MERIDIAN OIL

CASE # 10745

JULY 1, 1993

EXHIBIT 1

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)

RECEIVED
MAY 24 1993
OIL CONSERVATION DIVISION

May 24, 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

RE: Application of Meridian Oil, Inc.
for a Downhole Commingling,
San Juan County, New Mexico
Valdez # 5 Well

Dear Mr. LeMay:

On behalf of Meridian Oil, Inc. please find enclosed our Application for downhole commingling as referenced above, which we request be set for hearing on the next available Examiner's docket now scheduled for June 17, 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, June 11, 1993.

Also enclosed is our suggested advertisement for this case.

Very truly yours,

W. Thomas Kellahin

WTK/mg
Enclosures

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

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

ltr524.330

PROPOSED ADVERTISEMENT

Case ____: **Application of Meridian Oil Inc. for an unorthodox gas well location and downhole commingling, Rio Arriba County, New Mexico.** Applicant seeks approval to downhole commingle Choza Mesa-Pictured Cliffs Gas Pool and the Basin-Fruitland Coal Gas Pool production within the wellbore of its proposed Valdez #5 Well to be drilled at an unorthodox gas well "off pattern" location for the Basin-Fruitland Coal Gas Pool, being 1820 feet FWL and 1850 feet FNL, (Unit F) Section 16, T28N, R4W, NMPM, Rio Arriba County, New Mexico. Said well is to be dedicated a standard 320-acre gas spacing unit for the Basin-Fruitland Coal Gas Pool being N/2 of Section 16 and to a standard 160-acre gas spacing unit for the Choza Mesa-Pictured Cliffs Gas Pool being the NW/4 of Section 16. The well is located approximately ___ miles _____ from _____, 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:

APPLICATION OF MERIDIAN OIL INC. CASE:
FOR AN UNORTHODOX GAS WELL LOCATION
AND DOWNHOLE COMMINGLING
RIO ARRIBA 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 Choza Mesa-Pictured Cliffs Gas Pool and the Basin-Fruitland Coal Gas Pool production within the wellbore of its proposed Valdez #5 Well to be drilled at an "off pattern" gas well location for the Basin Fruitland Coal Gas Pool, being 1820 feet FWL and 1850 feet FNL, (Unit F) Section 16, T28N, R4W, NMPM, Rio Arriba County, New Mexico. The N/2 of Section 16 is to be dedicated to the subject well forming a standard 320-acre gas spacing unit for the Basin-Fruitland Coal Gas Pool. The NW/4 of Section 16 is to be dedicated to the subject well forming a standard 160 acre gas spacing unit for the Choza Mesa-Pictured Cliffs Gas Pool.

In support of its application, Meridian states:

(1) Meridian is the operator for the proposed Valdez #5 Well to be drilled at an unorthodox gas well location 1820 feet FWL and 1850 feet FNL (Unit F), Section 16, T28N, R4W, NMPM, Rio Arriba County, New Mexico as shown on Exhibit "A" attached.

(2) Said location is an unorthodox gas well location for the Basin-Fruitland Coal Gas Pool being located in the NW/4 rather than either the NE/4.

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

(4) The N/2 of Section 16 being 320 acres 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 NW/4 of Section 16 being 160 acres is to be dedicated to any production from the Choza Mesa-Pictured Cliffs Gas Pool which is spaced on 160-acre gas spacing units.

(6) The ownership is common 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 Valdez #5 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 either Fruitland Coal Gas or 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 the ownership in each of the two spacing units is common between the two pools and 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) That both the Fruitland Coal formation and 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.

(9) Meridian has selected to drill the proposed well in the NW/4 instead of the NE/4 of Section 16 because that location appears to have a greater opportunity for a successful although marginal Fruitland formation well.

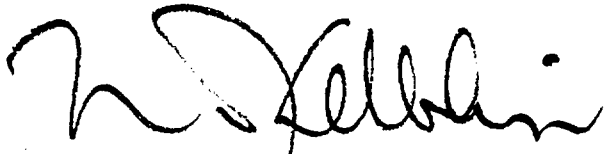
(10) Due to the nature of the Basin-Fruitland Coal Gas production, straight allocation of gas volumes from both zones is not appropriate. Meridian therefore seeks the adoption of a monthly allocation formula to be presented at the time of the hearing.

(11) Applicant requests that this matter be docketed for hearing on the Division's Examiner docket now scheduled for June 17, 1993.

(12) Copy of this application has been sent to all offsetting operators to the two spacing units as set forth on Exhibits B and C.

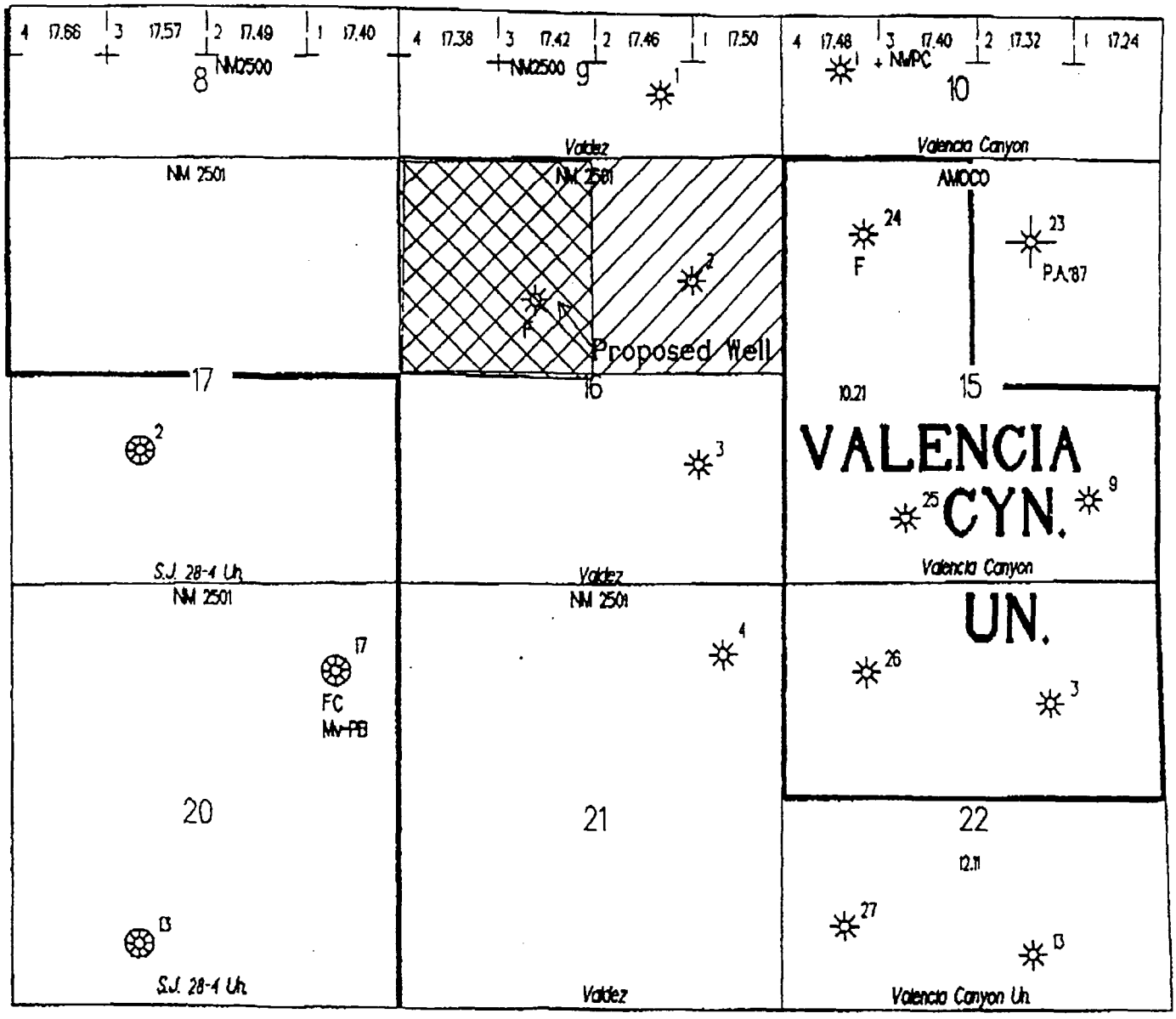
WHEREFORE Applicant requests that this matter be set for hearing on June 17, 1993 before a duly appointed Examiner of the Oil Conservation Division and that after notice and hearing as required by law, the Division enter its order granting this application.

Respectfully submitted



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

Meridian Oil Inc.
Valdez #5
Sec. 16-T28N-R04W
1820' FWL, 1850' FNL
Rio Arriba Co., NM



✲ Pictured Cliffs Well

⊛ Mesaverde Well

FR Spacing

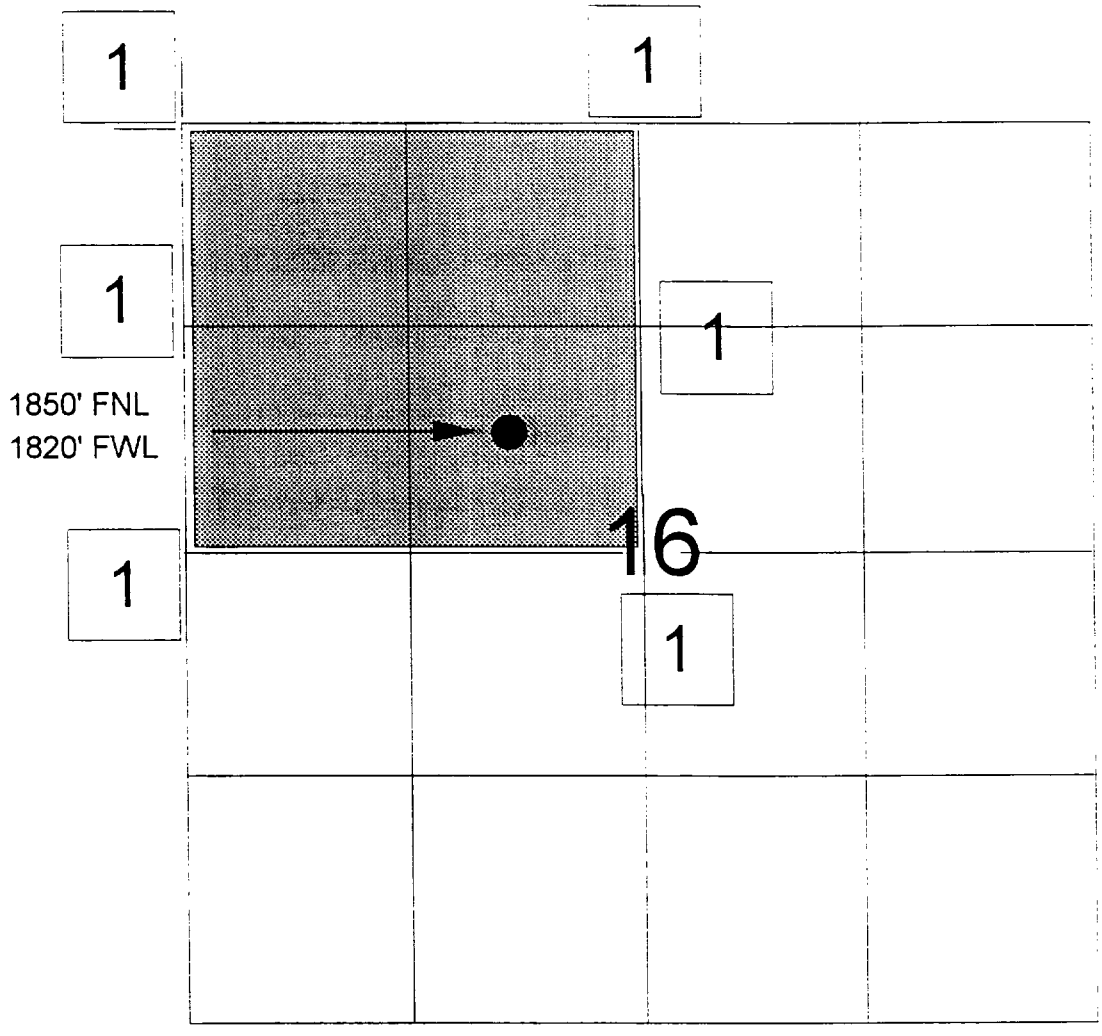
PC Spacing

EXHIBIT "A"

EXHIBIT 2

MERIDIAN OIL INC.

OFFSET OPERATOR/OWNER PLAT
Fruitland Coal/Pictured Cliffs Commingle
Offpattern Fruitland Location
VALDEZ #5
SE NW Section 16, T28N, R04W
Rio Arriba County, New Mexico

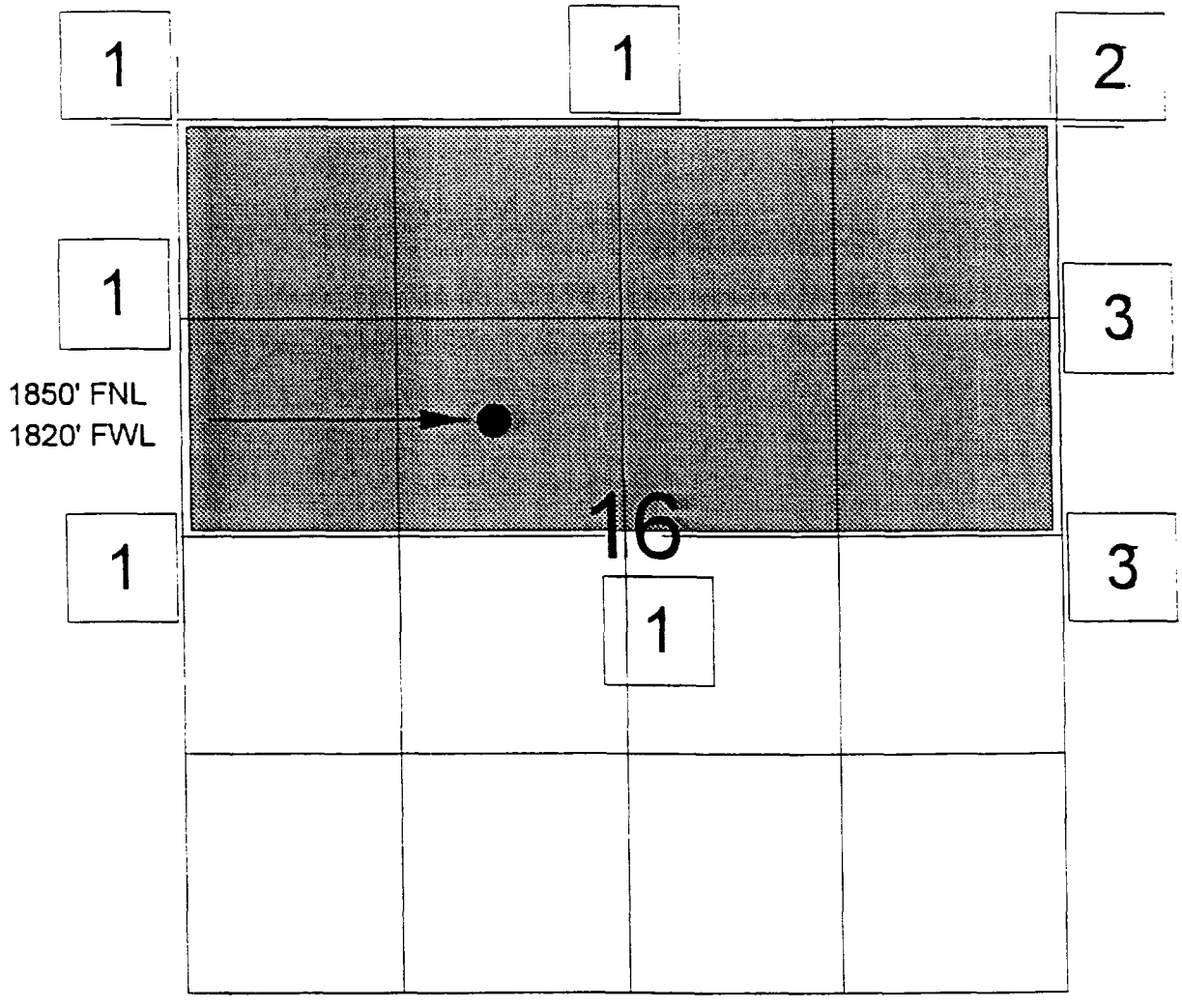


1) Meridian Oil Inc., 3535 East 30th St., P.O. Box 4289, Farmington, New Mexico 87499-4289.

PICTURED CLIFFS FORMATION

MERIDIAN OIL INC.

OFFSET OPERATOR/OWNER PLAT
Fruitland Coal/Pictured Cliffs Commingle
Offpattern Fruitland Location
VALDEZ #5
SE NW Section 16, T28N, R04W
Rio Arriba County, New Mexico



1) Meridian Oil Inc., 3535 East 30th St., P.O. Box 4289, Farmington, New Mexico 87499-4289.

2) Williams Production Company-18%, P.O. Box 58900, 295 Chipeta Way, Salt Lake City, Utah 84158-0900,

Phillips Petroleum-82%, 5525 Hwy. 64, NBU 3004, Farmington, New Mexico 87401.

3) Amoco Production Company, P.O. Box 800, 1670 Broadway, Denver, Colorado 80201.

FRUITLAND FORMATION

Valdez #5, Fruitland/Pictured Cliffs Commingle
N/2 Section 16, T28N, R4W
Rio Arriba County, New Mexico

Royalty Owner:

Minerals Management Service
Royalty Management Program
P.O. Box 5810
Denver, CO 80217

Overriding Royalty Owners:

MAR Oil & Gas Corporation
P.O. Box 5155
Santa Fe, NM 87502

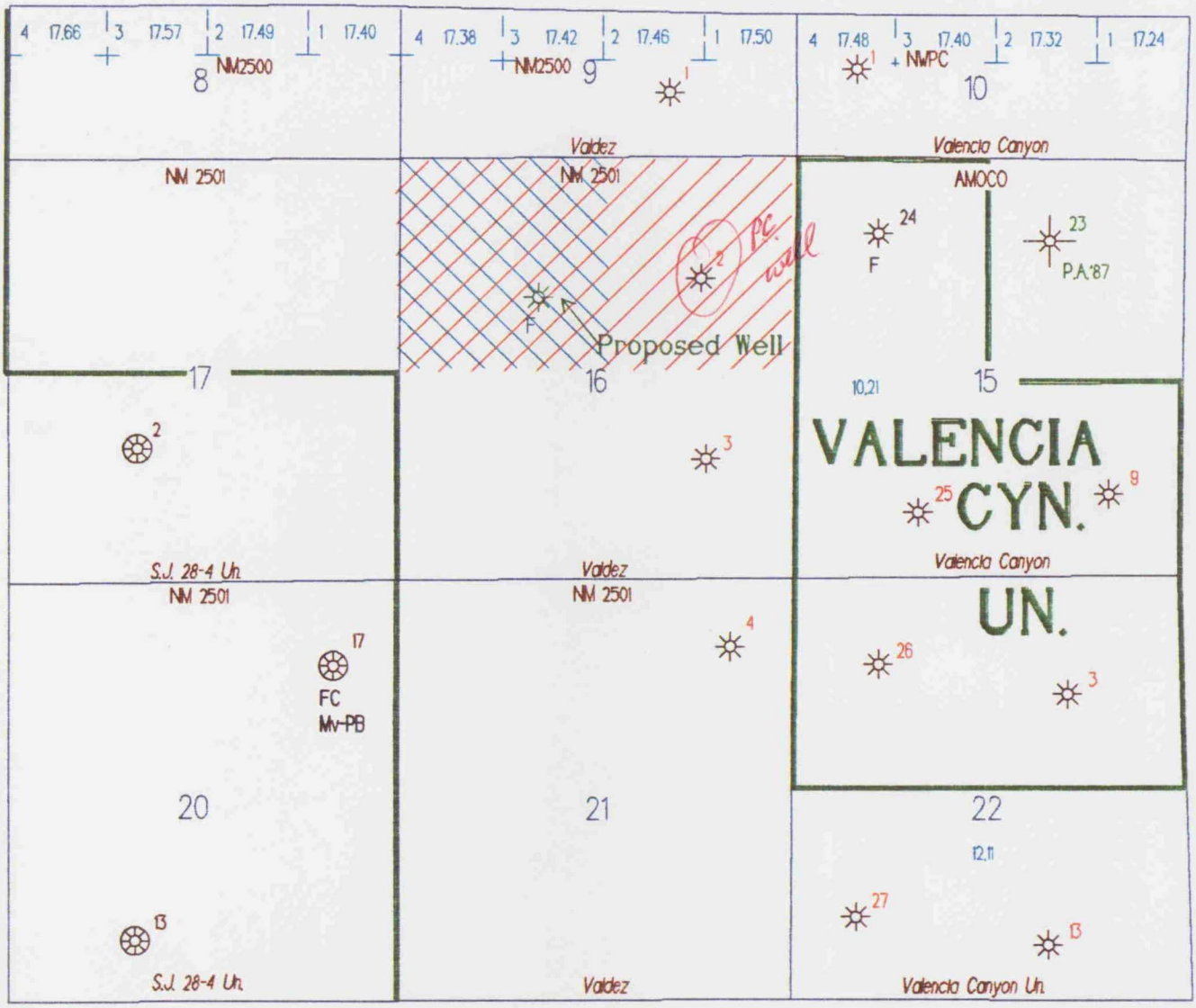
Bank One Trust Co Na Trustee
U/W/O Robert Critchfield
100 East Broad Street
Columbus, OH 43271

Timothy D. McCoy
Ninth Floor
200 North Harvey Street
Oklahoma City, OK 73102

Phillips Petroleum Company
5525 Hwy. 64, NBU 3004
Farmington, NM 87401

EXHIBIT 3

Meridian Oil Inc.
Valdez #5
Sec. 16-T28N-R04W
1820' FWL, 1850' FNL
Rio Arriba Co., NM



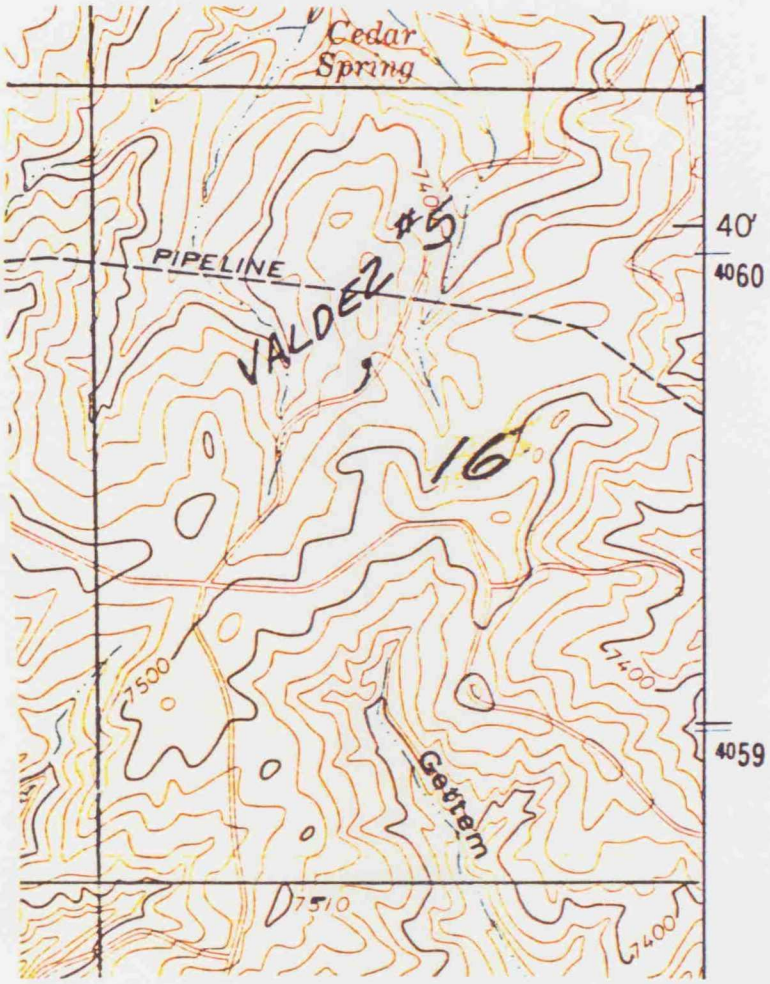
☼ Pictured Cliffs Well

⊛ Mesaverde Well

FR Spacing

PC Spacing

MOI Valdez #5
1850' FNL, 1820' FWL
Sec. 16, T28N, R4W, N.M.P.M.
Rio Arriba County, New Mexico



This location staked at these footages due to Forest Service approval and existing terrain, pipelines, archaeology, and lease lines.

Neale C. Edwards
N.M. R.L.S. #6857

EXHIBIT 4

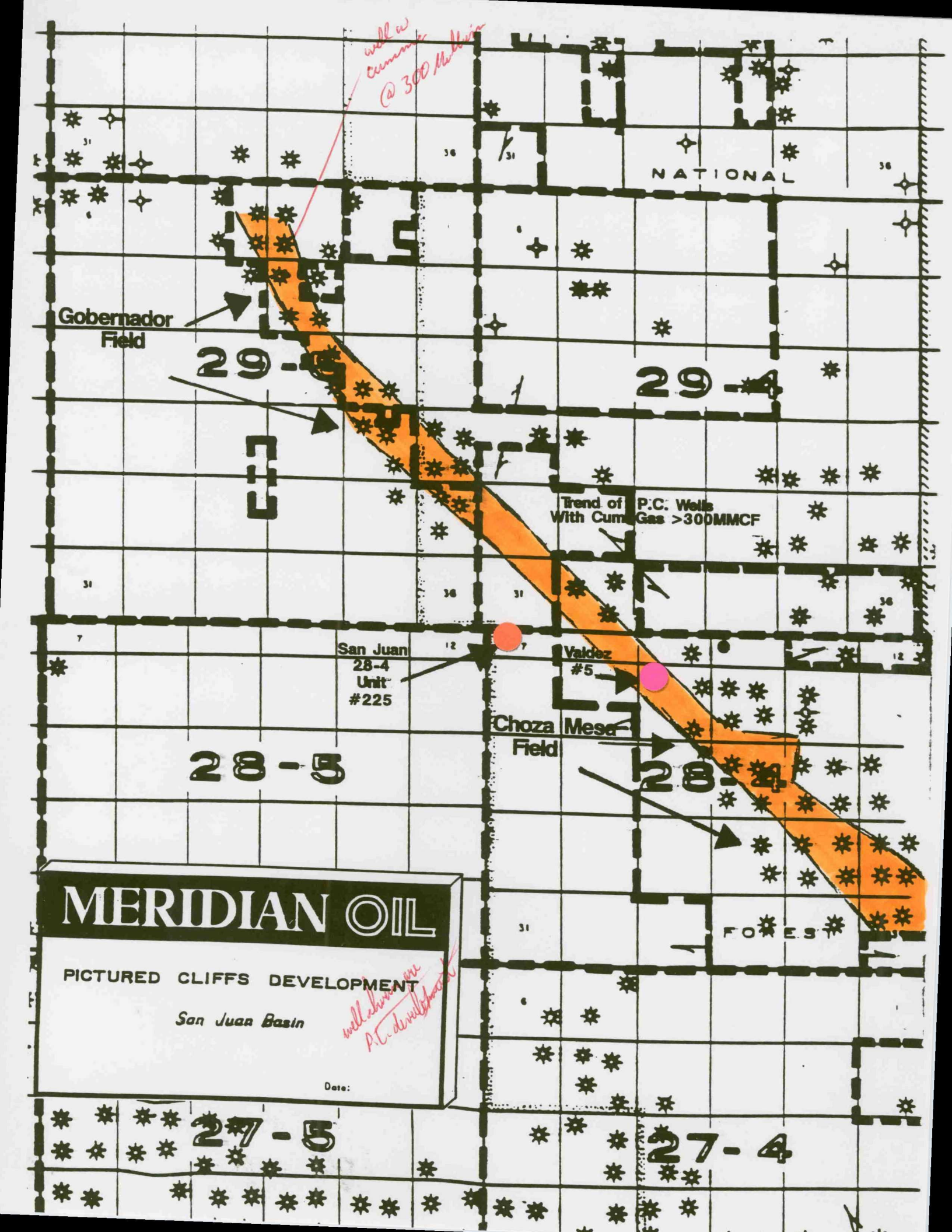
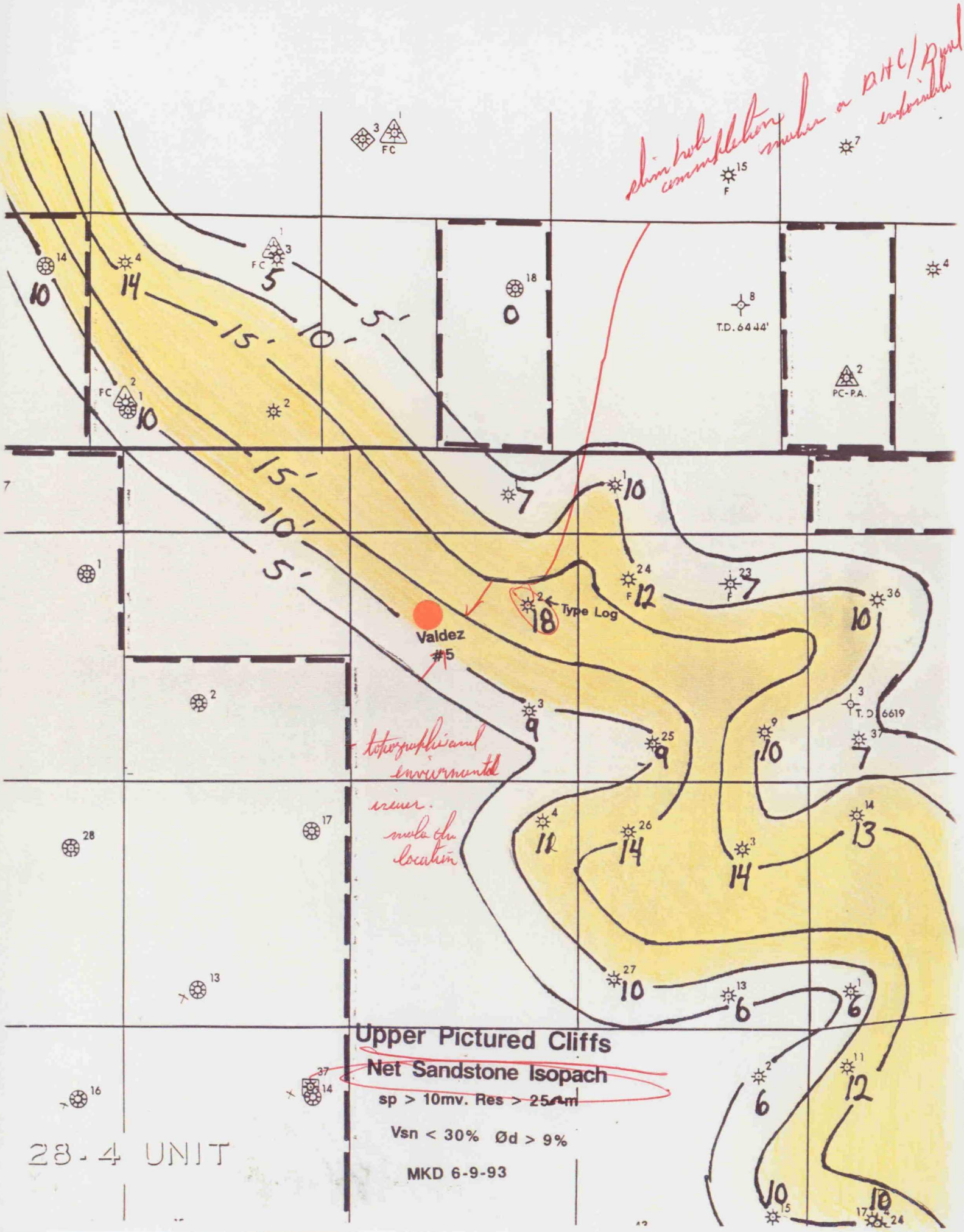

well w cumm @ 300 Mcf min
NATIONAL
Gobernador Field
29-5
29-4
Trend of P.C. Wells With Cum Gas >300MMCF
San Juan 28-4 Unit #225
Valdez #5
Choza Mesa Field
28-5
28-4
FOREST
MERIDIAN OIL
PICTURED CLIFFS DEVELOPMENT
San Juan Basin
well shows on P.C. drillboard
Date:
27-5
27-4

EXHIBIT 5


Valdez #5
Type Log
T.D. 6444'
T.D. 6619
PC-P.A.
FC
F
Upper Pictured Cliffs
Net Sandstone Isopach
sp > 10mv. Res > 25Ωm
Vsn < 30% Ød > 9%
MKD 6-9-93
28-4 UNIT

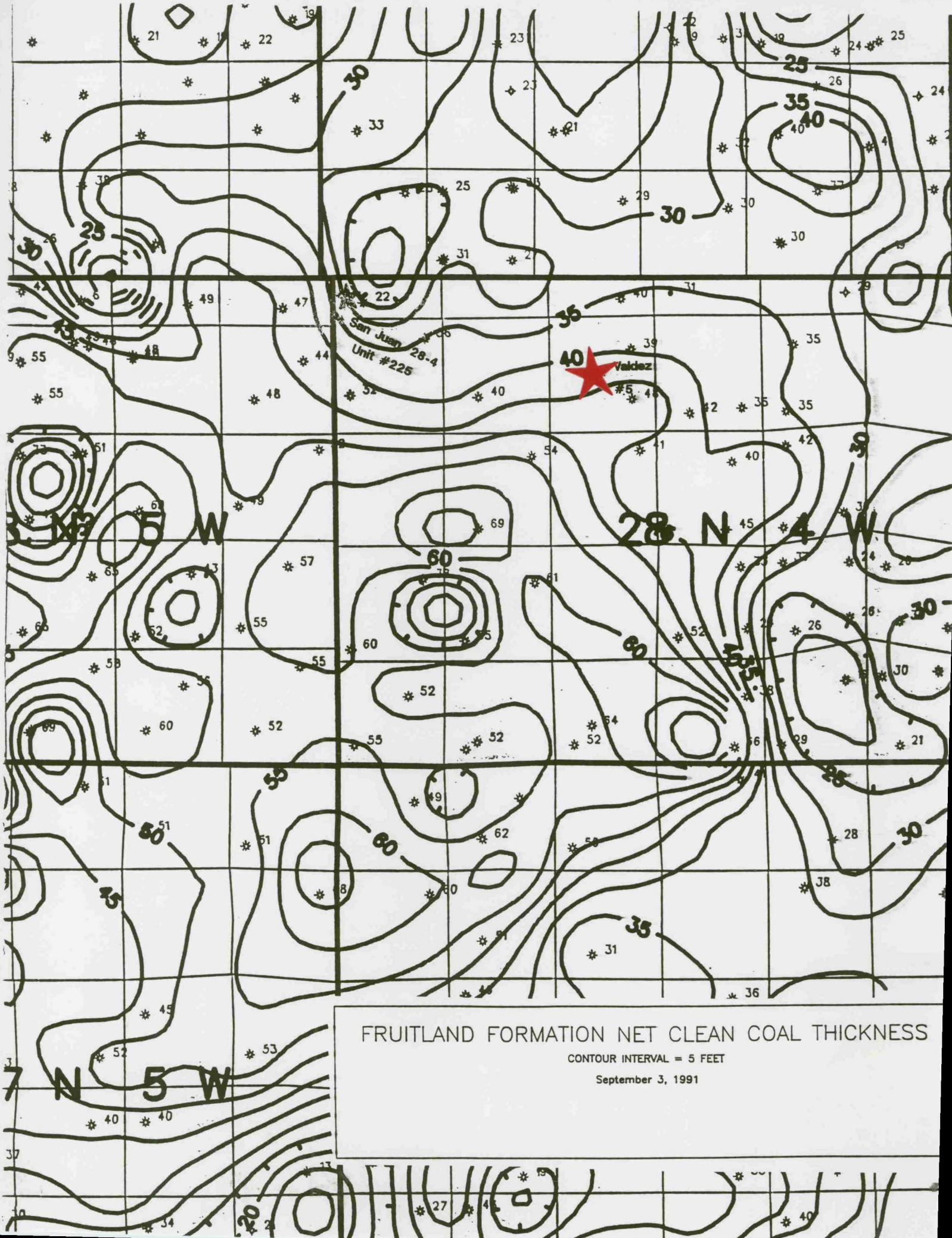

San Juan 28-4 Unit #225
Valdez
28 N 4 W
27 N 5 W
FRUITLAND FORMATION NET CLEAN COAL THICKNESS
CONTOUR INTERVAL = 5 FEET
September 3, 1991

EXHIBIT 6

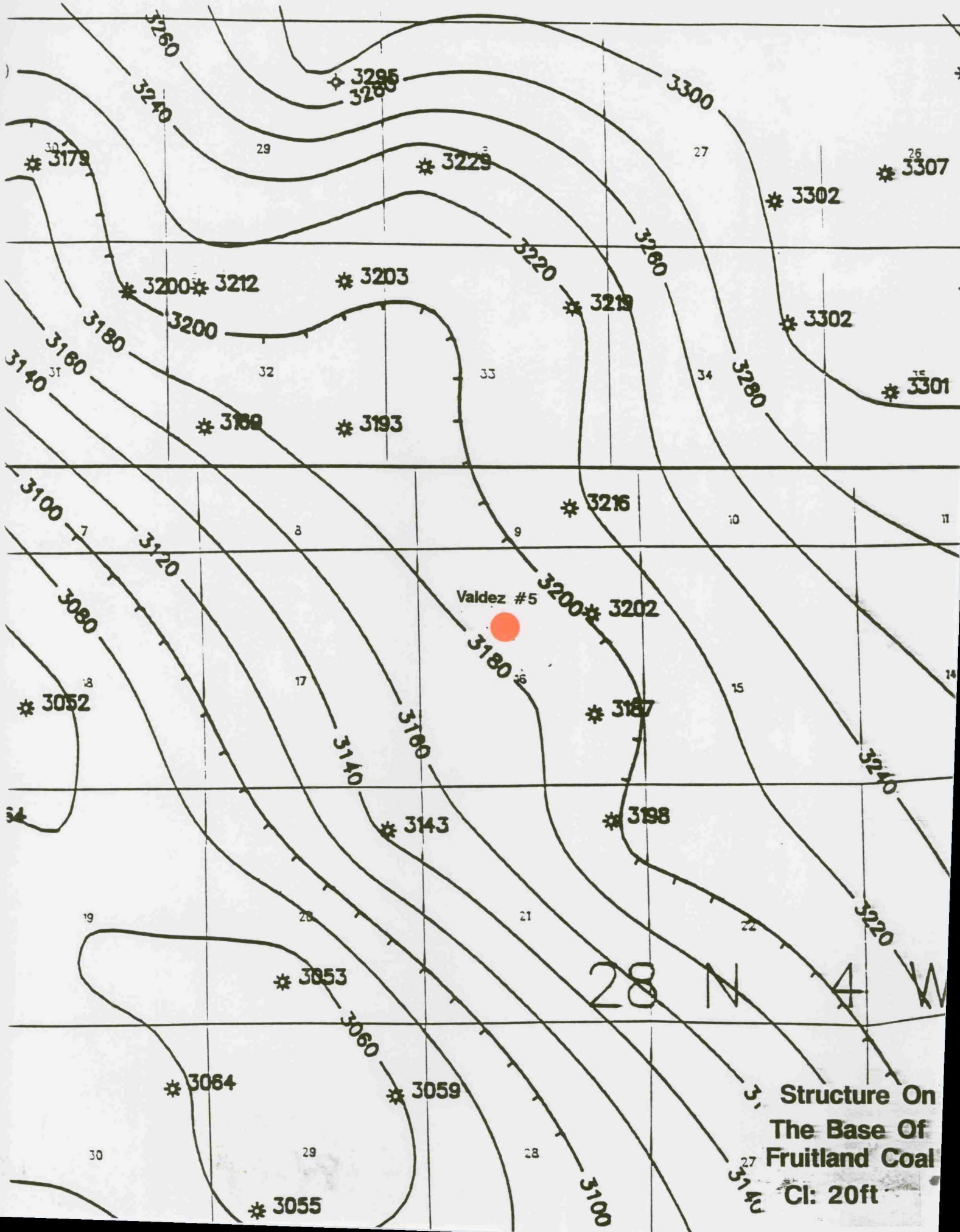
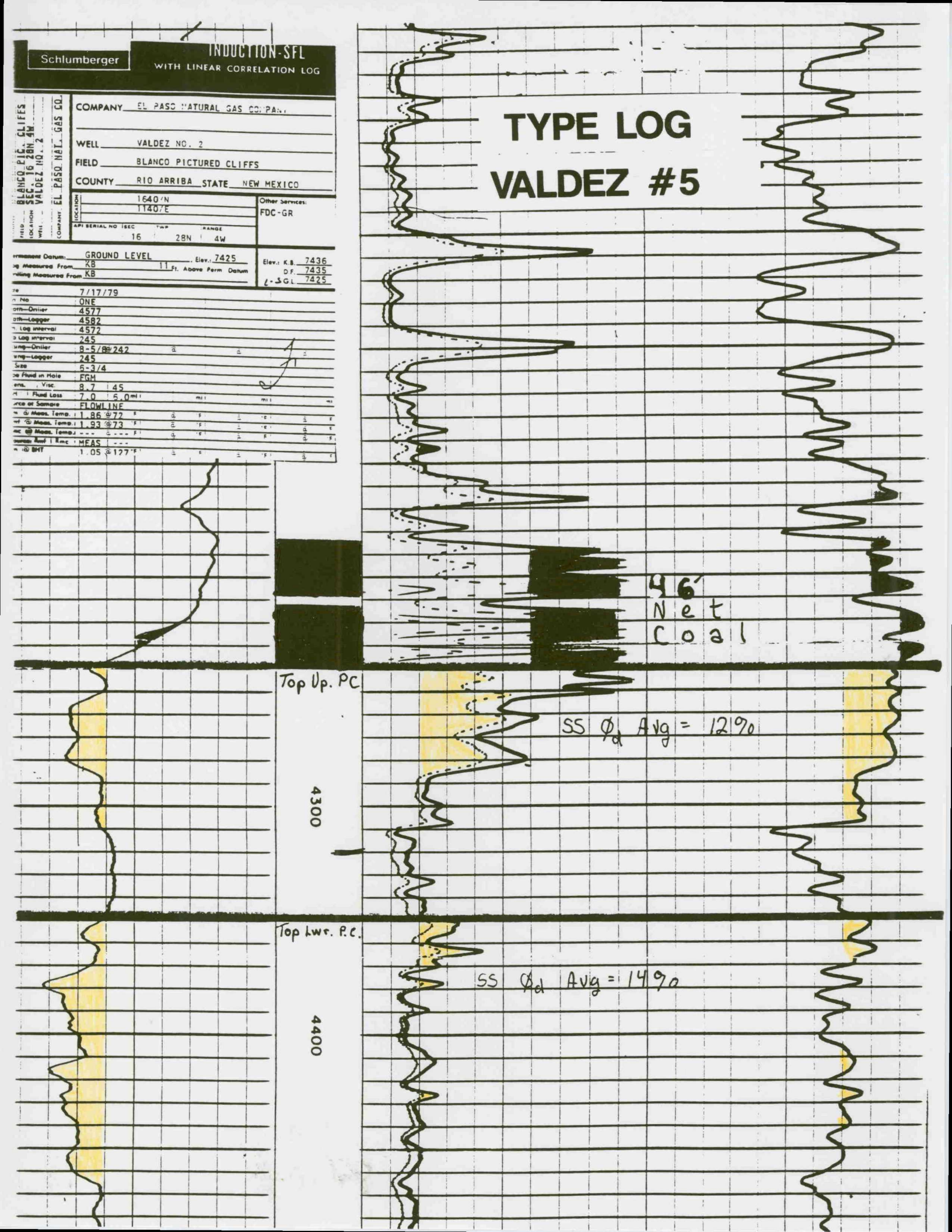

Valdez #5
28 N 4 W
Structure On
The Base Of
Fruitland Coal
CI: 20ft

EXHIBIT 7


Schlumberger
INDUCTION-SFL
WITH LINEAR CORRELATION LOG
COMPANY EL PASO NATURAL GAS COMPANY
WELL VALDEZ NO. 2
FIELD BLANCO PICTURED CLIFFS
COUNTY RIO ARRIBA STATE NEW MEXICO
1640'N
1140'E
Other Services:
FDC-GR
API SERIAL NO
SEC 16
TWP 28N
RANGE 4W
Permanent Datum: GROUND LEVEL Elev.: 7425
Log Measured From KB 11 Ft. Above Perm Datum
Drilling Measured From KB
Elev.: K.B. 7436
D.F. 7435
G.L. 7425
7/17/79
ONE
4577
4582
4572
245
8-5/8@242
245
6-3/4
FGM
8.7 45
7.0 6.0
FLOWLINE
1.86 @ 72
1.93 @ 73

MEAS
1.05 @ 127
BLANCO PIC. CLIFFS
SEC. 16 28N 4W
VALDEZ NO. 2
EL PASO NAT. GAS CO.
TYPE LOG
VALDEZ #5
46'
Net
Coal
Top Up. PC
SS ϕ_d Avg = 12%
4300
Top Lwr. P.C.
SS ϕ_d Avg = 14%
4400

EXHIBIT 8

VALDEZ #5

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 (Qpci)

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 Valdez #5, but the methodology is applicable for each of the subsequent commingle applications to submitted (the San Juan 28-4 Unit #225 in hearing; the San Juan 29-4 Unit #200, San Juan 28-4 Unit #226, San Juan 28-5 Unit #200, #227, #228, and #232 administratively). 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.

The monthly gas production allocation formula presented is similar to the allocation formula presented by Meridian Oil in previous commingle hearings.

VALDEZ #5

MONTHLY GAS PRODUCTION ALLOCATION FORMULA

GENERAL EQUATION

Qt = Qftc + Qpc

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

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

REARRANGING THE EQUATION TO SOLVE FOR Qftc:

Qftc = Qt - Qpc

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

PICTURED CLIFFS (PC) FORMATION PRODUCTION FORMULA IS:

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

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

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

WHERE: **Np(pc)** = PICTURED CLIFFS ESTIMATED ULTIMATE RECOVERY (EUR)
Np(pc) = P X 0.65 MMCF/PSI X Rf**
P* = INITIAL RESERVOIR PRESSURE (SIBHP)
RF = RECOVERY (FIELD ANALOGY): = 0.95
** DETERMINED FROM MATERIAL BALANCE (FIELD ANALOGY) AND VOLUMETRIC RESERVES (LOG ANALYSIS)

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

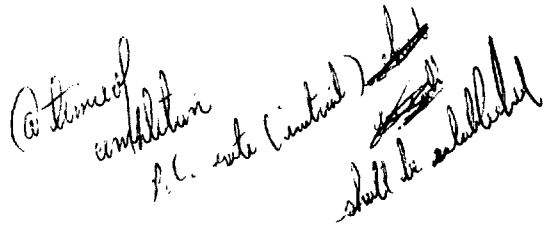
THUS: **Qftc = Qt - Qpci X e^{-(Dpc) X (t)}**
WHERE: **(t) IS IN MONTHS**

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

VALDEZ #5

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)

VALDEZ #5

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) = 0.65 (MMCF/PSI) X P*(PSI) X Rf

P* = 986 PSI (FROM SIBHP)

Np(pc) = 0.65 MMCF/PSI X 986 PSI X 0.95

Np(pc) = 608.9 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)/(608,900MCF)

Dpc = 0.0132/M

THUS: Qftc = Qt(MCF/M) - 8,333(MCF/M) X e^{-(0.0132(1/M)) X t(M)}

VALDEZ #5

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	=	21.0	ft
b.	(phi)	porosity	=	13.0	%
c.	(Sw)	H2O saturation	=	48.0	%
d.	(Rf)	Recovery Factor	=	95.0	%
e.	(rcf)	Reservoir Cubic Feet	@ reservoir conditions		
f.	(scf)	Standard Cubic Feet	@ standard conditions		

1. HCPV = HYDROCARBON PORE VOLUME (rcf)

= t (ft) X a (ft^2) X phi X (1-Sw)
= 21 (ft) X 160 (acres) X 43,560 (ft^2/acre) X 0.13 X (1-0.48)
= 9,894,044 ft^3 1mmrcf = 1,000,000 ft^3

HCPV = 9.894 mmrcf

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

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

REAL GAS LAW states: P V = Z n R T

Rearranging to solve for n: n = P V / Z R T

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

= 9.894 (mmrcf) X 0.0657 {scf/(rcf psia)} X Pr (psia) X 0.95

Np(pc) = 0.65 (mmscf/psia) X Pr (psia) X 0.95

cost shown are only attributed to P.C.

VALDEZ #5

B. PICTURED CLIFFS DRILLING /COMPLETION COST SUMMARY

1. STAND ALONE SINGLE PC COMPLETION

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

2. FTC/PC DUAL COMPLETION*

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

3. FTC/PC COMMINGLE COMPLETION*

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

*PICTURED CLIFFS COSTS ONLY

C. ECONOMIC SUMMARY

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

VALDEZ #5

Expected Reservoir Pressures

Pictured Cliffs - Average of the 4 closest PC completions is 986 psi SICP (pressures range from 668 to 1017 psi). All of the completions are 1-2 miles east and southeast of the subject location. The initial pressure of the Valdez #2 is 1137 psi and is located 1/2 mile away in Section 16. The initial pressure at the subject location is expected to be the offsetting PC average of 986 psi.

Fruitland Coal - Average of the 3 closest FTC completions is 1078 psi SICP (pressures range from 635 to 1459 psi). All of the completions are 1-5 miles west of the subject location within T28N, R04W and T29N, R04W. The pressure at the subject location is expected to be the offset FTC average of 1078 psi.

PC - 986 psi, FTC - 1078 psi. Within limits of pressure requirements for commingling.

Fluid Compatibility

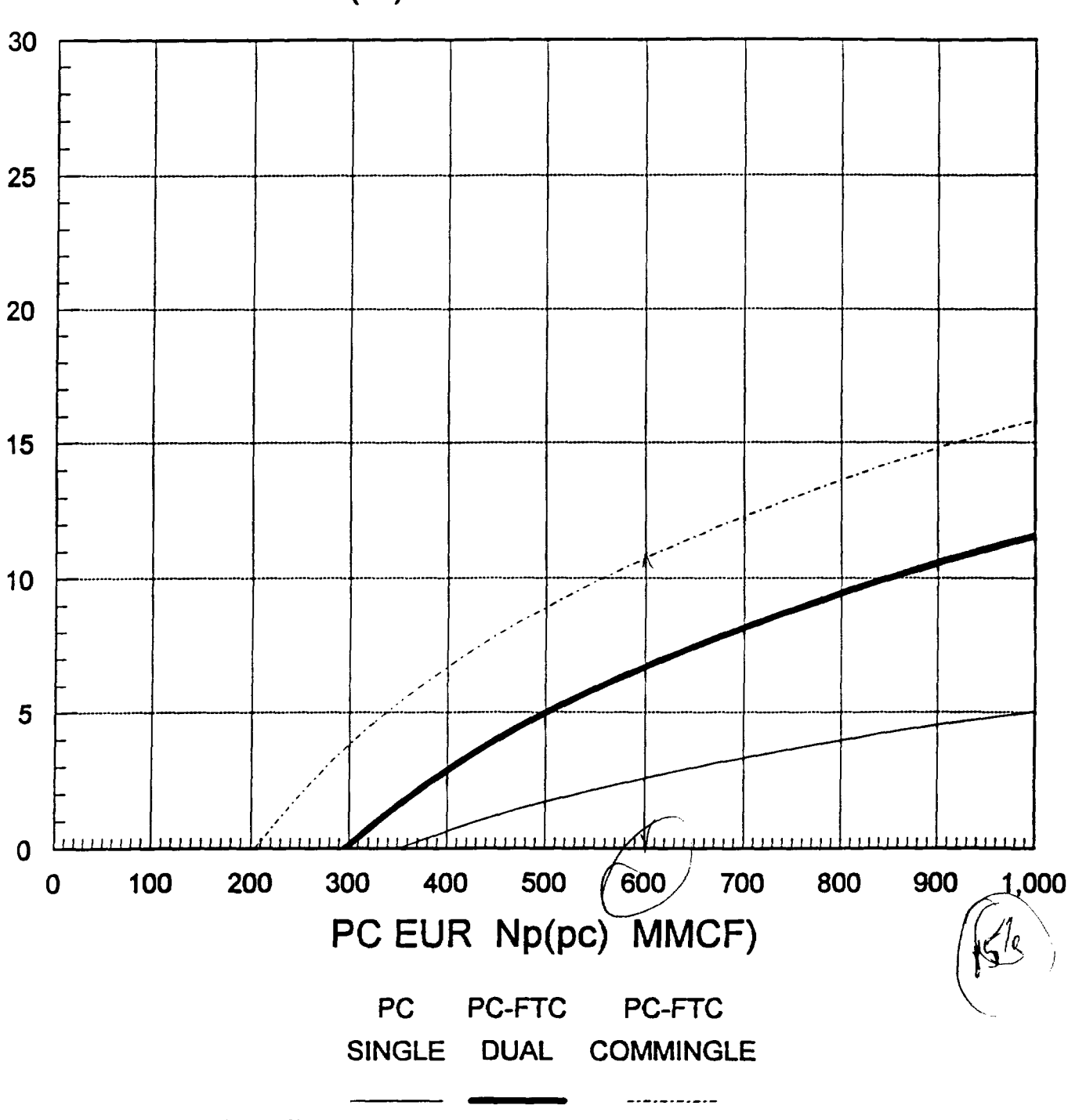
Neither producing formation makes oil or water in existing wells in the area. Both formations are very dry gas producers and no fluid production is anticipated in this well.

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

PICTURED CLIFFS

ECONOMIC EVALUATION

COMPLETION TECHNIQUE SENSITIVITY

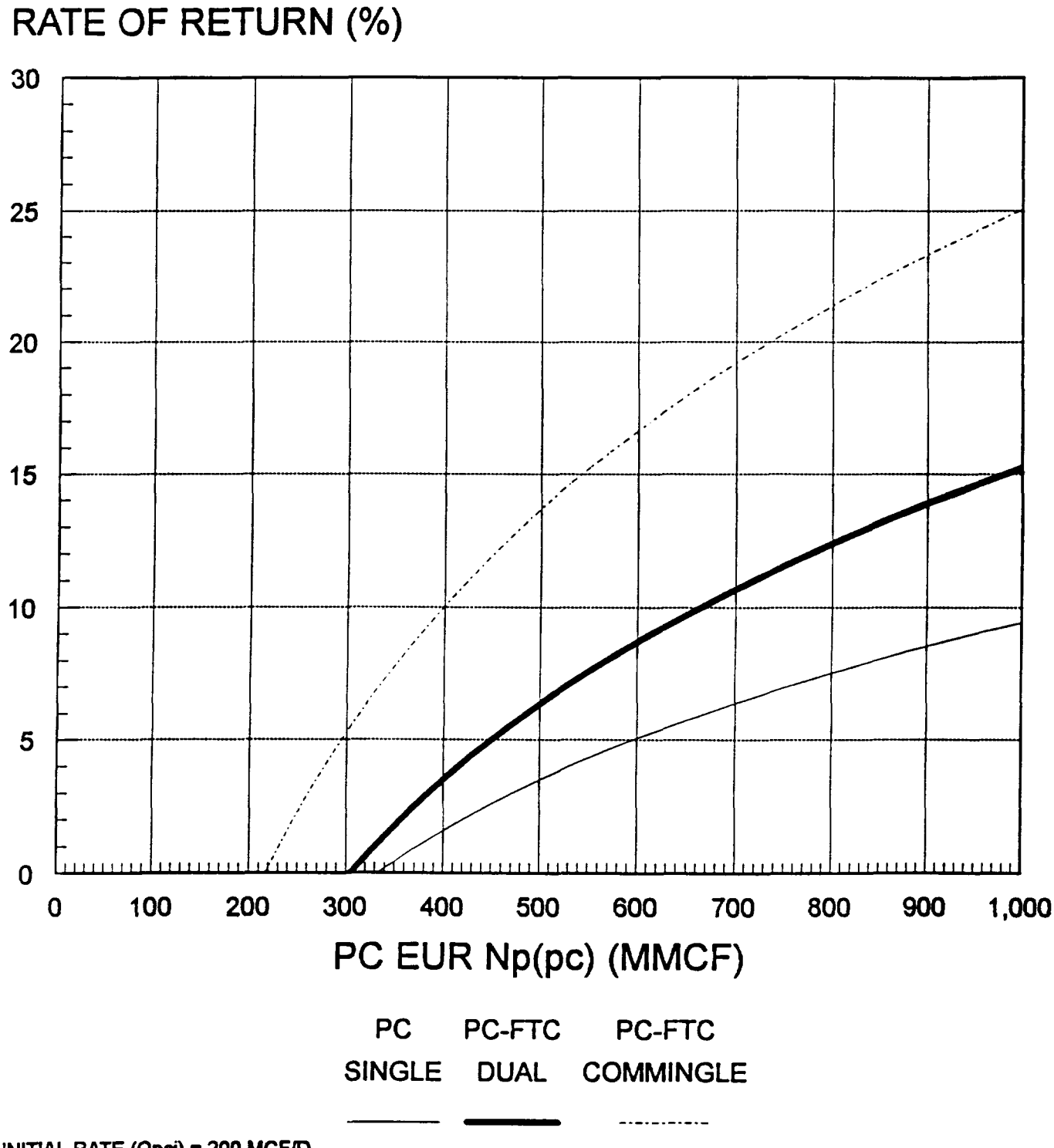


INITIAL RATE (Qpci) = 100 MCF/D
OR 3,000 MCF/M
FIGURE 1

PICTURED CLIFFS

ECONOMIC EVALUATION

COMPLETION TECHNIQUE SENSITIVITY



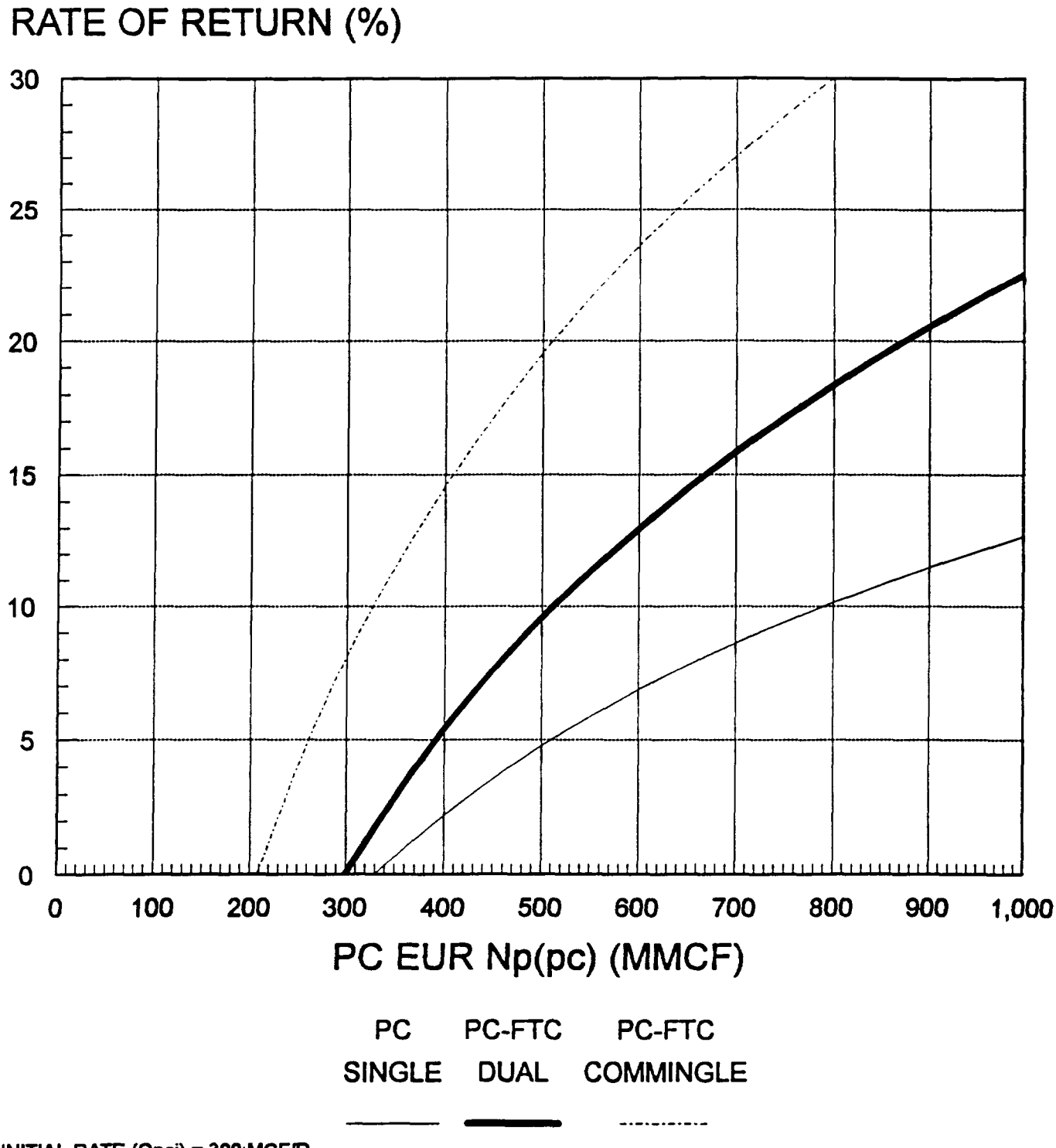
INITIAL RATE (Qpci) = 200 MCF/D
OR 6,000 MCF/M

FIGURE 2

PICTURED CLIFFS

ECONOMIC EVALUATION

COMPLETION TECHNIQUE SENSITIVITY



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

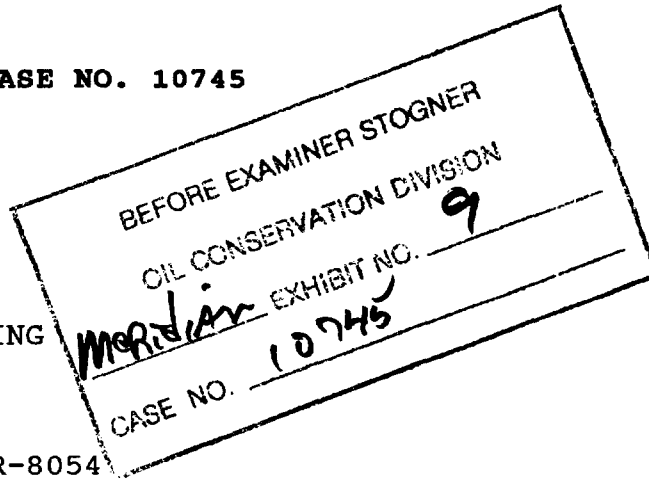
FIGURE 3

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. 10745

APPLICATION OF MERIDIAN OIL INC.
FOR A UNORTHODOX GAS WELL LOCATION
AND DOWNHOLE COMMINGLING
RIO ARRIBA COUNTY, NEW MEXICO.



CERTIFICATE OF MAILING

AND

COMPLIANCE WITH ORDER R-8054

W. THOMAS KELLAHIN, attorney in fact and authorized representative of Hallwood Petroleum Inc., states that the notice provisions of Division Rule 1207 (Order R-8054) have been complied with, that Applicant has caused to be conducted a good faith diligent effort to find the correct addresses of all interested parties entitled to receive notice, that on May 24, 1993, I caused to be mailed by certified mail return-receipt requested notice of this hearing and a copy of the application for the above referenced case along with the cover letter, at least twenty days prior to the hearing set for June 17, 1993, to the parties shown in the application as evidenced by the attached copies of return receipt cards, and that pursuant to Division Rule 1207, notice has been given at the correct addresses provided by such rule.

W. Thomas Kellahin

SUBSCRIBED AND SWORN to before me this 30 day of JUNE, 1993.

Michele Guadagnole
Notary Public

My Commission Expires:

June 9, 1997

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

MAR Oil & Gas Corporation
P.O. Box 5155
Santa Fe, NM 87502

4a. Article Number
670 689 144

4b. Service Type
☐ Registered ☐ Insured
☑ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
5-28-93

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)

PS Form 3811, December 1991 ☆U.S. GPO: 1992—323-402 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Minerals Management Service
Royalty Management Program
P.O. Box 5810
Denver, CO 80217

4a. Article Number
756 911 211

4b. Service Type
☐ Registered ☐ Insured
☑ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
5-28-93

5. Signature (Addressee)
CHAMPION MESSENGER

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)

DENVER, CO FINANCE MAY 28 1993 USPS

PS Form 3811, December 1991 ☆U.S. GPO: 1992—323-402 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

P 756 909 304

Certified Mail Rece
No Insurance Coverage Prov
Do not use for International M
(See Reverse)

Timothy D. McCoy
Ninth floor
200 North Harvey Street
Oklahoma City, OK 73102

Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form **3800**, June 1990

P 756 909 307

Certified Mail Receipt
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

Amoco Production Company
P.O. Box 800
1670 Broadway
Denver, Colorado 80201

Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form **3800**, June 1990

P 756 909 435

Certified Mail Receipt
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

Bank One Trust Co Na Trustee
U/W/O/ Robert Critchfield
100 East Broad Street
Columbus, OH 43271

Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form **3800**, June 1990

P 756 909 305

Certified Mail Receipt
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

Phillips Petroleum Company
5525 Hwy, 64, NBU 3004
Farmington, NM 87401

Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form **3800**, June 1990

P 756 909 306

Certified Mail Receipt
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

Williams Production Company
P.O. Box 58900
295 Chipeta Way
Salt Lake City, Utah
84158-0900

Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form **3800**, June 1990

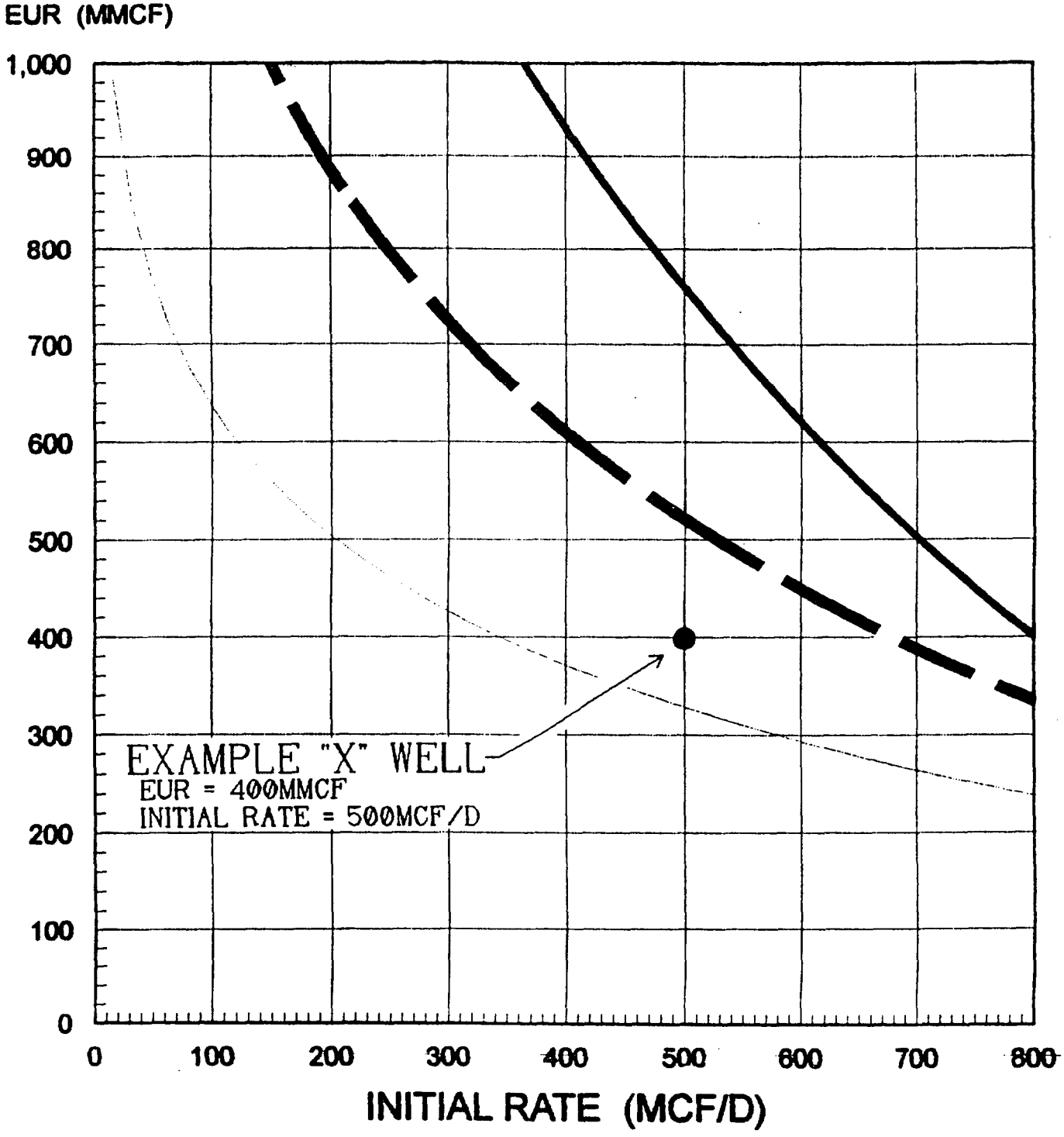
Consolidated Case Nos.
10745 and 10754.

Division Order No. R- 10002

PICTURED CLIFFS / FRUITLAND COAL

ECONOMIC EVALUATION

COMPLETION TECHNIQUE SENSITIVITY



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

INITIAL RATE VS EUR

Exhibit "B"

CONSOLIDATED CASES 10745 AND 10754

DIVISION ORDER NO. R-10002

Case No. 10745 — Valdez Well No. 5
Case No. 10754 — San Juan 28-4 Unit Well No. 225

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