECORD

AUG 16 1993

FARMINGTON DISTRICT OFFICE
BY _____

NMOCD

DEVIATION REPORT

Name of Company	Address
MERIDIAN OIL INC.	PO Box 4289, Farmington, NM

Lease Name & Number	Unit Letter	Sec.	Twn	Rge
San Juan 28-5 Unit #227	935'S, 790'W	11	28	5

Pool and Formation	County
Basin Ft Coal/W. Kutz Pic.Cliffs	Rio Arriba

Depth (Ft.)	Deviation (Degrees)	Depth (Ft.)	Deviation (Degrees)
215	3/4		
675	1		
1054	1 1/4		
1492	2 1/4		
1932	1 3/4		
2360	2		
2784	2		
3256	2 1/4		
3790	2 1/2		
4139	2		

I, the undersigned, certify that I, acting in my capacity as Petroleum Engineer for **MERIDIAN OIL INC.**, am authorized by said Company to make this report; and that this report was prepared under my supervision and directions, and that the facts stated herein are true to the best of my knowledge and belief.

Subscribed and ~~sworn~~ to before me this 7th day of September , 1993.

Notary Public in and for San Juan County, New Mexico
My commission expires August 17, 1996.