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May 21, 1993

HAND DELIVERED

Michael E. Stogner
Oil Conservation Division
310 Old Santa Fe Trail
Santa Fe, New Mexico 87501

Re: Meridian Oil Inc.
DHC cases

Dear Mike:

I have enclosed a 5.25 floppy disk which contains the DHC allocation formula for NMOCD Cases 10721 through 10725. In addition, I have enclosed a hard copy of that formula for each case and printed such that it can be attached to the respective order as an exhibit. Please call me if you need anything else.

Jason

ROWLEY COM #500

MONTHLY GAS PRODUCTION ALLOCATION FORMULA

GENERAL EQUATION

Q = 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 * e^{-(Dpc)*(t)}

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

Dpc = PICTURED CLIFFS MONTHLY DECLINE DATE DETERMINED FROM:

MATERIAL BALANCE (FIELD ANALOGY):
VOLUMETRIC RESERVES (LOG ANALYSIS)
G f(P*) = 0.84 MMCF/PSI x P* X Rf

P* = INITIAL RESERVOIR PRESSURE (7 DAY SIBHP)
RF = RECOVERY (FIELD ANALOGY): = 0.85

THUS: **Qftc = Qt - Qpci * e^{-(Dpc)*(T)}**

WHERE: (t) IS IN MONTHS

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

ROWLEY COM #500

DETERMINATION OF Qpci:
(INITIAL PICTURED CLIFFS MONTHLY PRODUCTION)

$$Qpci = Qt(1) * Qpc(p) \setminus \{Qpc(p) + Qftc(p)\}$$

WHERE:

Qt(1) = FIRST MONTH TOTAL PRODUCTION (MCF)

Qpc(p) = FINAL PICTURED CLIFFS FLOW TEST (MCFPD)

Qftc(p) = FINAL FRUITLAND COAL FLOW TEST (MCFPD)

ROWLEY COM #500

EXAMPLE DETERMINATION OF:

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

(a) DETERMINATION OF Np(pc)

Np(pc) = 0.84 (MMCF/PSI) X P*(PSI) X Rf

P* = 300 PSI (FROM 7 DAY SIBHP)

Np(pc) = 0.84 MMCF/PSI X 300 PSI X 0.85

Np(pc) = 214.2 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)/Npc

Qpcabd = 300 MCF/M

Dpc =(8,333MCF/M - 300MCF/M)/(214,200MCF)

Dpc = 0.038/M

THUS: Qftc = Qt(MCF/M) - 8,333(MCF/M) X e^{-(0.038(1/M)) X t(M)}

ROWLEY COM #500

DETERMINATION OF Qpci:
(INITIAL PICTURED CLIFFS MONTHLY PRODUCTION)

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

WHERE:

Qt(1) = FIRST MONTH TOTAL PRODUCTION (MCF)

Qpc(p) = FINAL PICTURED CLIFFS FLOW TEST (MCFPD)

Qftc(p) = FINAL FRUITLAND COAL FLOW TEST (MCFPD)

ROWLEY COM #500

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 * e^{-(Dpc)*(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 (EUR)
Qpcabd = 300 MCF/M

WHERE: **Np(pc)** = PICTURED CLIFFS ESTIMATED ULTIMATE RECOVERY (EUR)
P*x 0.84 MMCF/PSI x Rf**
P* = INITIAL RESERVOIR PRESSURE (7 DAY SIBHP)
RF = RECOVERY (FIELD ANALOGY): = 0.85
** DETERMINED FROM MATERIAL BALANCE (FIELD ANALOGY) AND VOLUMETRIC RESERVES (LOG ANALYSIS)

By calculating PC EUR FROM SIBHP and determining PC initial flow rate, Dpc can then be estimated utilizing the previously described parameters

THUS: **Qftc = Qt - Qpci * e^{-(Dpc)*(t)}**

WHERE: **(t) IS IN MONTHS**

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

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HUERFANO UNIT #549

In order to facilitate an economic Pictured Cliffs completion three requirements must be met. It is the combination of these three requirements that determines the economic status and completion method (PC single completion, PC-FTC Dual, PC-FTC commingle) utilized. These three requirements are as follows:

RESERVES Np(pc)

FLOW RATE (Qpcl)

COSTS (Investment and Operating)

Shown in the following example are the parameters and calculations used to determine Pictured Cliffs initial rate (Qpci), Pictured Cliffs Estimated Ultimate Recovery (Np(pc)), and Pictured Cliffs decline rate (Dpc). Additionally, estimated costs associated with each completion method and economic sensitivities (figures 1-3) are attached to show the effects of PC reserves (Np(pc)), initial PC rates (Qpci), and completion method (costs).

This example is for the Huerfano Unit #549, but the methodology is applicable for each of the commingle applications submitted (Rhodes C #'s 101 & 102, Whitley A #100, McAdams #500, and the Rowley Com #500). The variations in the Np(pc)'s are due to the specific drill block parameters (thickness, porosity, water saturation). Costs will be similar and the economic sensitivities are applicable for each case.

HUERFANO UNIT #549

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 1.08 MMCF/PSI X Rf**
P* = INITIAL RESERVOIR PRESSURE (SIBHP)
RF = RECOVERY (FIELD ANALOGY): = 0.85
** 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.

HUERFANO UNIT #549

DETERMINATION OF Qpci:
(INITIAL PICTURED CLIFFS MONTHLY PRODUCTION)

$$Qpci = Qt(1) \times Qpc(p) / \{Qpc(p) + Qftc(p)\}$$

WHERE:

Qt(1) = FIRST MONTH TOTAL PRODUCTION (MCF)

Qpc(p) = FINAL PICTURED CLIFFS FLOW TEST (MCFPD)

Qftc(p) = FINAL FRUITLAND COAL FLOW TEST (MCFPD)

HUERFANO UNIT #549

EXAMPLE DETERMINATION OF:

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

(a) DETERMINATION OF Np(pc)

(see page 5 for Np(pc) derivation)

Np(pc) = 1.08 (MMCF/PSI) X P*(PSI) X Rf

P* = 300 PSI (FROM SIBHP)

Np(pc) = 1.08 MMCF/PSI X 300 PSI X 0.85

Np(pc) = 275.4 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)/(275,400MCF)

Dpc = 0.029/M

THUS: Qftc = Qt(MCF/M) - 8,333(MCF/M) X e^{-(0.029(1/M)) X t(M)}

HUERFANO UNIT #549

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	=	35.0 ft
b.	(phi)	porosity	=	15.0 %
c.	(Sw)	H2O saturation	=	55.0 %
d.	(Rf)	Recovery Factor	=	85.0 %
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)
= 35 (ft) X 160 (acres) X 43,560 (ft^2/acre) X 0.15 X (1-0.55)
= 16,465,680 ft^3 1mmrcf = 1,000,000 ft^3

HCPV = 16.466 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

= 16.466 (mmrcf) X 0.0657 {scf/(rcf psia)} X Pr (psia) X 0.85

Np(pc) = 1.08 (mmscf/psia) X Pr (psia) X 0.85

HUERFANO UNIT #549

B. PICTURED CLIFFS DRILLING /COMPLETION COST SUMMARY

1. STAND ALONE SINGLE PC COMPLETION

ESTIMATED COSTS:	TANGIBLE (M$)	INTANGIBLE (M$)	TOTAL (M$)
	183.39	136.12	319.51

2. FTC/PC DUAL COMPLETION*

ESTIMATED COSTS:	TANGIBLE (M$)	INTANGIBLE (M$)	TOTAL (M$)
	173.49	93.67	267.16

3. FTC/PC COMMINGLE COMPLETION*

ESTIMATED COSTS:	TANGIBLE (M$)	INTANGIBLE (M$)	TOTAL (M$)
	91.69	93.67	185.36

*PICTURED CLIFFS COSTS ONLY

C. ECONOMIC SUMMARY

FIGURES 1-3 PICTURED CLIFFS RESERVES VS RATE OF RETURN (%)

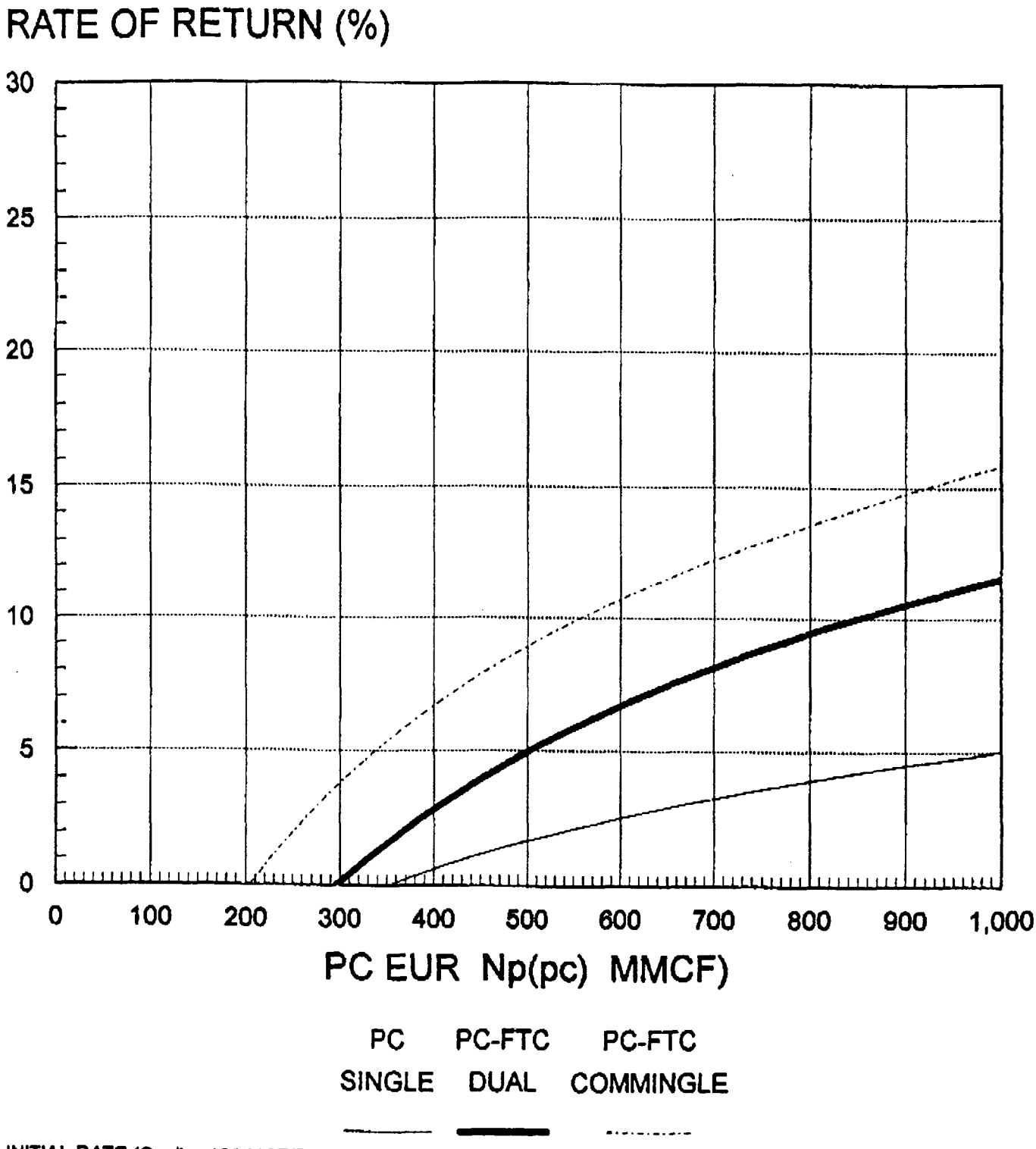
THREE CASES PER FIGURE (FTC/PC COMMINGLE, FTC/PC DUAL, PC SINGLE)

FIGURE 1 INITIAL RATE = 100 MCF/D
FIGURE 2 INITIAL RATE = 200 MCF/D
FIGURE 3 INITIAL RATE = 300 MCF/D

PICTURED CLIFFS

ECONOMIC EVALUATION

COMPLETION TECHNIQUE SENSITIVITY



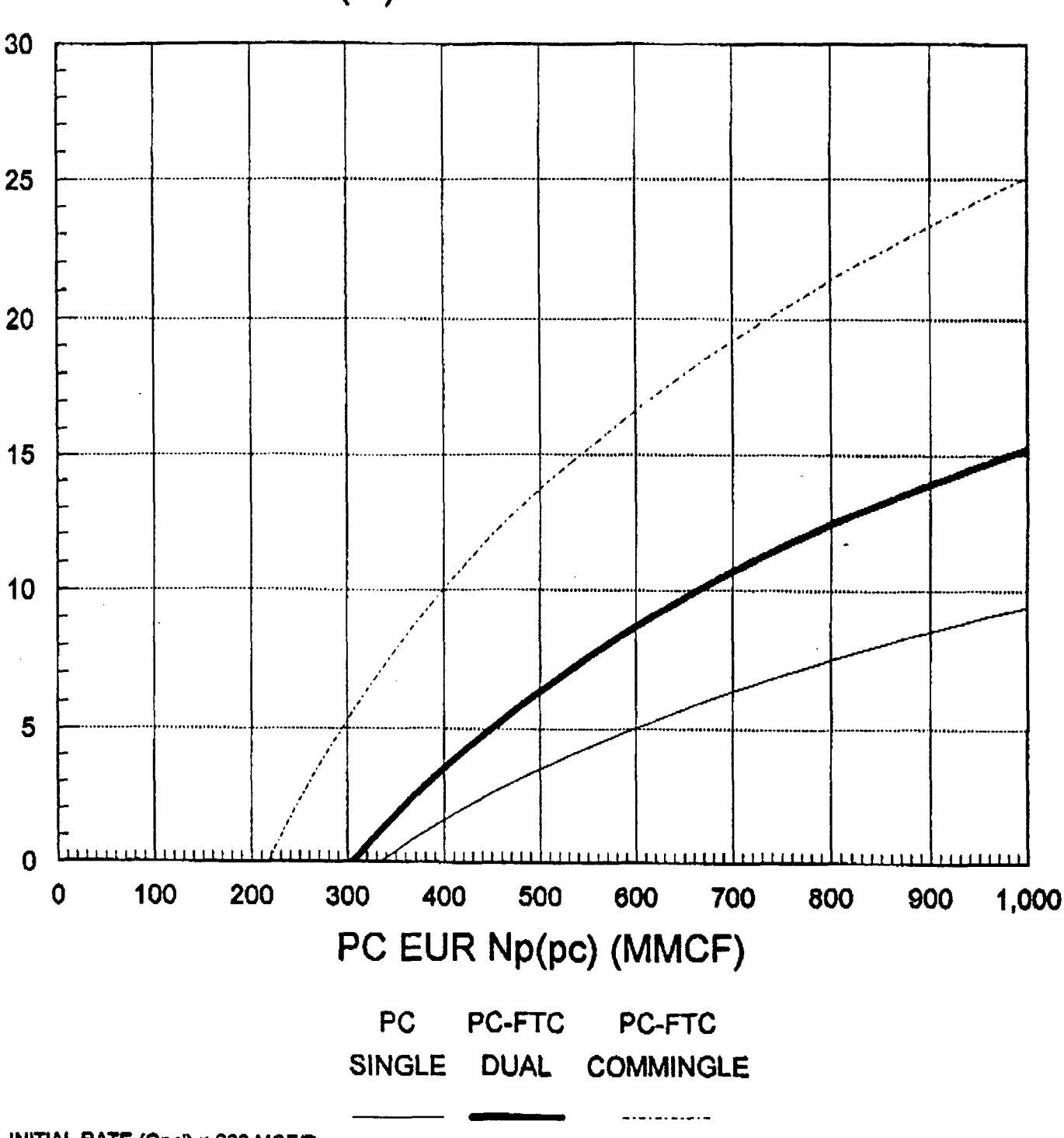
INITIAL RATE (Qpci) = 100 MCF/D
OR 3,000 MCF/M

FIGURE 1

PICTURED CLIFFS

ECONOMIC EVALUATION

COMPLETION TECHNIQUE SENSITIVITY

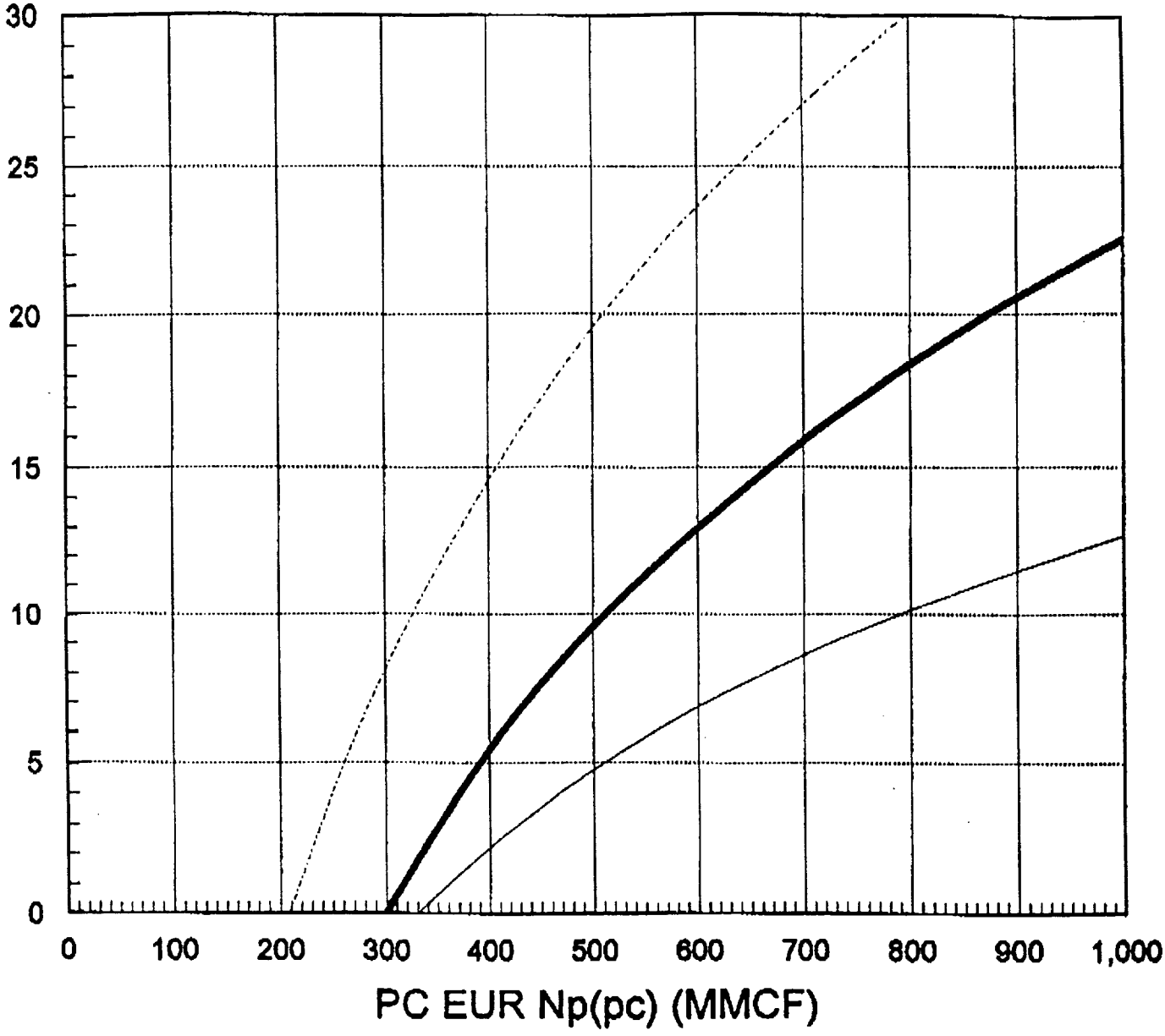


INITIAL RATE (Qpci) = 200 MCF/D
OR 6,000 MCF/M
FIGURE 2

ECONOMIC EVALUATION

COMPLETION TECHNIQUE SENSITIVITY

RATE OF RETURN (%)



INITIAL RATE (Qpci) = 300 MCF/D
OR 9,000 MCF/M
FIGURE 3

	WELL	POOL		OWNERSHIP		NSL		ECONOMICS
		FTC	PC	FTC	PC	FTC	PC	SUB ECON
1.	Rhodes C#101 10729	BFTC	W-K	Comm	Comm	NSL	NSL	FTC - PC
2.	Rhodes C#102 10725	BFTC	W-K	Comm	Comm	OK	NSL	FTC - PC
3.	Whitley A#100 10723	BFTC	W-K	Comm	Comm	OK	NSL	FTC - PC
4.	Rowley Com#500 10721	BFTC	FK	Diff	Diff	OK	NSL	PC -Margin
5.	McAdams #500 10722	BFTC	FK	Diff	Diff	OK	OK	PC

West Kutz

Fulcher Kutz

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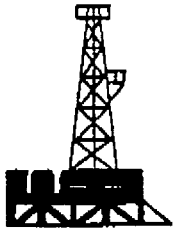

MERIDIAN OIL

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to plot, they yield results on a time basis, and they're deceptively easy to analyze. Decline curves are also one of the oldest methods of predicting reserves.

Decline curves, as used today, are simply a plot of production rate versus time on semilog, log-log, or specially scaled paper. The most common plot is semilog. When the logarithm of producing rate is plotted versus linear time, a straight line often results. This phenomenon is referred to as "exponential decline" and is similar to the decay of a radioactive element. Exponential decline is also referred to as constant percentage decline because of terminology used in the early 1900's. Occasionally, someone will state that exponential decline and constant percentage decline are different. This is not true; they are synonyms for decline curves which plot as a straight line on semi-log paper.

Often the data will not plot as a straight line on semi-log paper, but instead will "curve up" or be concave upwards. This situation, in which the decline rate continuously decreases with time, can usually be modeled with a hyperbolic equation. In cases of this type, the well is said to be experiencing "hyperbolic decline." A special case of hyperbolic decline is known as "harmonic decline."

5.1 DECLINE CURVE EQUATIONS

5.1.1 *Exponential Decline*

The equation of a straight line on semilog paper can be written as

$$q = q_i e^{-Dt} \qquad (5\text{-}1)$$

where

- q = producing rate at time t, vol/unit time
- q_i = producing rate at time 0, vol/unit time
- D = nominal exponential decline rate, 1/time
- t = time
- e = base of natural logarithms, (2.718....)

Any system of units can be used as long as the product **Dt** is unitless and q and q_i are expressed in the same units. Equation 5-1 can be "derived" by stating that the decline rate at any time is proportional to the production rate, but there is no theoretical foundation for this "derivation." The theoretical foundation for exponential decline will be discussed later.

5.1.1.1 *Nominal and Effective Decline Rates*

Equation (5-1) *defines* the nominal decline rate (D). In dealing with production data, we intuitively think in terms of "effective" decline rate. For example, if we are told that a well produced 100 BOPD one year ago and now produces 50 BOPD, we naturally feel that the well declined at a rate of 50% per year. Imagine our surprise when the engineer says it is declining at 69.3% per year! Which one of the these is correct? Both of them are. Effective decline is defined as

$$D_e = \frac{q_i - q}{q_i} \qquad (5\text{-}2)$$

for a given time period. The relationship between **D** and D_e can be derived as follows. We take **t** to be one time period (a year, perhaps). Since q_i and **q** are the same for both definitions of decline rate we can solve equations 5-1 and 5-2 for **q** and set the results equal:

$$q = q$$

$$q_i e^{-D} = q_i - q_i D_e$$

(t has been set to 1)

factor out q_i

$$q_i e^{-D} = q_i(1 - D_e)$$

Nominal decline as a function of effective decline is

$$D = -\ln(1 - D_e) \qquad (5\text{-}3)$$

or

Effective decline as a function of nominal decline is

$$D_e = 1 - e^{-D} \qquad (5\text{-}4)$$

The authors strongly prefer the use of nominal decline rather than effective decline for reasons which will be discussed throughout the rest of the chapter.

One of the major reasons for using nominal decline has to do with changing the time units on decline rate. With nominal decline, a yearly rate can be changed to a monthly rate simply by dividing by 12. *This is not possible with effective decline!* In order to convert yearly effective rate to monthly effective rate, the *twelfth root* of $1 - D_e$ must be taken. Taking the twelfth root or raising a number to the twelfth power is not difficult, but it is not intuitive. An example will illustrate the above ideas.

Example 5-1
Nominal and Effective Decline Rates

Given that a well has declined from 100 BOPD to 96 BOPD during a one month period.

A) Predict the rate after 11 more months using nominal exponential decline.

B) Same as A using effective decline.

A) Using Nominal Decline

$q_i = 100$ BOPD

$q = 96$ BOPD

$t = 1$ month

$$D = \left[\ln\left(\frac{q_i}{q}\right)\right]/t \qquad (5\text{-}1)$$

$D = .04082$/mo

Find rate at end of 1 year.

PRIMARY EQ

$$q = q_i e^{-Dt}$$

$q = 100e^{-.04082\,(12)}$

$q = 61.27$ BOPD

B) Using Effective Decline

$$D_e = \frac{q_i - q}{q_i} \qquad (5\text{-}2)$$

$$D_e = \frac{100 - 96}{100}$$

$D_e = .04$/month

Convert to yearly

$1 - D_{ey} = (1 - D_{em})^{12}$

$1 - D_{ey} = (1 - .04)^{12}$

$D_{ey} = .3875$/year

Find rate at end of 1 year

$q = q_i\,(1 - D_e)$

$q = 100(1 - .3873)$

$q = 61.27$ BOPD

The authors find it much easier to use nominal decline. No matter what the units on **D** and **t**, it is only necessary to multiply by the appropriate time factor to cause the product **Dt** to be unitless. Try to predict the rate 22½ months from now using effective decline — it's not worth the effort.

5.1.1.2 *Cumulative Production*

In oil property evaluation, we are more interested in the amount of oil produced each year than the rate at any given time. In order to determine the cumulative oil production (N_p) at any

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

APPLICATION OF MERIDIAN OIL INC. FOR AN UNORTHODOX GAS WELL LOCATION AND DOWNHOLE COMMINGLING, SAN JUAN COUNTY, NEW MEXICO. *Case No. 10721*

APPLICATION OF MERIDIAN OIL INC. FOR DOWNHOLE COMMINGLING, SAN JUAN COUNTY, NEW MEXICO. *Case No. 10722*

APPLICATION OF MERIDIAN OIL INC. FOR AN UNORTHODOX GAS WELL LOCATION AND DOWNHOLE COMMINGLING, SAN JUAN COUNTY, NEW MEXICO. *Case No. 10723*

APPLICATION OF MERIDIAN OIL INC. FOR AN UNORTHODOX GAS WELL LOCATION AND DOWNHOLE COMMINGLING, SAN JUAN COUNTY, NEW MEXICO. *Case No. 10724*

APPLICATION OF MERIDIAN OIL INC. FOR AN UNORTHODOX GAS WELL LOCATION AND DOWNHOLE COMMINGLING, SAN JUAN COUNTY, NEW MEXICO. *Case No. 10725*

Order No. R-9920

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on April 22, 1993, at Santa Fe, New Mexico, before Examiner Michael E. Stogner.

NOW, on this 9th day of July, 1993, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS THAT:

(1) Due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.

(2) At the time of the hearing Case Nos. 10721 through 10725 were consolidated for the purpose of presenting testimony.

(3) The applicant in each of the five following cases is Meridian Oil Inc. and due to the similarity, close proximity, and nature of each, a single directive issued by the Division is deemed appropriate:

(a) in Case No. 10721 the applicant seeks approval to downhole commingle Fulcher Kutz-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its proposed Rowley Com Well No. 500 to be drilled at an unorthodox gas well location for the Fulcher Kutz-Pictured Cliffs Pool 2335 feet from the South line and 1850 feet from the West line (Unit K) of Section 7, Township 27 North, Range 10 West, NMPM, San Juan County, New Mexico. Said well is to be dedicated to a standard 332.92-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool being Lots 1 through 4 and the E/2 W/2 (W/2 equivalent) of said Section 7 and to a 166.61-acre gas spacing unit for the Fulcher Kutz-Pictured Cliffs Pool being Lots 3 and 4 and the E/2 SW/4 (SW/4 equivalent) of said Section 7;

(b) in Case No. 10722 the applicant seeks approval to downhole commingle Fulcher Kutz-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its proposed McAdams Well No. 500 to be drilled at a standard gas well location 790 feet from the North line and 1010 feet from the East line (Unit A) of Section 28, Township 27 North, Range 10 West, NMPM, San Juan County, New Mexico. Said well is to be dedicated to a standard

320-acre gas spacing unit for the Basin-Fruitland Coal (Gas) Pool being the E/2 of said Section 28 and to a standard 160-acre gas spacing unit for the Fulcher Kutz-Pictured Cliffs Pool being the NE/4 of said Section 28;

(c) in Case No. 10723 the applicant seeks approval to downhole commingle West Kutz-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its proposed Whitley "A" Well No. 100 to be drilled at an unorthodox gas well location for the West Kutz-Pictured Cliffs Pool 2010 feet from the South line and 1090 feet from the West line (Unit L) of Section 17, Township 27 North, Range 11 West, NMPM, San Juan County, New Mexico. Said well is to be dedicated to a standard 320-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool being the W/2 of said Section 17 and to a standard 160-acre gas spacing unit for the West Kutz-Pictured Cliffs Pool being the SW/4 of said Section 17;

(d) in Case No. 10724 the applicant seeks approval to downhole commingle West Kutz-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its proposed Rhodes "C" Well No. 101 to be drilled at an unorthodox gas well location for both the West Kutz-Pictured Cliffs Pool and the Basin-Fruitland Coal (Gas) Pool, being 100 feet from the South line and 2270 feet from the West line (Unit N) of Section 30, Township 28 North, Range 11 West, NMPM, San Juan County, New Mexico. Said well is to be dedicated to a standard 315.97-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool being Lots 1 through 4 and the E/2 W/2 (W/2 equivalent) of said Section 30 and to a 158.04-acre gas spacing unit for the West Kutz-Pictured Cliffs Pool being Lots 3 and 4 and the E/2 SW/4 (SW/4 equivalent) of said Section 30; and,

(e) in Case No. 10725 the applicant seeks approval to downhole commingle West Kutz-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its proposed Rhodes "C" Well No. 102 to be drilled at an unorthodox gas well location for the West Kutz-Pictured Cliffs Pool being 790 feet from the North line and 1950 feet from the East line (Unit B) of Section 31, Township 28 North, Range 11 West, NMPM, San Juan County, New Mexico. Said well is to be dedicated to a standard 317.85-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool being Lots 1 and 2, the NE/4, and the E/2 NW/4 (N/2 equivalent) of said Section 31 and to a standard 160-acre gas spacing unit for the West Kutz-Pictured Cliffs Pool being the NE/4 of said Section 31.

(4) Both the West Kutz and Fulcher Kutz Pictured Cliffs Pools are governed under the spacing provisions of the Division's General Rules and Regulations [Rule 104.C(3)] which provides for 160-acre drilling tracts. The Basin Fruitland Coal (Gas) Pool is spaced on 320-acre spacing, pursuant to the provisions of Rule 4 of the Special Rules and Regulations for the Basin Fruitland Coal (Gas) Pool, as promulgated by Division Order No. R-8768, as amended.

(5) The proposed unorthodox locations are caused by various topographic reasons and not geologic.

(6) Applicant's geologic evidence indicates that gas production capabilities from both the Pictured Cliffs and Fruitland Coal intervals in this general area of the San Juan Basin is expected to be marginal in nature, thereby making the downhole commingling of both zones practical in order to adequately recover Basin-Fruitland Coal gas and conventional Pictured Cliffs gas reserves underlying each respective proration unit in a prudent manner.

(7) Further, the applicant's evidence indicates that due to the marginal production expected in both intervals, it will probably be uneconomic to drill either a stand alone Pictured Cliffs or Fruitland Coal Gas well or a dual producer in this area. However, in the event total gas production from both pools in a well exceeds 300 MCF per Day, downhole commingling will not be allowed in the effected well until the combined rate drops below 300 MCF/day.

(8) The ownership within the Basin-Fruitland Coal (Gas) Pool and the Fulcher Kutz-Pictured Cliffs Pool or West Kutz-Pictured Cliffs Pool underlying each respective proration unit is not common.

(9) The applicant has notified all interest owners owning an interest in either the Pictured Cliffs or Fruitland formation within the subject proration units of its proposed downhole commingling.

(10) No offset operator and/or interest owner appeared at the hearing in opposition to the proposed downhole commingling and/or unorthodox well locations.

(11) The applicant further demonstrated through its evidence and testimony that:

(a) there will be no crossflow between the two commingled pools;

(b) neither commingled zone exposes the other to damage by produced liquids;

(c) the fluids from each zone are compatible with the other;

(d) the bottomhole pressure of the lower pressure zone should not be less than 50 percent of the bottomhole pressure of the higher pressure zone adjusted to a common datum; and,

(e) the value of the commingled production is not less than the sum of the values of the individual production.

(12) In the interest of prevention of waste and protection of correlative rights, each of the subject applications should be approved.

(13) Due to the nature of gas production from the Basin-Fruitland Coal (Gas) Pool, straight allocation of gas volumes from both zones is not appropriate. The applicant therefore seeks the adoption of a monthly allocation formula, based on initial production test and known/assumed parameters from the Pictured Cliffs zone whereby its initial rate, estimated ultimate recovery, and decline rate can be determined. Any

production rate over what is calculated for the Pictured Cliffs utilizing the applied formula can be attributed to the Fruitland coal gas interval. See Exhibit "A" attached hereto and made a part hereof for additional reference.

(14) The operator should consult with the Supervisor of the Aztec Office of the Division to insure the validity and scientific accuracy of the initial test on each well.

(15) The operator should be responsible for reporting the monthly gas production from each of the subject wells by utilizing the proposed allocation formula.

(16) An annual report should be submitted by the operator for each well to both the Aztec and Santa Fe offices of the Division showing the complete computations for each month.

(17) Any condensate production should be allocated entirely to the Pictured Cliffs interval. Water production should be reported in a manner acceptable to the supervisor of the Aztec district office of the Division.

(18) Any change in the method of gas allocation between the two pools for any of the subject wells should be made only after due notice and hearing.

(19) To afford the Division an opportunity to assess the potential of waste and to expeditiously order the appropriate remedial action, the operator should notify the Aztec district office of the Division any time one of the five subject wells is shut-in for seven consecutive days.

IT IS THEREFORE ORDERED THAT:

(1) The applicant in Case Nos. 10721, 10722, 10723, 10724, and 10725, Meridian Oil Inc., is hereby authorized:

(a) to downhole commingle Fulcher Kutz-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its proposed Rowley Com Well No. 500 to be drilled at an unorthodox gas well location for the Fulcher Kutz-Pictured Cliffs Pool 2335 feet from the South line and 1850 feet from the West line (Unit K) of Section 7, Township 27 North, Range 10 West, NMPM, San Juan County, New Mexico. Said well shall be dedicated to a standard 332.92-acre gas spacing and proration unit for the

Basin-Fruitland Coal (Gas) Pool being Lots 1 through 4 and the E/2 W/2 (W/2 equivalent) of said Section 7 and to a 166.61-acre gas spacing unit for the Fulcher Kutz-Pictured Cliffs Pool being Lots 3 and 4 and the E/2 SW/4 (SW/4 equivalent) of said Section 7;

(b) to downhole commingle Fulcher Kutz-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its proposed McAdams Well No. 500 to be drilled at a standard gas well location 790 feet from the North line and 1010 feet from the East line (Unit A) of Section 28, Township 27 North, Range 10 West, NMPM, San Juan County, New Mexico. Said well shall be dedicated to a standard 320-acre gas spacing unit for the Basin-Fruitland Coal (Gas) Pool being the E/2 of said Section 28 and to a standard 160-acre gas spacing unit for the Fulcher Kutz-Pictured Cliffs Pool being the NE/4 of said Section 28;

(c) to downhole commingle West Kutz-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its proposed Whitley "A" Well No. 100 to be drilled at an unorthodox gas well location for the West Kutz-Pictured Cliffs Pool 2010 feet from the South line and 1090 feet from the West line (Unit L) of Section 17, Township 27 North, Range 11 West, NMPM, San Juan County, New Mexico. Said well shall be dedicated to a standard 320-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool being the W/2 of said Section 17 and to a standard 160-acre gas spacing unit for the West Kutz-Pictured Cliffs Pool being the SW/4 of said Section 17;

(d) to downhole commingle West Kutz-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its proposed Rhodes "C" Well No. 101 to be drilled at an unorthodox gas well location for both the West Kutz-Pictured Cliffs Pool

and the Basin-Fruitland Coal (Gas) Pool, being 100 feet from the South line and 2270 feet from the West line (Unit N) of Section 30, Township 28 North, Range 11 West, NMPM, San Juan County, New Mexico. Said well shall be dedicated to a standard 315.97-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool being Lots 1 through 4 and the E/2 W/2 (W/2 equivalent) of said Section 30 and to a 158.04-acre gas spacing unit for the West Kutz-Pictured Cliffs Pool being Lots 3 and 4 and the E/2 SW/4 (SW/4 equivalent) of said Section 30; and,

(e) to downhole commingle West Kutz-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its proposed Rhodes "C" Well No. 102 to be drilled at an unorthodox gas well location for the West Kutz-Pictured Cliffs Pool being 790 feet from the North line and 1950 feet from the East line (Unit B) of Section 31, Township 28 North, Range 11 West, NMPM, San Juan County, New Mexico. Said well shall be dedicated to a standard 317.85-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool being Lots 1 and 2, the NE/4, and the E/2 NW/4 (N/2 equivalent) of said Section 31 and to a standard 160-acre gas spacing unit for the West Kutz-Pictured Cliffs Pool being the NE/4 of said Section 31.

PROVIDED HOWEVER, in the event total gas production from both pools in a well exceeds 300 MCF per Day, downhole commingling will not be allowed in the effected well until the combined rate drops below 300 MCF/day.

(2) The allocation of gas produced from the Pictured Cliffs and Fruitland Coal intervals in each of the subject wells shall be in accordance with the adopted allocation formula, as further referenced in Exhibit "A" attached hereto and made a part hereof.

(3) The operator shall consult with the Supervisor of the Aztec Office of the Division to insure the validity and accuracy of the initial test on each well.

(4) Further, the operator is responsible for reporting the monthly gas production from each of the five wells to the Division utilizing said allocation formula. An annual report for each well 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.

(5) Any condensate production from a well shall be allocated entirely to the appropriate Pictured Cliffs Pool. Water production shall be reported in a manner acceptable to the supervisor of the Aztec district office of the Division.

(6) Any variance in the method of gas allocation between the two pools for any of the subject wells shall be made only after due notice and hearing.

(7) The operator shall immediately notify the supervisor of the Aztec District Office of the Division any time one of the five subject wells has been shut-in for seven consecutive days and shall concurrently present, to the Division, a plan for remedial action.

(8) Jurisdiction is hereby retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

WILLIAM J. LEMAY
Director

S E A L

Exhibit "A"

CONSOLIDATED CASES 10721, 10722, 10723, 10724, AND 10725

DIVISION ORDER NO. R-9920

Case No. 10721	Rowley Well No. 500
Case No. 10722	McAdams Well No. 500
Case No. 10723	Whitley "A" Well No. 100
Case No. 10724	Rhodes "C" Well No. 101
Case No. 10725	Rhodes "C" Well No. 102

MONTHLY GAS PRODUCTION ALLOCATION FORMULA GENERAL EQUATION

$$Qt = Qftc + Qpc$$

WHERE:
Qt = TOTAL MONTHLY PRODUCTION FROM WELL (MCF/MONTH)
Qftc = FRUITLAND COAL (FTC) MONTHLY PRODUCTION (MCF/MONTH)
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:

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

WHERE:
Qpci IS THE INITIAL PC MONTHLY FLOW RATE (CALCULATED FROM FLOW TEST)
OR

$$Qpci = Qt(1) * Qpc(p) \setminus \{Qpc(p) + Qftc(p)\}$$

WHERE:

Qt(1) = FIRST MONTH TOTAL PRODUCTION (MCF)
Qpc(p) = FINAL PICTURED CLIFFS FLOW TEST (MCFPD)
Qftc(p) = FINAL FRUITLAND COAL FLOW TEST (MCFPD)

AND WHERE:

Dpc IS THE CALCULATED PICTURED CLIFFS MONTHLY DECLINE RATE DETERMINED.

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

WHERE: Qpcabd = PICTURED CLIFFS PRODUCTION RATE AT ABANDONMENT (300 MCF/MO.); AND, Np(pc) IS THE PICTURED CLIFFS ESTIMATED ULTIMATE RECOVERY.

THUS: $$Qftc = Qt - Qpci * e^{-(Dpc)*(t)}$$

WHERE: (t) = TIME (MONTHS) FROM INITIAL PRODUCTION

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

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SANTA FE, NEW MEXICO 87504
(505) 827-5800

July 9, 1993

KELLAHIN AND KELLAHIN
Attorneys at Law
P. O. Drawer 2265
Santa Fe, New Mexico 87504

RE: CASE NOS. 10721, 10722, 10723, 10724, 10725
ORDER NO. R-9920

Dear Sir:

Enclosed herewith are two copies of the above-referenced Division order recently entered in the subject cases.

Sincerely,

Sally Leichtle

Sally E. Leichtle
Administrative Secretary

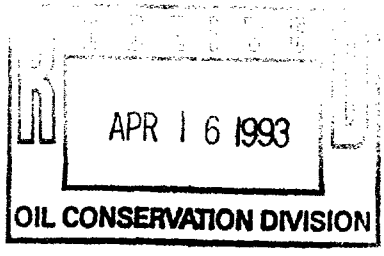
cc: BLM - Farmington
Steve Keene - TRD
Donna McDonald - OCD
Aztec OCD Office

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

CASE NO. 10721

APPLICATION OF MERIDIAN OIL INC.
FOR AN UNORTHODOX GAS WELL
LOCATION AND DOWNHOLE COMMINGLING,
SAN JUAN COUNTY, NEW MEXICO.



PRE-HEARING STATEMENT

This pre-hearing statement is submitted by MERIDIAN OIL INC. as required by the Oil Conservation Division.

APPEARANCE OF PARTIES

APPLICANT	ATTORNEY
MERIDIAN OIL INC. P. O. Box 4289 Farmington, N.M. 87499 Attn: Alan Alexander (505) 326-9757	W. Thomas Kellahin KELLAHIN AND KELLAHIN P.O. Box 2265 Santa Fe, NM 87504 (505) 982-4285

OPPOSITION OR OTHER PARTY ATTORNEY

N/A

STATEMENT OF CASE

APPLICANT:

Meridian Oil Inc. seeks approval to downhole commingle Fulcher Kutz-Pictured Cliffs Gas Pool (SW/4 dedication) and Basin-Fruitland Coal Gas Pool (W/2 dedication) production within the wellbore of its proposed ROWLEY COM WELL NO. 500 to be drilled at an unorthodox gas well location in Unit K of Section 7, T27N, R10W, San Juan County New Mexico. As set forth in its application, Meridian will establish, among other things, that:

(1) Ownership is different between the two spacing units but correlative rights will not be impaired because:

(a) there are insufficient Pictured Cliffs gas reserves under either the SW/4 or NW/4 of Section 7 to justify a "stand alone" Pictured Cliff well,

(b) the SW/4 of Section 7 has better potential for a successful Fruitland Coal Gas Well, and

(c) The Pictured Cliffs gas in the spacing unit cannot economically be produced in any other means than downhole commingling;

(2) The unorthodox location is 305 feet rather than 790 feet from the north line of the SW/4 of Section 7. It is necessary because the SW/4 of Section 7 is almost entirely within the Kutz Wash and the proposed location is the only surface location in the SW/4 of Section 7 which the BLM will approve.

(3) No reservoir damage will occur.

The proposed Basin-Fruitland Coal Gas Pool spacing unit is the W/2 equivalent of Section 7 being 332.92 acres. The proposed Fulcher Kutz-Pictured Cliffs Pool spacing unit is the SW/4 equivalent of Section 7 being 166.61 acres. Both are standard in size for their respective pools.

PROPOSED EVIDENCE

APPLICANT

WITNESSES	EST. TIME	EXHIBITS
Tom Yersak (geologist)	10 min.	2
Alan Alexander (landman)	10 min.	4
Scott Daves (petroleum engineer)	10 min.	2

PROCEDURAL MATTERS

Applicant proposes to consolidate this case with cases 10722, 10723, 10724 and 10725 for purposes of the hearing.

KELLAHIN AND KELLAHIN

By: _____

W. Thomas Kellahin
P.O. Box 2265
Santa Fe, New Mexico 87504
(505) 982-4285

DOCKET: EXAMINER HEARING - THURSDAY - APRIL 22, 1993

8:15 A.M. - OIL CONSERVATION DIVISION CONFERENCE ROOM, STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

Dockets Nos. 13-93 and 14-93 are tentatively set for May 6, 1993 and May 20, 1993. Applications for hearing must be filed at least 23 days in advance of hearing date.

The following cases will be heard before Michael E. Stogner, Examiner or David R. Catanach, Alternate Examiner:

CASE 10713: **Application of Petroleum Development Corporation for a high angle/horizontal directional drilling pilot project and for special operating rules therefor, Chaves County, New Mexico.** Applicant seeks authority to initiate a short-radius high angle/horizontal directional drilling pilot project in the NE/4 SE/4 of Section 25, Township 7 South, Range 31 East, being a standard 40-acre oil spacing and proration unit in the Tomahawk-San Andres Pool. The applicant proposes to utilize its existing Strange Federal Well No. 4 located 1980 feet from the South line and 660 feet from the East line (Unit I) of said Section 25 by kick-off from vertical, build angle to approximately 90 degrees with a short radius curve and continue with a horizontal drainhole in said pool. Applicant further seeks special rules and provisions within the project area including the designation of a prescribed area limiting the horizontal displacement of the well's producing interval within 100 feet to the outer boundary of said 40-acre unit. Said project area is located approximately 12 miles south by east of Kenna, New Mexico.

CASE 10714: **Application of Gary-Williams Company for a unit agreement and for special operating rules for drilling and producing horizontal/high angle wellbores in the Rio Puerco-Mancos Oil Pool, within said unit area, Sandoval County, New Mexico.** Applicant seeks approval of the Ceja Pelon Unit Agreement for an area comprising 25,445.43 acres, more or less, of State, Federal, and fee lands in portions of Townships 20 and 21 North, Ranges 2, 3, and 4 West. Further, the applicant seeks the promulgation of special operating rules and procedures for wells drilled in the Rio Puerco-Mancos Oil Pool within the proposed Unit boundary including provisions for administrative authorization for horizontal/high angle wellbores, the formation of oversized and irregular shaped spacing and proration units to accommodate such wellbores, and the assignment of a special oil allowable to units with horizontal wellbores. The center of said Unit area is located approximately nine miles west by north of Cuba, New Mexico.

CASE 10715: **Application of Gary-Williams Company for two non-standard oil proration units, an unorthodox oil well location, a horizontal/high angle directional drilling pilot project, special operating rules therefor, and a special temporary oil allowable, Sandoval County, New Mexico.** Applicant seeks the formation of a non-standard 320-acre oil spacing and proration unit in the Rio Puerco-Mancos Oil Pool comprising the SE/4 of Section 21, the W/2 SW/4 of Section 22, the NW/4 NW/4 of Section 27, and the NE/4 NE/4 of Section 28, all in Township 21 North, Range 3 West, for the purpose of initiating a horizontal/high angle directional drilling pilot project. The applicant proposes to commence drilling vertically at an unorthodox surface oil well location 460 feet from the North line and 125 feet from the West line (Unit D) of said Section 27, kick-off at a depth of approximately 4100 feet in a northwesterly direction, build angle to approximately 90 degrees, and continue to drill horizontally in the Mancos formation for approximately 2000 feet. Further, the applicant seeks the adoption of special operating provisions for said pilot project area including the designation of a prescribed area limiting the horizontal extent of said wellbore to a target window no closer than 600 feet to the outer boundary of said proration unit and the assignment of a special oil allowable of 19,200 barrels for the 60-day period commencing the day said well is "spudded". The applicant also requests the formation of a non-standard 280-acre oil spacing and proration unit in the Rio Puerco-Mancos Oil Pool comprising the W/2 NE/4, SE/4 NE/4, and NW/4 of said Section 28, to be dedicated to its existing Tayler "28" Well No. 4 located at a standard oil well location 660 feet from the North and West lines (Unit D) of said Section 28. This area is located approximately 11 miles west of Cuba, New Mexico.

CASE 10687: **(Continued from April 8, 1993, Examiner Hearing.)**

Application of Mewbourne Oil Company for compulsory pooling, Eddy County, New Mexico. Applicant seeks an order pooling all mineral interests from 500 feet below the top of the San Andres formation to the base of the Morrow formation underlying the following described areas in Section 17, Township 18 South, Range 28 East, and in the following manner: the E/2 forming a standard 320-acre gas spacing and proration unit for any and all formations and/or pools developed on 320-acre spacing within said vertical extent; and the SE/4 forming a standard 160-acre gas spacing and proration unit for any and all formations and/or pools developed on 160-acre spacing within said vertical extent. Said unit is to be dedicated to its Illinois Camp "17" State Well No. 2, to be drilled at a standard location within said E/2 proration unit. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well and a charge for risk involved in drilling said well. Said unit is located approximately 2 miles north of Illinois Camp.

CASE 10688: **(Continued from April 8, 1993, Examiner Hearing.)**

Application of Mewbourne Oil Company for compulsory pooling, Eddy County, New Mexico. Applicant seeks an order pooling all mineral interests from the base of the Abo formation to the base of the Morrow formation underlying the following described areas in Section 31, Township 17 South, Range 28 East, and in the following manner: the S/2 forming a standard 320-acre gas spacing and proration unit for any and all formations and/or pools developed on 320-acre spacing within said vertical extent; the SE/4 forming a standard 160-acre gas spacing and proration unit for any and all formations and/or pools developed on 160-acre spacing within said vertical extent; and the SW/4 SE/4 forming a standard 40-acre oil spacing and proration unit for any and all formations and/or pools developed on 40-acre spacing within said vertical extent. Said unit is to be dedicated to its Chalk Bluff "31" State Well No. 1, to be drilled at a standard location within said S/2 proration unit. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well and a charge for risk involved in drilling said well. Said unit is located approximately 1 mile southwest of the Baylor Triangulation Station.

CASE 10694: **(Continued from April 8, 1993, Examiner Hearing.)**

Application of Santa Fe Energy Operating Partners, L.P. for compulsory pooling, Lea County, New Mexico. Applicant seeks an order pooling all mineral interests from the surface to the base of the Morrow formation underlying the following described areas in Section 18, Township 20 South, Range 34 East, and in the following manner: The N/2 forming a standard 320-acre gas spacing and proration unit for any and all formations and/or pools developed on 320-acre spacing within said vertical extent; the NE/4 forming a standard 160-acre gas spacing and proration unit for any and all formations and/or pools developed on 160-acre spacing within said vertical extent; and the NW/4 NE/4 forming a standard 40-acre oil spacing and proration unit for any and all formations and/or pools developed on 40-acre spacing within said vertical extent. Said unit is to be dedicated to the applicant's Sinagua 18 Federal Well No. 1, to be drilled at an orthodox location within said N/2 proration unit. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well and a charge for risk involved in drilling said well. Said unit is located approximately 3 1/2 miles southwest of Warren Gas Co. Compressor Station.

CASE 10706: **(Continued from April 8, 1993, Examiner Hearing.)**

Application of Richardson Operating Company for compulsory pooling, San Juan County, New Mexico. Applicant seeks an order pooling all mineral interests from the surface to the base of the Fruitland formation underlying the N/2 of Section 15, Township 29 North, Range 12 West. Said unit is to be dedicated to its Ropco Fee 15-2 FC Well located at a standard location 1845 feet from the North line and 1405 feet from the East line of said Section 15. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well and a charge for risk involved in drilling said well. Said area is located approximately 4 miles west of Farmington, New Mexico.

CASE 10716: **Application of Marbob Energy Corporation for an unorthodox oil well location, Chaves County, New Mexico.** Applicant seeks approval to utilize the existing Mark D. Clark Morgan Elizabeth State Well No. 1 which was drilled at an unauthorized non-standard oil well location 920 feet from the South line and 1310 feet from the East line (Unit P) of Section 13, Township 11 South, Range 27 East, as a producing oil well in the Chisum-Devonian Pool, with the SE/4 SE/4 of said Section 13 dedicated to said well forming a standard 40-acre oil spacing and proration unit for said pool. This well is located approximately 4.25 miles south of U.S. Highway 380 at milemarker No. 175.

CASE 10648: **(Readvertised)**

Application of Seely Oil Company for waterflood project, four unorthodox injection well locations, and the Recovered Oil Tax credit pursuant to New Mexico Enhanced Oil Recovery Act, Lea County, New Mexico. Applicant seeks authority to institute a waterflood project on its proposed Central EK Queen Unit Area (Division Case No. 10647) located in portions of Sections 7, 8, 9, 17, and 18, all in Township 18 South, Range 34 East, by the injection of water into the Queen interval of the EK-Yates-Seven Rivers-Queen Pool through five existing wells and six new wells to be drilled, four of which are to be located at the following unorthodox (lease-line) injection well locations:

1370'FSL - 50'FWL (Unit L) of Section 7;
50'FS & WL (Unit M) of Section 7;
1270'FNL - 50'FEL (Unit A) of Section 18; and,
1270'FNL - 2590'FWL (Unit C) of Section 17.

The applicant further seeks to qualify said project for the recovered oil tax rate under the "New Mexico Enhanced Oil Recovery Act" (Laws 1992, Chapter 38, Sections 1 through 5). Said project area is centered approximately 22 miles west of Hobbs, New Mexico.

CASE 10717: **Application of Davcro Inc. for salt water disposal, Lea County, New Mexico.** Applicant seeks authority to re-enter the previously plugged and abandoned Cactus Drilling Corporation Sawyer Deep Well No. 1 located 330 feet from the South line and 2310 feet from the West line (Unit N) of Section 19, Township 9 South, Range 38 East,and utilize said well to dispose of produced salt water into the Sawyer-San Andres Associated Pool through the open-hole interval from approximately 5120 feet to 5600 feet. Said well is located approximately 4.5 miles east of Crossroads, New Mexico.

CASE 10676: **(Continued from April 8, 1993, Examiner Hearing.)**

Application of Mitchell Energy Corporation for compulsory pooling, Eddy County, New Mexico. Applicant seeks an order pooling all mineral interests from the surface to the base of the Pennsylvanian formation underlying the following described areas in Section 35, Township 24 South, Range 29 East, and in the following manner: the N/2 forming a standard 320-acre gas spacing and proration unit for any and all formations and/or pools developed on 320-acre spacing within said vertical extent; the NW/4 forming a standard 160-acre gas spacing and proration unit for any and all formations and/or pools developed on 160-acre spacing within said vertical extent; the E/2 NW/4 forming a standard 80-acre oil spacing and proration unit for any and all formations and/or pools developed on 80-acre spacing within said vertical extent; and the SE/4 NW/4 forming a standard 40-acre oil spacing and proration unit for any and all formations and/or pools developed on 40-acre spacing within said vertical extent. Said units are to be dedicated to a single well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the costs thereof as well as actual operating costs and charges for supervision, designation of applicant as the operator of the well and a charge for risk involved in drilling said well. Said unit is located approximately 16 miles southeast of Carlsbad, New Mexico.

CASE 10718: **Application of S & J Operating Company for an unorthodox oil well location, Chaves County, New Mexico.** Applicant seeks approval for an unorthodox oil well location 566 feet from the South line and 15 feet from the West line (Unit M) of Section 29, Township 11 South, Range 28 East, to test the Fusselman formation, the SW/4 SW/4 of said Section 29 is to be dedicated to said well forming a standard 40-acre oil spacing and proration unit. Said unit is located approximately 10 miles east of Bottomless Lake State Park.

CASE 10719: **Application of Anadarko Petroleum Corporation for directional drilling and an unorthodox bottomhole gas well location, Eddy County, New Mexico.** Applicant seeks authority to directionally drill its proposed Power Federal Com Well No. 2 from a surface location 1400 feet from the South line and 660 feet from the East line (Unit I) of Section 26, Township 17 South, Range 30 East, in such a manner as to bottom the well in the Cedar Lake-Morrow Gas Pool at an unorthodox subsurface gas well location within 75 feet of a point 660 feet from the South and East lines (Unit P) of said Section 26. The E/2 of said Section 26 is to be dedicated to said well forming a standard 320-acre gas spacing and proration unit for said pool. Said unit is located approximately 3 miles east-southeast of Loco Hills, New Mexico.

CASE 10720: **Application of Meridian Oil Inc. for amendment of Division Order No. R-9702, San Juan County, New Mexico.** Applicant seeks to amend Division Order No. R-9702 in order to change the commencement point of its previously approved Black Diamond Com "20" Well No. 1 to an unorthodox surface location 120 feet from the North and West lines (Unit D) of Section 20, Township 30 North, Range 15 West, being a previously approved high angle/horizontal directional drilling pilot project located in the W/2 of said Section 20, Undesignated Horseshoe-Gallup Oil Pool. Said pilot project area is located approximately 4.75 miles northwest by north of Fruitland, New Mexico.

CASE 10721: **Application of Meridian Oil Inc. for an unorthodox gas well location and downhole commingling, San Juan County, New Mexico.** Applicant seeks approval to downhole commingle Fulcher Kutz-Pictured Cliffs Gas Pool and Basin-Fruitland Coal Gas Pool production within the wellbore of its proposed Rowley Com Well No. 500 to be drilled at an unorthodox gas well location for the Fulcher Kutz-Pictured Cliffs Gas Pool 2335 feet from the South line and 1850 feet from the West line (Unit K) of Section 7, Township 27 North, Range 10 West. Said well is to be dedicated to a standard 332.92-acre gas spacing and proration unit for the Basin-Fruitland Coal Gas Pool being the W/2 of Section 7 and to a standard 166.61-acre gas spacing unit for the Fulcher Kutz-Pictured Cliffs Gas Pool being the SW/4 of Section 7. The well is located approximately 10 miles south of Bloomfield, New Mexico.

CASE 10722: **Application of Meridian Oil Inc. for downhole commingling, San Juan County, New Mexico.** Applicant seeks approval to downhole commingle Fulcher-Kutz Pictured Cliffs Gas Pool and Basin-Fruitland Coal Gas Pool production within the wellbore of its proposed McAdams Well No. 500 to be drilled at a standard gas well location 790 feet from the North line and 1010 feet from the East line (Unit A) of Section 28, Township 27 North, Range 10 West. Said well is to be dedicated to a standard 320-acre gas spacing unit for the Basin-Fruitland Coal Gas Pool being the E/2 of Section 28 and to a standard 160-acre gas spacing unit for the Fulcher Kutz- Pictured Cliffs Gas Pool being the NE/4 of Section 28. The well is located approximately 13 miles south of Bloomfield, New Mexico.

CASE 10723: **Application of Meridian Oil Inc. for an unorthodox gas well location and downhole commingling, San Juan County, New Mexico.** Applicant seeks approval to downhole commingle West Kutz-Pictured Cliffs Gas Pool and Basin-Fruitland Coal Gas Pool production within the wellbore of its proposed Whitley "A" Well No. 100 to be drilled at an unorthodox gas well location for the West Kutz-Pictured Cliffs Gas Pool 2010 feet from the South line and 1090 feet from the West line (Unit L) of Section 17, Township 27 North, Range 11 West. Said well is to be dedicated to a standard 320-acre gas spacing and proration unit for the Basin-Fruitland Coal Gas Pool being the W/2 of Section 17 and to a standard 160-acre gas spacing unit for the West Kutz-Pictured Cliffs Gas Pool being the SW/4 of Section 17. The well is located approximately 10 miles south of Bloomfield, New Mexico.

CASE 10724: **Application of Meridian Oil Inc. for an unorthodox gas well location and downhole commingling, San Juan County, New Mexico.** Applicant seeks approval to downhole commingle West Kutz-Pictured Cliffs Gas Pool and Basin-Fruitland Coal Gas Pool production within the wellbore of its proposed Rhodes C Well No. 101 to be drilled at an unorthodox gas well location for both the West Kutz-Pictured Cliffs Gas Pool and the Basin-Fruitland Coal Gas Pool, being 100 feet from the South line and 2270 feet from the West line (Unit N) of Section 30, Township 28 North, Range 11 West. Said well is to be dedicated to a standard 316.02-acre gas spacing and proration unit for the Basin-Fruitland Coal Gas Pool being the W/2 of Section 30 and to a standard 158.06-acre gas spacing unit for the West Kutz-Pictured Cliffs Gas Pool being the SW/4 of Section 30. The well is located approximately 7 miles south of Bloomfield, New Mexico.

CASE 10725: **Application of Meridian Oil Inc. for an unorthodox gas well location and downhole commingling, San Juan County, New Mexico.** Applicant seeks approval to downhole commingle West Kutz-Pictured Cliffs Gas Pool and the Basin-Fruitland Coal Gas Pool production within the wellbore of its proposed Rhodes C Well No. 102 to be drilled at an unorthodox gas well location for the West Kutz-Pictured Cliffs Gas Pool being 790 feet from the North line and 1950 feet from the East line (Unit B) of Section 31, Township 28 North, Range 11 West. Said well is to be dedicated to a standard 317.85-acre gas spacing and proration unit for the Basin-Fruitland Coal Gas Pool being the N/2 equivalent of Section 31 and to a standard 160-acre gas spacing unit for the West Kutz-Pictured Cliffs Gas Pool being the NE/4 of Section 31. The well is located approximately 7 miles south of Bloomfield, New Mexico.

CASE 10726: In the matter of the hearing called by the Oil Conservation Division on its own motion for an order creating and extending certain pools in Chaves and Eddy Counties, New Mexico.

(a) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Atoka production and designated as the Bunting Ranch-Atoka Gas Pool. The discovery well is the Mitchell Energy Corporation State "36" Well No. 1 located in Unit B of Section 36, Township 19 South, Range 21 East, NMPM. Said pool would comprise:

TOWNSHIP 19 SOUTH, RANGE 21 EAST, NMPM
Section 36: N/2

(b) CREATE a new pool in Chaves County, New Mexico, classified as a gas pool for Wolfcamp production and designated as the Diablo-Wolfcamp Gas Pool. The discovery well is the Yates Petroleum Corporation Pathfinder AFT State Well No. 6 located in Unit F of Section 21, Township 10 South, Range 27 East, NMPM. Said pool would comprise:

TOWNSHIP 10 SOUTH, RANGE 27 EAST, NMPM
Section 21: N/2

(c) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Morrow production and designated as the Laguna Salado-Morrow Gas Pool. The discovery well is the Amoco Production Company Teledyne Well No. 18 located in Unit J of Section 18, Township 23 South, Range 29 East, NMPM. Said pool would comprise:

TOWNSHIP 23 SOUTH, RANGE 29 EAST, NMPM
Section 18: S/2

(d) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Cisco production and designated as the Penasco-Cisco Gas Pool. The discovery well is the Yates Petroleum Corporation Federal AB Com Well No. 11 located in Unit F of Section 30, Township 18 South, Range 25 East, NMPM. Said pool would comprise:

TOWNSHIP 18 SOUTH, RANGE 25 EAST, NMPM
Section 30: N/2

(e) CREATE a new pool in Eddy County, New Mexico, classified as an oil pool for Strawn production and designated as the Red Lake-Strawn Pool. The discovery well is the Marbob Energy Corporation Scoggins Draw Federal Com Well No. 1 located in Unit F of Section 22, Township 18 South, Range 27 East, NMPM. Said pool would comprise:

TOWNSHIP 18 SOUTH, RANGE 27 EAST, NMPM
Section 22: W/2

(f) CREATE a new pool in Chaves County, New Mexico, classified as a gas pool for Mississippian production and designated as the West White Ranch-Mississippian Gas Pool. The discovery well is the C. W. Trainer West White Ranch Well No. 1 located in Unit A of Section 1, Township 12 South, Range 28 East, NMPM. Said pool would comprise:

TOWNSHIP 12 SOUTH, RANGE 28 EAST, NMPM
Section 1: E/2

(g) EXTEND the West Atoka-Upper Pennsylvanian Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 25 EAST, NMPM
Section 11: N/2
Section 12: N/2

(h) EXTEND the Brushy Draw-Delaware Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 26 SOUTH, RANGE 29 EAST, NMPM
Section 9: SE/4
Section 16: NE/4

(i) EXTEND the East Burton Flat-Strawn Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 20 SOUTH, RANGE 29 EAST, NMPM
Section 19: NE/4
Section 20: N/2

(j) EXTEND the North Dagger Draw-Upper Pennsylvanian Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 19 SOUTH, RANGE 25 EAST, NMPM
Section 20: SE/4

(k) EXTEND the South Empire-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 17 SOUTH, RANGE 29 EAST, NMPM
Section 16: S/2

(l) EXTEND the East Herradura Bend-Delaware Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 23 SOUTH, RANGE 28 EAST, NMPM
Section 2: NE/4

(m) EXTEND the Ingle Wells-Delaware Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 23 SOUTH, RANGE 31 EAST, NMPM
Section 27: SE/4
Section 34: NE/4

(n) EXTEND the Los Medanos-Delaware Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 23 SOUTH, RANGE 31 EAST, NMPM
Section 9: SW/4

(o) EXTEND the East Loving-Delaware Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 23 SOUTH, RANGE 28 EAST, NMPM
Section 33: SE/4
Section 34: S/2

(p) EXTEND the Old Millman Ranch-Bone Spring Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 20 SOUTH, RANGE 28 EAST, NMPM
Section 3: W/2
Section 4: SE/4

(q) EXTEND the Pecos Slope-Abo Gas Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 8 SOUTH, RANGE 27 EAST, NMPM
Section 26: E/2 and SW/4
Section 27: SE/4

(r) EXTEND the South Sand Dunes-Delaware Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 24 SOUTH, RANGE 31 EAST, NMPM
Section 6: NE/4

(s) EXTEND the West Sand Dunes-Delaware Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 23 SOUTH, RANGE 31 EAST, NMPM
Section 29: NE/4 and SW/4
Section 32: NW/4

(t) EXTEND the North Shugart-Bone Spring Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 31 EAST, NMPM
Section 8: SW/4

(u) EXTEND the Turkey Track-Bone Spring Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 19 SOUTH, RANGE 29 EAST, NMPM
Section 23: S/2

(v) EXTEND the Willow Lake-Delaware Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 24 SOUTH, RANGE 29 EAST, NMPM
Section 29: SW/4

DOCKET: COMMISSION HEARING - THURSDAY - APRIL 29, 1993
9:00 A.M. - OIL CONSERVATION DIVISION CONFERENCE ROOM, STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO
The Land Commissioner's designee for this hearing will be Jami Bailey

CASE 10656: (De Novo)

Application of Mitchell Energy Corporation for compulsory pooling and an unorthodox gas well location, Lea County, New Mexico. Applicant seeks an order pooling all mineral interests from the top of the Wolfcamp formation to the base of the Pennsylvanian formation underlying the W/2 of Section 28, Township 20 South, Range 33 East, forming a standard 320-acre gas spacing and proration unit for any and all formations and/or pools developed on 320-acre spacing within said vertical extent, which presently includes but is not necessarily limited to the South Salt Lake-Morrow Gas Pool. Said unit is to be dedicated to its Tomahawk "28" Federal Com Well No. 1 to be drilled and completed at an unorthodox gas well location 1650 feet from the North line and 1980 feet from the West line (Unit F) of said Section 28. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as the operator of the well and a charge for risk involved in drilling and completing said well. Said unit is located approximately 22 miles southeast of Maljamar, New Mexico. Upon application of Strata Production Company, this case will be heard De Novo pursuant to the provisions of Rule 1220.

CASE 10345: **(De Novo - Continued from February 25, 1993, Commission Hearing.)**

Application of Louise Y. Locke to consider objections to well costs, San Juan County, New Mexico. Applicant requests the Commission review actual well costs charged against her interest by BHP Petroleum (Americas), Inc., for the drilling of the Gallegos Canyon Unit Well #390 to determine the reasonableness of such costs pursuant to the provisions of Commission Order R-9581-A. Said well is located at the southeast edge of Farmington, New Mexico.

CASE 10346: **(De Novo - Continued from February 25, 1993, Commission Hearing.)**

Application of Louise Y. Locke to consider objections to well costs, San Juan County, New Mexico. Applicant requests the Commission review actual well costs charged against her interest by BHP Petroleum (Americas), Inc., for the drilling of the Gallegos Canyon Unit Well #391 to determine the reasonableness of such costs pursuant to the provisions of Commission Order R-9581-A. Said well is located at the southeast edge of Farmington, New Mexico.

CASE 10653: **(De Novo - Continued from March 11, 1993, Commission Hearing.)**

Application of Armstrong Energy Corporation for special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order promulgating special rules and regulations for the Northeast Lea-Delaware Pool including a provision for a special oil allowable of 300 barrels of oil per day. Said pool is located in portions of Townships 19 and 20 South, Range 34 East, located near the Warren Gas Company Compressor Station. Upon application of Armstrong Energy Corporation, this case will be heard De Novo pursuant to the provisions of Rule 1220.

NOTICE: The Commission will Review the Following Orders:

CASE 10507: (De Novo)

Application of C & C Landfarm Inc. for a commercial surface waste disposal facility, Lea County, New Mexico.

KELLAHIN AND KELLAHIN
ATTORNEYS AT LAW
EL PATIO BUILDING
117 NORTH GUADALUPE
POST OFFICE BOX 2265
SANTA FE, NEW MEXICO 87504-2265

W. THOMAS KELLAHIN*
*NEW MEXICO BOARD OF LEGAL SPECIALIZATION RECOGNIZED SPECIALIST IN THE AREA OF NATURAL RESOURCES-OIL AND GAS LAW

JASON KELLAHIN (RETIRED 1991)

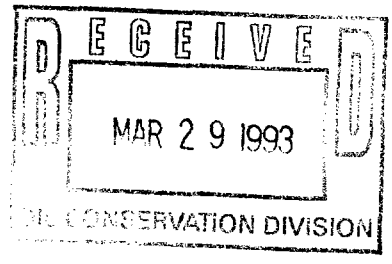
TELEPHONE (505) 982-4285
TELEFAX (505) 982-2047

March 29, 1993

Mr. William J. LeMay
Oil Conservation Division
State Land Office Building
310 Old Santa Fe Trail, Room 219
Santa Fe, New Mexico 87501

HAND DELIVERED

10721



RE: Application of Meridian Oil, Inc.
for an Unorthodox Gas Well Location
and Downhole Commingling,
San Juan County, New Mexico
Rowley Com #500 Well

Dear Mr. LeMay:

On behalf of Meridian Oil, Inc. please find enclosed our Application for an unorthodox gas well location and downhole commingling as referenced above, which we request be set for hearing on the next available Examiner's docket now scheduled for April 22, 1993.

By copy of this letter and application, sent certified mail-return receipt requested, we are notifying all interested parties offsetting the subject well and its proposed spacing and proration unit of their right to appear at the hearing and participate in this case, including the right to present evidence either in support of or in opposition to the application and that failure to appear at the hearing may preclude them from any involvement in this case at a later date. Also, all parties entitled to notice are hereby informed that pursuant to the Division Memorandum 2-90 all parties appearing in this case are requested to file a Pre-Hearing Statement with the Division no later than 4:00 p.m. on Friday, April 16, 1993.

Also enclosed is our suggested advertisement for this case.

Very truly yours,

W. Thomas Kellahin

WTK/lam
Enclosures

cc: **with Enclosures**
Alan Alexander - Meridian Oil Inc.

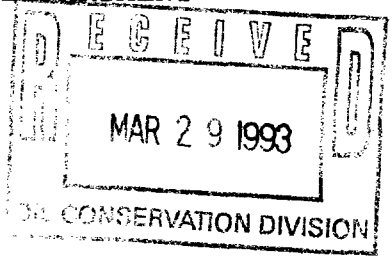
By Certified Mail - Return Receipt
All Parties Listed on Exhibits B, C & D of Application

ltrt329.330

PROPOSED ADVERTISEMENT

Case 10721: **Application of Meridian Oil Inc. for an unorthodox gas well location and downhole commingling, San Juan County, New Mexico.** Applicant seeks approval to downhole commingle Fulcher Kutz-Pictured Cliffs Gas Pool and the Basin-Fruitland Coal Gas Pool production within the wellbore of its proposed Rowley Com #500 Well to be drilled at an unorthodox gas well location for the Fulcher Kutz-Pictured Cliffs Gas Pool 1850 feet FWL and 2335 feet FSL, (Unit K) Section 7, T27N, R10W, NMPM, San Juan County, New Mexico. Said well is to be dedicated a standard 332.92-acre gas spacing unit for the Basin-Fruitland Coal Gas Pool being W/2 of Section 7 and to a standard 166.61-acre gas spacing unit for the Fulcher Kutz-Pictured Cliffs Gas Pool being the SW/4 of Section 7. The well is located approximately 10 (miles) south (direction) from Bloomfield, New Mexico.

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION



IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

CASE: 10721

APPLICATION OF MERIDIAN OIL INC.
FOR AN UNORTHODOX GAS WELL LOCATION
AND DOWNHOLE COMMINGLING
SAN JUAN COUNTY, NEW MEXICO.

A P P L I C A T I O N

Comes now MERIDIAN OIL INC., ("Meridian") by and through its attorneys Kellahin and Kellahin, and applies to the New Mexico Oil Conservation Division for approval to downhole commingle Fulcher Kutz-Pictured Cliffs Gas Pool and the Basin-Fruitland Coal Gas Pool production within the wellbore of its proposed Rowley Com #500 Well to be drilled at a standard gas well location for the Basin Fruitland Coal Gas Pool but an unorthodox gas well location for the Fulcher Kutz-Pictured Cliffs Gas Pool being 1850 feet FWL and 2335 feet FSL, (Unit K) Section 7, T27N, R10W, NMPM, San Juan County, New Mexico. The W/2 of Section 7 is to be dedicated to the subject well forming a standard 332.92-acre gas spacing unit for the Basin-Fruitland Coal Gas Pool. The SW/4 of Section 7 is to be dedicated to the subject well forming a standard 166.61-acre gas spacing unit for the Fuclher-Pictured Cliffs Gas Pool.

In support of its application, Meridian states:

(1) Meridian is the operator for the proposed Rowley Com #500 Well to be drilled at a gas well location 1850 feet FWL and 2335 feet FSL (Unit K), Section 7, T27N, R10W, NMPM, San Juan County, New Mexico as shown on Exhibit "A" attached.

(2) Said location is a standard gas well location for the Basin Fruitland Coal Gas Pool but is an unorthodox gas well location for the Fuclher-Pictured Cliffs Gas Pool being only 305 feet rather than the required 790 feet from the north line of the 160 acre spacing unit.

(3) The Well is to be drilled so that production from the Basin-Fruitland Coal Gas Pool and the Fulcher Kutz-Pictured Cliffs Gas Pool can be downhole commingled in the wellbore.

(4) The W/2 of Section 7 is to be dedicated to any production from the Basin Fruitland Coal Gas Pool which is spaced on 320-acre gas spacing units.

(5) The SW/4 of Section 7 is to be dedicated to any production from the Fulcher Kutz-Pictured Cliffs Gas Pool which is spaced on 160-acre gas spacing units.

(6) The ownership is different between these two spacing units.

(7) In accordance with Division Rule 303-C-1.(b), the Applicant states and will demonstrate at hearing:

1. That drilling the Rowley Com #500 Well initially for downhole commingling in the wellbore is necessary because it is not otherwise economic to attempt to drill and complete a separate well for Pictured Cliffs gas production nor is it economic to attempt to dually complete those formations in the proposed well.

2. That there will be no crossflow between the two zones commingled.

3. That while the ownership is each of the two spacing units is not common between the two pools, no impairment of correlative rights will occur.

4. It is expected that the bottom hole pressure of the lower pressure zone is not less than 50 percent of the bottom hole pressure of the higher pressure zone adjusted to a common datum.

WHEREFORE Applicant requests that this matter be set for hearing on April 22, 1993 before a duly appointed Examiner of the Oil Conservation Division and that after notice and hearing as required by law, the Division enter its order granting this application.

Respectfully submitted

W. Thomas Kellahin
KELLAHIN and KELLAHIN
P. O. Box 2265
Santa Fe, New Mexico 87501
(505) 982-4285
Attorneys for Applicant

app329.330

5. That the value of the commingled production will not be less than the sum of the values of the individual production.

(8) The Pictured Cliffs formations in this area of the basin should be marginally productive and cannot be economically produced unless it is done so by downhole commingling that production with the Basin Fruitland Coal Gas Pool production..

(9) Meridian has selected to drill the proposed well in the SW/4 instead of the NW/4 of Section 7 because that location appears to have a greater opportunity for a successful Fruitland formation well.

(10) In addition, the SW/4 of Section 7 is a standard location for a Fruitland Coal Gas Well while the NW/4 is an unorthodox location.

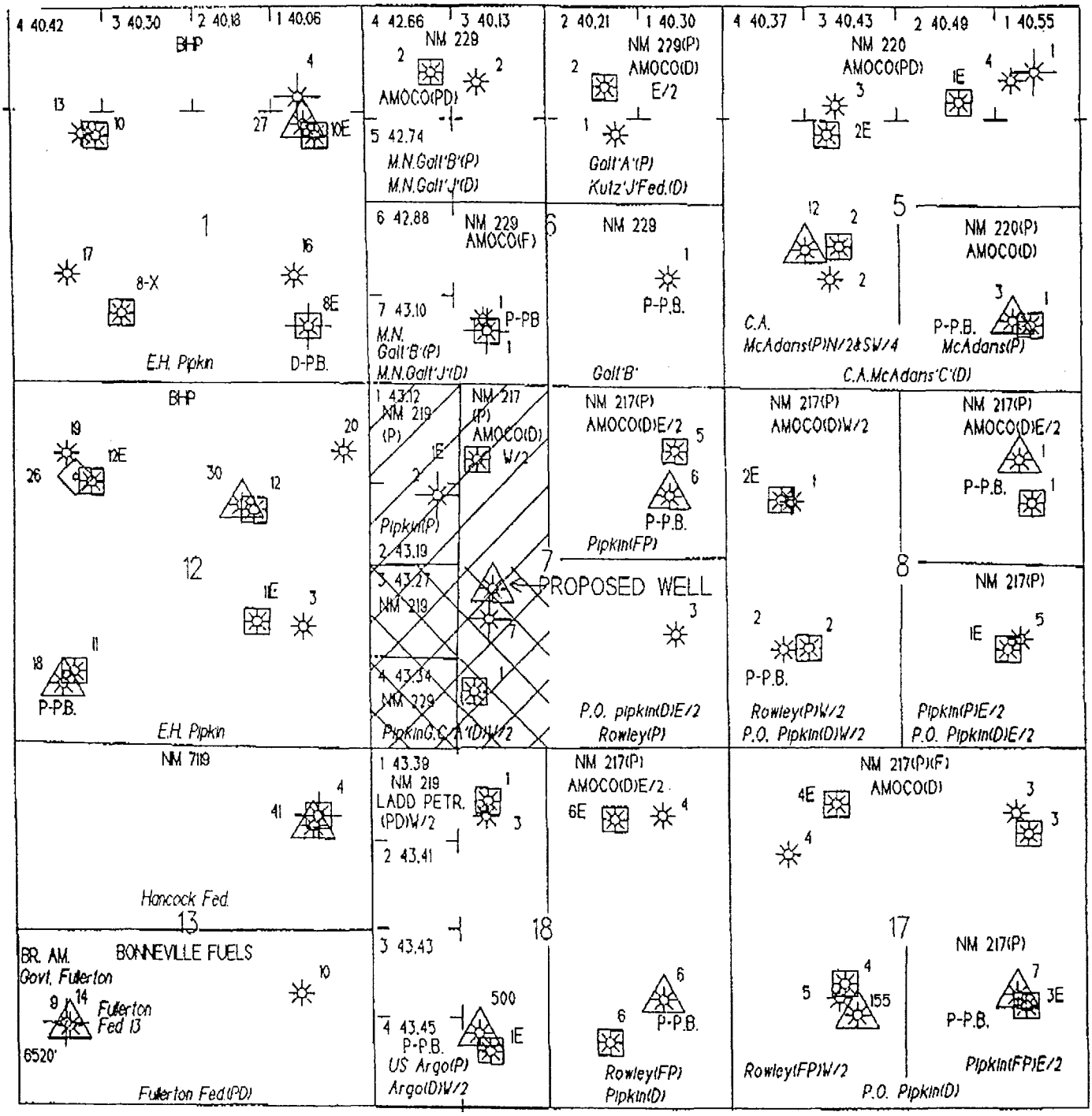
(11) Due to the nature of the Basin-Fruitland Coal Gas production, straight allocation of gas volumes from both zones is not appropriate. Meridian therefore seeks the adoption of a monthly allocation formula to be presented at the time of the hearing.

(12) The ownership between the Basin Fruitland Coal Gas Pool spacing unit and the Fulcher Kutz-Pictured Cliffs Gas Pool spacing unit is not identical and accordingly, applicant seeks the approval of the Division after notice and hearing.

(13) Applicant requests that this matter be docketed for hearing on the Division's Examiner docket now scheduled for April 22, 1993.

(14) Copy of this application has been sent to all offsetting operators and to the owners of interests in the affected production within the two spacing units as set forth on Exhibits B, C and D.

MERIDIAN OIL INC.
ROWLEY # 500 WELL
1850'FWL,2335'FSL
SECTION 7-27N-10W



PICTURED CLIFFS WELL

FRUITLAND COAL WELL

DAKOTA WELL

SPACING UNIT (FRUITLAND COAL)

SPACING UNIT (PICTURED CLIFFS)

EXHIBIT "A"

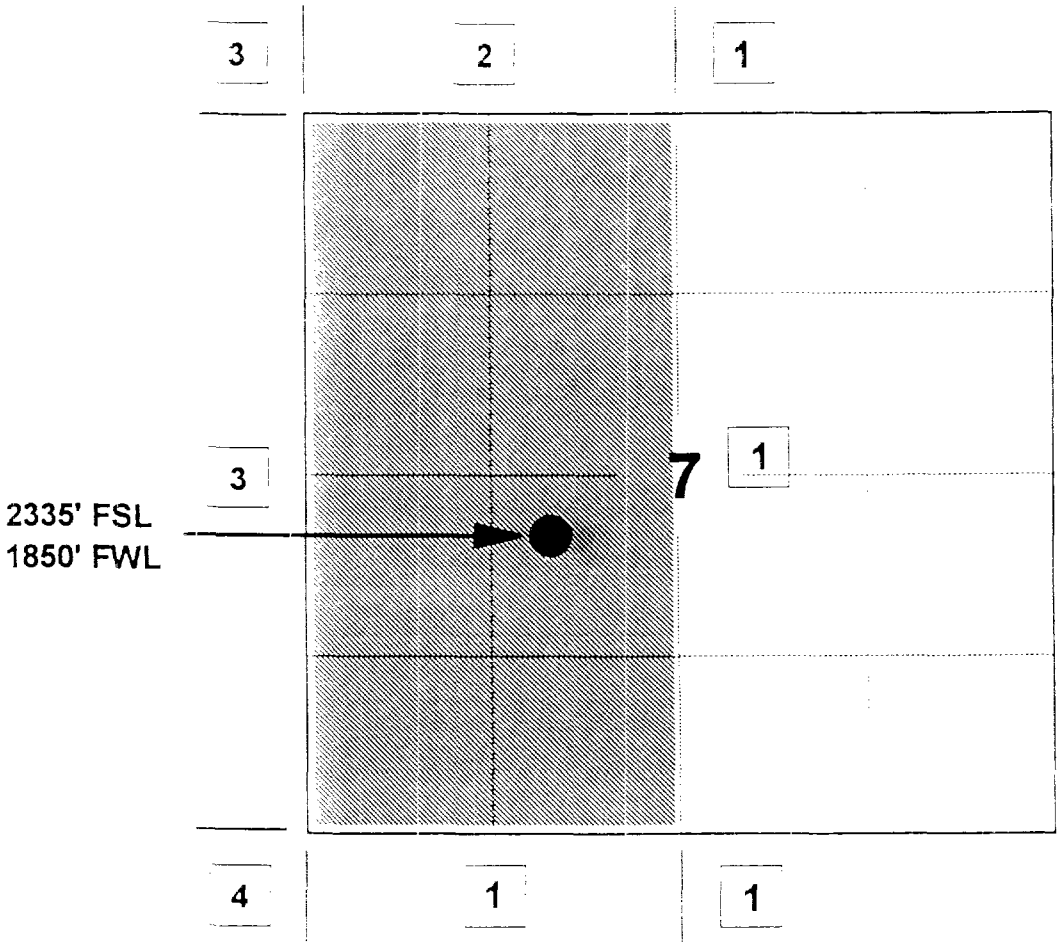
MERIDIAN OIL INC

OFFSET OPERATOR \ OWNER PLAT

ROWLEY #500

Fruitland Coal \ Pictured Cliffs Formations Commingle

Township 27 North, Range 10 West



1) Meridian Oil Inc

2) Amoco Production Company	PO Box 800, Denver, CO 80202
3) BHP Petroleum	5847 San Felipe, Suite 3600, Houston, TX 77057
4) Bonneville Fuels Corp.	1600 Lincoln St., Suite 1800, Denver, CO 80264

EXHIBIT B

Fruitland Coal Formation

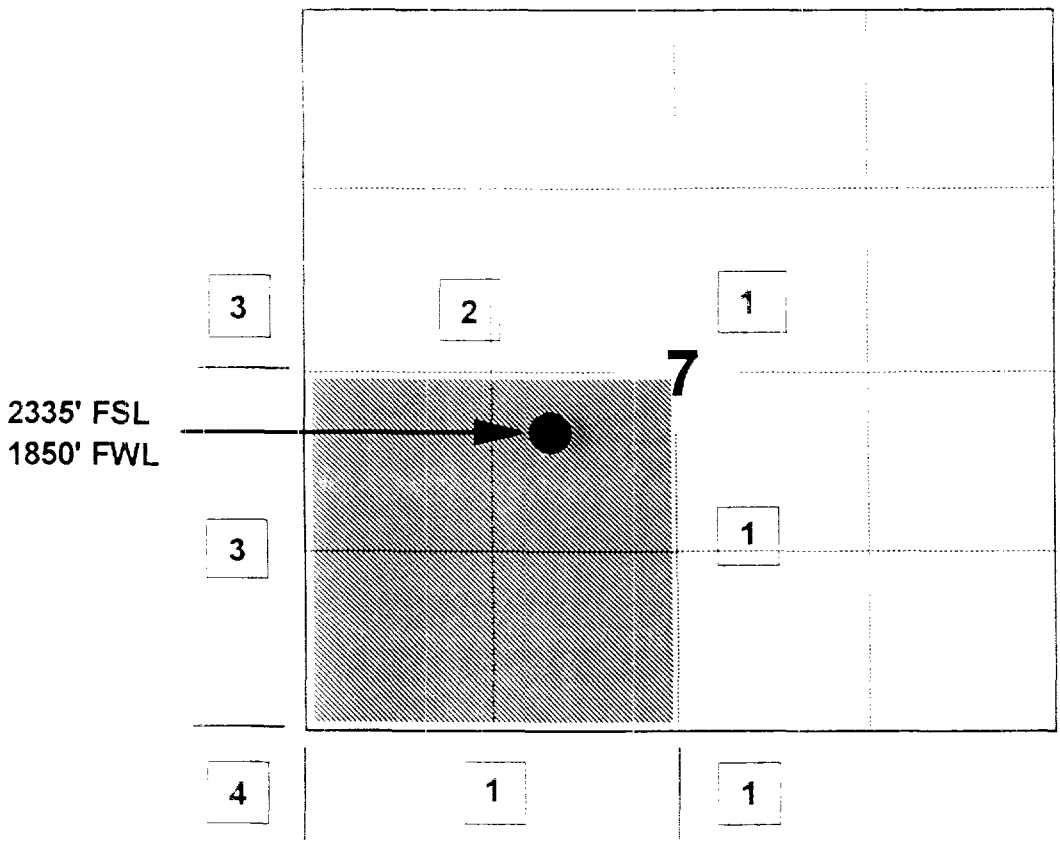
MERIDIAN OIL INC

OFFSET OPERATOR \ OWNER PLAT

ROWLEY #500

Fruitland Coal \ Pictured Cliffs Formations Commingle

Township 27 North, Range 10 West



1) Meridian Oil Inc	
2) Amoco Production Company	PO Box 800, Denver, CO 80202
Conoco, Inc	10 Desta Dr., Suite 100W, Midland, TX 79705-4500
ARCO Oil & Gas Company	PO Box 1610, Midland, TX 79702-1610
Hondo Oil & Gas Company	PO Box 2208, Roswell, NM 88202-2208
3) BHP Petroleum	5847 San Felipe, Suite 3600, Houston, TX 77057
4) Bonneville Fuels Corp.	1600 Lincoln St., Suite 1800, Denver, CO 80264

EXHIBIT C

Pictured Cliffs Formation

ROWLEY #500

Working Interest Owners:

Devon Energy Corporation
1500 Mid American Tower
20 North Broadway
Oklahoma City, OK 73102-8250

Devon Energy Partners a Limited Partnership
P.O. Box 840563
Dallas, TX 75284-0563

Amoco Production Company
P.O. Box 800
Denver, CO 80201

Conoco Inc.
Attn: Steve Klein
10 Desta Drive West
Midland, TX 79705

El Paso Production Company
P.O. Box 4289
Farmington, NM 87401

S. Lawrence Farrington &
John C. Vaughey CO-Execu.
E. A. Vaughey Estate
1840 Capital Towers
125 S. Congress St.
Jackson, MS 39201-3382

Royalty Owner:

U.S.A.

ORRI Owners:

Lucille H. Piplin, Personal Rep
of the Estate of Pearl O. Pipkin
P.O. Box 1174
Roswell, NM 88201

Madeline Galt
c/o Tom Galt
352 Fifth Street
Altantic Beach, FL 32233

KELLAHIN AND KELLAHIN
ATTORNEYS AT LAW
EL PATIO BUILDING
117 NORTH GUADALUPE
POST OFFICE BOX 2265
SANTA FE, NEW MEXICO 87504-2265

W. THOMAS KELLAHIN*
*NEW MEXICO BOARD OF LEGAL SPECIALIZATION RECOGNIZED SPECIALIST IN THE AREA OF NATURAL RESOURCES-OIL AND GAS LAW

JASON KELLAHIN (RETIRED 1991)

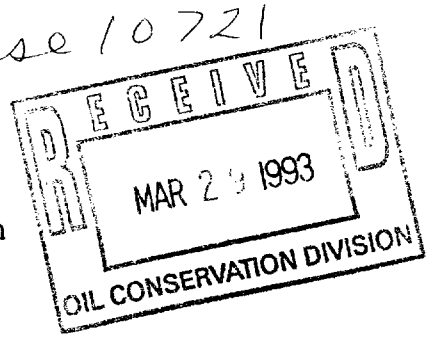
TELEPHONE (505) 982-4285
TELEFAX (505) 982-2047

March 29, 1993

Mr. William J. LeMay
Oil Conservation Division
State Land Office Building
310 Old Santa Fe Trail, Room 219
Santa Fe, New Mexico 87501

HAND DELIVERED

Case 10721



RE: Application of Meridian Oil, Inc.
for an Unorthodox Gas Well Location
and Downhole Commingling,
San Juan County, New Mexico
Rowley Com #500 Well

Dear Mr. LeMay:

On behalf of Meridian Oil, Inc. please find enclosed our Application for an unorthodox gas well location and downhole commingling as referenced above, which we request be set for hearing on the next available Examiner's docket now scheduled for April 22, 1993.

By copy of this letter and application, sent certified mail-return receipt requested, we are notifying all interested parties offsetting the subject well and its proposed spacing and proration unit of their right to appear at the hearing and participate in this case, including the right to present evidence either in support of or in opposition to the application and that failure to appear at the hearing may preclude them from any involvement in this case at a later date. Also, all parties entitled to notice are hereby informed that pursuant to the Division Memorandum 2-90 all parties appearing in this case are requested to file a Pre-Hearing Statement with the Division no later than 4:00 p.m. on Friday, April 16, 1993.

Also enclosed is our suggested advertisement for this case.

Very truly yours,

W. Thomas Kellahin

WTK/lam
Enclosures

cc: **with Enclosures**
Alan Alexander - Meridian Oil Inc.

By Certified Mail - Return Receipt
All Parties Listed on Exhibits B, C & D of Application

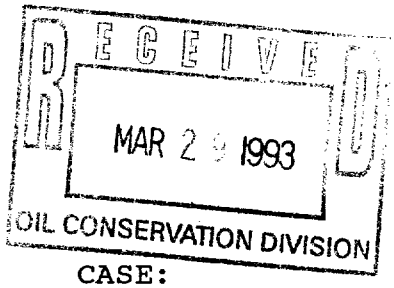
ltrt329.330

PROPOSED ADVERTISEMENT

10721

Case _____: **Application of Meridian Oil Inc. for an unorthodox gas well location and downhole commingling, San Juan County, New Mexico.** Applicant seeks approval to downhole commingle Fulcher Kutz-Pictured Cliffs Gas Pool and the Basin-Fruitland Coal Gas Pool production within the wellbore of its proposed Rowley Com #500 Well to be drilled at an unorthodox gas well location for the Fulcher Kutz-Pictured Cliffs Gas Pool 1850 feet FWL and 2335 feet FSL, (Unit K) Section 7, T27N, R10W, NMPM, San Juan County, New Mexico. Said well is to be dedicated a standard 332.92-acre gas spacing unit for the Basin-Fruitland Coal Gas Pool being W/2 of Section 7 and to a standard 166.61-acre gas spacing unit for the Fulcher Kutz-Pictured Cliffs Gas Pool being the SW/4 of Section 7. The well is located approximately 10 (miles) south (direction) from Bloomfield, New Mexico.

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION



IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

CASE:
10721

APPLICATION OF MERIDIAN OIL INC.
FOR AN UNORTHODOX GAS WELL LOCATION
AND DOWNHOLE COMMINGLING
SAN JUAN COUNTY, NEW MEXICO.

A P P L I C A T I O N

Comes now MERIDIAN OIL INC., ("Meridian") by and through its attorneys Kellahin and Kellahin, and applies to the New Mexico Oil Conservation Division for approval to downhole commingle Fulcher Kutz-Pictured Cliffs Gas Pool and the Basin-Fruitland Coal Gas Pool production within the wellbore of its proposed Rowley Com #500 Well to be drilled at a standard gas well location for the Basin Fruitland Coal Gas Pool but an unorthodox gas well location for the Fulcher Kutz-Pictured Cliffs Gas Pool being 1850 feet FWL and 2335 feet FSL, (Unit K) Section 7, T27N, R10W, NMPM, San Juan County, New Mexico. The W/2 of Section 7 is to be dedicated to the subject well forming a standard 332.92-acre gas spacing unit for the Basin-Fruitland Coal Gas Pool. The SW/4 of Section 7 is to be dedicated to the subject well forming a standard 166.61-acre gas spacing unit for the Fuclher-Pictured Cliffs Gas Pool.

In support of its application, Meridian states:

(1) Meridian is the operator for the proposed Rowley Com #500 Well to be drilled at a gas well location 1850 feet FWL and 2335 feet FSL (Unit K), Section 7, T27N, R10W, NMPM, San Juan County, New Mexico as shown on Exhibit "A" attached.

(2) Said location is a standard gas well location for the Basin Fruitland Coal Gas Pool but is an unorthodox gas well location for the Fuclher-Pictured Cliffs Gas Pool being only 305 feet rather than the required 790 feet from the north line of the 160 acre spacing unit.

(3) The Well is to be drilled so that production from the Basin-Fruitland Coal Gas Pool and the Fulcher Kutz-Pictured Cliffs Gas Pool can be downhole commingled in the wellbore.

(4) The W/2 of Section 7 is to be dedicated to any production from the Basin Fruitland Coal Gas Pool which is spaced on 320-acre gas spacing units.

(5) The SW/4 of Section 7 is to be dedicated to any production from the Fulcher Kutz-Pictured Cliffs Gas Pool which is spaced on 160-acre gas spacing units.

(6) The ownership is different between these two spacing units.

(7) In accordance with Division Rule 303-C-1.(b), the Applicant states and will demonstrate at hearing:

1. That drilling the Rowley Com #500 Well initially for downhole commingling in the wellbore is necessary because it is not otherwise economic to attempt to drill and complete a separate well for Pictured Cliffs gas production nor is it economic to attempt to dually complete those formations in the proposed well.

2. That there will be no crossflow between the two zones commingled.

3. That while the ownership is each of the two spacing units is not common between the two pools, no impairment of correlative rights will occur.

4. It is expected that the bottom hole pressure of the lower pressure zone is not less than 50 percent of the bottom hole pressure of the higher pressure zone adjusted to a common datum.

5. That the value of the commingled production will not be less than the sum of the values of the individual production.

(8) The Pictured Cliffs formations in this area of the basin should be marginally productive and cannot be economically produced unless it is done so by downhole commingling that production with the Basin Fruitland Coal Gas Pool production..

(9) Meridian has selected to drill the proposed well in the SW/4 instead of the NW/4 of Section 7 because that location appears to have a greater opportunity for a successful Fruitland formation well.

(10) In addition, the SW/4 of Section 7 is a standard location for a Fruitland Coal Gas Well while the NW/4 is an unorthodox location.

(11) Due to the nature of the Basin-Fruitland Coal Gas production, straight allocation of gas volumes from both zones is not appropriate. Meridian therefore seeks the adoption of a monthly allocation formula to be presented at the time of the hearing.

(12) The ownership between the Basin Fruitland Coal Gas Pool spacing unit and the Fulcher Kutz-Pictured Cliffs Gas Pool spacing unit is not identical and accordingly, applicant seeks the approval of the Division after notice and hearing.

(13) Applicant requests that this matter be docketed for hearing on the Division's Examiner docket now scheduled for April 22, 1993.

(14) Copy of this application has been sent to all offsetting operators and to the owners of interests in the affected production within the two spacing units as set forth on Exhibits B, C and D.

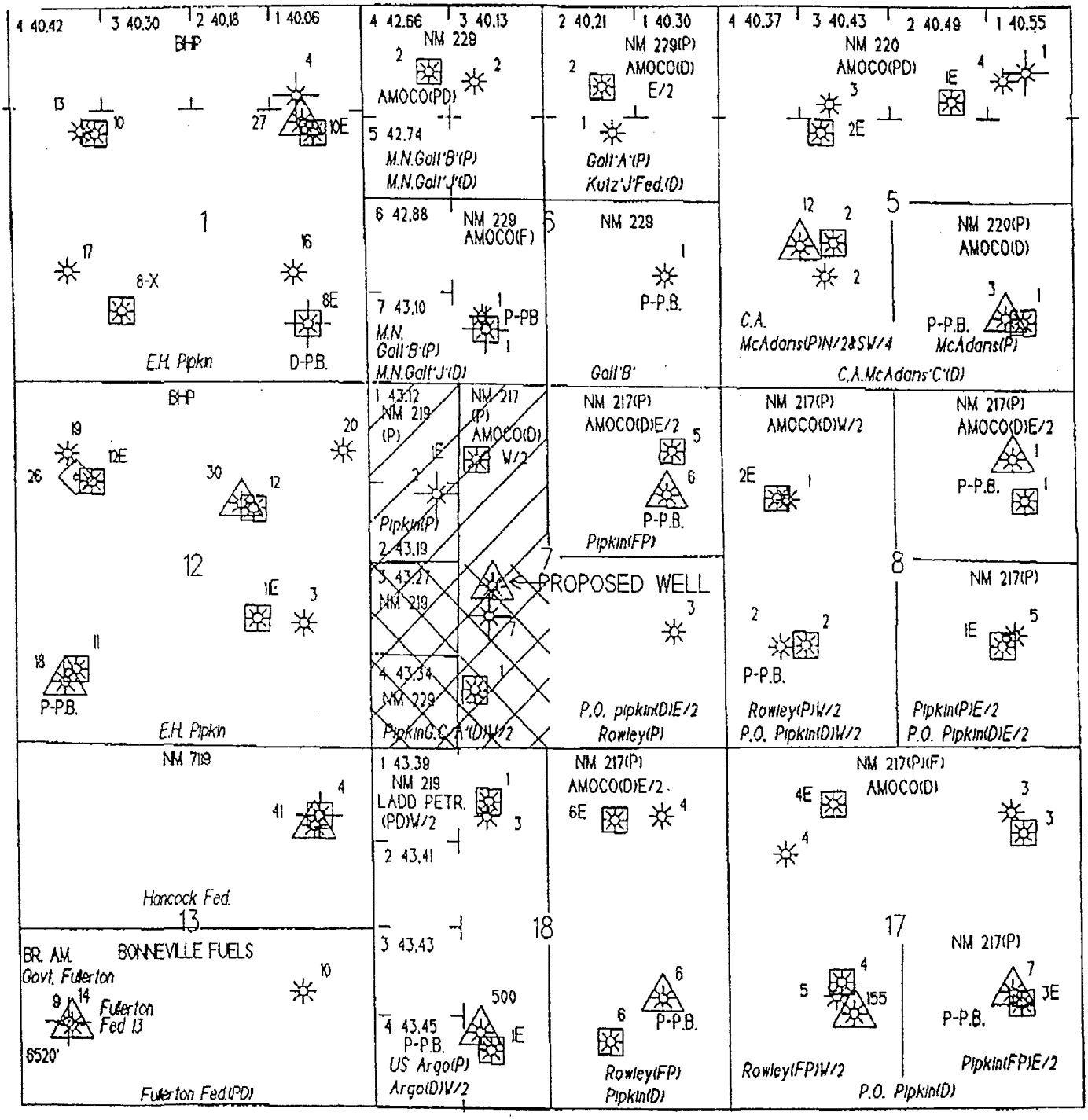
WHEREFORE Applicant requests that this matter be set for hearing on April 22, 1993 before a duly appointed Examiner of the Oil Conservation Division and that after notice and hearing as required by law, the Division enter its order granting this application.

Respectfully submitted

W. Thomas Kellahin
KELLAHIN and KELLAHIN
P. O. Box 2265
Santa Fe, New Mexico 87501
(505) 982-4285
Attorneys for Applicant

app329.330

MERIDIAN OIL INC.
ROWLEY # 500 WELL
1850'FWL,2335'FSL
SECTION 7-27N-10W



PICTURED CLIFFS WELL

FRUITLAND COAL WELL

DAKOTA WELL

SPACING UNIT (FRUITLAND COAL)

SPACING UNIT (PICTURED CLIFFS)

EXHIBIT "A"

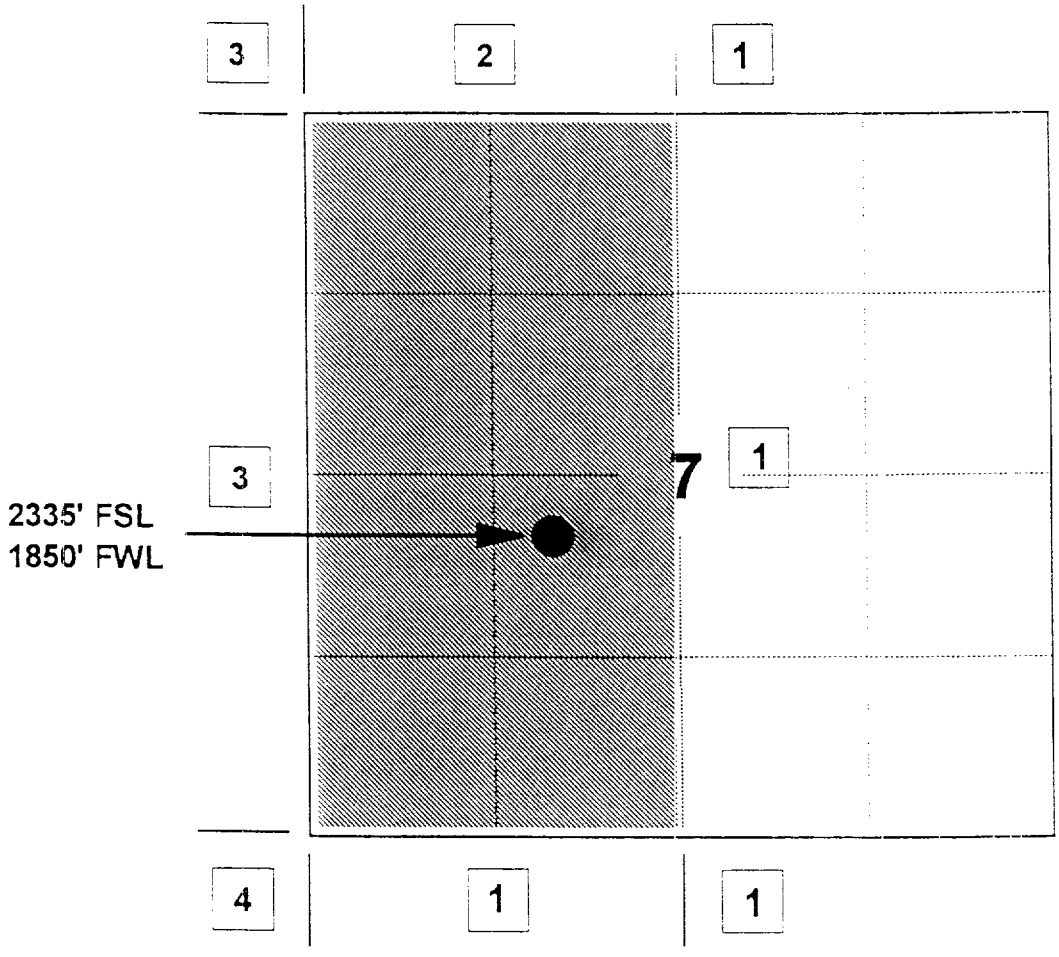
MERIDIAN OIL INC

OFFSET OPERATOR \ OWNER PLAT

ROWLEY #500

Fruitland Coal \ Pictured Cliffs Formations Commingle

Township 27 North, Range 10 West



1) Meridian Oil Inc

2) Amoco Production Company — PO Box 800, Denver, CO 80202

3) BHP Petroleum — 5847 San Felipe, Suite 3600, Houston, TX 77057

4) Bonneville Fuels Corp. — 1600 Lincoln St., Suite 1800, Denver, CO 80264

EXHIBIT B

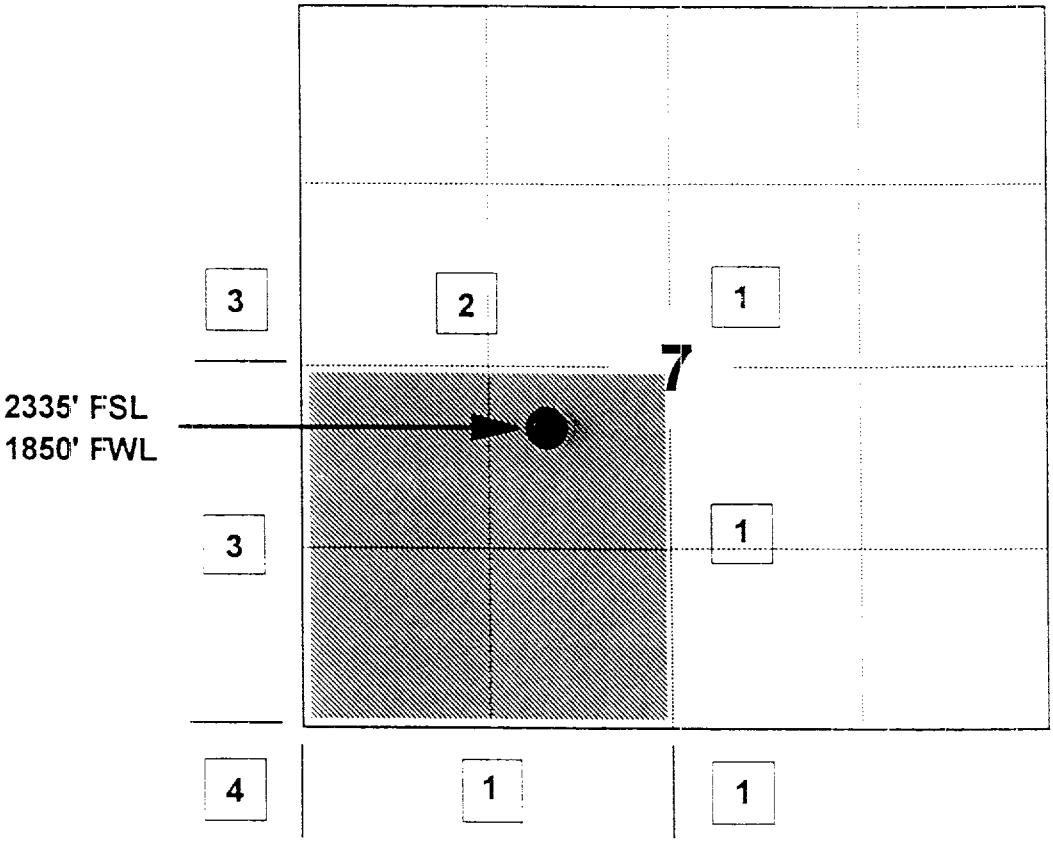
MERIDIAN OIL INC

OFFSET OPERATOR \ OWNER PLAT

ROWLEY #500

Fruitland Coal \ Pictured Cliffs Formations Commingle

Township 27 North, Range 10 West



1) Meridian Oil Inc	
2) Amoco Production Company	PO Box 800, Denver, CO 80202
Conoco, Inc	10 Desta Dr., Suite 100W, Midland, TX 79705-4500
ARCO Oil & Gas Company	PO Box 1610, Midland, TX 79702-1610
Hondo Oil & Gas Company	PO Box 2208, Roswell, NM 88202-2208
3) BHP Petroleum	5847 San Felipe, Suite 3600, Houston, TX 77057
4) Bonneville Fuels Corp.	1600 Lincoln St., Suite 1800, Denver, CO 80264

EXHIBIT C

ROWLEY #500

Working Interest Owners:

Devon Energy Corporation
1500 Mid American Tower
20 North Broadway
Oklahoma City, OK 73102-8250

Devon Energy Partners a Limited Partnership
P.O. Box 840563
Dallas, TX 75284-0563

Amoco Production Company
P.O. Box 800
Denver, CO 80201

Conoco Inc.
Attn: Steve Klein
10 Desta Drive West
Midland, TX 79705

El Paso Production Company
P.O. Box 4289
Farmington, NM 87401

S. Lawrence Farrington &
John C. Vaughey CO-Execu.
E. A. Vaughey Estate
1840 Capital Towers
125 S. Congress St.
Jackson, MS 39201-3382

Royalty Owner:

U.S.A.

ORRI Owners:

Lucille H. Piplin, Personal Rep
of the Estate of Pearl O. Pipkin
P.O. Box 1174
Roswell, NM 88201

Madeline Galt
c/o Tom Galt
352 Fifth Street
Altantic Beach, FL 32233

KELLAHIN AND KELLAHIN
ATTORNEYS AT LAW
EL PATIO BUILDING
117 NORTH GUADALUPE
POST OFFICE BOX 2265
SANTA FE, NEW MEXICO 87504-2265

W. THOMAS KELLAHIN*
*NEW MEXICO BOARD OF LEGAL SPECIALIZATION RECOGNIZED SPECIALIST IN THE AREA OF NATURAL RESOURCES-OIL AND GAS LAW

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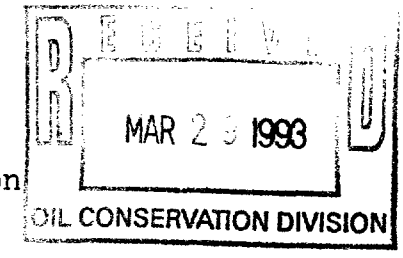

RE: Application of Meridian Oil, Inc. for an Unorthodox Gas Well Location and Downhole Commingling, San Juan County, New Mexico Rowley Com #500 Well

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W. Thomas Kellahin

WTK/lam
Enclosures

cc: **with Enclosures**
Alan Alexander - Meridian Oil Inc.

By Certified Mail - Return Receipt
All Parties Listed on Exhibits B, C & D of Application

ltrt329.330

PROPOSED ADVERTISEMENT 10721

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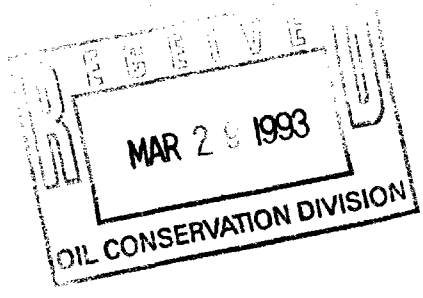
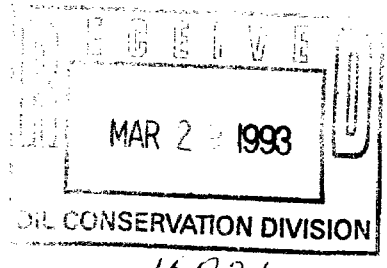


STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION



IN THE MATTER OF THE HEARING
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CASE: 10721

APPLICATION OF MERIDIAN OIL INC.
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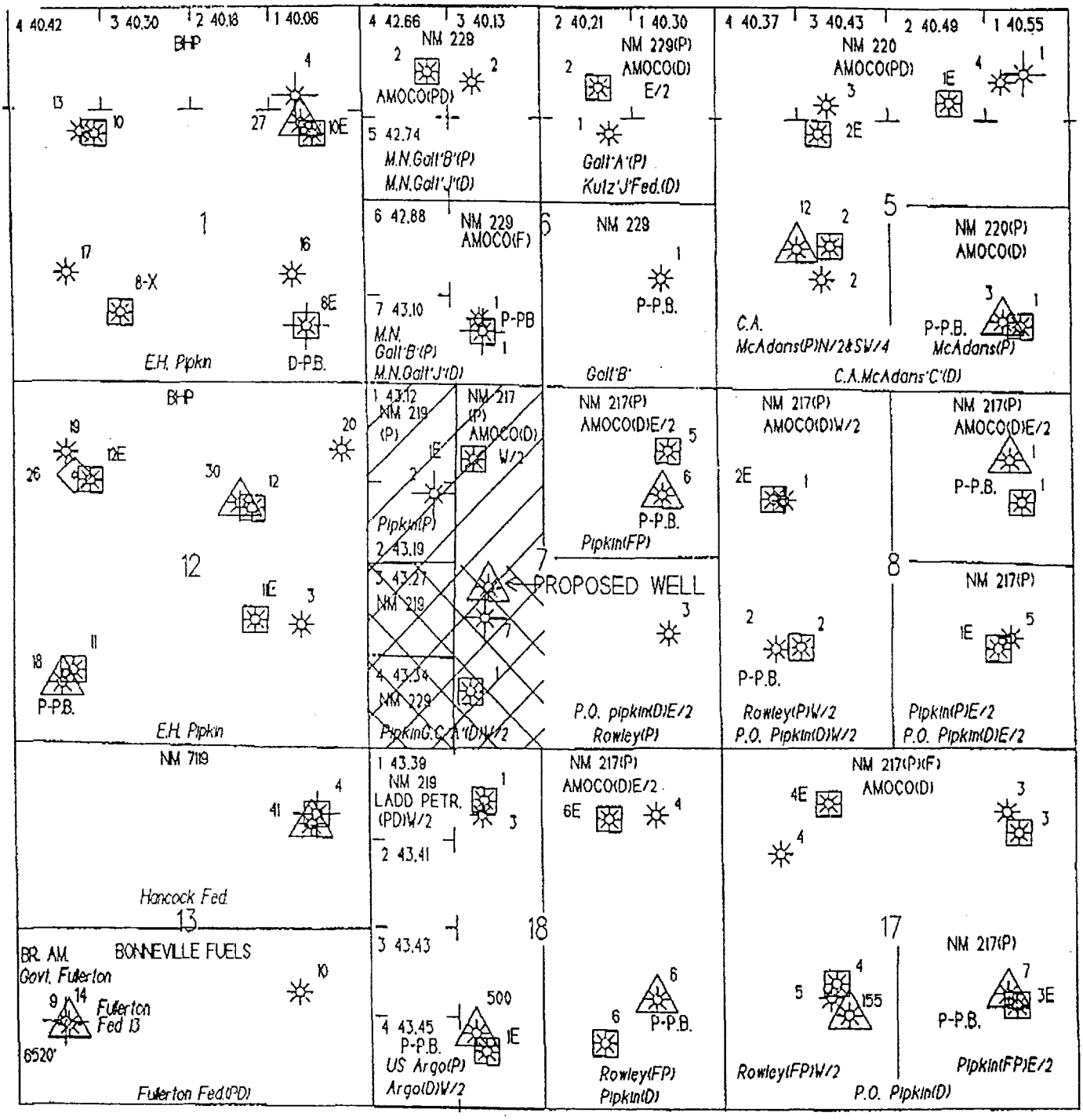
WHEREFORE Applicant requests that this matter be set for hearing on April 22, 1993 before a duly appointed Examiner of the Oil Conservation Division and that after notice and hearing as required by law, the Division enter its order granting this application.

Respectfully submitted

W. Thomas Kellahin
KELLAHIN and KELLAHIN
P. O. Box 2265
Santa Fe, New Mexico 87501
(505) 982-4285
Attorneys for Applicant

app329.330

MERIDIAN OIL INC.
ROWLEY # 500 WELL
1850'FWL,2335'FSL
SECTION 7-27N-10W



PICTURED CLIFFS WELL

FRUITLAND COAL WELL

DAKOTA WELL

SPACING UNIT (FRUITLAND COAL)

SPACING UNIT (PICTURED CLIFFS)

EXHIBIT "A"

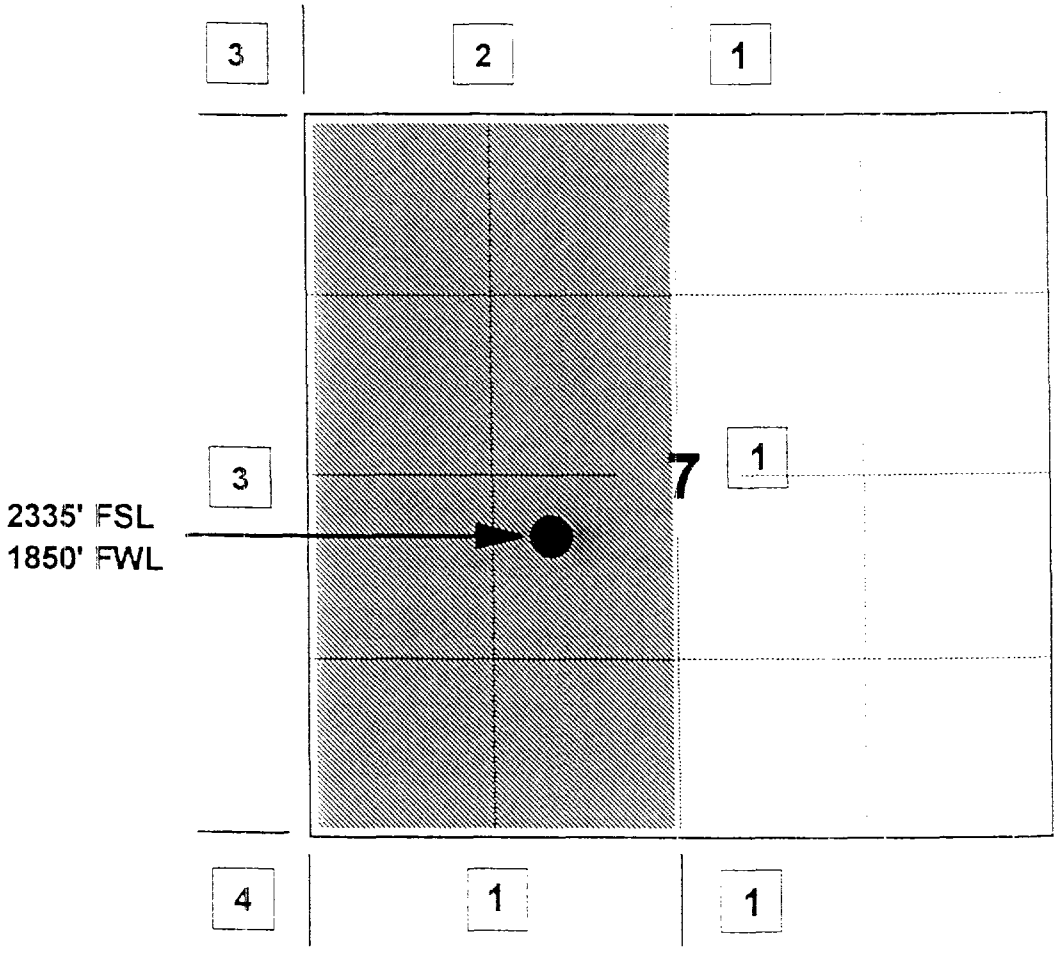
MERIDIAN OIL INC

OFFSET OPERATOR \ OWNER PLAT

ROWLEY #500

Fruitland Coal \ Pictured Cliffs Formations Commingle

Township 27 North, Range 10 West



1) Meridian Oil Inc

2) Amoco Production Company	PO Box 800, Denver, CO 80202
3) BHP Petroleum	5847 San Felipe, Suite 3600, Houston, TX 77057
4) Bonneville Fuels Corp.	1600 Lincoln St., Suite 1800, Denver, CO 80264

EXHIBIT B

Fruitland Coal Formation

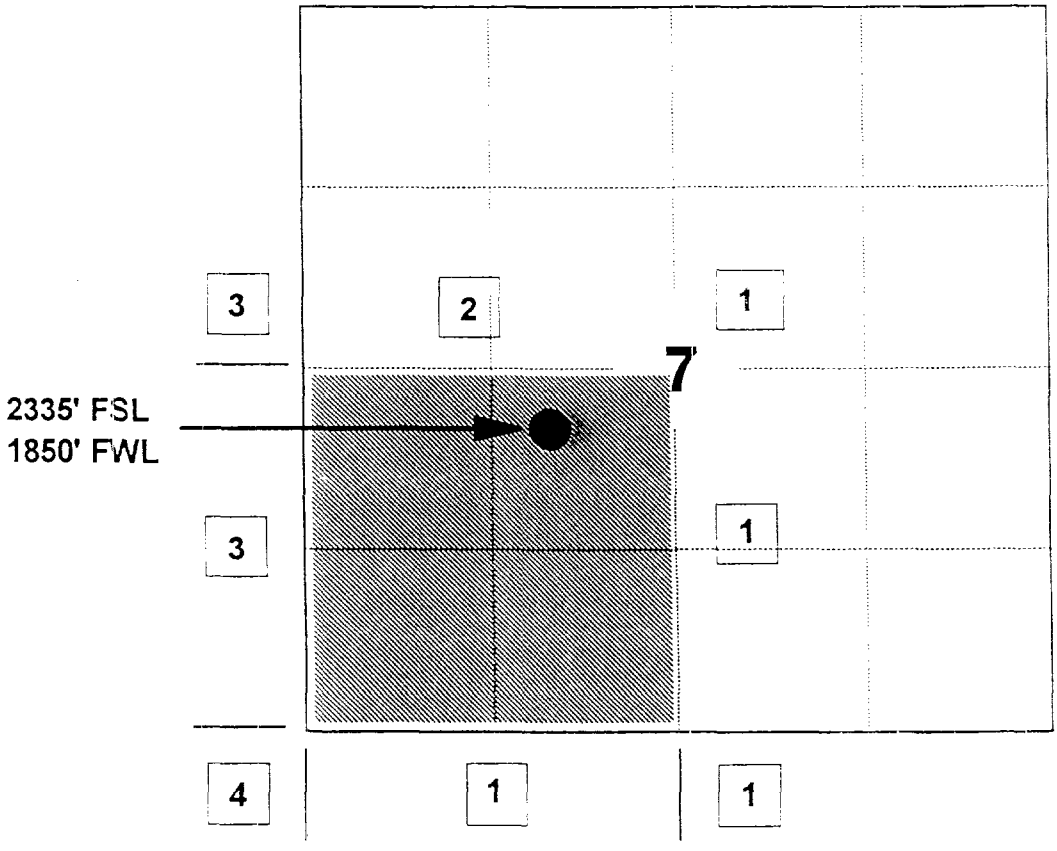
MERIDIAN OIL INC

OFFSET OPERATOR \ OWNER PLAT

ROWLEY #500

Fruitland Coal \ Pictured Cliffs Formations Commingle

Township 27 North, Range 10 West



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2) Amoco Production Company	PO Box 800, Denver, CO 80202
Conoco, Inc	10 Desta Dr., Suite 100W, Midland, TX 79705-4500
ARCO Oil & Gas Company	PO Box 1610, Midland, TX 79702-1610
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3) BHP Petroleum	5847 San Felipe, Suite 3600, Houston, TX 77057
4) Bonneville Fuels Corp.	1600 Lincoln St., Suite 1800, Denver, CO 80264

EXHIBIT C

ROWLEY #500

Working Interest Owners:

Devon Energy Corporation
1500 Mid American Tower
20 North Broadway
Oklahoma City, OK 73102-8250

Devon Energy Partners a Limited Partnership
P.O. Box 840563
Dallas, TX 75284-0563

Amoco Production Company
P.O. Box 800
Denver, CO 80201

Conoco Inc.
Attn: Steve Klein
10 Desta Drive West
Midland, TX 79705

El Paso Production Company
P.O. Box 4289
Farmington, NM 87401

S. Lawrence Farrington &
John C. Vaughey CO-Execu.
E. A. Vaughey Estate
1840 Capital Towers
125 S. Congress St.
Jackson, MS 39201-3382

Royalty Owner:

U.S.A.

ORRI Owners:

Lucille H. Piplin, Personal Rep
of the Estate of Pearl O. Pipkin
P.O. Box 1174
Roswell, NM 88201

Madeline Galt
c/o Tom Galt
352 Fifth Street
Altantic Beach, FL 32233

KELLAHIN AND KELLAHIN
ATTORNEYS AT LAW
EL PATIO BUILDING
117 NORTH GUADALUPE
POST OFFICE BOX 2265
SANTA FE, NEW MEXICO 87504-2265

W. THOMAS KELLAHIN*
*NEW MEXICO BOARD OF LEGAL SPECIALIZATION RECOGNIZED SPECIALIST IN THE AREA OF NATURAL RESOURCES-OIL AND GAS LAW

JASON KELLAHIN (RETIRED 1991)

TELEPHONE (505) 982-4285
TELEFAX (505) 982-2047

May 21, 1993

HAND DELIVERED

Michael E. Stogner
Oil Conservation Division
310 Old Santa Fe Trail
Santa Fe, New Mexico 87501

Re: Meridian Oil Inc.
DHC cases

Dear Mike:

I have enclosed a 5.25 floppy disk which contains the DHC allocation formula for NMOCD Cases 10721 through 10725. In addition, I have enclosed a hard copy of that formula for each case and printed such that it can be attached to the respective order as an exhibit. Please call me if you need anything else.

John

RHODES C #102

MONTHLY GAS PRODUCTION ALLOCATION FORMULA

GENERAL EQUATION

Q = 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 * e^{-(Dpc)*(t)}

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

Dpc = PICTURED CLIFFS MONTHLY DECLINE DATE DETERMINED FROM:

MATERIAL BALANCE (FIELD ANALOGY):
VOLUMETRIC RESERVES (LOG ANALYSIS)
G f(P*) = 0.61 MMCF/PSI x P* X Rf

P* = INITIAL RESERVOIR PRESSURE (7 DAY SIBHP)
RF = RECOVERY (FIELD ANALOGY): = 0.85

THUS: **Qftc = Qt - Qpci * e^{-(Dpc)*(T)}**

WHERE: (t) IS IN MONTHS

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

RHODES C #102

DETERMINATION OF Qpci:
(INITIAL PICTURED CLIFFS MONTHLY PRODUCTION)

$$Qpci = Qt(1) * Qpc(p) \setminus \{Qpc(p) + Qftc(p)\}$$

WHERE:

Qt(1) = FIRST MONTH TOTAL PRODUCTION (MCF)

Qpc(p) = FINAL PICTURED CLIFFS FLOW TEST (MCFPD)

Qftc(p) = FINAL FRUITLAND COAL FLOW TEST (MCFPD)

RHODES C #102

EXAMPLE DETERMINATION OF:

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

(a) DETERMINATION OF Np(pc)

Np(pc) = 0.61 (MMCF/PSI) X P*(PSI) X Rf

P* = 300 PSI (FROM 7 DAY SIBHP)

Np(pc) = 0.61 MMCF/PSI X 300 PSI X 0.85

Np(pc) = 155.6 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)/Npc

Qpcabd = 300 MCF/M

Dpc =(8,333MCF/M - 300MCF/M)/(155,600MCF)

Dpc = 0.052/M

THUS: Qftc = Qt(MCF/M) - 8,333(MCF/M) X e^{-(0.052(1/M)) X t(M)}

RHODES C #102

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 * e^{-(Dpc)*(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 (EUR)
Qpcabd = 300 MCF/M

WHERE: **Np(pc)** = PICTURED CLIFFS ESTIMATED ULTIMATE RECOVERY (EUR)
P*x 0.61 MMCF/PSI x Rf**
P* = INITIAL RESERVOIR PRESSURE (7 DAY SIBHP)
RF = RECOVERY (FIELD ANALOGY): = 0.85
** DETERMINED FROM MATERIAL BALANCE (FIELD ANALOGY) AND VOLUMETRIC RESERVES (LOG ANALYSIS)

By calculating PC EUR FROM SIBHP and determining PC initial flow rate, Dpc can then be estimated utilizing the previously described parameters

THUS: **Qftc = Qt - Qpci * e^{-(Dpc)*(t)}**

WHERE: **(t) IS IN MONTHS**

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

RHODES C #102

DETERMINATION OF Qpci:
(INITIAL PICTURED CLIFFS MONTHLY PRODUCTION)

$$Qpci = Qt(1) \times Qpc(p) / \{Qpc(p) + Qftc(p)\}$$

WHERE:

Qt(1) = FIRST MONTH TOTAL PRODUCTION (MCF)

Qpc(p) = FINAL PICTURED CLIFFS FLOW TEST (MCFPD)

Qftc(p) = FINAL FRUITLAND COAL FLOW TEST (MCFPD)

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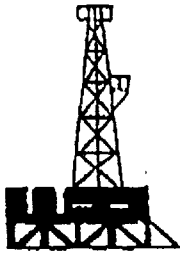
MERIDIAN OIL



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HUERFANO UNIT #549

In order to facilitate an economic Pictured Cliffs completion three requirements must be met. It is the combination of these three requirements that determines the economic status and completion method (PC single completion, PC-FTC Dual, PC-FTC commingle) utilized. These three requirements are as follows:

RESERVES Np(pc)

FLOW RATE (Qpcl)

COSTS (Investment and Operating)

Shown in the following example are the parameters and calculations used to determine Pictured Cliffs initial rate (Qpci), Pictured Cliffs Estimated Ultimate Recovery (Np(pc)), and Pictured Cliffs decline rate (Dpc). Additionally, estimated costs associated with each completion method and economic sensitivities (figures 1-3) are attached to show the effects of PC reserves (Np(pc)), initial PC rates (Qpci), and completion method (costs).

This example is for the Huerfano Unit #549, but the methodology is applicable for each of the commingle applications submitted (Rhodes C #'s 101 & 102, Whitley A #100, McAdams #500, and the Rowley Com #500). The variations in the Np(pc)'s are due to the specific drill block parameters (thickness, porosity, water saturation). Costs will be similar and the economic sensitivities are applicable for each case.

HUERFANO UNIT #549

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 1.08 MMCF/PSI X Rf**
P* = INITIAL RESERVOIR PRESSURE (SIBHP)
RF = RECOVERY (FIELD ANALOGY): = 0.85
** 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.

HUERFANO UNIT #549

DETERMINATION OF Qpci:
(INITIAL PICTURED CLIFFS MONTHLY PRODUCTION)

$$Qpci = Qt(1) \times Qpc(p) / \{Qpc(p) + Qftc(p)\}$$

WHERE:

Qt(1) = FIRST MONTH TOTAL PRODUCTION (MCF)

Qpc(p) = FINAL PICTURED CLIFFS FLOW TEST (MCFPD)

Qftc(p) = FINAL FRUITLAND COAL FLOW TEST (MCFPD)

HUERFANO UNIT #549

EXAMPLE DETERMINATION OF:

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

(a) DETERMINATION OF Np(pc)

(see page 5 for Np(pc) derivation)

Np(pc) = 1.08 (MMCF/PSI) X P*(PSI) X Rf

P* = 300 PSI (FROM SIBHP)

Np(pc) = 1.08 MMCF/PSI X 300 PSI X 0.85

Np(pc) = 275.4 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)/(275,400MCF)

Dpc = 0.029/M

THUS: Qftc = Qt(MCF/M) - 8,333(MCF/M) X e^{-(0.029(1/M)) X t(M)}

HUERFANO UNIT #549

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	=	35.0	ft
b.	(phi)	porosity	=	15.0	%
c.	(Sw)	H2O saturation	=	55.0	%
d.	(Rf)	Recovery Factor	=	85.0	%
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)
= 35 (ft) X 160 (acres) X 43,560 (ft^2/acre) X 0.15 X (1-0.55)
= 16,465,680 ft^3 1mmrcf = 1,000,000 ft^3

HCPV = 16.466 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: $n_r = n_s$

WHERE: n_r = NUMBER OF MOLES OF GAS AT RESERVOIR CONDITION

n_s = 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

= 16.466 (mmrcf) X 0.0657 {scf/(rcf psia)} X Pr (psia) X 0.85

Np(pc) = 1.08 (mmscf/psia) X Pr (psia) X 0.85

HUERFANO UNIT #549

B. PICTURED CLIFFS DRILLING /COMPLETION COST SUMMARY

1. STAND ALONE SINGLE PC COMPLETION

ESTIMATED COSTS:	TANGIBLE (M$)	INTANGIBLE (M$)	TOTAL (M$)
	183.39	136.12	319.51

2. FTC/PC DUAL COMPLETION*

ESTIMATED COSTS:	TANGIBLE (M$)	INTANGIBLE (M$)	TOTAL (M$)
	173.49	93.67	267.16

3. FTC/PC COMMINGLE COMPLETION*

ESTIMATED COSTS:	TANGIBLE (M$)	INTANGIBLE (M$)	TOTAL (M$)
	91.69	93.67	185.36

*PICTURED CLIFFS COSTS ONLY

C. ECONOMIC SUMMARY

FIGURES 1-3 PICTURED CLIFFS RESERVES VS RATE OF RETURN (%)

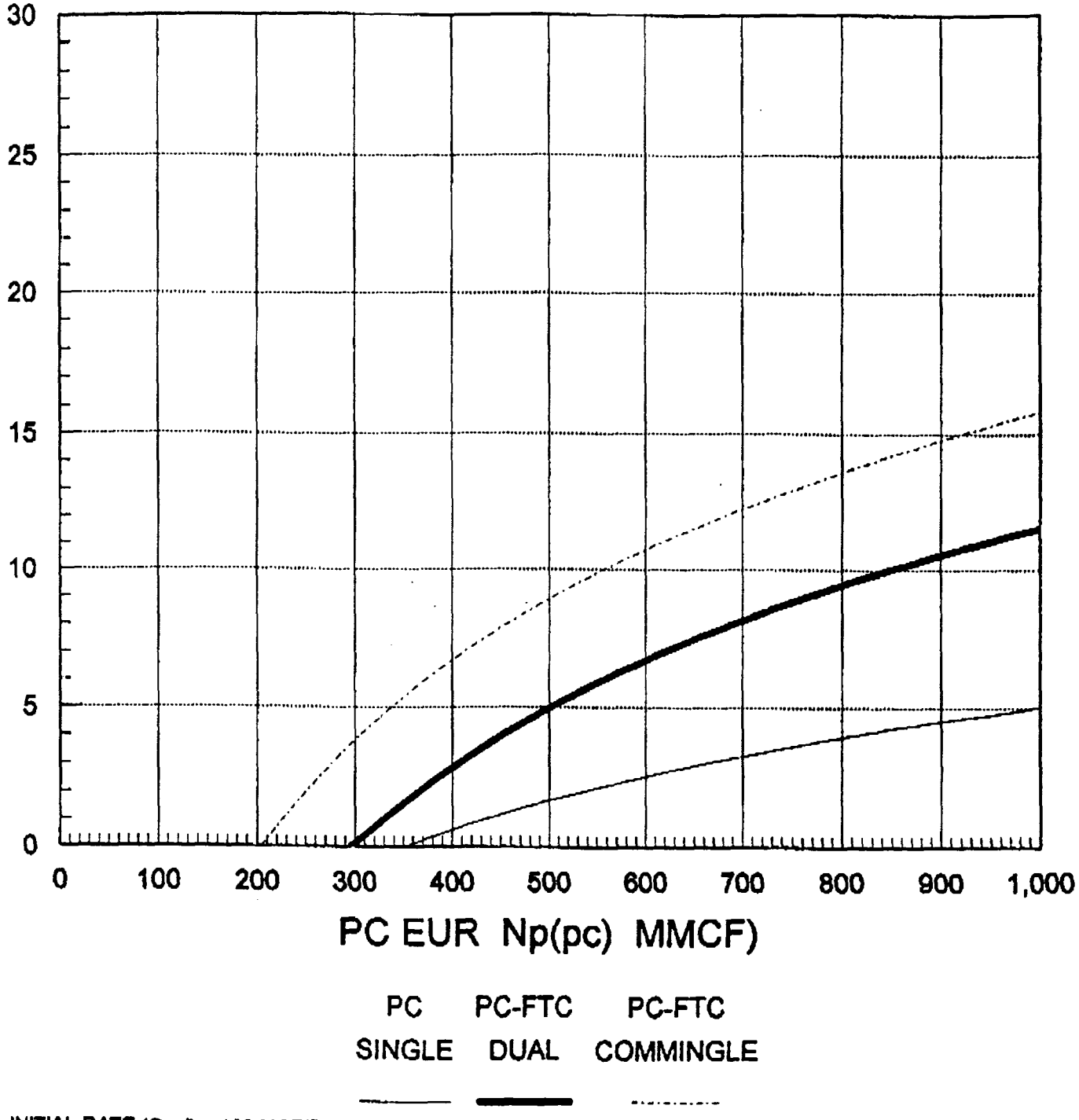
THREE CASES PER FIGURE (FTC/PC COMMINGLE, FTC/PC DUAL, PC SINGLE)

FIGURE 1 INITIAL RATE = 100 MCF/D
FIGURE 2 INITIAL RATE = 200 MCF/D
FIGURE 3 INITIAL RATE = 300 MCF/D

PICTURED CLIFFS

ECONOMIC EVALUATION

COMPLETION TECHNIQUE SENSITIVITY



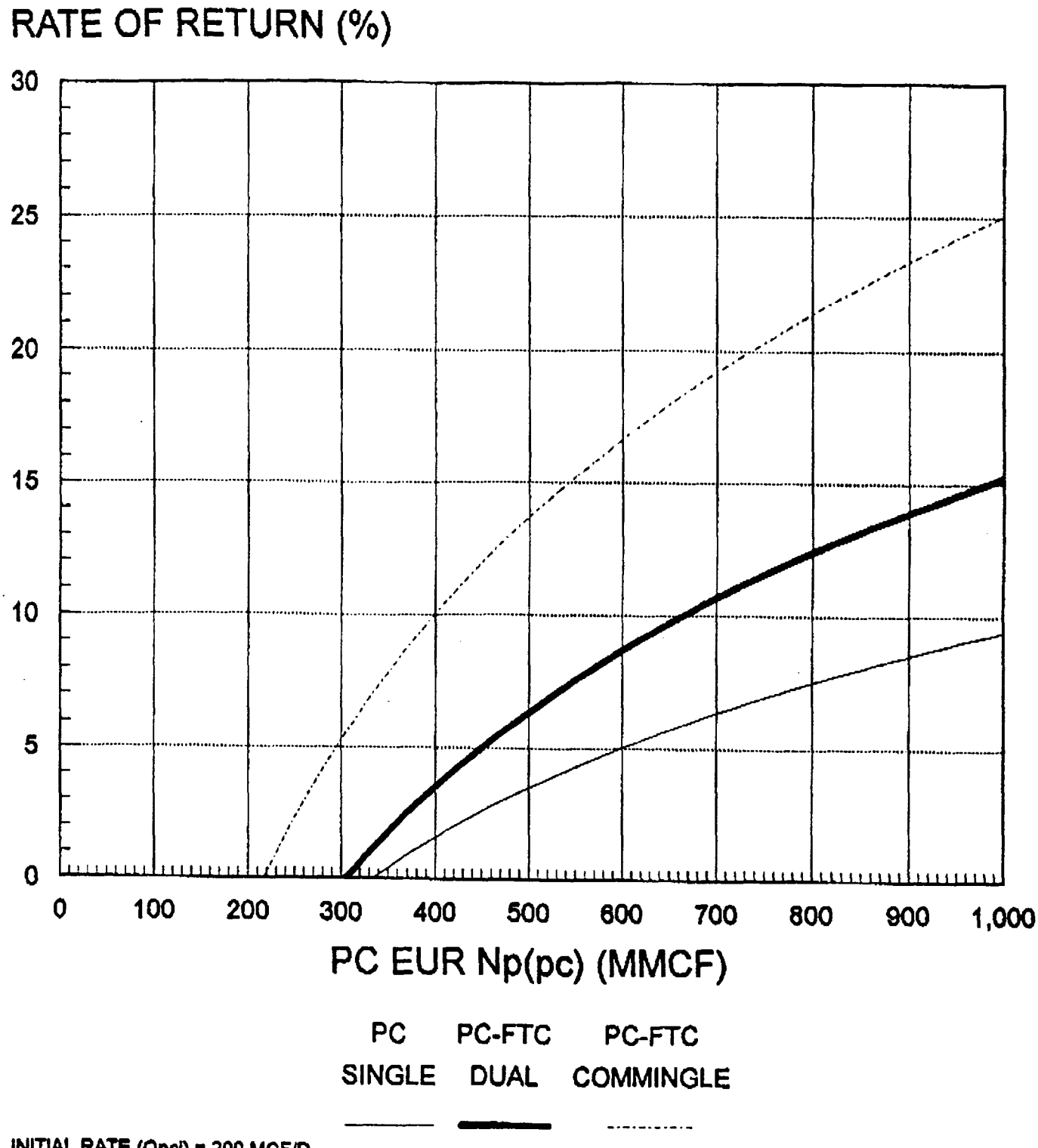
INITIAL RATE (Qpci) = 100 MCF/D
OR 3,000 MCF/M

FIGURE 1

PICTURED CLIFFS

ECONOMIC EVALUATION

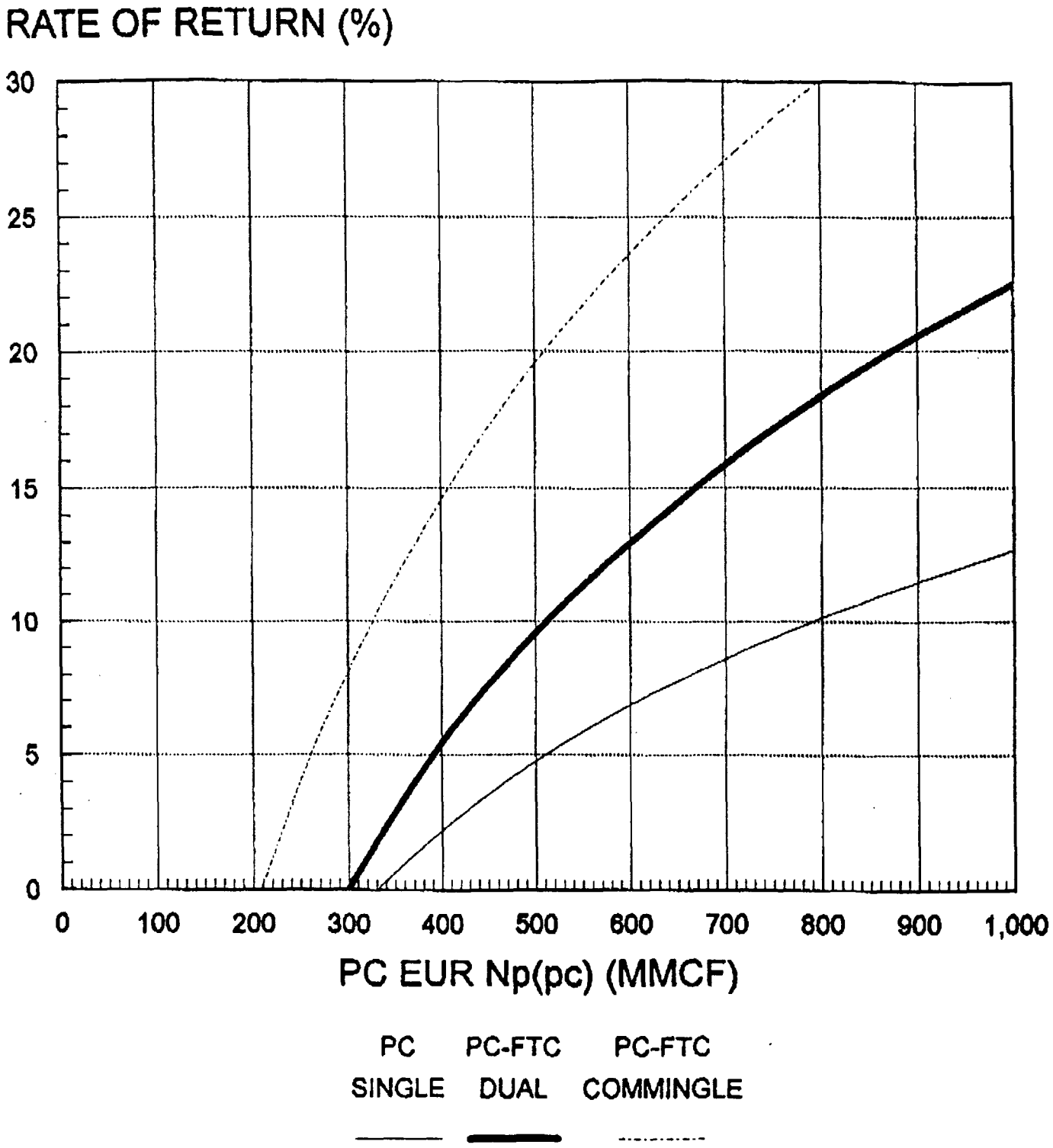
COMPLETION TECHNIQUE SENSITIVITY



INITIAL RATE (Qpci) = 200 MCF/D
OR 6,000 MCF/M
FIGURE 2

ECONOMIC EVALUATION

COMPLETION TECHNIQUE SENSITIVITY



INITIAL RATE (Qpci) = 300 MCF/D
OR 9,000 MCF/M

FIGURE 3

	WELL	POOL		OWNERSHIP		NSL		ECONOMICS
		FTC	PC	FTC	PC	FTC	PC	SUB ECON
1.	Rhodes C#101	BFTC	W-K	Comm	Comm	NSL	NSL	FTC - PC
2.	Rhodes C#102	BFTC	W-K	Comm	Comm	OK	NSL	FTC - PC
3.	Whitley A#100	BFTC	W-K	Comm	Comm	OK	NSL	FTC - PC
4.	Rowley Com#500	BFTC	FK	Diff	Diff	OK	NSL	PC -Margin
5.	McAdams #500	BFTC	FK	Diff	Diff	OK	OK	PC

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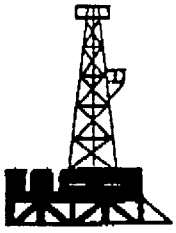

MERIDIAN OIL

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to plot, they yield results on a time basis, and they're deceptively easy to analyze. Decline curves are also one of the oldest methods of predicting reserves.

Decline curves, as used today, are simply a plot of production rate versus time on semilog, log-log, or specially scaled paper. The most common plot is semilog. When the logarithm of producing rate is plotted versus linear time, a straight line often results. This phenomenon is referred to as "exponential decline" and is similar to the decay of a radioactive element. Exponential decline is also referred to as constant percentage decline because of terminology used in the early 1900's. Occasionally, someone will state that exponential decline and constant percentage decline are different. This is not true; they are synonyms for decline curves which plot as a straight line on semi-log paper.

Often the data will not plot as a straight line on semi-log paper, but instead will "curve up" or be concave upwards. This situation, in which the decline rate continuously decreases with time, can usually be modeled with a hyperbolic equation. In cases of this type, the well is said to be experiencing "hyperbolic decline." A special case of hyperbolic decline is known as "harmonic decline."

5.1 DECLINE CURVE EQUATIONS

5.1.1 *Exponential Decline*

The equation of a straight line on semilog paper can be written as

$$q = q_i e^{-Dt} \qquad (5\text{-}1)$$

where

- q = producing rate at time t, vol/unit time
- q_i = producing rate at time 0, vol/unit time
- D = nominal exponential decline rate, 1/time
- t = time
- e = base of natural logarithms, (2.718....)

Any system of units can be used as long as the product **Dt** is unitless and q and q_i are expressed in the same units. Equation 5-1 can be "derived" by stating that the decline rate at any time is proportional to the production rate, but there is no theoretical foundation for this "derivation." The theoretical foundation for exponential decline will be discussed later.

5.1.1.1 *Nominal and Effective Decline Rates*

Equation (5-1) *defines* the nominal decline rate (D). In dealing with production data, we intuitively think in terms of "effective" decline rate. For example, if we are told that a well produced 100 BOPD one year ago and now produces 50 BOPD, we naturally feel that the well declined at a rate of 50% per year. Imagine our surprise when the engineer says it is declining at 69.3% per year! Which one of the these is correct? Both of them are. Effective decline is defined as

$$D_e = \frac{q_i - q}{q_i} \qquad (5\text{-}2)$$

for a given time period. The relationship between **D** and D_e can be derived as follows. We take **t** to be one time period (a year, perhaps). Since q_i and **q** are the same for both definitions of decline rate we can solve equations 5-1 and 5-2 for **q** and set the results equal:

$$q = q$$

$$q_i e^{-D} = q_i - q_i D_e$$

(t has been set to 1)

factor out q_i

$$q_i e^{-D} = q_i(1 - D_e)$$

Nominal decline as a function of effective decline is

$$D = -\ln(1 - D_e) \qquad (5\text{-}3)$$

or

Effective decline as a function of nominal decline is

$$D_e = 1 - e^{-D} \qquad (5\text{-}4)$$

The authors strongly prefer the use of nominal decline rather than effective decline for reasons which will be discussed throughout the rest of the chapter.

One of the major reasons for using nominal decline has to do with changing the time units on decline rate. With nominal decline, a yearly rate can be changed to a monthly rate simply by dividing by 12. *This is not possible with effective decline!* In order to convert yearly effective rate to monthly effective rate, the *twelfth root* of $1 - D_e$ must be taken. Taking the twelfth root or raising a number to the twelfth power is not difficult, but it is not intuitive. An example will illustrate the above ideas.

Example 5-1
Nominal and Effective Decline Rates

Given that a well has declined from 100 BOPD to 96 BOPD during a one month period.

A) Predict the rate after 11 more months using nominal exponential decline.

B) Same as A using effective decline.

A) Using Nominal Decline

$q_i = 100$ BOPD

$q = 96$ BOPD

$t = 1$ month

$$D = \left[\ln\left(\frac{q_i}{q}\right)\right]/t \qquad (5\text{-}1)$$

$D = .04082$/mo

Find rate at end of 1 year.

$q = q_i e^{-Dt}$ PRIMARY EQ

$q = 100e^{-.04082\,(12)}$

$q = 61.27$ BOPD

B) Using Effective Decline

$$D_e = \frac{q_i - q}{q_i} \qquad (5\text{-}2)$$

$$D_e = \frac{100 - 96}{100}$$

$D_e = .04$/month

Convert to yearly

$1 - D_{ey} = (1 - D_{em})^{12}$

$1 - D_{ey} = (1 - .04)^{12}$

$D_{ey} = .3875$/year

Find rate at end of 1 year

$q = q_i\,(1 - D_e)$

$q = 100(1 - .3873)$

$q = 61.27$ BOPD

The authors find it much easier to use nominal decline. No matter what the units on **D** and **t**, it is only necessary to multiply by the appropriate time factor to cause the product **Dt** to be unitless. Try to predict the rate 22½ months from now using effective decline — it's not worth the effort.

5.1.1.2 *Cumulative Production*

In oil property evaluation, we are more interested in the amount of oil produced each year than the rate at any given time. In order to determine the cumulative oil production (N_p) at any

9920A

WJT 10/20/93

MS 10/19/93

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

APPLICATION OF MERIDIAN OIL INC. FOR AN UNORTHODOX GAS WELL LOCATION AND DOWNHOLE COMMINGLING, SAN JUAN COUNTY, NEW MEXICO. — Case No. 10721

APPLICATION OF MERIDIAN OIL INC. FOR DOWNHOLE COMMINGLING, SAN JUAN COUNTY, NEW MEXICO. — Case No. 10722

APPLICATION OF MERIDIAN OIL INC. FOR AN UNORTHODOX GAS WELL LOCATION AND DOWNHOLE COMMINGLING, SAN JUAN COUNTY, NEW MEXICO. — Case No. 10723

APPLICATION OF MERIDIAN OIL INC. FOR AN UNORTHODOX GAS WELL LOCATION AND DOWNHOLE COMMINGLING, SAN JUAN COUNTY, NEW MEXICO. — Case No. 10724

APPLICATION OF MERIDIAN OIL INC. FOR AN UNORTHODOX GAS WELL LOCATION AND DOWNHOLE COMMINGLING, SAN JUAN COUNTY, NEW MEXICO. — Case No. 10725

Order No. R-9920-A

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on August 26, 1993, at Santa Fe, New Mexico, before Michael E. Stogner.

MS 10/22/93

NOW, on this ____day of October, 1993, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS THAT:

(1) Due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.

(2) At the August 26, 1993 Division hearing Case Nos. 10721 through 10725 and Case Nos. 10745 and 10754 were reopened and consolidated for the purpose of presenting additional testimony.

(3) These cases all involve applications by Meridian Oil Inc. ("Meridian") for approval to initially drill, complete and produce each subject well as downhole commingled wells which would commingle production from the Pictured Cliffs formation with production from the Basin-Fruitland Coal Gas Pool.

(4) On July 9, 1993 the Division entered Order No. R-9920 approving the applications in Case Nos 10721 through 10725, which adopted Meridian's proposed allocation formula but which also established economic limitations on downhole commingling of the production from these two formations which provided:

> "...in the event total gas production from both pools in a well exceeds 300 MCF per Day, downhole commingling will not be allowed in the effected well until the combined rate drops below 300 MCF/day."

(5) Meridian timely requested that these cases be reopened so that it could present supplemental evidence concerning this issue in order to demonstrate that this economic limitation, unless amended, would restrict

Méridian's ability to produce the Pictured Cliffs formation gas and Basin Fruitland Coal gas in these wells.

(6) Meridian presented additional engineering testimony and economic analysis which supports the adoption of an "Economic Limit" for downhole commingling in these wells with such Economic Limit being based upon the relationship of costs to rate and estimated ultimate gas recovery from either the Pictured Cliffs formation or the Basin Fruitland Coal Gas Pool.

(7) In addition, Meridian presented a graph which may be utilized by the Division as an accurate and reliable means by which to establish an Economic Limit for the downhole commingling of production from either of these pools in this area and should be adopted as Exhibit "B" to the original Order.

(8) The Economic Limit plotted on said Exhibit "B", attached hereto and made a part hereof, is based upon either the Pictured Cliff formation or Basin Fruitland Coal Gas Pool well costs with three individual curves representing the minimum estimated cost of:

(a) a single well ($320,000.00);
(b) a dual completed well ($270,000.00); or,
(c) a downhole commingled well ($200,000.00).

(9) As established by Exhibit "B", if the combination of initial rate and estimated ultimate gas recovery ("EUR") for each of the subject wells falls below the curve plotted for the dual completed cost example, then and in that event downhole commingling may be allowed as an alternative economic means by which to produce either pool. For example, if the initial rate of a well is 500 MCFPD and an EUR has been calculated for the well to be 400 MMCF, then as indicated on Exhibit "B" the example well's Economic Limit will be below the dual completion economic limit curve and therefore the example well is entitled to be downhole commingled.

(10) In contrast, the Economic Limit adopted in Order R-9920 is too restrictive because it failed to

600.

address the fact that there are various combinations of either rate or EUR other than those used in Order R-9920 which would be economic or uneconomic.

(11) As observed by the applicant, Division Order R-9920 is more restrictive than the Division's statewide Rule 303-C(1)(b)(i) which allows downhole commingling based upon the economics of a single zone rather than requiring the combined total gas production from both zones to be uneconomic.

(12) The issue of downhole commingling unconventional coal gas production in northwest New Mexico is covered in RULE 12 of the Special Rules and Regulations for the Basin Fruitland Coal Gas Pool, as promulgated by Division Order No. R-8768, as amended, for those reasons covered in this matter such downhole commingling is in itself more confining and is in greater need of protection from abuses than commingling conventional gas production.

(13) No operator or interested party appeared in opposition to the application.

(14) This application should therefore be granted.

IT IS THEREFORE ORDERED THAT:

(1) The application of Meridian Oil Inc. to amend Division Order R-9920 to include additional factors in the Economic Limit provisions of said order based upon the relationship of costs to rate and estimated ultimate gas recovery from either the Pictured Cliffs formation or the Basin Fruitland Coal Gas Pool is hereby approved.

(2) The proviso included as a part of Decretory Paragraph No. (1) on page 8 of said Order R-9920 is hereby amended to read as follows:

"PROVIDED HOWEVER, in the event the Economic Limit plotted for production from

> either pool in a well is less than the curve for the dual completion case as plotted on Exhibit "B" [being a plot of costs compared to both maximum average daily producing rate against pipeline pressure ("Initial Rate") and an estimated ultimate gas recovery ("EUR")] attached hereto and made a part hereof, then and in that event, downhole commingling shall be allowed in the effected well. In the event the Economic Limit plotted for production from both pools in a well initially exceeds the curve for the dual completion case, then downhole commingling shall not be allowed in the well until such time as the Economic Limit in that well for production from either pool drops below the dual completion curve plotted on Exhibit "B"."

(3) Decretory Paragraph No. (3) on page 8 being one in the same shall be changed to read in its entirety as follows:

> "(3) The operator shall consult with the Supervisor of the Aztec Office of the Division to insure the validity and accuracy of the initial test on each well. Further, as part of the procedure for obtaining authorization to produce the subject well as a downhole commingled well, the operator shall submit to the Supervisor of the Aztec Office of the Division a sworn certificate verifying the cost, the Initial Rate and the EUR for that well. The Supervisor of the Aztec Office of the Division shall approve the downhole commingling and authorize the operator to produce the well if the Economic Limit for production from either pool in that well is less than the curve for the dual completion case as plotted on Exhibit "B". In the event the well initially fails to qualify for downhole commingling, the well can still qualify at some future date if and when the Economic Limit in that well for production from either pool drops below the dual

completion case curve plotted on Exhibit "B"."

(4) Exhibit "B" attached hereto shall be made a part of the order issued in Case No. 10721 through 10725.

(5) Jurisdiction of this cause is hereby retained for the entry of such further orders as the Division may deem necessary.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

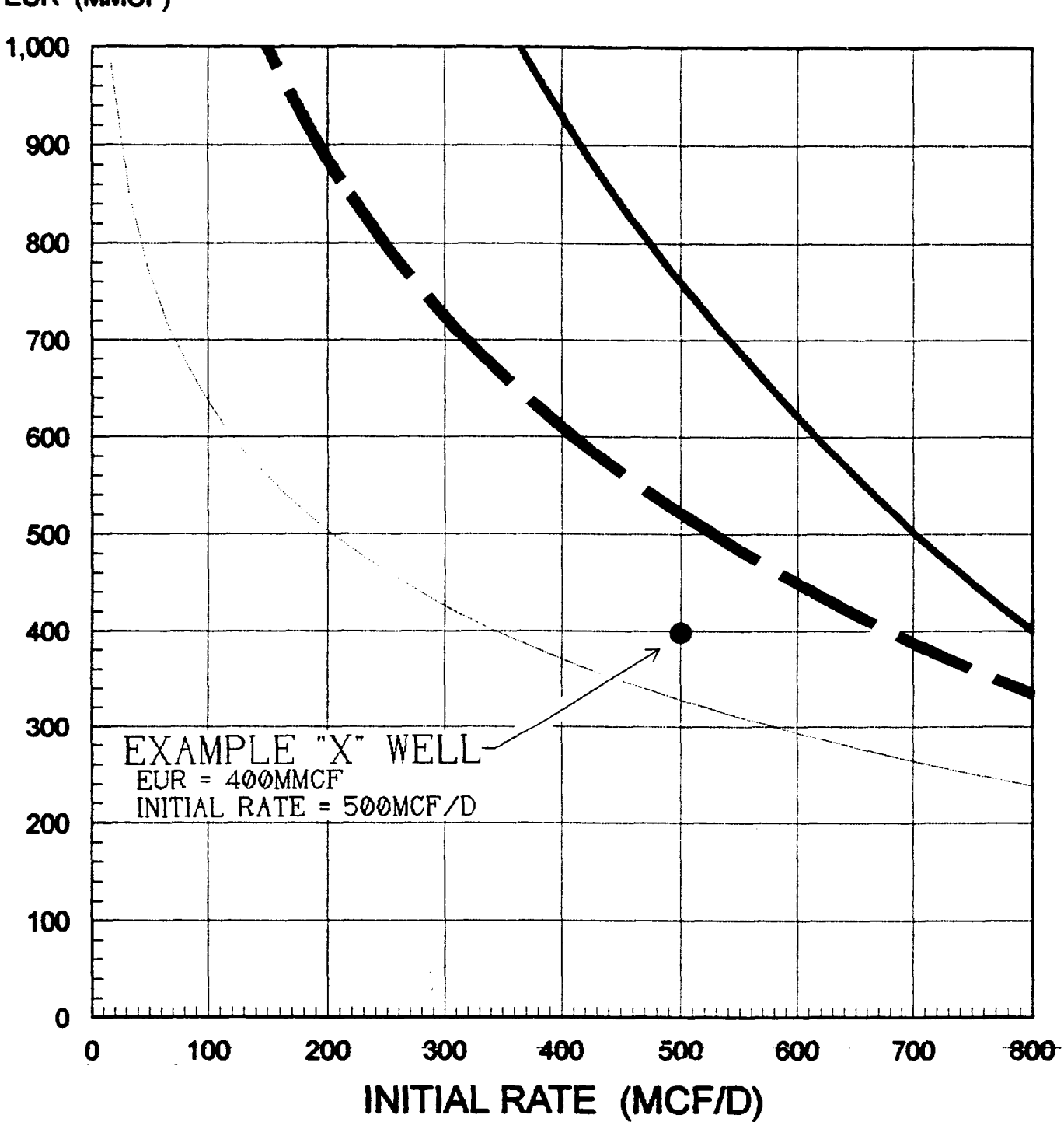
WILLIAM J. LEMAY
Director

S E A L

PICTURED CLIFFS / FRUITLAND COAL

ECONOMIC EVALUATION

COMPLETION TECHNIQUE SENSITIVITY



SINGLE 15% ROR | DUAL 15% ROR | COMMINGLE 15% ROR

INITIAL RATE VS EUR