

#10774

FEB - 7 2000

Santa Fe Snyder Corporation

February 3, 2000

New Mexico Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505
ATTN.: Ms. Lori Wrotenbery

New Mexico Oil Conservation Division
1625 N. French Drive
Hobbs, New Mexico 88240
ATTN.: Mr. Chris Williams

U.S. Department of Interior
Bureau of Land Management
2909 W. Second Street
Roswell, New Mexico 88201
ATTN.: Mr. Armando Lopez

State of New Mexico
Commissioner of Public Lands
Oil, Gas and Mineral Division
P.O. Box 1148
Santa Fe, New Mexico 87594-1148
ATTN: Mr. Pete Martinez

Re: Thistle State/Federal Unit
Proposed Thistle Unit #6 Well
660' FSL & 1,580' FWL
Section 34, T-23-S, R-33-E
Lea County, New Mexico
Rainbow Prospect - #NM-0396

Ladies and Gentlemen:

This letter is to advise of an ongoing disagreement between Santa Fe Snyder Corporation (Santa Fe) and Southwestern Energy Production Company (SWEPCO) concerning operations within the Thistle State/Federal Unit as they pertain to the SWEPCO proposed Thistle Unit #6 well referenced above.

SWEPCO has notified Santa Fe of its intent to remove Santa Fe as Operator of the Thistle State/Federal Unit for an alleged failure by Santa Fe to comply with terms of the Unit Operating Agreement. Please be advised that Santa Fe does not agree with the assertions being made by SWEPCO and will therefore view any effort by SWEPCO to remove Santa Fe as Operator to be invalid for lack of cause. Santa Fe currently has no plans to resign as Operator of the Thistle State/Federal Unit.

Santa Fe considers this disagreement a private matter between the parties who are bound by and subject to the Thistle Unit Operating Agreement. We would therefore ask that the NMOCD, BLM and SLO refrain from acting upon any assertions or allegations being made by SWEPCO and allow the parties subject to the Thistle Unit Operating Agreement to either reach a negotiated settlement or resolve this matter in the appropriate court of competent jurisdiction.

We thank you for your cooperation in this matter. If you have any questions, please feel free to contact the undersigned at (915) 686-6712.

Respectfully,

SANTA FE SNYDER CORPORATION

A handwritten signature in black ink, appearing to read "Steven J. Smith", with a long horizontal flourish extending to the right.

Steven J. Smith
Senior Staff Landman

cc: Mr. Jim Dewbre/Southwestern Energy Production Company
Mr. Larry Cunningham/EOG Resources, Inc.
Mr. C. W. Trainer

SJS/

COMMERCIAL RESOURCES
(505)-827-5724

SURFACE RESOURCES
(505)-827-5793

MINERAL RESOURCES
(505)-827-5744

ROYALTY
(505)-827-5772

**State of New Mexico
Commissioner of Public Lands**

Ray Powell, M.S., D.V.M.
310 Old Santa Fe Trail, P. O. Box 1148
Santa Fe, New Mexico 87504-1148
Phone (505)-827-5760, Fax (505)-827-5766

PUBLIC AFFAIRS
(505)-827-5765

ADMINISTRATIVE MGMT.
(505)-827-5700

LEGAL
(505)-827-5713

PLANNING
(505)-827-5752

November 4, 1997

Santa Fe Energy Resources, Inc.
550 West Texas
Suite 1330
Midland, Texas 79701

Attn: Ms. Meg Muhlinghuase

Re: 1997 Plan of Development
Thistle Unit
Lea County, New Mexico

Dear Ms. Muhlinghuase:

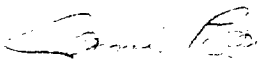
The Commissioner of Public Lands has, of this date, approved the above-captioned Plan of Development. Our approval is subject to like approval by all other appropriate agencies.

The possibility of drainage by wells outside of the unit area and the need for further development of the unit may exist. You may be contacted at a later date regarding these possibilities.

If you have any questions or if we may be of further help, please contact Pete Martinez at (505) 827-5791.

Very truly yours,

RAY POWELL, M.S., D.V.M.
COMMISSIONER OF PUBLIC LANDS


BY:
JAMI BAILEY, Director
Oil, Gas and Minerals Division
(505) 827-5744

RP/JB/cpm
xc: Reader File

OCD

BLM

#10774



OIL CONSERVATION DIVISION
RECEIVED
95 FEB 25 10 08 52

RAY POWELL, M.S., D.V.M.
COMMISSIONER

State of New Mexico
Commissioner of Public Lands

310 OLD SANTA FE TRAIL P.O. BOX 1148

SANTA FE, NEW MEXICO 87504-1148

(505) 827-5760
FAX (505) 827-5766

February 21, 1995

Santa Fe Energy Resources, Inc.
550 W. Texas, Suite 1330
Midland, Texas 79701

Attn: Mr. Curtis D. Smith

Re: Thistle Unit Well No. 1
Initial Brushy Canyon (Delaware) Participating Area
NE/4NW/4 Sec. 33-23S-33E
Effective October 13, 1993
Lea County, New Mexico

Dear Mr. Smith:

This office is in receipt of your letter of January 23, 1995 requesting approval of the Initial Brushy Canyon Participating Area for the Thistle Unit, Lea County, New Mexico.

Please be advised that pursuant to Article 11. PARTICIPATION AFTER DISCOVERY, of the Thistle Unit Agreement, the Commissioner of Public Lands hereby grants approval to the Initial Brushy Canyon Participating Area, effective October 13, 1993.

The Initial Brushy Canyon Participating Area is predicated upon the successful completion of the Thistle Unit Well No. 1-C, Sec. 33-23S-33E, which was determined to be capable of producing unitized substances in paying quantities from the Lower Brushy Canyon Formation by this office on March 14, 1994, the Bureau of Land Management on April 6, 1994 and the New Mexico Oil Conservation Division on March 15, 1994.

The boundary included in the Initial Brushy Canyon Participating Area contains 40.00 acres and is described as follows:

Township 23 South, Range 33 East

Section 33: NE/4NW/4

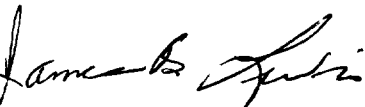
Since approval of the participating area and the effective date is also contingent upon approval by the Bureau of Land Management and the New Mexico Oil Conservation Division, our approval is subject to like approval by the above mentioned agencies.

Santa Fe Energy Resources, Inc.
February 21, 1995
Page 2

If you have any questions, or if we may be of further help, please contact Pete Martinez at (505) 827-5791.

Very truly yours,

RAY POWELL, M.S., D.V.M.
COMMISSIONER OF PUBLIC LANDS

BY: 

JAMES B. LEWIS, Director
Oil, Gas and Minerals Division
(505) 827-5744

RP/JBL/pm

cc: Reader File
BLM-Roswell Attn: Mr. John Simitz
OCD-Santa Fe Attn: Mr. Roy Johnson
TRD-Santa Fe Attn: Mr. Valdean Severson

Santa Fe Energy Operating Partners, L.P.

Santa Fe Pacific Exploration Company
Managing General Partner

1994 MAR 8 39

D -
Unit letter
Tux
Ky

March 7, 1994

U.S. Dept. of the Interior
Bureau of Land Management
1717 West Second Street
Roswell, New Mexico 88201

Commissioner of Public Lands
New Mexico State Land Office
P.O. Box 1148
Santa Fe, New Mexico 87504-1148

ATTN: Mr. Gary Gourley

ATTN: Mr. Ray Powell

New Mexico Oil Conservation Div.
P.O. Box 2088
Santa Fe, New Mexico 87501

ATTN: Mr. Bill Lemay

Re: Commercial Determination
SFEOP Cont. #NM-4682
Thistle Unit #1 Well
790' FNL & 1780 FWL
Sec. 33, T-23-S, R-33-E
Lea County, New Mexico

Gentlemen:

Santa Fe Energy Operating Partners, L.P., Operator of the Thistle Unit, has recently drilled and completed to discovery the captioned well in the Lower Brushy Canyon/Delaware Formation and does hereby submit this commercial determination pursuant to Paragraph 9 of the Thistle Unit Agreement No. NM NM 88526X. This well was completed in the Lower Brushy Canyon/Delaware Formation on October 13, 1993 and cumulative oil production to January of 1994 is 6,743 barrels of oil. Based upon the enclosed evaluation, the Thistle Unit #1 is a commercial producer in the Delaware Formation. Accordingly, Santa Fe Energy's evaluation indicates that the Thistle Unit #1 is commercial, in that it produces from the Delaware Formation, and should receive a participating area under the terms of the Thistle Unit Agreement.

As I have discussed with Mr. Gary Gourley of the BLM and Mr. Pete Martinez of the State Land Office, time is of the essence in that this well was completed October 13, 1993 and under the terms of the Unit Agreement Santa Fe Energy must drill to discovery and establish a commercial well or spud a well within six months of completion of the Thistle Unit #1 Well; therefore, please evaluate

Page 2
Roswell BLM
Commissioner Public Lands
NMOCD
March 7, 1994

the enclosed economic package and call me at (915) 686-6631 or Rod Adams, Production Engineer, at (915) 686-6797 with your questions or comments.

Yours very truly,

SANTA FE ENERGY OPERATING PARTNERS, L.P.
By: Santa Fe Pacific Exploration Company
Managing General Partner

By: 
Curtis D. Smith, Senior Landman

CDS/efw
Atch a/s

cc: Rod Adams w/Atch
(SFEOP Eng. Dept.)

EWP1613

Submit to Appropriate
District Office
State Lease - 6 copies
Fee Lease - 5 copies
DISTRICT I
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

Form C-105
Revised 1-1-89

WELL API NO.	30-025-32138
5. Indicate Type of Lease	STATE ☒ FEE ☐
6. State Oil & Gas Lease No.	V-2787

WELL COMPLETION OR RECOMPLETION REPORT AND LOG				
1a. Type of Well: OIL WELL ☒ GAS WELL ☐ DRY ☐ OTHER ☐	7. Lease Name or Unit Agreement Name Thistle Unit 33 State			
b. Type of Completion: NEW WELL ☒ WORK OVER ☐ DEEPEN ☐ PLUG BACK ☐ DUFF RESER ☐ OTHER ☐				
2. Name of Operator Santa Fe Energy Operating Partners, L.P.	8. Well No. 1			
3. Address of Operator 550 W. Texas, Suite 1330, Midland, Texas 79701	9. Pool name or Wildcat Wildcat (Delaware)			
4. Well Location Unit Letter C : 790 Feet From The North Line and 1780 Feet From The West Line Section 33 Township 23S Range 33E NMPM Lea County				
10. Date Spudded 8-24-93	11. Date T.D. Reached 9-14-93	12. Date Compl. (Ready to Prod.) 10-13-93	13. Elevations (DF& RKB, RT, GR, etc.) 3670' GR	14. Elev. Casinghead ---
15. Total Depth 9240'	16. Plug Back T.D. 9134'	17. If Multiple Compl. How Many Zones? N/A	18. Intervals Drilled By Rotary Tools All	Cable Tools N/A
19. Producing Interval(s), of this completion - Top, Bottom, Name 8900'-8940'; 9030'-9034' (Delaware)				20. Was Directional Survey Made No
21. Type Electric and Other Logs Run LDT/CNL; AIT/AMS				22. Was Well Cored No

23. CASING RECORD (Report all strings set in well)					
CASING SIZE	WEIGHT LB/FT.	DEPTH SET	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
13-3/8"	48.0	586'	17-1/2"	650 sx Cl "C"	None
8-5/8"	32.0	5174'	12-1/4"	1850 sx Lite + 500 sx "C"	
5-1/2"	15.5 & 17.0	9240'	7-7/8"	575 sx H, 275 sx Lite + 200 Neat	

24. LINER RECORD				25. TUBING RECORD			
SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN	SIZE	DEPTH SET	PACKER SET
N/A					2-7/8"	8978'	TA @ 8850

26. Perforation record (interval, size, and number) 8900'-8940' (1SPF) 9030'-9034' (1 SPF) Total 46 holes	27. ACID, SHOT, FRACTURE, CEMENT, SQUEEZE, ETC.	
	DEPTH INTERVAL	AMOUNT AND KIND MATERIAL USED
	8900'-9034'	1500 gals 7 1/2% NEFE + 50 BS. Frac w/41,538 gal gel w/ 115,280# 16/30 & 23,520# resin coated sand.

28. PRODUCTION							
Date First Production 10-14-93		Production Method (Flowing, gas lift, pumping - Size and type pump) Pumping - 2 1/2 x 1 1/2" x 22'				Well Status (Prod. or Shut-in) Producing	
Date of Test 10-28-93	Hours Tested 24	Choke Size N/A	Prod'n For Test Period	Oil - Bbl 277	Gas - MCF 89	Water - Bbl 48	Gas - Oil Ratio 321
Flow Tubing Press. N/A	Casing Pressure 70	Calculated 24-Hour Rate	Oil - Bbl 277	Gas - MCF 89	Water - Bbl 48	Oil Gravity - API - (Carr.) 39°	

29. Disposition of Gas (Sold, used for fuel, vented, etc.) Vented	Test Witnessed By
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30. List Attachments Letter for Confidentiality, C-104, Logs, Deviation Survey

31. I hereby certify that the information shown on both sides of this form is true and complete to the best of my knowledge and belief

Signature Terry McCullough Title Sr. Prod. Clerk Date 11/24/9

Santa Fe Energy
Thistle Unit 33 St. #1
Lea County, NM

STATE OF NEW MEXICO
DEVIATION REPORT

242	0
586	1/4
1,090	1/2
1,566	1-1/2
2,039	1-1/2
2,537	1-1/2
3,025	1-1/2
3,494	2
3,990	3/4
4,461	2-1/2
4,555	3-1/4
4,836	5
4,867	5
4,899	4-1/2
4,930	4
4,970	3-1/4
5,000	3
5,172	1-3/4
5,539	1-1/2
5,943	1-1/4
6,415	1
6,886	3/4
7,417	3/4
7,915	1/2
8,414	1-1/4
8,662	3
8,730	1-3/4
8,853	1-1/4
9,230	1-3/4

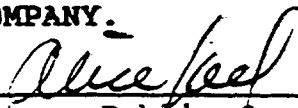

By: Ray Peterson

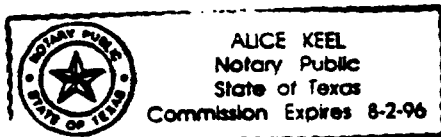
STATE OF TEXAS

COUNTY OF MIDLAND

The foregoing instrument was acknowledged before me
this 17th day of September, 1993, by RAY PETERSON
on behalf of PETERSON DRILLING COMPANY.

My Commission Expires: 8/2/96


Notary Public for Midland
County, Texas



Economic Assumptions

Spud Date	8/24/93	
Production Start Date		10/93
9/93 Oil Price		\$16.09 /bbl
9/93 Gas Price		\$ 2.48 / MCF
Est. Op. Costs		\$2,500 / mo

Most Recent Test

3/6/94 47 BOPD 23 BWPD 37 mcf/d

Reserve Discussion

Oil Reserves based on volumetric and
Decline Analysis. 82 MBO

Gas Reserves based on PVT data from Los Medanos Field which predicts an ultimate
produced GOR of 5,500. 450 mmcf

Net Pay

From Core Analysis Below 8,900'
 ϕ Cutoff 10%
Est. Sw $\approx$ 50%

From Log
Net pay 43' interval 8,900-9,035
Ave ϕ $\approx$ 12%

Drainage Area

A $\approx$ 40 Acres

Formation Volume Factor

Bo $\approx$ 1.7 Est. from Pure Gold Area PVT Data

Original Oil in Place

$$\begin{aligned} 001P &= 7,780 \phi Ah (1-Sw) / Bo \\ &= 7,780 (.12) (40) (43) (1-.5) / 1.7 \\ &= 472 . 3 \text{ mbo} \end{aligned}$$

Recovery Factor $\approx$ 17.5%

$$EUR = 82.7 \text{ MBO}$$

Recovery Factor

$$\frac{N_p}{N} = \frac{(B_o - B_{oi}) + (R_{si} - R_s) B_g}{B_o + (R_p - R_s) B_g}$$

From Pure Gold PVT Data

$$\begin{aligned} B_{oi} &= 1.703 \\ R_{si} &= 1289 \\ \text{Assume } &750 \text{ psi abandonment pressure} \\ B_o / 750 &= 1.278 \\ R_s / 750 &= 352 \\ B_g / 750 &= .01916 \end{aligned}$$

$$RF = \frac{N_p}{N} = \frac{(1.278 - 1.703) + (1289 - 352) .01916}{1.278 + (R_p - 352) .01916}$$

$$R_p = N_p / N$$

3000	.337
4000	.246
5000	.194
5500	.175
6000	.160
7000	.136

LEASE : THISTLE 33 STATE 1
CASE NO : 218
FIELD : WILDCAT
RESERVOIR : DELAWARE
ST, CNVY : NM , LEA
OPERATOR : SFLOP

DATE : 03/07/94
TIME : 15:45:19
DBS FILE : RSEDLW
SETUP FILE : THISTLE
SEQ NUMBER : 132

A F T E R T A X E C O N O M I C S

AS OF DATE: 10/93

PRESENT WORTH PROFILE AND RATE-OF-RETURN VS. BONUS TABLE PRIMARY DISCOUNT RATE : 15.00%

		PW %	BFIT NPV	AFIT NPV	AFIT BONUS
		----	-----M\$-----	-----M\$-----	-----M\$-----
BTAX RATE OF RETURN (PCT)	27.31				
BTAX PAYOUT (YEARS)	2.97	25.76	813.384	528.536	774.489
BTAX PAYOUT (YEARS) DISC	4.16	2.97	548.510	355.213	467.323
BTAX NET INCOME/INVEST	2.37	4.17	358.707	229.527	282.731
BTAX NET INCOME/INV (DISC)	1.37	1.89	297.776	188.816	228.145
		1.23	218.688	135.644	160.058
PROD START DATE	10/93	20.00	112.578	63.590	72.854
INITIAL WI (PCT)	100.0000	25.00	30.176	6.931	7.774
INITIAL NRI (PCT)	83.3300	30.00	-35.235	-38.595	-42.620
INITIAL OIL PRICE (\$/B)	16.09	35.00	-88.182	-75.873	-82.789
INITIAL GAS PRICE (\$/M)	2.48	40.00	-131.786	-106.909	-115.566
GROSS OIL WELLS	1.0	50.00	-199.146	-155.550	-165.869
CUMULATIVE OIL (MBBL)	.000	60.00	-248.612	-191.899	-202.720
REMAINING OIL (MBBL)	83.226	70.00	-286.425	-220.103	-230.933
ULTIMATE OIL (MBBL)	83.226	80.00	-316.266	-242.648	-253.272
LOCATION : 33F 23S 33E		100.00	-360.408	-276.539	-286.525
LAG NO :					
ACTIVITY : G418					

LEASE : THISTLE 33 STATE 1
CASE NO : 218
FIELD : WILDCAT
RESERVOIR : DELAWARE
ST. CNTY : NM , LEA
OPERATOR : SFEOP

DATE : 03/07/94
TIME : 15:45:19
DBS FILE : RSDCLW
SETUP FILE : THISTLE
SEQ NUMBER : 132

I N P U T D A T A				C A L C U L A T E D D A T A			
ITEM	SCHEDULING RATES	SCHEDULE UNTIL	PROCEDURE	ULTIMATE	LAST	EFF. DECL	INIT. RATE FINAL RATE
401 START	10/93						
406 OIL	2516.50	X B/M	02/96 AD				
411 "	784.90	X B/M	51.27 IMU				
416 GAS/OIL	1.30	9.70 M/B	TO LIFE				
418 STX/OIL	8.12	X %	TO LIFE				
420 S /34	.00	X \$	TO LIFE				
422 STX/GAS	8.00	X %	TO LIFE				
425 STX/NGL	8.00	X %	TO LIFE				
429 ATX	.90	X %	TO LIFE				
434 S /102	S/34	X \$/B	TO LIFE				
439 S /106	S/106	X \$/B	TO LIFE				
441 OPC/T	2500.00	X \$/M	TO LIFE				
691 S /101	1/94 1.0191 .9205 1.0191 #						
692 "	X .9863 1.0191 .9863 1.0191 #						
693 "	X .9863 1.0191 .9863 1.0191 #						
694 "	X .9205 1.0191 .9863 1.0191 .9863 #						
695 "	X 1.0191 1.0191 .9863 1.0191 .9863 #						
696 "	X 1.0191 800*1 #						
698 PRI/OIL	16.09	X \$/B	TO LIFE				
700 PRI/GAS	2.48	X \$/M	TO LIFE				
702 NET/WI	100.00	D %	TO LIFE				
712 NET/NIC	83.33	D %	TO LIFE				
722 NET/NIG	83.33	D %	TO LIFE				

INVESTMENT	TANGIBLES & INTANGIBLES	TIME	PROCEDURE	TOTAL T&I	MONTH	RISK INV.	TOT. T&I&R	ESC. T&I&R
801 DEWELL	.00	594.74 M\$G	.00 MOS	594.741	10/93	.	594.7	594.7

RESERVE PARAMETERS	ITEM
201 LOSS	NO
202 TAXP	US
203 PLAN	
206 CUMO, MB	.00 CUMG, MMF

PROJECT ASSUMPTIONS

BASE DATE : 1/93 P.W. DATE : 10/93
QUALIFIERS - PROD : NMCD1 OWNER :
REPORT DATE : 1/93
OTHER :

LEASE : THISTLE 33 STATE 1
CASE NO : 218
FIELD : WILDCAT
RESERVOIR : DELAWARE
ST, CNTY : NM , LEA
OPERATOR : SFEOP

DATE : 03/07/94
TIME : 15:45:19
DBS FILE : RSDCLW
SETUP FILE : THISTLE
SEQ NUMBER : 132

R E S E R V E S A N D E C O N O M I C S

AS OF DATE: 10/93

END- MO-VR	GROSS PRODUCTION		NET PRODUCTION		PRICES		WELL COUNT	OIL		NET REVENUE		TOTAL
	OIL ---MBBLS---	GAS ---MMCF---	OIL ---MBBLS---	GAS ---MMCF---	OIL ---\$/BBL---	GAS ---\$/MCF---		---	---	---	---	
1-93	.000	.000	.000	.000	.000	.000	.00	.000	.000	.000	.000	.000
2-93	.000	.000	.000	.000	.000	.000	.00	.000	.000	.000	.000	.000
3-93	.000	.000	.000	.000	.000	.000	.00	.000	.000	.000	.000	.000
4-93	.000	.000	.000	.000	.000	.000	.00	.000	.000	.000	.000	.000
5-93	.000	.000	.000	.000	.000	.000	.00	.000	.000	.000	.000	.000
6-93	.000	.000	.000	.000	.000	.000	.00	.000	.000	.000	.000	.000
7-93	.000	.000	.000	.000	.000	.000	.00	.000	.000	.000	.000	.000
8-93	.000	.000	.000	.000	.000	.000	.00	.000	.000	.000	.000	.000
9-93	.000	.000	.000	.000	.000	.000	.00	.000	.000	.000	.000	.000
10-93	2.271	3.212	1.892	2.677	16.090	2.480	1.00	30.445	6.638	37.083		
11-93	1.939	3.154	1.616	2.628	16.090	2.480	1.00	25.995	6.518	32.513		
12-93	1.731	3.137	1.443	2.614	16.090	2.480	1.00	23.212	6.483	29.695		
1993	5.941	9.503	4.950	7.919	16.090	2.480	1.00	79.653	19.639	99.291		
1-94	1.585	3.137	1.321	2.614	16.090	2.480	1.00	21.252	6.483	27.735		
2-94	1.475	3.146	1.229	2.621	16.090	2.480	1.00	19.770	6.501	26.271		
3-94	1.387	3.159	1.156	2.633	16.090	2.480	1.00	18.596	6.529	25.125		
4-94	1.315	3.175	1.096	2.646	16.090	2.480	1.00	17.635	6.562	24.197		
5-94	1.255	3.193	1.046	2.660	16.090	2.480	1.00	16.827	6.598	23.425		
6-94	1.203	3.211	1.003	2.675	16.090	2.480	1.00	16.136	6.635	22.771		
7-94	1.159	3.229	.965	2.691	16.090	2.480	1.00	15.535	6.673	22.208		
8-94	1.119	3.248	.933	2.706	16.090	2.480	1.00	15.005	6.711	21.717		
9-94	1.084	3.266	.903	2.722	16.090	2.480	1.00	14.534	6.749	21.284		
10-94	1.052	3.284	.877	2.737	16.090	2.480	1.00	14.111	6.787	20.898		
11-94	1.024	3.302	.853	2.752	16.090	2.480	1.00	13.728	6.825	20.553		
12-94	.998	3.320	.832	2.767	16.090	2.480	1.00	13.379	6.861	20.240		
1994	14.656	38.670	12.213	32.224	16.090	2.480	1.00	196.509	79.915	276.424		
12-95	10.521	41.121	8.768	34.266	16.090	2.480	1.00	141.069	84.980	226.050		
12-96	8.809	43.014	7.340	35.844	16.090	2.480	1.00	118.103	88.893	206.996		
12-97	7.490	42.734	6.242	35.610	16.090	2.480	1.00	100.427	88.313	188.739		
12-98	6.367	40.774	5.305	33.977	16.090	2.480	1.00	85.364	84.262	169.626		
12-99	5.412	37.873	4.510	31.560	16.090	2.480	1.00	72.560	78.268	150.829		
12-00	4.600	34.516	3.833	28.762	16.090	2.480	1.00	61.677	71.329	133.007		
12-01	3.910	31.017	3.258	25.846	16.090	2.480	1.00	52.427	64.099	116.526		
12-02	3.324	27.577	2.770	22.980	16.090	2.480	1.00	44.563	56.991	101.554		
12-03	2.825	24.317	2.354	20.264	16.090	2.480	1.00	37.879	50.254	88.133		
12-04	2.401	21.303	2.001	17.752	16.090	2.480	1.00	32.198	44.025	76.223		
12-05	2.041	18.565	1.701	15.470	16.090	2.480	1.00	27.369	38.367	65.735		
12-06	1.735	16.111	1.446	13.425	16.090	2.480	1.00	23.264	33.295	56.559		
12-07	1.475	13.934	1.229	11.611	16.090	2.480	1.00	19.774	28.795	48.569		
12-08	1.254	12.016	1.045	10.013	16.090	2.480	1.00	16.809	24.832	41.641		
12-09	.465	4.499	.388	3.749	16.090	2.480	1.00	6.236	9.297	15.533		
HLM	.000	.000	.000	.000	.000	.000	1.00	.000	.000	.000		.000
TOT	83.226	457.545	69.352	381.272	16.090	2.480	1.00	1115.881	945.554	2061.435		

LEASE : THISTLE 33 STATE 1
CASE NO : 218
FIELD : WILDCAT
RESERVOIR : DELAWARE
ST, CNTY : NM, LEA
OPERATOR : SFEOP

DATE : 03/07/94
TIME : 15:45:19
OBS FILE : RSEDLW
SETUP FILE : THISTLE
SEQ NUMBER : 132

R E S E R V E S A N D E C O N O M I C S

AS OF DATE: 10/93

-END- MO-YR	NET ADVAL & SEV TAX	OPERATING EXPENSE	OPERATIONS CASHFLOW	TANGIBLE	NET CAPITAL COSTS INTANGIBLE	SALVAGE	TOT EQUITY	BEFORE TAX CASHFLOW	CUM BTAX CASHFLOW	CUM DISC CASHFLOW
	-----M\$-----	-----M\$-----	-----M\$-----	-----M\$-----	-----M\$-----	-----M\$-----	-----M\$-----	-----M\$-----	-----M\$-----	-----M\$-----
1-93	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
2-93	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
3-93	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
4-93	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
5-93	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
6-93	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
7-93	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
8-93	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
9-93	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
10-93	3.310	2.500	31.273	.000	594.741	.000	594.741	-563.468	-563.468	-563.662
11-93	2.901	2.500	27.112	.000	.000	.000	.000	27.112	-536.356	-537.054
12-93	2.649	2.500	24.546	.000	.000	.000	.000	24.546	-511.810	-513.263
1993	8.860	7.500	82.931	.000	594.741	.000	594.741	-511.810	-511.810	-513.263
1-94	2.474	2.500	22.761	.000	.000	.000	.000	22.761	-489.048	-491.475
2-94	2.343	2.500	21.429	.000	.000	.000	.000	21.429	-467.620	-471.218
3-94	2.240	2.500	20.385	.000	.000	.000	.000	20.385	-447.235	-452.187
4-94	2.157	2.500	19.540	.000	.000	.000	.000	19.540	-427.695	-434.172
5-94	2.088	2.500	18.837	.000	.000	.000	.000	18.837	-408.858	-417.020
6-94	2.029	2.500	18.242	.000	.000	.000	.000	18.242	-390.616	-400.617
7-94	1.979	2.500	17.729	.000	.000	.000	.000	17.729	-372.888	-384.873
8-94	1.935	2.500	17.282	.000	.000	.000	.000	17.282	-355.606	-369.716
9-94	1.896	2.500	16.887	.000	.000	.000	.000	16.887	-338.718	-355.089
10-94	1.862	2.500	16.537	.000	.000	.000	.000	16.537	-322.182	-340.944
11-94	1.831	2.500	16.222	.000	.000	.000	.000	16.222	-305.960	-327.241
12-94	1.803	2.500	15.938	.000	.000	.000	.000	15.938	-290.022	-313.944
1994	24.636	30.000	221.788	.000	.000	.000	.000	221.788	-290.022	-313.944
12-95	20.123	30.000	175.926	.000	.000	.000	.000	175.926	-114.096	-178.501
12-96	18.414	30.000	158.582	.000	.000	.000	.000	158.582	44.486	-73.413
12-97	16.781	30.000	141.958	.000	.000	.000	.000	141.958	186.444	7.557
12-98	15.076	30.000	124.550	.000	.000	.000	.000	124.550	310.994	68.705
12-99	13.401	30.000	107.427	.000	.000	.000	.000	107.427	418.421	114.101
12-00	11.815	30.000	91.191	.000	.000	.000	.000	91.191	509.613	147.269
12-01	10.349	30.000	76.176	.000	.000	.000	.000	76.176	585.789	171.118
12-02	9.018	30.000	62.536	.000	.000	.000	.000	62.536	648.325	187.970
12-03	7.825	30.000	50.308	.000	.000	.000	.000	50.308	698.633	199.638
12-04	6.767	30.000	39.455	.000	.000	.000	.000	39.455	738.088	207.515
12-05	5.836	30.000	29.900	.000	.000	.000	.000	29.900	767.988	212.653
12-06	5.021	30.000	21.538	.000	.000	.000	.000	21.538	789.526	215.839
12-07	4.311	30.000	14.258	.000	.000	.000	.000	14.258	803.784	217.654
12-08	3.696	30.000	7.945	.000	.000	.000	.000	7.945	811.729	218.525
12-09	1.379	12.500	1.654	.000	.000	.000	.000	1.654	813.384	218.688
REM	.000	.000	.000	.000	.000	.000	.000	.000	813.384	218.688
101	183.311	470.000	1408.125	.000	594.741	.000	594.741	813.384	813.384	218.688

IFASE : THISTLE 33 STATE 1
 CASE NO : 218
 FIELD : WILDCAT
 RESERVOIR : DELAWARE
 ST. CNTY : NM , LEA
 OPERATOR : SFEOP

DATE : 03/07/94
 TIME : 15:45:19
 DBS FILE : RSEDLW
 SETUP FILE : THISTLE
 SEQ NUMBER : 132

A F T E R T A X E C O N O M I C S

AS OF DATE: 10/93

-END- MO-YR	BEFORE TAX CASHFLOW	DEPR EXPENSE	DEPL EXPENSE	INTANGIBLE EXPENSE	INTEREST EXPENSE	TAXABLE INCOME	TAXES PAYABLE	ATAX CASHFLOW	DISC ATAX CASHFLOW	CUM DISC ATAX CF
	---	---	---	---	---	---	---	---	---	---
	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$
1-93	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
2-93	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
3-93	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
4-93	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
5-93	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
6-93	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
7-93	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
8-93	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
9-93	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
10-93	-563.468	.000	.000	594.741	.000	-563.468	-140.867	-422.601	-423.672	-423.672
11-93	27.112	.000	.000	.000	.000	27.112	6.778	20.334	19.957	-403.715
12-93	24.546	.000	.000	.000	.000	24.546	6.136	18.409	17.843	-385.872
1-94	22.761	.000	.000	.000	.000	22.761	5.690	17.071	16.341	-369.532
2-94	21.429	.000	.000	.000	.000	21.429	5.357	16.072	15.193	-354.339
3-94	20.385	.000	.000	.000	.000	20.385	5.096	15.289	14.273	-340.066
4-94	19.540	.000	.000	.000	.000	19.540	4.885	14.655	13.511	-326.554
5-94	18.837	.000	.000	.000	.000	18.837	4.709	14.128	12.864	-313.690
6-94	18.242	.000	.000	.000	.000	18.242	4.560	13.681	12.302	-301.388
7-94	17.729	.000	.000	.000	.000	17.729	4.432	13.297	11.808	-289.580
8-94	17.282	.000	.000	.000	.000	17.282	4.320	12.961	11.367	-278.212
9-94	16.887	.000	.000	.000	.000	16.887	4.222	12.666	10.970	-267.242
10-94	16.537	.000	.000	.000	.000	16.537	4.134	12.402	10.609	-256.633
11-94	16.222	.000	.000	.000	.000	16.222	4.055	12.166	10.278	-246.356
12-94	15.938	.000	.000	.000	.000	15.938	3.984	11.953	9.972	-236.384
12-95	175.926	.000	.000	.000	.000	175.926	43.982	131.945	101.583	-134.801
12-96	158.582	.000	.000	.000	.000	158.582	39.645	118.936	78.816	-55.985
12-97	141.958	.000	.000	.000	.000	141.958	35.489	106.468	60.728	4.743
12-98	124.550	.000	.000	.000	.000	124.550	47.329	77.221	37.912	42.654
12-99	107.427	.000	.000	.000	.000	107.427	40.822	66.605	28.146	70.800
12-00	91.191	.000	.000	.000	.000	91.191	34.653	56.539	20.565	91.364
12-01	76.176	.000	.000	.000	.000	76.176	28.947	47.229	14.786	106.150
12-02	62.536	.000	.000	.000	.000	62.536	23.764	38.772	10.448	116.599
12-03	50.308	.000	.000	.000	.000	50.308	19.117	31.191	7.234	123.833
12-04	39.455	.000	.000	.000	.000	39.455	14.993	24.462	4.884	128.717
12-05	29.900	.000	.000	.000	.000	29.900	11.362	18.538	3.186	131.902
12-06	21.538	.000	.000	.000	.000	21.538	8.185	13.354	1.975	133.877
12-07	14.258	.000	.000	.000	.000	14.258	5.418	8.840	1.125	135.003
12-08	7.945	.000	.000	.000	.000	7.945	3.019	4.926	.540	135.543
12-09	1.654	.000	.000	.000	.000	1.654	.629	1.026	.101	135.644
S 101	813.384	.000	.000	594.741	.000	813.384	284.848	528.536	135.644	135.644
AFTER	.000	.000	.000	.000	.000	.000	.000	.000	.000	135.644
TOTAL	813.384	.000	.000	594.741	.000	813.384	284.848	528.536	135.644	135.644

THISTLE 33 STATE 1 00001
NM LEA
WILDCAT
DELAWARE
SFEOP

DATE: 03/04/94
TIME: 17:54:11
PAGE: 1

	P R O D U C T I O N L E D G E R							
DATE	OIL, BBL	GAS, MCF	WATER, BBL	GOR, CF/B	WTR CUT, %	CUMOIL, BBL	CUMGAS, MCF	
PRIOR	0	0	0	0	0.00	0	0	
1/93								
2/93								
3/93								
4/93								
5/93								
6/93								
7/93								
8/93								
9/93								
10/93	1566	0	1163	0	42.62	1,566	0	
11/93	1935	0	1430	0	42.50	3,501	0	
12/93	1799	0	1297	0	41.89	5,300	0	
TOT/93	5300	0	3890	0		5,300	0	
1/94	1443	0	0	0	0.00	6,743	0	
2/94								
3/94								
4/94								
5/94								
6/94								
7/94								
8/94								
9/94								
10/94								
11/94								
12/94								
TOT/94	1443	0	0	0		6,743	0	
TOTAL	6743	0	3890	0		6,743	0	

BOPD

* GOR
* WATER
* GAS
* OIL

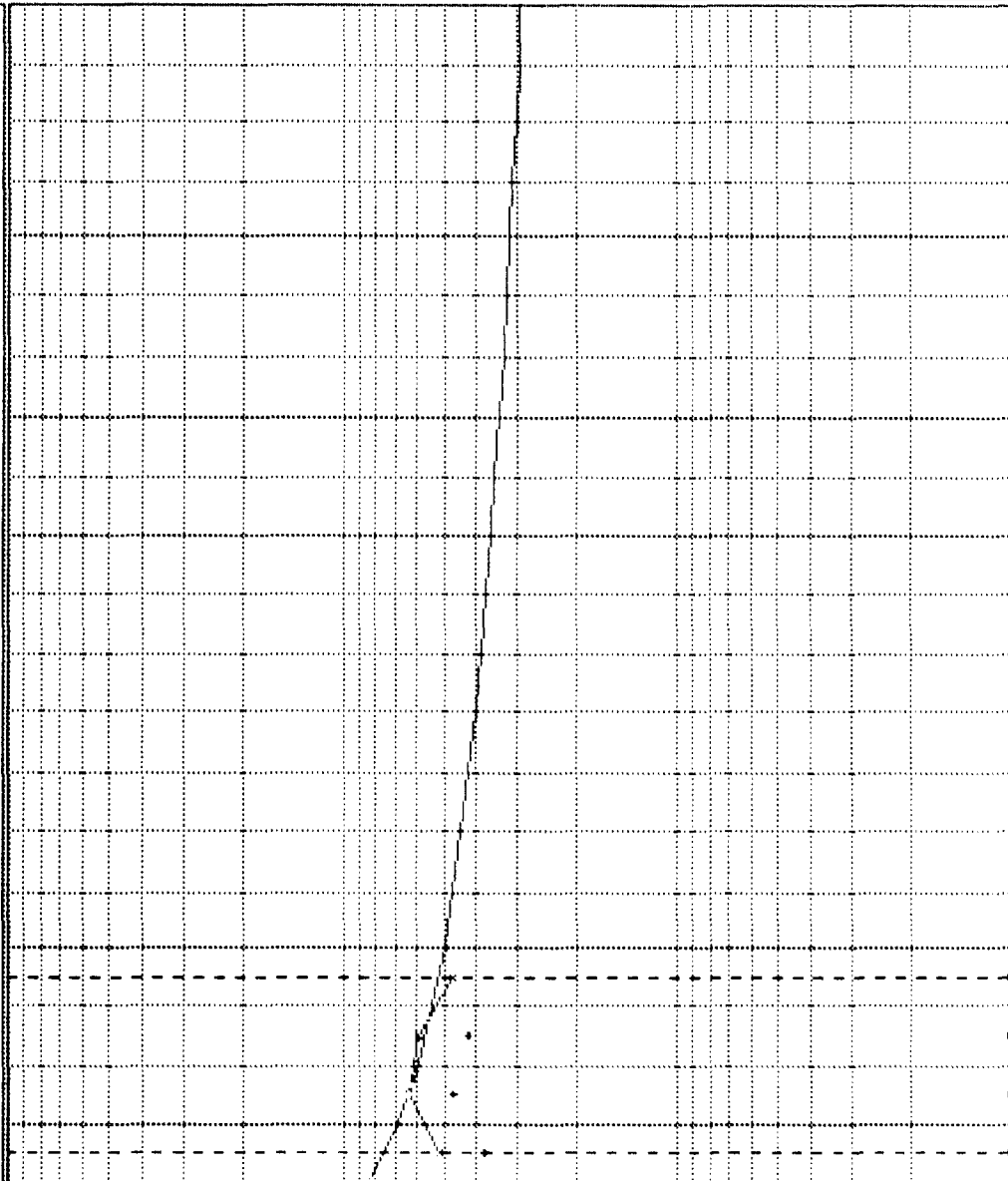
10000
100
100
100

1000
10
10
10

100
10
10
10

THISTLE 33 STATE 1 : PRM : DELW

Prop 132	
☒ OIL /d	☐ GAS /d
☐ WATER	☐ GOR /m
☐ Rate	☐ Time
☐ Semi	☐ Log
EUR	82,488
Cum	8,102
Rem	74,385
Rem%	90.2%
Yrs	15.25
Date	3/1/1994
Act	0
Qmo	1,419
Q	47.1
n	2.5
De	51.809
Qab	3
GetQual	NMCD1

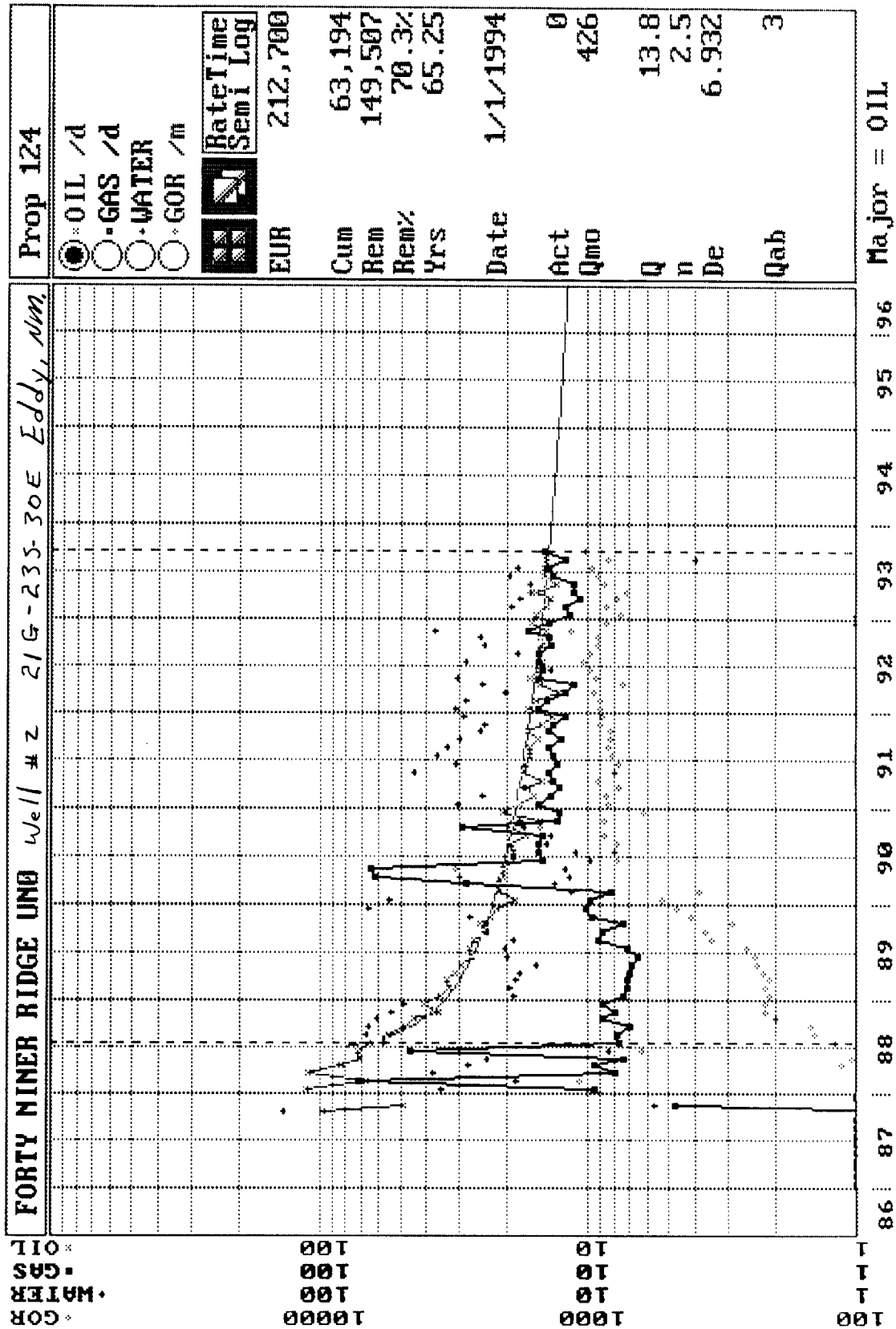


O N D J J F M A M J J A S O N D J F M A M 1993 1994 1995

Major = OIL

3-6-94 Test
47 BOPD
23 BOPD

This type curve justifies using hyperbolic decline $n = 2.5$ with a final decline rate of 7 % /yr



CORE LABORATORIES

Company : SANTA FE ENERGY OPERATING PARTNERS, LP
 Well : THISTLE UNIT "33" NO. 1
 Location : 790' FNL & 1780' FWL
 Co,State : LEA COUNTY, NEW MEXICO

Field : WILDCAT
 Formation : DELAWARE
 Coring Fluid : DRISPAC/FRESH WATER
 Elevation : 3683' KB

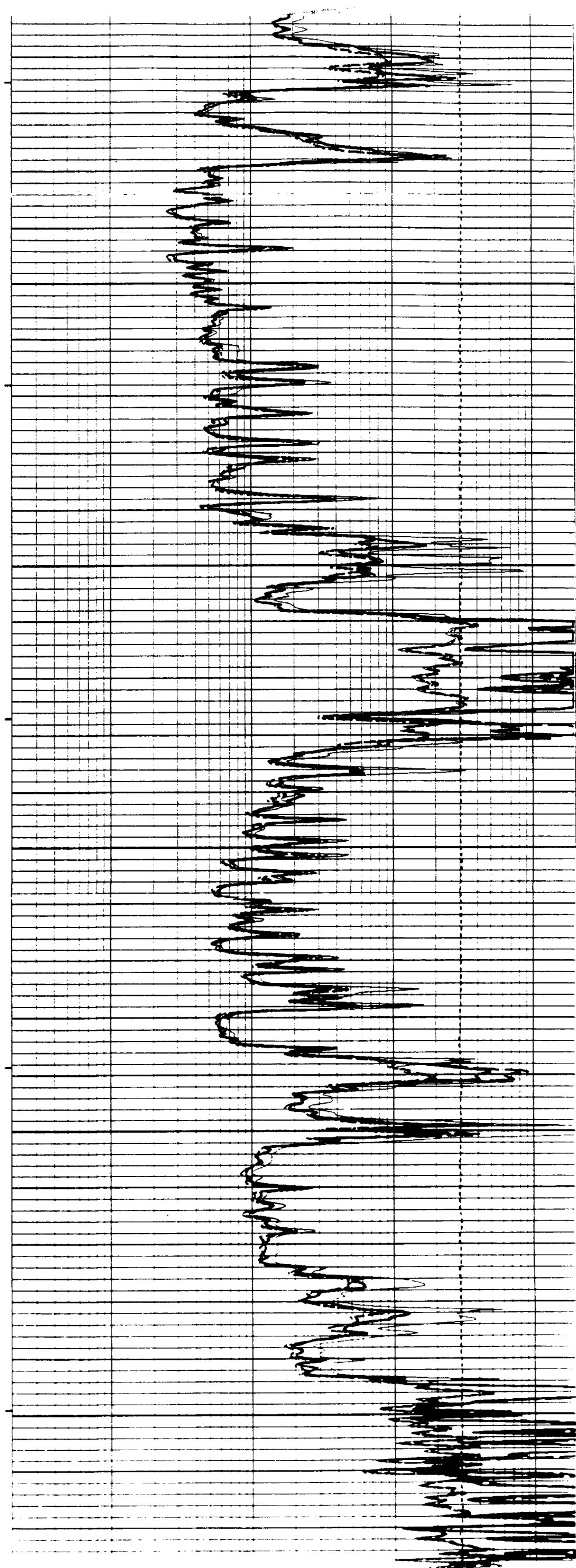
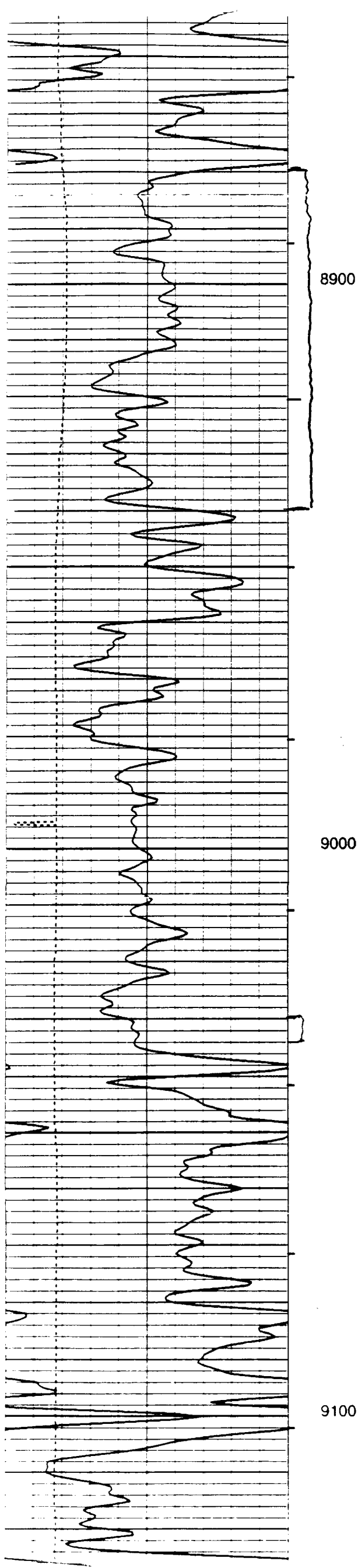
File No.: 57181-16911
 Date : 9-16-93
 API No. : 30-025-32138
 Analysts: OLSON

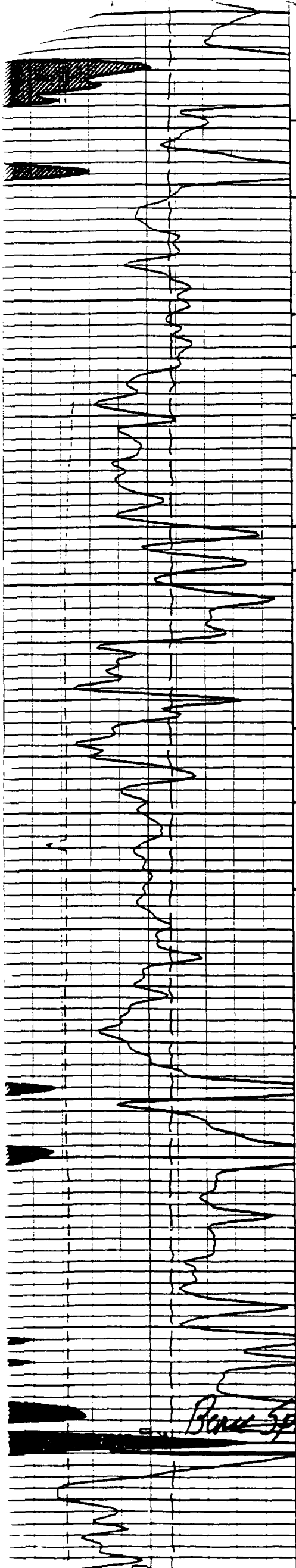
S I D E W A L L C O R E A N A L Y S I S R E S U L T S

SAMPLE NUMBER	DEPTH ft	SAMPLE REC. in.	PERMEABILITY (HORIZONTAL) Kair md	POROSITY (HELIUM) %	SATURATION		SATURATION		GRAIN DENSITY gm/cc	GAS DETECTOR UNITS	DESCRIPTION
					(PORE VOLUME) OIL %	(PORE VOLUME) WATER %	(BULK VOLUME) OIL %	(BULK VOLUME) GAS %			

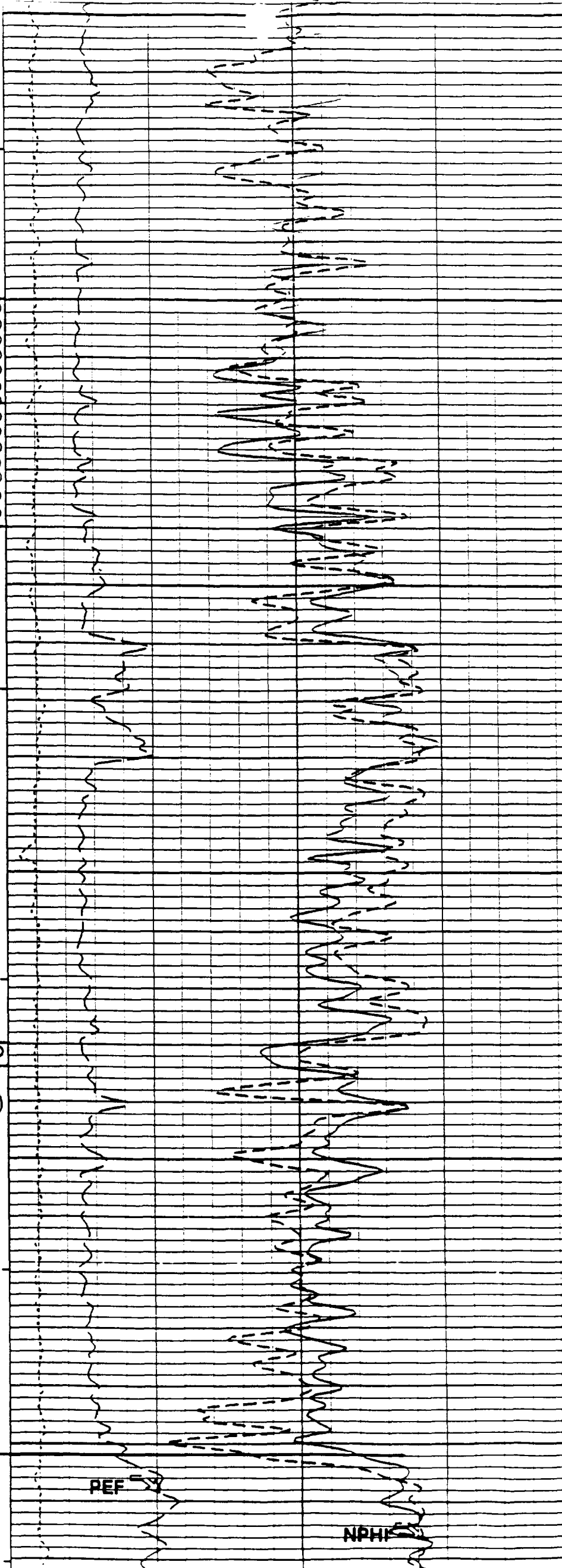
DRILLED SIDEWALL ANALYSIS

1	7428.0	1.9	42.0	20.3	0.0	96.6	0.0	0.7	2.66	0.	Sd, gry, vf gr, sl calc, 0% flu, no cut
2	7506.0	1.9	7.97	14.4	0.0	94.5	0.0	0.8	2.65	0.	Sd, gry, vf gr, sl calc, sl pyr, 0% flu, no cut
3	7521.0	1.9	18.8	18.0	0.0	96.3	0.0	0.7	2.66	1.	Sd, gry, vf gr, sl calc, tr pyr, 0% flu, no cut
4	7543.0	1.8	13.4	16.1	0.0	92.9	0.0	1.1	2.67	4.	Sd, gry blk, vf gr, calc, sl pyr, lam, 0% flu, no cut
5	8130.0	1.9	0.16	9.2	6.1	72.5	0.6	2.0	2.67	38.	Sd, gry blk, slt-vf gr, sl calc, sl pyr, lam, 10% yel
6	8139.0	1.8	0.76	13.1	0.0	94.4	0.0	0.7	2.67	1.	Sd, gry, vf gr, calc, 0% flu, no cut
7	8146.0	1.8	4.35	15.4	0.0	95.8	0.0	0.6	2.66	1.	Sd, gry, vf gr, sl calc, 0% flu, no cut
8	8680.0	1.3	0.63	14.2	11.9	58.3	1.7	4.2	2.69	38.	Sd, gry dk gry, vf gr, sl calc, pyr, lam, 70% med yel
9	8705.0	1.8	0.05	9.8	0.0	83.1	0.0	1.7	2.68	3.	Sd, gry blk, vf gr, calc, lam, 0% flu, no cut
10	8715.0	1.8	0.06	13.7	0.0	91.6	0.0	1.2	2.68	1.	Sd, gry dk gry, vf gr, calc, lam, 0% flu, no cut
11	8882.0	1.2	0.13	8.4	0.0	82.1	0.0	1.5	2.67	1.	Sd, gry, vf-slt gr, v calc, tr pyr, 0% flu, no cut
12	8895.0	1.6	0.27	10.8	1.8	92.2	0.2	0.6	2.67	3.	Sd, gry, vf-slt gr, calc, 0% flu, sl trace cut
13	8902.0	1.8	0.24	11.1	12.5	50.5	1.4	4.1	2.67	79.	Sd, gry dk gry, vf gr, calc, lam, 75% yel-wh flu
14	8908.0	1.9	0.04	8.4	7.1	65.3	0.6	2.3	2.67	78.	Sd, gry blk, vf-slt gr, sl calc, sl pyr, lam, 10% yel-
15	8913.0	1.9	3.35	14.7	15.8	69.0	2.3	2.2	2.66	115.	Sd, gry blk, vf gr, calc, lam, 80% pale yel
16	8920.0	1.8	3.87	14.4	15.0	67.6	2.2	2.5	2.66	92.	Sd, gry, vf gr, v calc, tr pyr, 90% pale yel flu
17	8926.0	1.8	0.57	11.8	15.7	46.2	1.9	4.5	2.66	110.	Sd, gry, vf gr, calc, tr pyr, 95% pale yel flu
18	8940.0	1.8	0.35	11.0	15.1	48.2	1.7	4.0	2.66	125.	Sd, gry, vf gr, calc, tr pyr, 95% pale yel flu
19	8988.0	1.8	0.01	4.3	1.7	83.4	0.1	0.6	2.67	2.	Sd, dk gry, vf gr, v calc, sl pyr, 0% flu, sl trace cu
20	9031.0	1.7	0.08	9.9	16.8	46.6	1.7	3.6	2.66	130.	Sd, dk gry, vf gr, calc, 55% yel flu





8900
8940
(41 Holes)
9000
9030
9034
(5 Holes)
9100
9102
-5419



REF 58

NPHI

556' 13 jts 13 3/8" OD 12.715" ID 48.00#/ft H-40 SURF CSG
 0 - 5174' 12.25" OD 8.625" ID CEMENT 2350 sx Class C

5174' 122 jts 8 5/8" OD 7.921" ID 32.00#/ft K-55 INT CSG
 6363' 7.875" OD 5.5" ID CEMENT 2nd Stage w/ 475 sx Class C

6363' 159 jts 5 1/2" (6) 4.950" ID 15.50#/ft K-55 PROD CSG
 6963 - 6965' 5.5" OD DV TOOL

6963' 9240' 7.875" OD 5.5" ID CEMENT 1st Stage w/ 575 sx Class H

6964' 9240' 52 jts 5 1/2" OD 4.892" ID 17.00#/ft K-55 PROD CSG
 9151 - 9153' 5.5" OD FLCOLLAR

0 - 8875' 265 jts 2.875" OD 2.441" ID 6.50#/ft N-80 1BG
 0 - 2400' 96 jts 1" Rods
 2400 - 4800' 96 jts 7/8" Rods
 4800 - 8750' 158 jts 3/4" Rods
 8750 - 8875' 5 jts 1" Rods
 8900 - 8940' PERFS 1 JSPT
 9030 - 9034' PERFS 1 JSPT

"TIGHT HOLE"

SFEOP,LP

Thistle Unit 33 State #1 (E)

790' FNL & 1780' FWL	SFE WI 95.95697% BPO	<u>Completion</u>
Sec 33, T23S, R33E	SFE WI 95.95697% APO	Rig: Peterson #3
Lea Co., NM	SFE NRI 79.964142% APOSPUD:	08/24/93
Prospect: Rainbow	SFE NRI 79.964142% APO20" @ 40'	
PTD 9200' Delaware	SFE ORRI BPO N/A	13-3/8" @ 586'
	SFE ORRI APO N/A	8-5/8" @ 5173'
	SFE WI BCP N/A	5-1/2" @ 9240'
	SFE WI ACP N/A	Perfs: 8900-9034'
	SFE AFE #C93040	
	AFE DHC: \$10,500	

11/02/93

P/166 BO, 112 BW, 207 MCF.

11/03/93

P/83 BO, 80 BW, 131 MCF.

11/04/93

P/109 BO, 64 BW, 146 MCF.

CTD: \$594,741

11/06/93

P/69 BO, 60 BW, 120 MCF. Set 640 American Unit, 144" stroke. Well producing into battery, venting gas.

11/7/93 thru 11/08/93

Hole in fire tube, well SD for repairs.

CTD: \$594,741

"TIGHT HOLE"

SFEOP,LP

Thistle Unit 33 State #1 (E)

790' FNL & 1780' FWL	SFE WI 95.95697% BPO	<u>Completion</u>
Sec 33, T23S, R33E	SFE WI 95.95697% APO	Rig: Peterson #3
Lea Co., NM	SFE NRI 79.964142% APOSPUD:	08/24/93
Prospect: Rainbow	SFE NRI 79.964142% APO20" @ 40'	
PTD 9200' Delaware	SFE ORRI BPO N/A	13-3/8" @ 586'
	SFE ORRI APO N/A	8-5/8" @ 5173'
	SFE WI BCP N/A	5-1/2" @ 9240'
	SFE WI ACP N/A	Perfs: 8900-9034'
	SFE AFE #C93040	
	AFE DHC: \$10,500	

10/26/93

P/119 BO, 70 BW, 76 MCF. Engine down. 20 BOL.

CTD: \$594,741

10/27/93

P/167 BO, 75 BW, 94 MCF, 9 SPM. FL 112 jts from surface. 95 BOL.

CTD: \$594,741

10/28/93

P/277 BO, 48 BW, 89 MCF. 143 BOL.

CTD: \$594,741

10/29/93

P/73 BO, 78 BW, 62 MCF. 221 BOL.

CTD: \$594,741

10/30/93

P/51 BO, 60 BW, 101 MCF. 281 BOL.

10/31/93

P/87 BO, 60 BW, 101 MCF. 341 BOL.

11/01/93

P/118 BO, 45 BW, 88 MCF. 386 BOL.

CTD: \$594,741

"TIGHT HOLE"

SFEOP,LP

Thistle Unit 33 State #1 (E)

790' FNL & 1780' FWL	SFE WI 95.95697% BPO	<u>Completion</u>
Sec 33, T23S, R33E	SFE WI 95.95697% APO	Rig: Peterson #3
Lea Co., NM	SFE NRI 79.964142%	APOSPUD: 08/24/93
Prospect: Rainbow	SFE NRI 79.964142%	APO20" @ 40'
PTD 9200' Delaware	SFE ORRI BPO N/A	13-3/8" @ 586'
	SFE ORRI APO N/A	8-5/8" @ 5173'
	SFE WI BCP N/A	5-1/2" @ 9240'
	SFE WI ACP N/A	Perfs: 8900-9034'
	SFE AFE #C93040	
	AFE DHC: \$10,500	

10/19/93

SITP 360 psi, SICP 580 psi. Flow back 5 BO. Made 14 swab runs, rec 45 BO, 57 BW, strong gas blow. IFL @ 400'. FFL, gas cut fluid from 2000-7000'. 303 BLWTR.

CTD: \$117,417

10/20/93

SITP 360 psi, SICP 590 psi. Flow down tbg, rec 20 BO. Flow down csg, pump 100 BBL 2% KCl wtr down csg. Load tbg w/2% KCl wtr. ND WH, NU BOP. POH w/tbg. TIH w/2.25" SN, 4 jts 2-7/8" N-80, TA, 270 jts 2-7/8" N-80. ND BOP, NU WH. Shut well in & SDFN. Set 456 Lufkin test unit. 303 BLWTR & 130 BW used to kill well. 433 BLWTR.

CTD: \$583,301

10-21-93

TIH with 2-1/2" x 1-1/2" x 22' pump w/6' sand screen. Reverse back-off box, 2' x 1' sub, 6 - 1" rods, 165 - 3/4" rods, 96 - 7/8" rods, 94 - 1" rods, 1-1/2" x 22' polished rod.. Hang well on, good pump action. Build WH, tie into frac tanks, 8.5 SPM. RD. 433 BLTR.

CTD: \$594,741

10-22-93

In 15 hrs produced 150 BW, 8 BO, 74 MCF, 9 SPM. 283 BLWTR.

CTD: \$594,741

10/23/93

P/133 BO, 49 BW, 128 MCF. 234 BLWTR.

CTD: \$594,741

10/24/93

In 24 hrs P/69 BO, 89 BW, 105 MCF. 145 BLWTR.

10/25/93

In 24 hrs P/80 BO, 89 BW, 116 MCF. 56 BLWTR.

runs, rec 36 BO & 69 BW. FFL @ 2000'. Gas cut to 5000'. Good
tail gas after each run. 360 BLWTR.
CTD: \$115,590
10/18/93
Shut down for Sunday.
CTD: \$115,774

"TIGHT HOLE"

SFEOP,LP

Thistle Unit 33 State #1 (E)

790' FNL & 1780' FWL	SFE WI 95.95697% BPO	<u>Completion</u>
Sec 33, T23S, R33E	SFE WI 95.95697% APO	Rig: Peterson #3
Lea Co., NM	SFE NRI 79.964142% APOSPUD:	08/24/93
Prospect: Rainbow	SFE NRI 79.964142% APO20" @ 40'	
PTD 9200' Delaware	SFE ORRI BPO N/A	13-3/8" @ 586'
	SFE ORRI APO N/A	8-5/8" @ 5173'
	SFE WI BCP N/A	5-1/2" @ 9240'
	SFE WI ACP N/A	Perfs: 8900-9034'
	SFE AFE #C93040	
	AFE DHC: \$10,500	

10/12/93

SITP 60 psi. RU Western. Frac well w/41,538 gals gel w/115,280# 16/30 Ottawa sand, 23,520# 16/30 resin coated sand. Flush w/53 bbls. Max press 6800 psi, avg press 4650, min press 2500 psi @ 20 BPM, 54 bbls into 8# resin coated stage press increasing rapid, start flush, TP 6000 psi, 18 BPM, w/10 bbls flush pumped press break from 6000-5100 psi. ISIP 1000, 15 min 3600 psi, SWI for 4 hrs. After 4 hrs SITP 600 psi. Flow dn instantly. RIH w/stickline tag sand @ 7019', press csg to 500 psi. Open by-pass rev sand out of tbg. Shut by-pass, well flowing, Flow on 20/64" chk, FTP 400 psi, 60 bbls to pit, sand cleaned up. Flow to tank. 1078 bbls of load to recover. Flow from 5:30 pm 2:00 am @ 2:00 am well dead. SWI & rec 185 bbls, 833 bbls left to rec.

CTD: \$105,243.

10/13/93

SITP 100 psi. Flow back 10 BBL. TIH w/slickline. Tag sd @ 8968'. POOH w/tbg & pkr. TIH w/2.25" SN, 274 jts 2-7/8" N-80. Tag sd @ 8968'. Reverse hole clean to FC. LD 9 jts. EOT @ 8875'. ND BOP, NU WH. Shut well in. 823 BBL of load & 203 BW in csg. 1026 BLWTR.

CTD: \$108,669.

10/14/93

SITP 100 psi. Made 39 swab runs. Rec 306 BW & 9 BO. IFL @ surface. FFL @ 1700'. Small amount of gas. 8 runs per hr, 32 BBL/hr. FL stayed @ 1300'. Last 3 hrs FL @ 1700' w/10% oil cut. 720 BLWTR.

CTD: \$110,303.

10/15/93

SITP 100 psi. Flow back 6 BO. Made 28 swab runs. Rec 202 BW, 17 BO, IFL 300', FFL 2000'. Gas cut fluid from 2000-2500'. FL @ 1500' first 20 runs w/10% oil cut. Last 8 runs FL @ 2000' w/30% oil cut. 518 BLWTR.

CTD: \$112,051.

10/16/93

SITP 480 psi. Flow on 20/64" ck, rec 10 BO. Made 18 runs. IFL @ 1300'. FFL @ 3500'. Gas cut fluid to 7500'. Strong tail gas after each run. Rec 32 BO & 89 BW. 429 BLWTR.

CTD: \$113,799.

10/17/93

SITP 400 psi. Flow on 18/64" ck. Rec 5 BO. IFL @ 1200'. Made 15

"TIGHT HOLE"

SFEOP,LP

Thistle Unit 33 State #1 (E)

790' FNL & 1780' FWL	SFE WI 95.95697% BPO	<u>Completion</u>
Sec 33, T23S, R33E	SFE WI 95.95697% APO	Rig: Peterson #3
Lea Co., NM	SFE NRI 79.964142% APOSPUD:	08/24/93
Prospect: Rainbow	SFE NRI 79.964142% APO20" @ 40'	
PTD 9200' Delaware	SFE ORRI BPO N/A	13-3/8" @ 586'
	SFE ORRI APO N/A	8-5/8" @ 5173'
	SFE WI BCP N/A	5-1/2" @ 9240'
	SFE WI ACP N/A	Perfs: 8900-9034'
	SFE AFE #C93040	
	AFE DHC: \$10,500	

10/06/93

RU, set pipe racks & rev unit.

CTD: \$2,085.

10/07/93

Unload 288 jts tbg on location. TIH w/4-3/4" bit, 6 3-1/2" collars, 217 jts 2-7/8" N-80. Tag cmt @ 6955'. Clean out to DV tool. Drill out DV tool. Test to 1500 psi, POOH. TIH w/4-3/4" bit, 6 3-1/2" collars, string mill, scraper, 273 jts 2-7/8" N-80. Tag cmt @ 9138'. SWI. SDFN.

CTD: \$504,690.

10/08/93

Clean out to FC @ 9148'. Acid wash tubing w/500 gal 15% acid. Reverse hole clean w/2% KCl wtr. POOH. Run CBL from 9134-2600', good bond. TOC @ 5240'. Log w/1000 psi. No change in log from 5240-2600'. Perf Brushy Canyon @ 8900-8940', 9030-9034', 1 spf, 46 holes, no response after firing gun.

CTD: \$48,844.

10/09/93

Test in hole w/UNI 5 8K pkr, SN, 276 jts 2-7/8" N-80, 7000 psi above slips, spot 250 gals 7-1/2% NEFE @ 9034'. LD 9 jts, set pkr, open by-pass. Spot acid w/balls to pkr. Shut by-pass. Break down @ 1800 psi @ 2 BPM. Acidize w/1250 gals 7-1/2% NEFE w/50 1.3 ball sealers. Good ball action. No ball out. Avg press 1500 psi @ 3.5 BPM. ISIP 700 psi, 15 min 500 psi, 90 bbls of load to recover. Made 12 swb runs, recovered 54 BW. IFL @ 300'. FFL @ SN. No oil, 36 bbls of load left. SDFN.

CTD: \$54,704.

10/10/93 thru 10/11/93

Well shut in.

CTD: \$54,704.

10/09/93

Test in hole w/UNI 5 8K pkr, SN, 276 jts 2-7/8" N-80, 7000 psi above slips, spot 250 gals 7-1/2% NEFE @ 9034'. LD 9 jts, set pkr, open by-pass. Spot acid w/balls to pkr. Shut by-pass. Break down @ 1800 psi @ 2 BPM. Acidize w/1250 gals 7-1/2% NEFE w/50 1.3 ball sealers. Good ball action. No ball out. Avg press 1500 psi @ 3.5 BPM. ISIP 700 psi, 15 min 500 psi, 90 bbls of load to recover. Made 12 swb runs, recovered 54 BW. IFL @ 300'. FFL @ SN. No oil, 36 bbls of load left. SDFN.

CTD: \$54,704.

10/10/93 thru 10/11/93

"TIGHT HOLE"

SFEOP,LP

Thistle Unit 33 State #1 (E)

790' FNL & 1780' FWL	SFE WI 95.95697% BPO	<u>Drilling</u>
Sec 33, T23S, R33E	SFE WI 95.95697% APO	Rig: Peterson #3
Lea Co., NM	SFE NRI 79.964142% APOSPUD:	08/24/93
Prospect: Rainbow	SFE NRI 79.964142% APO20" @ 40'	
PTD 9200' Delaware	SFE ORRI BPO N/A	13-3/8" @ 586'
	SFE ORRI APO N/A	8-5/8" @ 5173'
	SFE WI BCP N/A	5-1/2" @ 9240'
	SFE WI ACP N/A	
	SFE AFE #C93040	
	AFE DHC: \$10,500	

09/13/93

(Day 21) 8904' (206') MW 8.6, Vis 30, pH 10.5, WL 19, Chl 9,000, Ca 40. Drlg. WLS @ 8662' 3°. Drlg. POOH. Cut DL. TIH. Wash & ream 40' to btm. Drlg. WLS @ 8730' 1-3/4°. Drlg. WLS @ 8853' 1-1/4°. Drlg.

CTD: \$337,237.

09/14/93

(Day 22) 9230' (326') MW 8.6, Vis 30, pH 10, WL 15, Chl 10,000, Ca 80. Drlg. TD 7-7/8" hole @ 11:00 pm MST 09/14/93. Circ for logs. Pump 50 bbls sweep.

CTD: \$345,153.

09/15/93

(Day 23) 9230' (0') MW 8.6, Vis 30, pH 10, WL 15, Chl 11,000, Ca 80. Circ for logs. Totco & POOH (SLM 9226.22'). RU Schlum w/pack-off, loggers TD 9225'. Run #1 AIT/SFL from TD/5170'. Run #2 CNL/LTD/Gr/CAL from TS/5170'/Gr to surf. Run #3 Cut 20 side wall cores from 7428-9031'. Retrieved 20 cores. TIH w/bit, washed 29' to btm, no fill. Circ to LDDP & DC.

CTD: \$378,264.

09/16/93

(Day 24) 9230' TD. Circ, sand blast 5-1/2" csg. LD DP & DC. RU & run 211 jts 5-1/2" 17 & 15.5# K-55 LT&C csg. Set @ 9240'. TP 9243.01', FS @ 9240', FC @ 9151', DV tool @ 6963'. RU BJ & circ 5-1/2" csg. Cmt 1st stg w/575 sxs Cl "H" w/.8% FL-25 + 5% KCl. Circ thru DV tool. Circ out 140 sxs. Cmt 2nd st w/275 sxs Cl "C" lite 35:65:6 + 200 sxs Cl "C" Neat. PD @ 10:15 pm. ND BOP & set 5-1/2" csg slips w/all wt. Cut off 5-1/2" csg.

CTD: \$462,241.

09/17/93

(Day 25) 9230' (0') Finish ND BOP. NU 11" 3000 x 7-1/16" 3000 tbg. Spool w/B-1 adaptor. Jet & clean all pits. Rig released @ 5:00 am MST 09/17/93.

CTD: \$463,957.

"TIGHT HOLE"

SFEOP,LP

Thistle Unit 33 State #1 (E)

790' FNL & 1780' FWL	SFE WI 95.95697% BPO	<u>Drilling</u>
Sec 33, T23S, R33E	SFE WI 95.95697% APO	Rig: Peterson #3
Lea Co., NM	SFE NRI 79.964142% APOSPUD:	08/24/93
Prospect: Rainbow	SFE NRI 79.964142% APO20" @ 40'	
PTD 9200' Delaware	SFE ORRI BPO N/A	13-3/8" @ 586'
	SFE ORRI APO N/A	8-5/8" @ 5173'
	SFE WI BCP N/A	
	SFE WI ACP N/A	
	SFE AFE #C93040	
	AFE DHC: \$10,500	

09/07/93

(Day 15) 5172' (0') MW 8.4, Vis 28, pH 9, Chl 3000, Ca 800. Cmt 8-5/8" csg. PD 12:45 am MST. Circ out 250 sxs cmt to pit. Woc. Cut off & ND stack, weld on 8-5/8" sow x 11" 3K# Vetco Grey braden head. NU BOP stack. Prod test BOP & manifold, all valves to 3K#, hydril 1500, ok. Rig repair - hydromatic chain. PU BHA & TIH w/bit.

CTD: \$258,396.

09/08/93

(Day 16) 5995' (823') MW 8.4, Vis 28, pH 11, Chl 3000, Ca 800. Drlg plug, FC & 80' cmt. Test csg to 1500 psi, ok. Drlg. Rig repair, remove hydromatic. WL @ 5507' NP. Drlg. WL @ 5539' 1-1/2". Drlg. WL @ 5943' 1-1/4". Drlg.

CTD: \$274,918.

09/09/93

(Day 17) 6828' (833') MW 8.6, Vis. 29, pH 10, Chl 11,000, Ca 1200. WL @ 6415' 1".

Drlg., W.L., R.R. (install Hydromatic), Drlg.

CTD: \$291,898.

09/10/93

(Day 18) 7624' (796') MW 8.5, Vis 28, pH 10.5, Chl 12,000, Ca 1200. Drlg. WLS @ 6886' 3/4". Drlg. WLS @ 7417' 3/4". Drlg.

CTD: \$307,434.

09/11/93

(Day 19) 8216' (592') MW 8.6, Vis 29, pH 10, Chl 12,000, Ca 1200. Drlg. WLS @ 7915' 1/2". Drlg.

CTD: \$319,970.

09/12/93

(Day 20) 8698' (482') MW 8.6, Vis 29, pH 10.5, WL 17, Chl 9000, Ca 40. Drlg. WLS @ 8414' 1-1/4". Drlg.

CTD: \$332,630.

Drlg. WLS @ 4899' 4-1/2°. Drlg. Rig repair, rotary sprocket.
Drlg. WLS @ 4930' 4°. Drlg. WLS @ 4960' 3-1/4°. Drlg. WLS @
5000' 3°. Drlg.

CTD: \$161,800.

09/06/93

(Day 14) 5172' (146') MW 10+, Vis 29, pH 10. Drlg. TD 12-1/4"
hole @ 9:30 am MST. Pump sweep & circ. Spot 100 bbls pill.
Totco. POOH (SLM NC). RU LD machine & LD 8" DCs. RU & run 121
jts 8-5/8" 32# K-55 csg. RU BJ & circ. Cmt w/1850 sxs Cl "C" lite
(35/65/6) + 9 pps salt, 1/4 pps Celloflakes + 500 sxs Cl "C" 2%
CaCl².

CTD: \$254,063.

"TIGHT HOLE"

SFEOP,LP

Thistle Unit 33 State #1 (E)

790' FNL & 1780' FWL	SFE WI 95.95697% BPO	<u>Drilling</u>
Sec 33, T23S, R33E	SFE WI 95.95697% APO	Rig: Peterson #3
Lea Co., NM	SFE NRI 79.964142% APOSPUD:	08/24/93
Prospect: Rainbow	SFE NRI 79.964142% APO20" @ 40'	
PTD 9200' Delaware	SFE ORRI BPO N/A	13-3/8" @ 586'
	SFE ORRI APO N/A	8-5/8" @ 5173'
	SFE WI BCP N/A	
	SFE WI ACP N/A	
	SFE AFE #C93040	
	AFE DHC: \$10,500	

08/30/93

(Day 7) 2876' (0') Jar on fish, string parted. POOH. Bumper sub sleeve parted. LD jars & accelerator. WO OS. TIH w/OS. Tag up & catch fish w/OS. Freepoint, some movement in IBS. Try to back off same. Backed off screw in sub. TOH w/fish. LD bumper sub, sub, OS. PU SIS, jars, 4 DC, accelerator, TIH. Screw into fish & jar on fish. Attempt to back off @ btm IBS, could not.

CTD: \$110,907.

08/31/93

(Day 8) 2876' (0') MW 10.1, Vis 34, pH 8, WL 19, Chl 161,000, Ca 1400. Freepoint, back off 1 8" DC. Top IBS @ 2781'. POOH. LD jars & 1 8" DC. GIH w/bit (SLM). Circ & cond mud. POOH w/bit. PU 2 jts wash pipe, jars. GIH. Stop @ 2075'. Wash & ream from 2045-2095'. GIH & install RH rubber. Wash 15' to top of fish. Cut over IBS & washover fish from 2795-2841'. TOH w/wash pipe.

CTD: \$113,652.

09/01/93

(Day 9) 2923' (47') MW 10, Vis 36, pH 8, WL 16, Chl 151,000, Ca 1400. TOH. LD wash pipe. TIH w/jars, screw into fish. Jar on fish, moved fish up hole 4". Back off & POOH. PU wash pipe. TIH. Wash over fish from 2840-2854'. Circ BU. TOH w/wash pipe & LD same. GIH w/jars & acc, screw into fish. Jar 2 times, fish free. COOH w/fish. LD 7-3/4" DC, SS, S Dd. Load out fishing tools. Make up BHA & TIH. Tag fill @ 2824'. Wash & ream to 2876'. Drlg.

CTD: \$115,452.

09/02/93

(Day 10) 3778' (855') MW 10.1, Vis 29, pH 10. Drlg. WL @ 3025' 1-1/2°. Drlg. WL @ 3493' 2°. Drlg. LD 16 jts DP. POOH to DC. PU 5 DC & RT tool. TIH. Drlg.

CTD: \$133,604.

09/03/93

(Day 11) 4236' (458') MW 10+, Vis 29, pH 10, Chl 160,000, Ca 1400. Drlg. WLS @ 3990' 3/4°. Drlg.

CTD: \$142,929.

09/04/93

(Day 12) 4907' (671') MW 10, Vis 29, pH 10, Chl 160,000, Ca 1400. Drlg. WLS @ 4461' 2-1/2°. Drlg. WLS @ 4555' 3-1/4°. Drlg. WLS @ 4805' 5°. Drlg. WLS @ 4867' 5°. Drlg. Ream. Drlg.

CTD: \$156,382.

09/05/93

(Day 13) 5026' (119') MW 10, Vis 29, pH 10, Chl 152,000, Ca 1600.

"TIGHT HOLE"

SFEOP,LP

Thistle Unit 33 State #1 (E)

790' FNL & 1780' FWL	SFE WI 95.95697% BPO	<u>Drilling</u>
Sec 33, T23S, R33E	SFE WI 95.95697% APO	Rig: Peterson #3
Lea Co., NM	SFE NRI 79.964142% APOSPUD:	08/24/93
Prospect: Rainbow	SFE NRI 79.964142% APO20" @ 40'	
PTD 9200' Delaware	SFE ORRI BPO N/A	13-3/8" @ 586'
	SFE ORRI APO N/A	
	SFE WI BCP N/A	
	SFE WI ACP N/A	
	SFE AFE #C93040	
	AFE DHC: \$10,500	

08/24/93

(Day 1) 106' (106') MW 8.6, Vis 34, pH 8, Chl 2000, Ca 1600. MIRU.
Drlg. Spud @ 9:30 CST 08/24/93.

CTD: \$23,520.

08/25/93

(Day 2) 586' (480') MW 9.2, Vis 32. Drlg. Survey @ 240' BE deg.
Drlg. Pump sweep & circ hole (packing off). Drlg. Pump sweep.
TOOH to run 13-3/8" csg. Ran 13 jts 591.46' 13-3/8" csg. Set @
586'. Float @ 490'. Circ, no fill. Cmt w/350 sxs Lead "C" + 4%
gel + 2% A-7. Tail w/300 sxs "C" + 2% A-7. Circ 150 sxs to pit.
WOC. Cut off & weld on head.

CTD: \$53,575.

08/26/93

(Day 3) 972', (386'), MW 10, Vis. 29, pH 10.5, Chl. 178,000.
Nipple up Hydril & Rotating Head. Trip in Hole. Drlg cmt out of
mouse hole. Drlg insert flout & 32' cement, Test Hydril & csg to
600 psi, held ok. Finsh Drlg shoe joints. Drlg, Install Rotating
Head, Bearing Asmbly Drlg.

CTD: \$63,497.

08/27/93

(Day 4) 2058' (1086') Drlg, Sd/Salt. MW 10, Vis 29, pH 10.5, Chl
165,000. Drlg. Surveys @ 1090' 1/2 deg & 1566' 1-1/2 deg. Drlg.

CTD: \$87,816

08/28/93

(Day 5) 2876' (818') Free point & back off, Salt/Anhy. MW 10.1,
Vis 29, pH 8, Chl 169,000. Drlg. Surveys @ 2039' 1-1/2 deg &
2537' 1-1/2 deg. Drlg. Rig released (weld stand pipe). Work
stuck pipe. Take kelly hose off & pull goose neck. RU & run free
point, back off @ 2759'.

CTD: \$105,277

08/29/93

(Day 6) 2876' (0') Jarring on fish, Salt/Anhy. MW 10.1, Vis 29, pH
8. Chain out of hole. Install goose neck on swivel. PU fishing
tools & TIH. Could not break circ w/brine wtr. Pump 2 - 150 BBL
35 vis LCM sweeps & break circ, screw into fish. Jar on fish, move
fish up hole 3'. Back off fish & TOH (jars quit). W/O jars &
excellerator. PU fishing tools & TIH. Screw into fish. Jar on
fish. Moved fish total of 8' uphole.

CTD: \$108,830.

EXERCISE 3.2 SOLUTION

1) For a solution gas drive reservoir, below the bubble point, the following are assumed

- $m = 0$; no initial gascap
- negligible water influx
- the term $NB_{oi} \left(\frac{C_w S_{wc} + C_i}{1 - S_{wc}} \right) \Delta p$ is negligible once a significant free gas saturation develops in the reservoir.

Under these conditions the material balance equation can be simplified as

$$N_p (B_o + (R_p - R_s) B_g) = N (B_o - B_{oi}) + (R_{si} - R_s) B_g \quad (3.20)$$

underground = expansion of the oil plus
withdrawal = originally dissolved gas

and the recovery factor at abandonment pressure of 900 psia is

$$(RF)_{900} = \frac{N_p}{N} \bigg|_{900} = \frac{(B_o - B_{oi}) + (R_{si} - R_s) B_g}{B_o + (R_p - R_s) B_g} \bigg|_{900 \text{ psia}}$$

in which all the PVT parameters B_o , R_s and B_g are evaluated at the abandonment pressure. Using the data in table 2.4, the recovery factor can be expressed as

$$\frac{N_p}{N} \bigg|_{900} = \frac{(1.0940 - 1.2417) + (510 - 122) .00339}{1.0940 + (R_p - 122) .00339}$$

which can further be reduced to

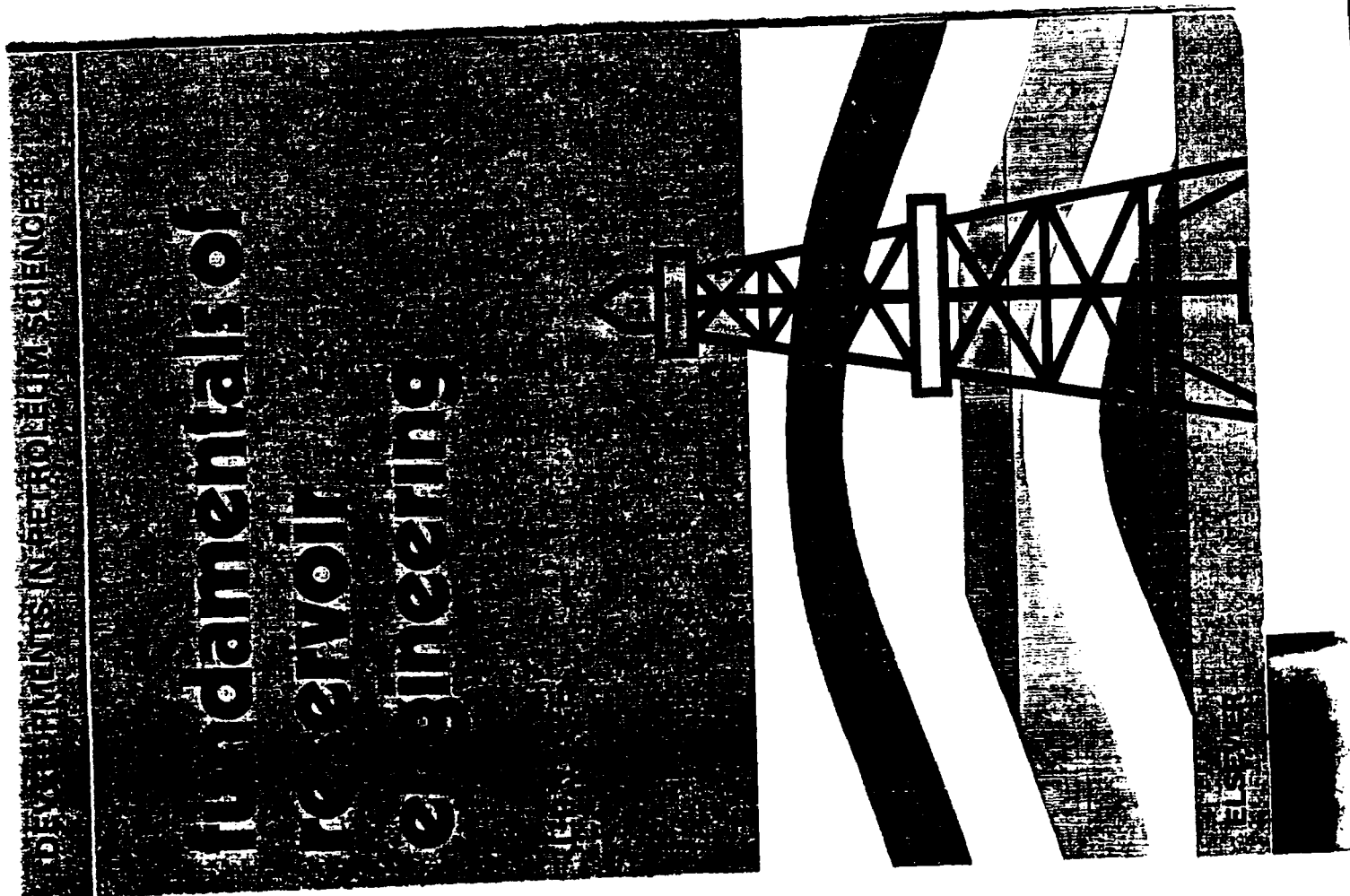
$$\frac{N_p}{N} \bigg|_{900} = \frac{344}{R_p + 201}$$

This clearly demonstrates that there is an inverse relationship between the oil recovery and the cumulative gas oil ratio R_p , as illustrated in fig. 3.3.

The conclusion to be drawn from the relationship is that, to obtain a high primary recovery, as much gas as possible should be kept in the reservoir, which requires that the cumulative gas oil ratio should be maintained as low as possible. By keeping the gas in the reservoir the total reservoir system compressibility in the simple material balance

$$dV = cV \Delta p$$

will be greatly increased by the presence of the gas and the dV , which is the production, will be large for a given pressure drop.



ELSEVIER

FROM PURE GOLD PVT DATA

Rp	Np/N
1500	0.753122
2000	0.533515
2500	0.413066
3000	0.336987
3500	0.284573
4000	0.24627
4500	0.217054
5000	0.194035
5500	0.175431
6000	0.160082
6500	0.147202
7000	0.136241
7500	0.126799
8000	0.118581
8500	0.111364
9000	0.104974
9500	0.099278
10000	0.094168

Reservoir Fluid Study
for
KAISER FRANCIS
Pure Gold "A" #2
Eddy County, New Mexico

RFLM 93014
14-Apr-93

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Core Laboratories
a division of Western Atlas International, Inc.

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CORE LABORATORIES

14 March 1993

Kaiser Francis
P.O. Box 21468
Tulsa, Oklahoma 74121-1468

Attention: Mr. Jim Wakefield

Subject: Black Oil Reservoir Fluid Study
Well: Pure Gold "A" #2
File: RFLM 93014

Gentlemen :

Duplicate subsurface fluid samples were collected from the subject well on 18 March 1993 and submitted to our Midland laboratory facilities for use in a reservoir fluid study. Presented in the following report are the results of this study as requested by Kaiser Francis.

Should any questions arise or if we may be of further service in anyway, please do not hesitate to contact us.

Sincerely,

Thomas R. Coleman
Supervisor
Reservoir Fluid Laboratory-Midland,Texas

TABLE OF CONTENTS

	<i>pg</i>
<i>Laboratory Procedures</i>	<i>i</i>
<i>Summary of PVT Data</i>	<i>1</i>
<i>General Well Information</i>	<i>2-3</i>
<i>Preliminary Quality Checks</i>	<i>4</i>
<i>Pressure Volume Relations</i>	<i>5-8</i>
<i>Differential Vaporization</i>	<i>9-12</i>
<i>Viscosity of Reservoir Fluid</i>	<i>13-15</i>
<i>Separator Flash Analyses</i>	<i>16</i>
<i>DV adjusted to Separator Conditions</i>	<i>17-19</i>
<i>Wellstream Composition</i>	<i>20</i>
<i>Nomenclature and Equations</i>	<i>Appendix</i>

LIST OF FIGURES

	<i>fig</i>
<i>Pressure-Volume Relations</i>	
<i>Relative Volume</i>	<i>A-1</i>
<i>Y-Function</i>	<i>A-2</i>
<i>Differential Vaporization</i>	
<i>Relative Oil Volume</i>	<i>B-1</i>
<i>Solution Gas/Oil Ratio</i>	<i>B-2</i>
<i>Z-Factor</i>	<i>B-5</i>
<i>Viscosity Analysis</i>	
<i>Reservoir Fluid Viscosity</i>	<i>C-1, C-2</i>
<i>Differential Vaporization Adjusted to Separator Conditions</i>	
<i>Solution Gas/Oil Ratio</i>	<i>E-1</i>
<i>Formation Volume Factor</i>	<i>E-2</i>

LABORATORY PROCEDURES

Kaiser Francis
Pure Gold "A" #2
RFLM 93014

As a quality check, the room temperature saturation pressure of each sample was initially determined. At 68°F., subsurface fluid samples, numbers 349069D and 349067D, were found to have bubble point pressures of 2912 psig and 2865 psig, respectively. These values were considered to be in good agreement with one another and subsurface fluid sample number 349069D was selected for use in the reservoir fluid study.

The hydrocarbon composition of the subsurface fluid was determined thru C_{20+} by spike-flash/chromatographic technique.

A small quantity of the reservoir fluid was charged to a high pressure windowed cell and thermally expanded to the reservoir temperature of 125°F. During a constant composition expansion at this temperature, the fluid was found to have a saturation pressure of 3220 psig. Other data derived from the pressure-volume relations measurements, include relative volumes, Y-functions, calculated single-phase densities, and average single-phase compressibilities.

When subjected to differential pressure depletion at the reservoir temperature, the fluid evolved a total of 1425 cubic feet of gas at 15.025 psia and 60°F. per barrel of residual oil at 60°F. The resulting relative oil volume factor was 1.754 barrels of saturated fluid per barrel of residual oil. The oil density and the properties of evolved gases were measured at each point during the differential pressure depletion and these data are included in the summary of the differential depletion data.

The viscosity of the reservoir fluid was measured over a wide range of pressures at 125°F. in a rolling ball viscosimeter. The viscosity of the fluid was found to vary from a minimum of 0.364 centipoise at the saturation pressure to a maximum of 1.86 centipoise at atmospheric pressure.

One multi-stage separator test was performed at pressures of 650 psig, 90 psig, and 0 psig all at 70°F to measure gas/oil ratio, stock tank oil gravity, and formation volume factor.

Equations and nomenclature are included in the appendix of the report which extend and define the analytical expressions and data relationships presented in the study.

Summary of PVT Data

(Section 1)

RFLM 93014
14-Apr-93

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Pure Gold "A" #2

RFLM 93014

SUMMARY OF PVT DATA

Reported Reservoir Conditions

Average Reservoir Pressure	3263	psig
Average Reservoir Temperature	125	°F

Pressure-Volume Relations

Saturation Pressure	3220	psig
Avg Single-Phase Compressibility	14.30	E-6 v/v/psi (5000 to 3220 psig)
Thermal Exp @ 5000 psig	1.07176	V at 125 °F / V at 68 °F

Differential Vaporization Data

(at 3220 psig and 125 °F)

Solution Gas/Oil Ratio	1,425	scf / bbl of residual oil at 60 °F
Relative Oil Volume	1.754	bbl / bbl of residual oil at 60 °F
Density of Reservoir Fluid	0.6148	gm/cc

Reservoir Fluid Viscosity

0.364 cp at 3220 psig and 125 °F

Separator Test Results

Separator Conditions		Formation Volume Factor (A)	Total Solution Gas/Oil Ratio (B)	Tank Oil Gravity (°API at 60 °F)
psig	°F			
650	70	1.703	1,289	42.8

(A) Barrels of saturated oil per barrel of stock tank oil at 60 °F.

(B) Total standard cubic feet of gas per barrel of stock tank oil at 60 °F.

General Well Information

(Section 2)

RFLM 93014
14-Apr-93

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Pure Gold "A" #2

RFLM 93014

General Well Information

Company.....	KAISER FRANCIS
Well Name.....	Pure Gold "A" #2
API Well Number.....	
File Number.....	RFLM 93014
Date Sample Collected.....	18-Mar-93
Sample Type.....	Bottom-Hole
Geographical Location.....	Eddy County, New Mexico
Field.....	

Well Description

Formation.....	*	
Pool (or Zone).....	*	
Date Completed.....	*	
Elevation.....	*	ft
Producing Interval.....	*	ft
Total Depth.....	*	ft
Tubing Size.....	*	in
Tubing Depth.....	*	ft
Casing Size.....	*	in
Casing Depth.....	*	ft

Pressure Survey Data

Data from Original Discovery Well

Date	*	
Reservoir Pressure	*	psig
Gas / Oil Contact.....	*	ft
Oil / Water Contact.....	*	ft

Data at Sample Collection

Date.....	18-Mar-93	
Reservoir Pressure.....	3263	psig
Reservoir Temperature.....	125	°F
Pressure Tool.....	*	
Flowing Bottom-Hole Pressure.....	*	psig
Gas / Oil Contact.....	*	ft
Oil / Water Contact.....	*	ft

* Data not forwarded to Core Laboratories.

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Pure Gold "A" #2

RFLM 93014

Production Data

Data from Original discovery Well

Location.....	*	
Date.....	*	
Oil Gravity @ STP.....	*	°API
Separator Pressure.....	*	psig
Separator Temperature.....	*	°F
Production Rates		
Gas.....	*	Mscf/D
Liquid.....	*	STbbl/D
Gas/Liquid Ratio.....	*	scf/bbl

Data at Sample Collection

Sampling Date.....	18-Mar-93		
Production Rate.....	*	bbl/D	
Produced G.O.R.	*	scf/bbl	
Liquid Gravity at 60.0 °F.....	*	°API	
Productivity Index.....	*	bbl/D/psi at	°F
		and	bbl/D

Sampling Information

Sample Collected at.....	7725	ft
Status of Well.....	Shut In	
Sampled By.....	Tefteller Inc.	
Type Sampler.....	Wofford	
Cylinder Names/Numbers	349069D,349067D	

* Data not forwarded to Core Laboratories.

Preliminary Quality Checks

(Section 3)

RFLM 93014
14-Apr-93

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Pure Gold "A" #2
RFLM 93014

PRELIMINARY QUALITY CHECKS
PERFORMED ON SAMPLES RECEIVED IN LABORATORY

Cylinder Number	Sampling Date	Sampling Conditions		Bubblepoint Conditions		Approximate Sample Volume (cc)	Water Recovered (cc)
		psig	°F	psig	°F		
349069D*	18-Mar-93	3,263	125	2,912	68	520	0
349067D	18-Mar-93	3,263	125	2,865	68	510	0

* Used for reservoir fluid study

Pressure-Volume Relations

(Section 4)

RFLM 93014

14-Apr-93

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Pure Gold "A" #2

RFLM 93014

VOLUMETRIC DATA

(at 125 °F)

Saturation Pressure (P _{sat})	3220	psig
Density at P _{sat}	0.6148	gm/cc
Thermal Exp @ 5000 psig	1.07176	V at 125 °F / V at 68 °F

AVERAGE SINGLE-PHASE COMPRESSIBILITIES

Pressure Range psig			Single-Phase Compressibility v/v/psi
5000	to	4500	12.47 E -6
4500	to	4000	13.71 E -6
4000	to	3500	15.39 E -6
3500	to	3220	17.54 E -6

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Pure Gold "A" #2

RFLM 93014

PRESSURE-VOLUME RELATIONS

(at 125 °F)

Pressure psig	Relative Volume (A)	Y-Function (B)	Density gm/cc
5000	0.9745		0.6308
4500	0.9807		0.6269
4000	0.9874		0.6226
3500	0.9951		0.6178
3400	0.9968		0.6168
3300	0.9985		0.6157
b»3220	1.0000		0.6148
3169	1.0039		
3149	1.0055		
3120	1.0079		
3101	1.0095		
2992	1.0193		
2660	1.0578	3.620	
2447	1.0916	3.428	
1787	1.2810	2.830	
1321	1.5901	2.409	
1120	1.8309	2.227	
906	2.2357	2.033	
709	2.8697	1.855	
522	3.9804	1.686	

(A) Relative Volume: V/V_{sat} or volume at indicated pressure per volume at saturation pressure.

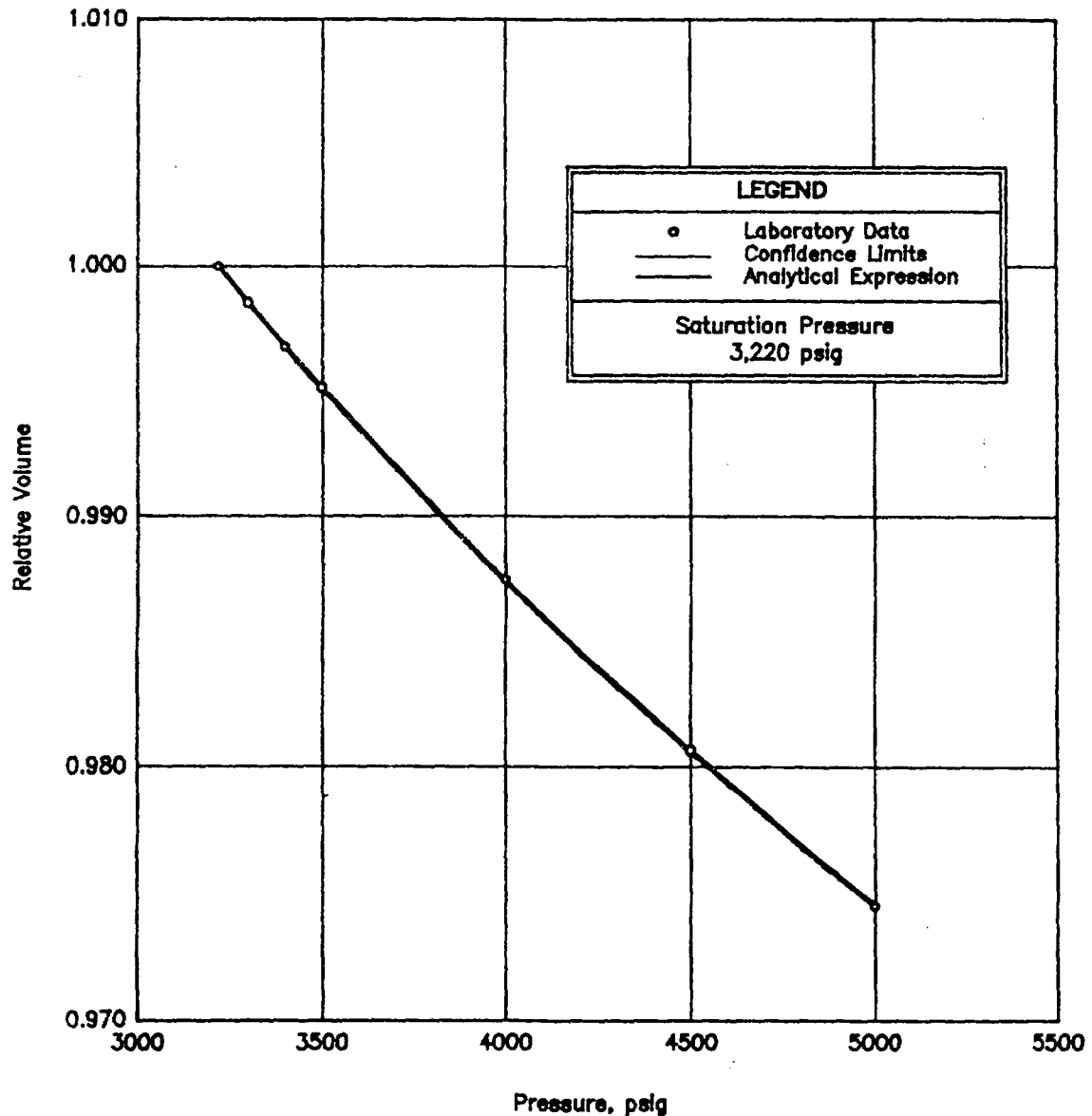
(B) Where: Y-Function =
$$\frac{(P_{sat} - P)}{(P_{abs}) * (V/V_{sat} - 1)}$$

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Pure Gold

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RELATIVE VOLUME (at 125 °F)



Analytical Expression

$$1 - 10^{-4} [-4.691E00 + 9.802E-01 (\log(dP)) + -7.552E-05 (\log(dP))^6]$$

Note: dP is defined as | P1 - P2 |, psig

Statistical Summary

r squared: 0.999990
Confidence Interval (+/-): 0.0001
Confidence: 99 %

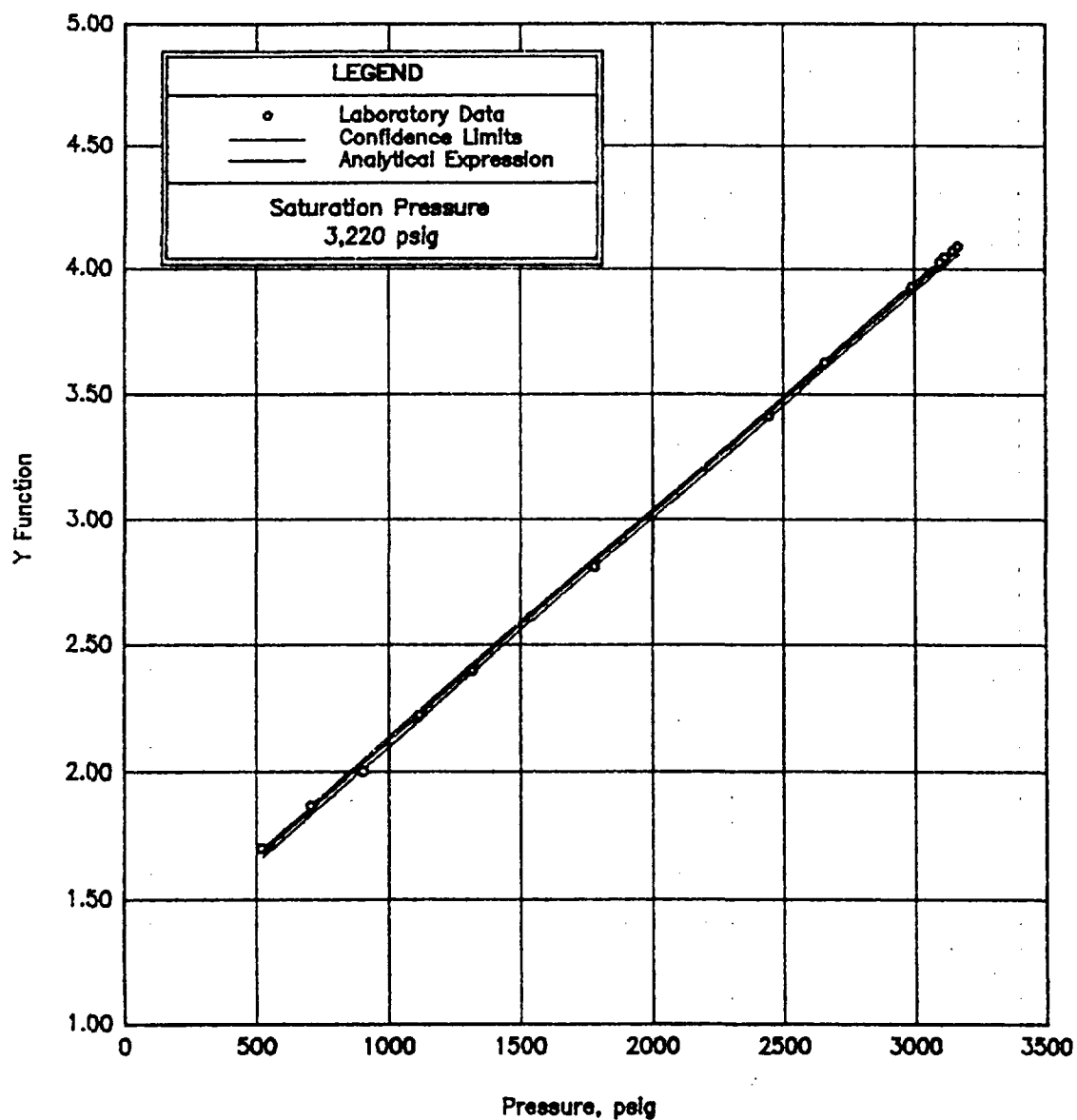
Pressure-Volume Relations

Figure A-1

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Pure Gold
RFLM 93014

Y-FUNCTION (at 125 °F)



Analytical Expression

$$9.049E-04 (PI) + 1.213E00$$

Note: PI is defined as pressure, psig

Statistical Summary

r squared: 0.999479
Confidence Interval (+/-): 0.0185
Confidence: 98 %

Pressure-Volume Relations

Figure A-2

Differential Vaporization Analysis

(Section 5)

RFLM 93014

14-Apr-93

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Pure Gold "A" #2

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DIFFERENTIAL VAPORIZATION

(at 125 °F)

Pressure psig	Solution Gas/Oil Ratio Rsd (A)	Relative Oil Volume Bod (B)	Relative Total Volume Btd (C)	Oil Density gm/cc	Deviation Factor Z	Gas Formation Volume Factor (D)	Incremental Gas Gravity (Air=1.000)
b.3220	1,425	1.754	1.754	0.6148			
2850	1,252	1.674	1.812	0.6272	0.763	0.00450	0.744
2500	1,101	1.605	1.902	0.6384	0.765	0.00514	0.725
2150	959	1.542	2.042	0.6493	0.773	0.00604	0.716
1800	827	1.483	2.265	0.6600	0.787	0.00733	0.717
1450	701	1.428	2.629	0.6710	0.807	0.00931	0.731
1100	580	1.374	3.276	0.6826	0.834	0.01264	0.759
750	459	1.317	4.612	0.6956	0.867	0.01916	0.805
400	329	1.250	8.469	0.7120	0.908	0.03699	0.877
170	222	1.186	19.617	0.7282	0.941	0.08600	0.946
0	0	1.036		0.7855			1.046
	@ 60 °F = 1.000						

Gravity of Residual Oil = 42.4 °API at 60 °F

Density of Residual Oil = 0.8130 gm/cc at 60 °F

(A) Cubic Feet of gas at 15.025 psia and 60 °F per Barrel of residual oil at 60 °F.

(B) Barrel of oil at indicated pressure and temperature per Barrel of residual oil at 60 °F.

(C) Barrels of oil plus liberated gas at indicated pressure and temperature per Barrel of residual oil at 60 °F.

(D) Cubic Feet of gas at indicated pressure and temperature per Cubic Feet at 15.025 psia and 60 °F.

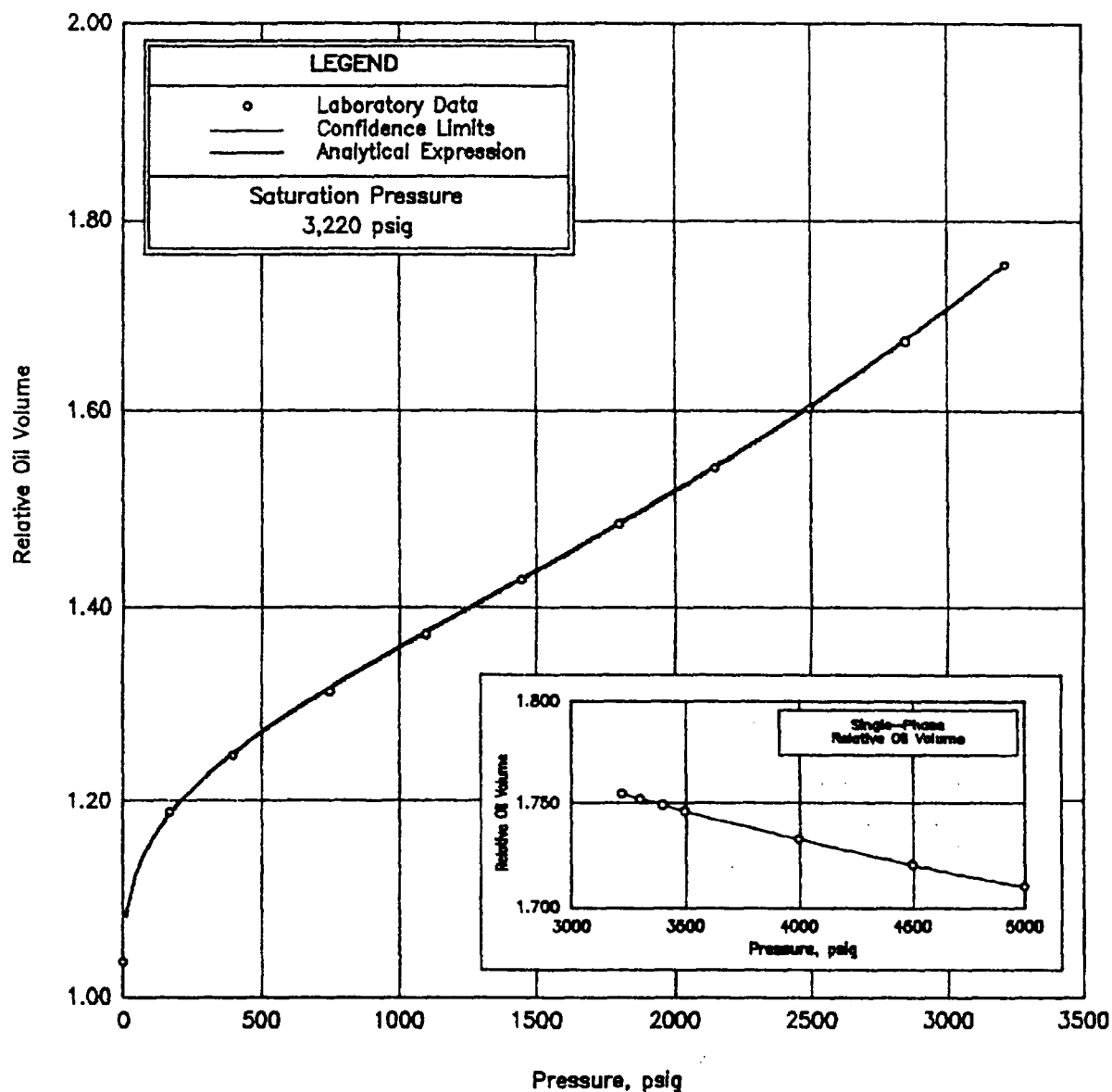
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Pure Gold

RFLM 93014

RELATIVE OIL VOLUME

(at 125 °F)



Analytical Expression (below bubblepoint)

$$1.038E00 + 1.710E-08 (P_i)^{-2} + 1.918E-02 (P_i)^{-0.4} + 2.935E-14 (P_i)^{-3.5}$$

Note: P_i is defined as pressure, psig

Statistical Summary

r squared: 0.999959
Confidence Interval (+/-): .0013
Confidence: 99 %

Differential Vaporization

Figure B-1

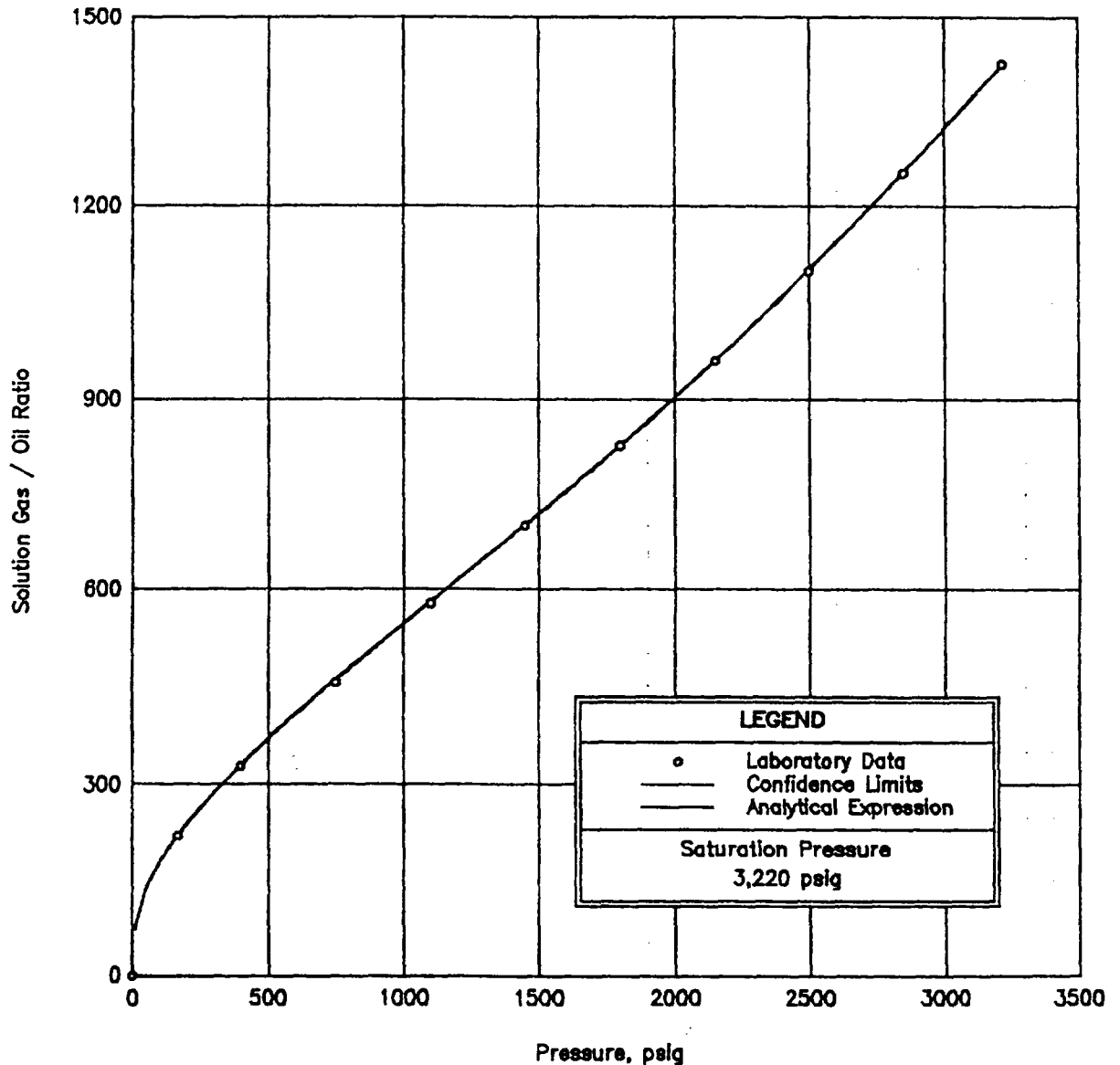
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SOLUTION GAS/OIL RATIO

(scf/bbl at 125 °F)



Analytical Expression (below bubblepoint)

$$3.330E-01 (P_i)^{-0.92} + 3.382E01 (P_i)^{-0.3295} + 2.541E-08 (P_i)^{-2.33}$$

Note: P_i is defined as pressure, psig

Statistical Summary

r squared: 0.999989
Confidence Interval (+/-): 1
Confidence: 99 %

Differential Vaporization

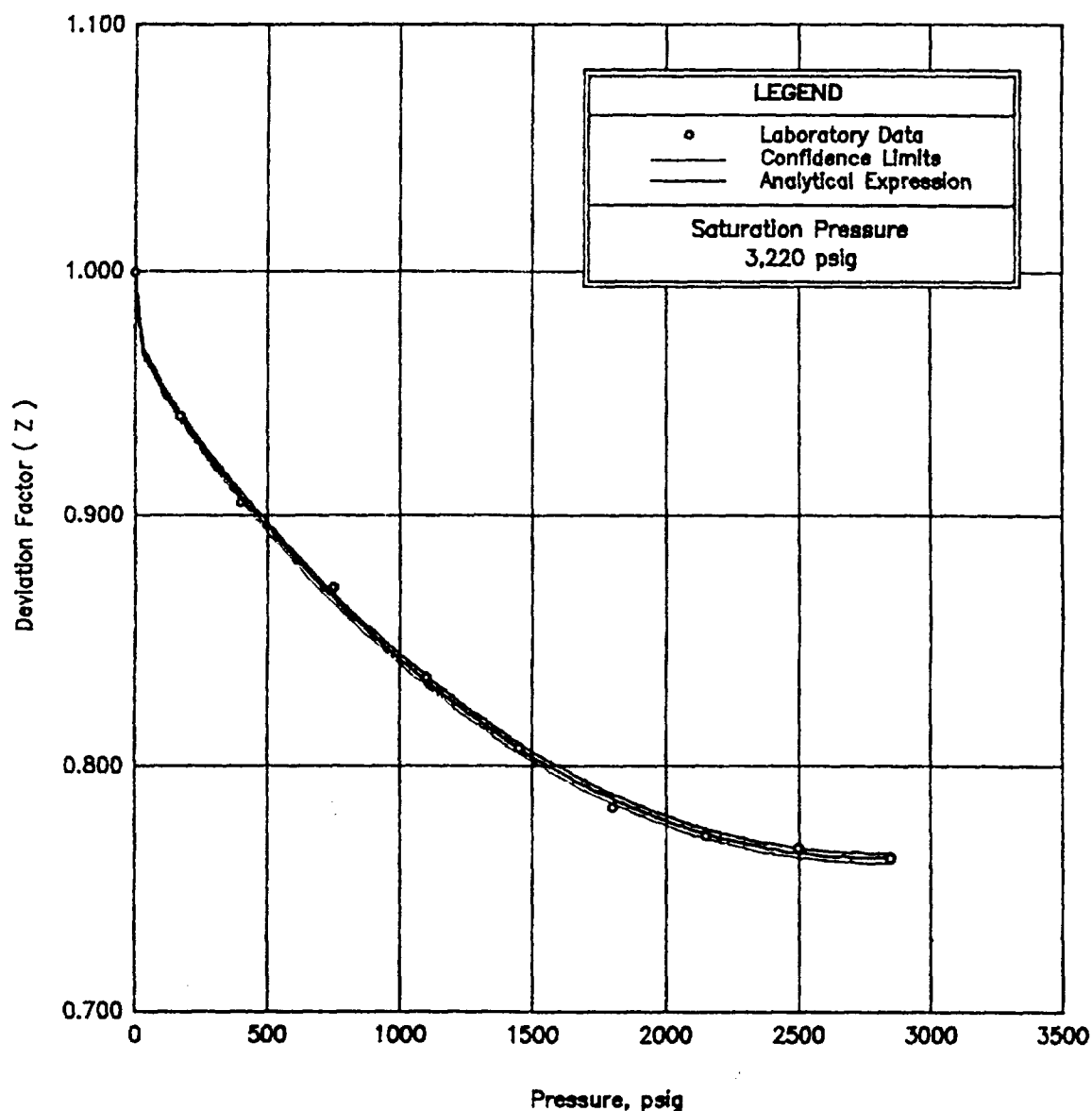
Figure B-2

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Z-FACTOR (at 125 °F)



Analytical Expression

$$1 + -1.274E-04 (P1) + -1.349E-02 (P1)^{-0.2} + 2.371E-08 (P1)^{-2}$$

Note: P1 is defined as pressure, psig

Statistical Summary

r squared: 0.999326
Confidence Interval (+/-): 0.002
Confidence: 99 %

Differential Vaporization

Figure B-5

Viscosity Analysis

(Section 6)

RFLM 93014
14-Apr-93

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Pure Gold "A" #2

RFLM 93014

RESERVOIR FLUID VISCOSITY

(at 125 °F)

Pressure psig	Oil Viscosity cp	Calculated Gas Viscosity* cp	Oil/Gas Viscosity Ratio
------------------	------------------------	---------------------------------------	-------------------------------

5000	0.392		
4500	0.384		
4000	0.376		
3500	0.368		
3400	0.366		
3300	0.365		
b»3220	0.364		
2850	0.376	0.0238	15.8
2500	0.395	0.0209	18.9
2150	0.423	0.0187	22.6
1800	0.461	0.0168	27.4
1450	0.510	0.0153	33.4
1100	0.575	0.0139	41.4
750	0.662	0.0127	52.2
400	0.789	0.0115	68.4
170	0.933	0.0108	86.5
0	1.86	0.0101	184

* Gas Viscosity data calculated from correlation of Lee A.L., Gonzalez M.H., and Eakin B.E., "The Viscosity of Natural Gases", Journal of Petroleum Technology, August, 1966, pp. 997-1000.

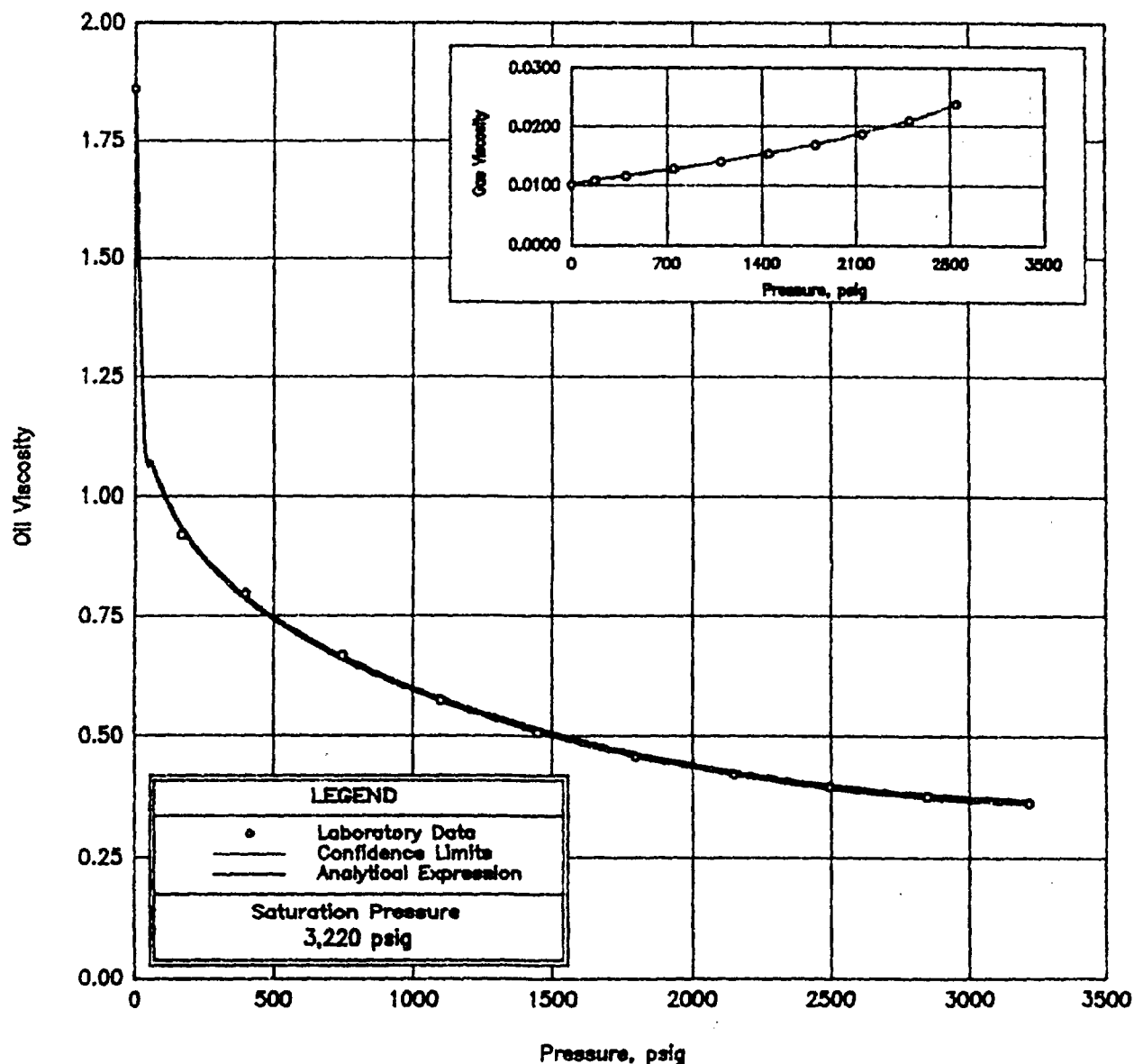
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RESERVOIR FLUID VISCOSITIES

(cp at 125 °F)



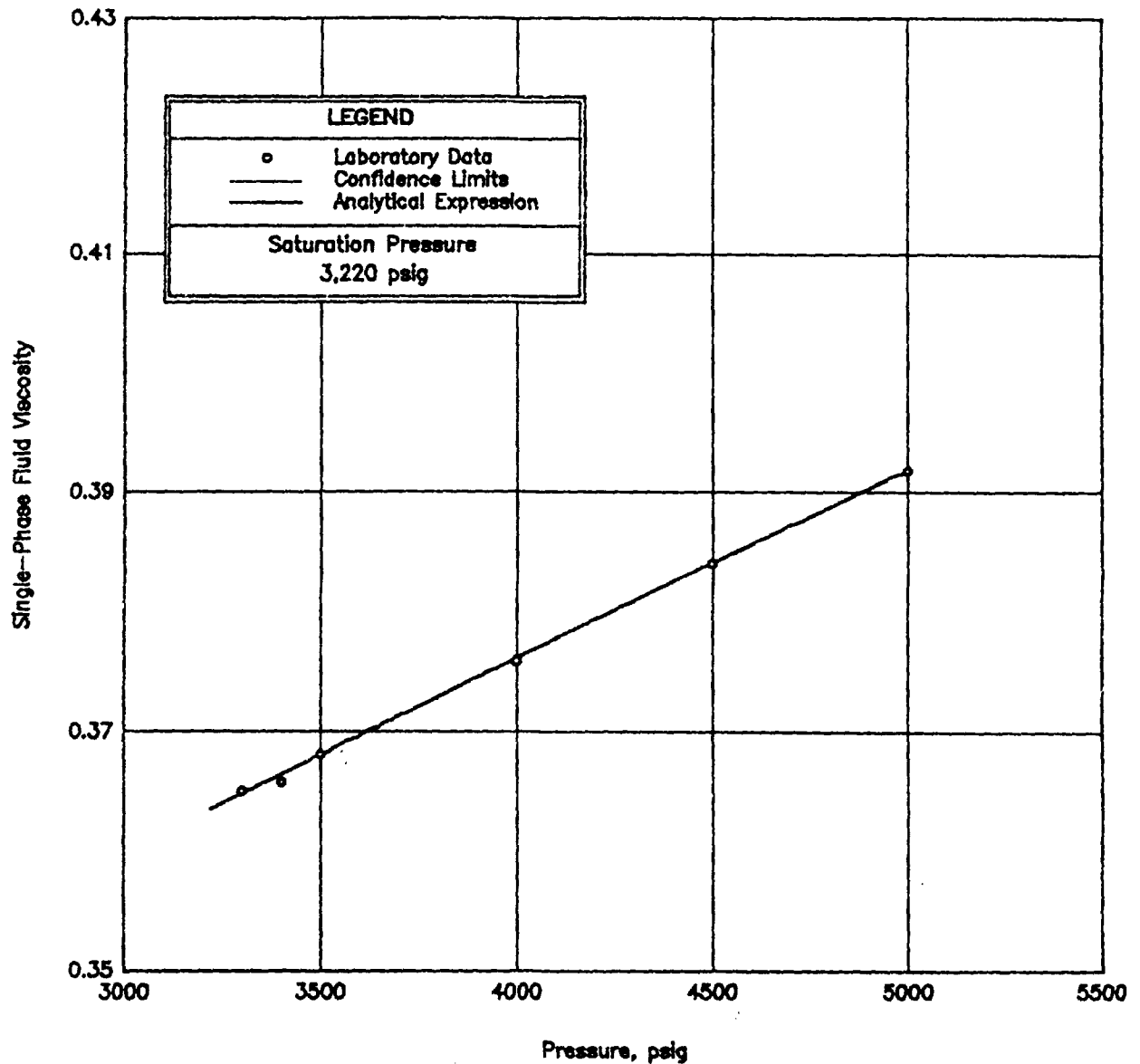
Analytical Expression (below bubblepoint) $1.862 \text{ E}00 + -9.576\text{E}-05 (P1) + 2.222\text{E}-08 (P1)^2 + -4.228\text{E}-01 (P1)^{-0.15}$	
Note: P1 is defined as pressure, psig	
Statistical Summary	
r squared:	0.999850
Confidence Interval (+/-):	0.005
Confidence:	99 %
Viscosity Analyses Figure C-1	

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SINGLE-PHASE VISCOSITY (cp at 125 °F)



Analytical Expression

$$3.636E-01 + 3.637E-01 (dP)$$

Note: dP is defined as $| P_1 - P_{sat} |$, psig

Statistical Summary

r squared: 0.999266
Confidence Interval (+/-): 0.000
Confidence: 99 %

Viscosity Analyses

Figure C-2

Flash Separator Tests

(Section 7)

RFLM 93014
14-Apr-93

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RFLM 93014

SEPARATOR FLASH ANALYSIS

Flash Conditions		Gas/Oil Ratio (scf/bbl) (A)	Gas/Oil Ratio (scf/STbbl) (B)	Stock Tank Oil Gravity at 60 °F (°API)	Formation Volume Factor Bofb (C)	Separator Volume Factor (D)	Specific Gravity of Flashed Gas (Air=1.000)	Oil Phase Density (gm/cc)
psig	°F							
3220	125							0.6065
650	70	682	858			1.259	0.680	0.7172
90	70	224	253			1.132	0.845	0.7557
0	70	177	177	42.8	1.703	1.005	1.115	0.8069
Rsfb = 1,289								

- (A) Cubic Feet of gas at 15.025 psia and 60 °F per Barrel of oil at indicated pressure and temperature.
 (B) Cubic Feet of gas at 15.025 psia and 60 °F per Barrel of Stock Tank Oil at 60 °F.
 (C) Barrels of saturated oil at 3220 psig and 125 °F per Barrel of Stock Tank Oil at 60 °F.
 (D) Barrels of oil at indicated pressure and temperature per Barrel of Stock Tank Oil at 60 °F.

DV Adjusted to Separator Conditions

(Section 8)

RFLM 93014

14-Apr-93

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Pure Gold "A" #2

RFLM 93014

DIFFERENTIAL VAPORIZATION ADJUSTED TO SEPARATOR CONDITIONS*

Pressure psig	Solution Gas/Oil Ratio Rs (A)	Formation Volume Factor Bo (B)	Gas Formation Volume Factor (C)	Oil Density gm/cc	Oil/Gas Viscosity Ratio
5000	1289	1.659		0.6308	
4500	1289	1.670		0.6269	
4000	1289	1.681		0.6226	
3500	1289	1.694		0.6178	
3400	1289	1.697		0.6168	
3300	1289	1.700		0.6157	
b» 3220	1289	1.703		0.6148	
2850	1122	1.624	0.00450	0.6272	15.8
2500	975	1.557	0.00514	0.6384	18.9
2150	837	1.496	0.00604	0.6493	22.6
1800	709	1.440	0.00733	0.6600	27.4
1450	587	1.386	0.00931	0.6710	33.4
1100	469	1.333	0.01264	0.6826	41.4
750	352	1.278	0.01916	0.6956	52.2
400	226	1.213	0.03699	0.7120	68.4
170	122	1.151	0.08600	0.7282	86.5

*Separator Conditions	
First Stage	650 psig at 70 °F
Second Stage	90 psig at 70 °F
Stock Tank	0 psig at 70 °F

(A) Cubic Feet of gas at 15.025 psia and 60 °F per Barrel of Stock Tank Oil at 60 °F.

(B) Barrel of oil at indicated pressure and temperature per Barrel of Stock Tank Oil at 60 °F.

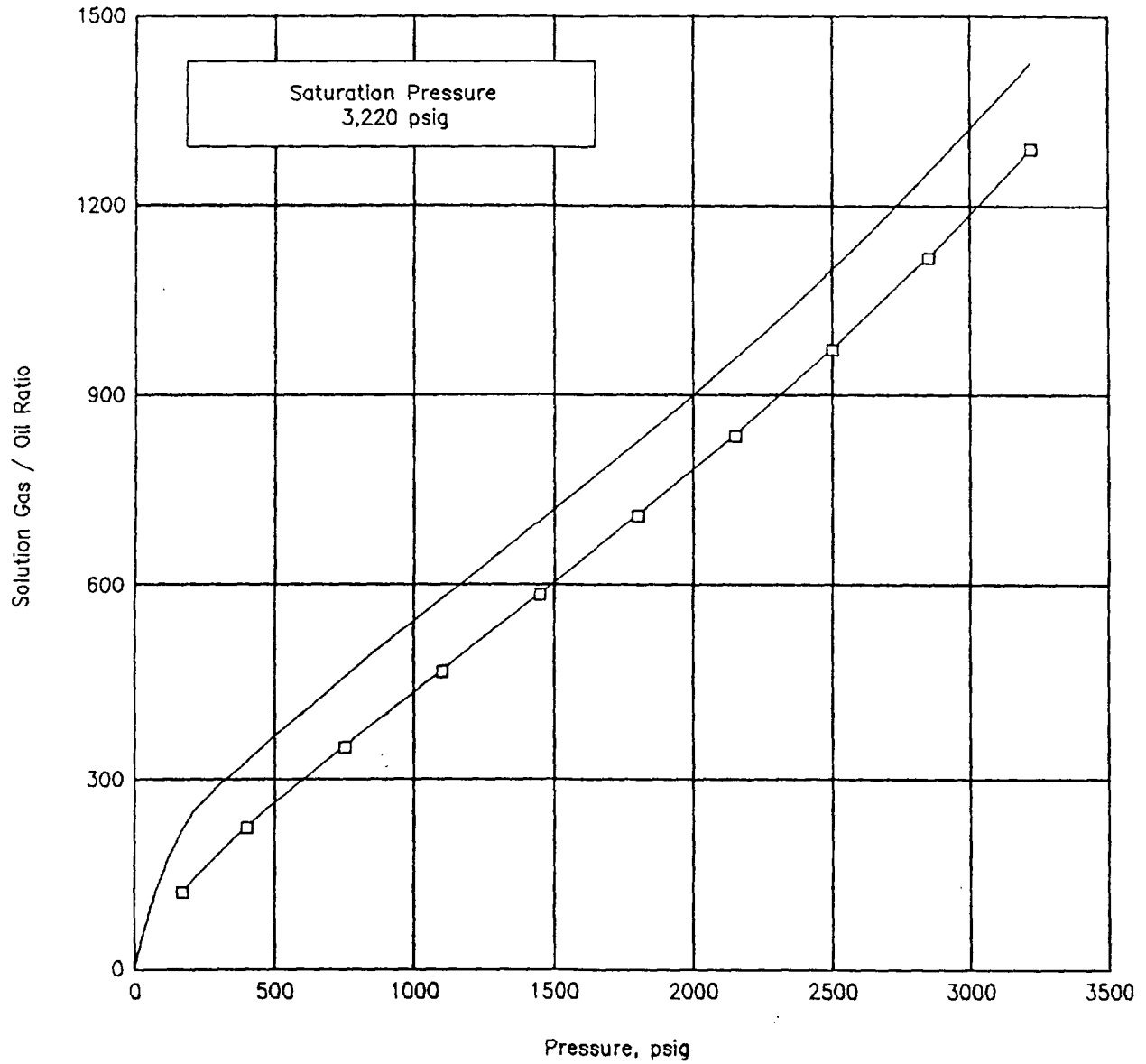
(C) Cubic Feet of gas at indicated pressure and temperature per Cubic Feet at 15.025 psia and 60 °F.

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SOLUTION GAS/OIL RATIO
(scf/STbbl)



LEGEND

- Differential Vaporization
- 650 psig at 70 °F
- △
-
- ◇

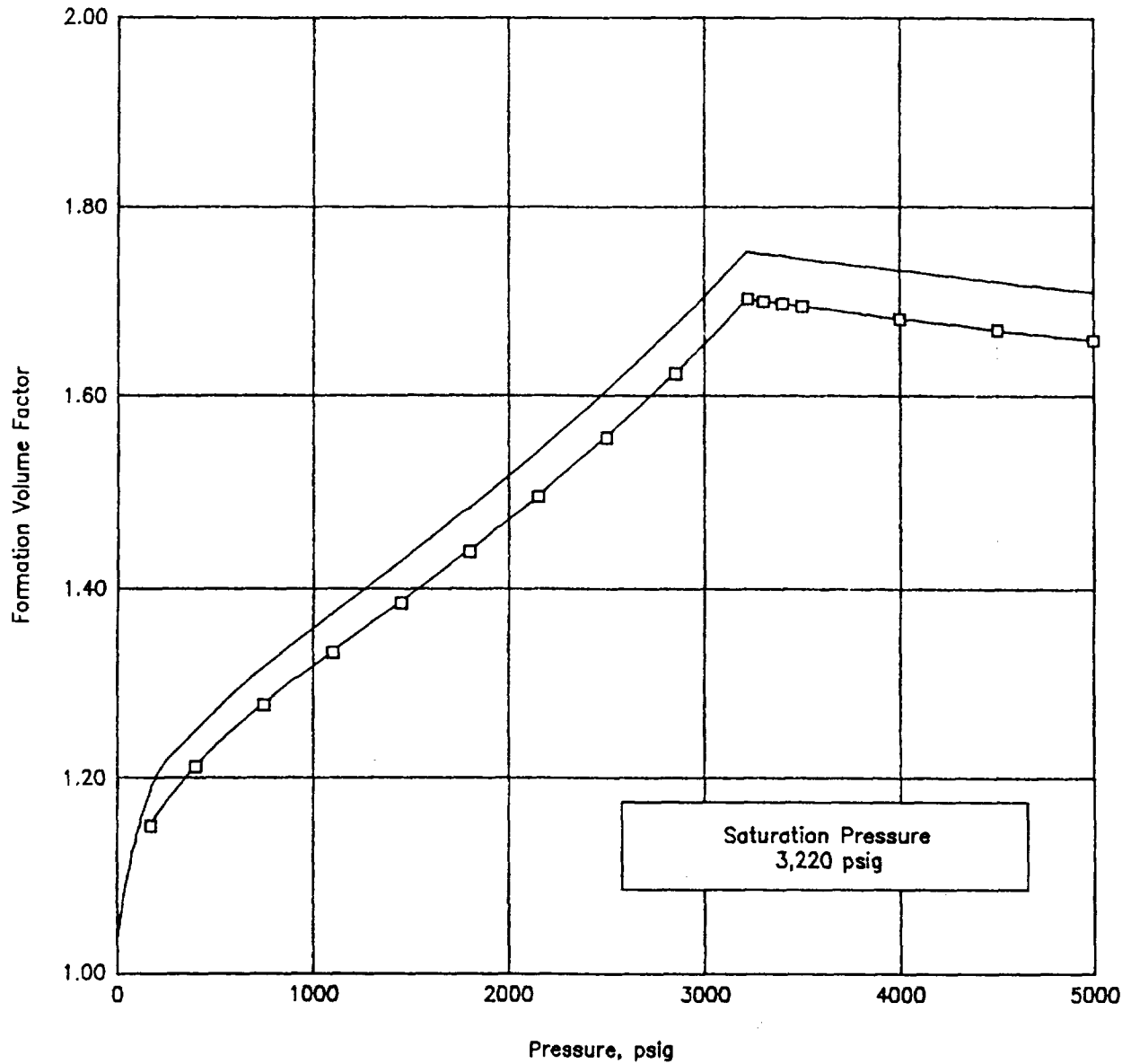
DV Adjusted to Separator
Figure D-1

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Pure Gold

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FORMATION VOLUME FACTOR



LEGEND	
—	Differential Vaporization
□	650 psig at 70 °F
△	
○	
◇	

DV Adjusted to Separator
Figure D-2

Wellstream Composition

(Section 9)

RFLM 92086
28-Oct-92

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Pure Gold "A" #2

RFLM 93014

Composition of Reservoir Fluid

(From Flash / Chromatographic Technique)

Component	Mol %	Wt %	Density (gm/cc)	GPM	Vol %
Hydrogen Sulfide	0.00				
Carbon Dioxide	0.11	0.07	0.8172		0.05
Nitrogen	1.51	0.61	0.8086		0.48
Methane	44.02	10.17	0.2997		21.73
Ethane	9.63	4.17	0.3558	2.627	7.50
Propane	7.33	4.65	0.5065	2.060	5.88
iso-Butane	1.15	0.96	0.5623	0.384	1.10
n-Butane	3.34	2.80	0.5834	1.074	3.07
iso-Pentane	1.36	1.42	0.6241	0.508	1.45
n-Pentane	1.70	1.77	0.6305	0.628	1.79
Hexanes	2.33	2.82	0.6850	0.922	2.63
Heptanes	3.59	4.97	0.7220	1.541	4.40
Octanes	3.94	6.07	0.7450	1.827	5.21
Nonanes	2.87	5.00	0.7640	1.467	4.18
Decanes	2.32	4.48	0.7780		3.68
Undecanes	1.80	3.80	0.7890		3.08
Dodecanes	1.34	3.12	0.8000		2.49
Tridecanes	1.33	3.35	0.8110		2.64
Tetradecanes	1.10	3.00	0.8220		2.33
Pentadecanes	1.00	2.96	0.8320		2.27
Hexadecanes	0.72	2.30	0.8390		1.76
Heptadecanes	0.66	2.25	0.8470		1.70
Octadecanes	0.63	2.28	0.8520		1.71
Nonadecanes	0.55	2.08	0.8570		1.55
Eicosanes plus	5.67	24.90	0.9200		17.32
Totals	100.00	100.00		13.038	100.00

Sample Characteristics

Total Sample Molecular Weight 69.4

Theoretical Sample Density at 15.025 psia and 60 °F
in gm/scc 0.6396

Gas Mol Fraction 0.7177

Liquid Mol Fraction 0.2823

Properties of Heavy Fractions

Plus Fraction	Mol %	Wt %	Density (gm/cc)	°API	MW
Hexanes Plus	29.85	73.38	0.8238	40.3	171
Heptanes Plus	27.52	70.56	0.8306	38.9	178
Decanes Plus	17.12	54.52	0.8602	33.0	221
Undecanes Plus	14.80	50.04	0.8685	31.4	235
Dodecanes Plus	13.00	46.24	0.8757	30.1	247
Pentadecanes Plus	9.23	36.77	0.8942	26.7	277
Eicosanes Plus	5.67	24.90	0.9200	22.3	305

Appendix
Nomenclature and Equations

PRESSURE-VOLUME RELATIONS

Nomenclature and Equations

P_b	=	Bubblepoint Pressure
X_d	=	Dimensionless Pressure (P_i / P_b)
dP	=	Pressure Difference ($P_i - P_b$)
Y_f	=	Y-Function (dimensionless compressibility)
RV	=	PV Relative Volume
C_{sp}	=	Average Single-Phase Compressibility of Reservoir Fluid

For Relative Volume below bubblepoint pressure:

$$RV_i = (P_b - P_i) / Y_f$$

For Average Single-Phase Compressibility above bubblepoint pressure:

$$C_{sp} = (RV_i - RV_{i-1}) / [RV_i (P_{i-1} - P_i)]$$

DIFFERENTIAL VAPORIZATION

Nomenclature and Equations

P_b	=	Bubblepoint Pressure
P_{base}	=	Base Pressure
T_{base}	=	Base Temperature
T_{res}	=	Reservoir Temperature
X_d	=	Dimensionless Pressure (P_i / P_b)
dP	=	Pressure Difference ($P_i - P_b$)
RV	=	Relative Volume from Pressure-Volume Relations
$Dens$	=	Single-Phase Oil Density
$Dens_b$	=	Oil Density at Bubblepoint Pressure
ROV	=	Relative Oil Volume
ROV_b	=	Relative Oil Volume at Bubblepoint Pressure
B_g	=	Gas Formation Volume Factor

For Oil Density above bubblepoint pressure:

$$Dens_i = Dens_b / RV_i$$

For Relative Oil Volume above bubblepoint pressure:

$$ROV_i = ROV_b * RV_i$$

For Gas Formation Volume Factor below bubblepoint pressure:

$$B_g = P_{base} * Z_i * T_{res} / (P_i * T_{base})$$

DIFFERENTIAL VAPORIZATION DATA ADJUSTED TO SURFACE CONDITIONS Nomenclature and Equations

P_b	=	Bubblepoint Pressure
B_o	=	Oil Formation Volume Factor
B_{ofb}	=	Formation Volume Factor from field conditions or optimum separator flash test
B_{od}	=	Relative Oil Volume from differential vaporization test
B_{odb}	=	Value of B_{od} at bubblepoint pressure
RV	=	Relative Volume from Pressure-Volume relations

For B_o above bubblepoint pressure:

$$B_o = RV * B_{ofb}$$

For B_o below bubblepoint pressure:

$$B_o = (B_{od}) * (B_{ofb} / B_{odb})$$

R_s	=	Gas in solution
R_{sfb}	=	Sum of separator gas and the stock tank gas from field conditions (or optimum) separator flash test
R_{sd}	=	Gas in solution from the differential vaporization test
R_{sdb}	=	R_{sd} at bubblepoint pressure

$$R_s = R_{sfb} - [(R_{sdb} - R_{sd}) * (B_{ofb} / B_{odb})]$$



RAY B. POWELL
COMMISSIONER

State of New Mexico

OFFICE OF THE

Commissioner of Public Lands

Santa Fe

P.O. BOX 1148
SANTA FE, NEW MEXICO 87504-1148

August 20, 1993

Santa Fe Energy Operating Partners, L.P.
550 West Texas
Suite 1330
Midland, Texas 79701

Attention: Mr. Curtis Smith

Re: Final Approval of Thistle Unit
Lea County, New Mexico

Dear Mr. Smith:

This office is in receipt of your letter of August 26, 1993, wherein on behalf of Santa Fe Energy Operating Partners, L.P., you have requested Final Approval of the Thistle Unit, Lea County, New Mexico. It is our understanding that all tracts are committed to the unit agreement.

Please be advised that the Commissioner of Public Lands has this date granted final approval to the Thistle Unit Agreement, Lea County, New Mexico.

Our approval is subject to like approval by the New Mexico Oil Conservation Division and the Bureau of Land Management.

Enclosed are Five (5) Certificates of Approval.

Your filing fee in the amount of \$240.00 dollars has been received.

If you have any questions, or if we may be of further help, please contact Pete Martinez at (505) 827-5791.

Very truly yours,

RAY B. POWELL
COMMISSIONER OF PUBLIC LANDS

BY:

FLOYD O. PRANDO, Director
Oil/Gas and Minerals Division
(505) 827-5744

RBP/FOP/pm

cc: Reader File

OCD

BLM - Roswell, Mr. Gary Gourley

TRD

Hinkle, Cox, Eaton, Coffield & Hensley--Att: James Bruce

10774

UNIT NAME: **THISTLE UNIT**
OPERATOR: SANTA FE ENERGY OPERATING PARTNERS, L.P.
COUNTY: LEA

DATE	OCD CASE NO.	EFFECTIVE DATE	TOTAL ACREAGE	STATE	FEDERAL-	FEE	SEG CLAUSE	TERM
08/20/93	08/09/93	08/20/93	4,880.00	3,200.00	1,680.00	0	MODIFIED	5 years and so long as

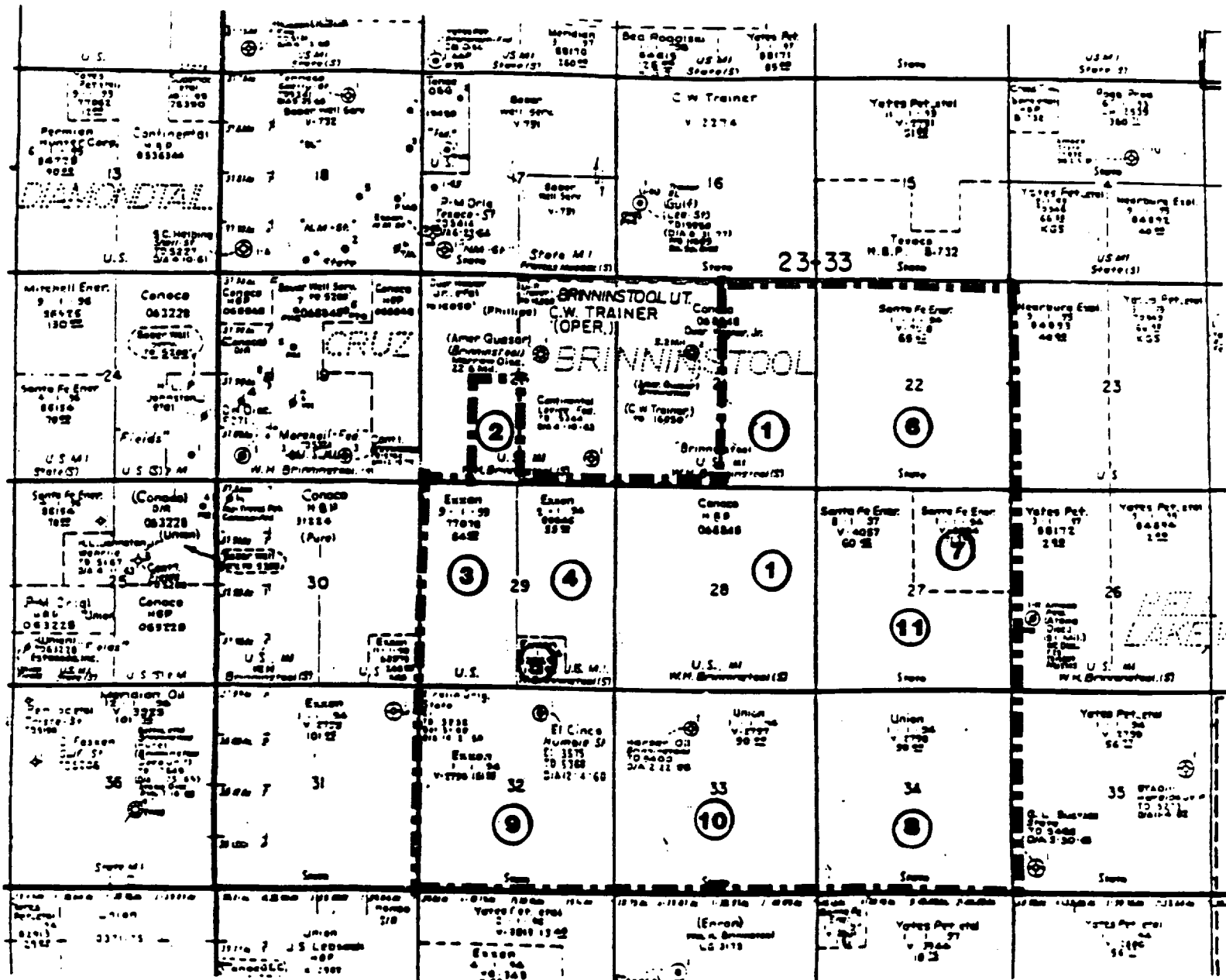
OCD: 08/09/93 - Case #10774, Order No. R-9932
CPL: 08/20/93
BLM: 08/19/93

UNIT AREA:

TOWNSHIP 23 SOUTH-RANGE 33 EAST

SECTION 20: E~~3~~⁴S~~4~~⁵W~~4~~⁵
SECTION 21: E~~3~~⁴
SECTION 22: ALL
SECTIONS 27 through 29: ALL
SECTIONS 32 through 34: ALL

EXHIBIT "A"
Santa Fe Energy Operating Partners, L.P.
THISTLE UNIT
LEA CO., N.M.



LAND ACRES

○ **Tract Numbers as
Listed on Exhibit "B"**

Federal 1680

State 3200

Total 4880

UNIT OUTLINE

State of Maryland
 Dep. NMSA
 505-827-5766
 415-686-6631
 415-686-6714

EXHIBIT "B" SCHEDULE OF OWNERSHIP

Schedule Showing All Lands and Leases
 Within the THISTLE UNIT
 EA COUNTY, NEW MEXICO

TRACT NUMBER OF LANDS	DESCRIPTION	ACRES	SERIAL NUMBER AND EXPIRATION DATE	BASIC ROYALTY AND PERCENTAGE	LESSEE OF RECORD	OVERRIDING ROYALTY AND PERCENTAGE	WORKING INTEREST AND PERCENTAGE	BENEFICIARY
FEDERAL LANDS								
T-23-S, R-33-E								
1) Sec. 21: E/2		960 ac.	LC-66848	USA 1/8	CONOCO, INC. 100%	3% PP L.L. Marshall et al		CONOCO, INC. 33.40816% AMERICAN OIL 10.46943% SITEOP, L.P. 19.31408% MERIDIAN OIL 12.41582% C.W. TRAINER 24.39251%
from 13,900 to 16,050'								
Sec. 21: E/2						1.8348% ORR (Phillips Pet)		CONOCO, INC. 33.40816% C.W. TRAINER 37.90774% AMERICAN OIL 16.26828% MERIDIAN OIL 12.41582%
Surf. to 15,900'								
Sec. 28: All						5% ORR B.L. Mitchell et al		AMERICAN OIL 24.39251% C.W. TRAINER 10.53633% MERIDIAN OIL 12.41582% CONOCO, INC. 33.40816% SITEOP, L.P. 19.31408%
Surf. to 16,050'								
Sec. 28: All						5% ORR B.L. Mitchell et al		CONOCO, INC. 100%
Below 16,050'								
2) Sec. 20: E/2 SW/4		80 ac.	NM-2386-A	USA 1/8	SANTA FE ENERGY OPERATING PARTNERS, L.P. 100%	6.33% ORR B.L. Mitchell et al		SANTA FE ENERGY OPERATING PARTNERS, L.P. 19.31408% CONOCO, INC. 33.40816% CONQUEST EXP 24.39251% C.W. TRAINER 10.53633% MERIDIAN OIL 12.41582%
			6-1-77 HBP					

TRACT DESCRIPTION OF LANDS	ACRES	SERIAL NUMBER AND EXPIRATION DATE	BASIC ROYALTY AND PERCENTAGE	LESSEE OF RECORD	OVERRIDING ROYALTY AND PERCENTAGE	WORKING INTEREST AND PERCENTAGE	BENEFICIARY
FEDERAL LANDS (CONTINUED)							
T23S, R-33-E							
3) Sec. 28; W/2	320 ac.	NM-77878 9-1-93	USA 1/8	SANTA FE ENERGY OPERATING PARTNERS, L.P. 100%	0%	SFEOP, L.P.	100%
4) Sec. 28; NE/4, N/2 SE/4 & SE/4 SE/4	280 ac.	NM-80644 2-1-94	USA 1/8	SANTA FE ENERGY OPERATING PARTNERS, L.P. 100%	0%	SFEOP, L.P.	100%
5) Sec. 28; SW/4 SE/4	40 ac.	NM-82928 11-1-94	USA 1/8	SANTA FE ENERGY OPERATING PARTNERS, L.P. 100%	0%	SFEOP, L.P.	100%

TOTAL FEDERAL ACRES - 1680 ACRES - OR 34.2622%

EXHIBIT 'B'. SCHEDULE OF OWNERSHIP
 Showing All Lands and Leases
 Within the THS11B UNIT
 LEA COUNTY, NEW MEXICO

TRACT DESCRIPTION NUMBER OF LANDS	ACRES	SERIAL NUMBER AND EXPIRATION DATE	BASIC ROYALTY AND PERCENTAGE	LESSEE OF RECORD	OVERRIDE ROYALTY AND PERCENTAGE	WORKING INTEREST AND PERCENTAGE	BENEFICIARY
STATE LANDS:							
<u>T-23-S, R-33-E</u>							
6) Sec. 22: All	640 ac.	V-2818 1-1-94	State 1%	SANTA FE ENERGY OPERATING PARTNERS, L.P. 100%	0% 6/14/43	SFEOP, L.P. 100%	
7) Sec. 27: NE/4	160 ac.	V-2794 1-1-94	State 1%	SANTA FE ENERGY OPERATING PARTNERS, L.P. 100%	0% 6/14/43	SFEOP, L.P. 100%	
8) Sec. 34: All	640 ac.	V-2798 1-1-94	State 1%	SANTA FE ENERGY OPERATING PARTNERS, L.P. 100%	0% 6/14/43	SFEOP, L.P. 100%	
9) Sec. 32: All	640 ac.	V-2796-2 1-1-94	State 1%	SANTA FE ENERGY OPERATING PARTNERS, L.P. 100%	0% 6/14/43	SFEOP, L.P. 100%	
10) Sec. 23: All	640 ac.	V-2797 1-1-94	State 1%	SANTA FE ENERGY OPERATING PARTNERS, L.P. 100%	0% 6/14/43	SFEOP, L.P. 100%	
11) Sec. 27: NW/4 & S/2	480 ac.	V-4057 8-1-97	State 1%	SANTA FE ENERGY OPERATING PARTNERS, L.P. 100%	0% 6/14/43	SFEOP, L.P. 100%	

TOTAL STATE LANDS - 3200 ACRES - OR 65.5737%

RECAPITULATION:

Federal Lands 1690.00 Acres or 34.43%
 State Lands 1000.00 Acres or 65.57%
 Total Unit Acres 4690.00 Acres or 100.00%

CDS/DM/355



State of New Mexico
Commissioner of Public Lands

RAY POWELL, M.S., D.V.M.
COMMISSIONER

310 OLD SANTA FE TRAIL P.O. BOX 1148

(505) 827-5760
FAX (505) 827-5766

March 14, 1994

SANTA FE, NEW MEXICO 87504-1148

Santa Fe Energy Operating Partners, L.P.
550 W. Texas
Suite 1330
Midland, Texas 79701

Attn: Mr. Curtis D. Smith

Re: Thistle Unit Well No. 1-C
Commercial Determination
Section 33-23S-33E
Lea County, New Mexico

Dear Mr. Smith:

This office is in receipt of your letter of March 7, 1994, together with an engineering report supporting your contention that the Thistle Unit Well No. 1-C is a commercial producer in the Lower Brushy Canyon/Delaware formation.

Please be advised that according to the data submitted, the Commissioner of Public Lands concurs with your determination that the Thistle Unit Well No. 1-C is a commercial well in the Lower Brushy Canyon/Delaware formation. This well is located in the NE $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 33, Township 23 South, Range 33 East, Lea County, New Mexico. Our approval is subject to like approval by the Bureau of Land Management and the New Mexico Oil Conservation Division.

Pursuant to the terms of the Thistle Unit Agreement, please submit an application for the Initial Delaware Participating Area and a 1994 Plan of Development for approval by this office and the Bureau of Land Management.

If you have any questions, or if we may be of further help, please contact Pete Martinez at (505) 827-5791.

Very truly yours,

RAY B. POWELL, M.S., D.V.M.
COMMISSIONER OF PUBLIC LANDS

BY: *[Signature]* for F.O. Prando
FLOYD O. PRANDO, Director
Oil/Gas and Minerals Division
(505) 827-5744
RBP/FOP/pm
cc: Reader File
OCD
BLM
TRD

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION



BRUCE KING
GOVERNOR
ANITA LOCKWOOD
CABINET SECRETARY

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

August 9, 1993

HINKLE, COX, EATON,
COFFIELD & HENSLEY
Attorneys at Law
P. O. Box 2068
Santa Fe, New Mexico 87501

RE: CASE NO. 10774
ORDER NO. R-9932

Dear Sir:

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

Sincerely,

Sally Leichtle
Sally E. Leichtle
Administrative Secretary

cc: BLM - Carlsbad



RAY B. POWELL
COMMISSIONER

State of New Mexico
OFFICE OF THE
Commissioner of Public Lands
Santa Fe

P.O. BOX 1148
SANTA FE, NEW MEXICO 87504-1148

July 19, 1993

Santa Fe Energy Operating Partners, L.P.
550 W. Texas
Suite 1330
Midland, Texas 79701

Attention: Mr. Curtis Smith

Re: Proposed Thistle Unit
Lea County, New Mexico

Dear Mr. Smith:

This office has reviewed the unexecuted copy of the unit agreement which you have submitted for the proposed Thistle Unit Area, Lea County, New Mexico. This agreement meets the general requirements of the Commissioner of Public Lands and has this date granted you preliminary approval as to form and content.

Preliminary approval shall not be construed to mean final approval of this agreement in any way and will not extend any short term leases, until final approval and an effective date have been given. Also, any well commenced prior to the effective date of this agreement which penetrates its objective horizon prior to said effective date shall not be construed as the initial test well.

When submitting your agreement for final approval, please submit the following:

1. Application for final approval by the Commissioner setting forth the tracts that have been committed and the tracts that have not been committed.
2. All ratifications from the Lessees of Record and Working Interest Owners. All signatures should be acknowledged by a notary and one set must contain original signatures.
3. Order of the New Mexico Oil Conservation Division. Our approval will be conditioned upon subsequent favorable approval by the New Mexico Oil Conservation Division.
4. A copy of the Unit Operating Agreement.

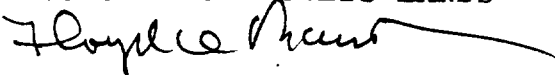
Yates Petroleum Corporation
Page 2
July 19, 1993

5. Designation from the Bureau of Land Management. Our Approval will be subject to like approval by the Bureau of Land Management.
6. The filing fee for a Unit Agreement is Thirty (\$30.00) Dollars for every section or partial section thereof. Please submit a filing fee in the amount of \$240.00.

If you have any questions, or if we may be of further help, please contact Pete Martinez at (505) 827-5791.

Very truly yours,

RAY B. POWELL
COMMISSIONER OF PUBLIC LANDS

BY: 

FLOYD O. PRANDO, Director
Oil/Gas and Minerals Division
(505) 827-5744
RBP/FOP/pm
cc: Reader File
OCD
BLM - Mr. Armando Lopez



RAY B. POWELL
COMMISSIONER

State of New Mexico
OFFICE OF THE
Commissioner of Public Lands
Santa Fe

P.O. BOX 1148
SANTA FE, NEW MEXICO 87504-1148

June 29, 1993

Santa Fe Energy Operating Partners, L. P.
550 W. Texas, Suite 1330
Midland, Texas 79701

Attention: Mr. Curtis D. Smith

Re: Proposed Thistle Unit
Lea County, New Mexico

Dear Mr. Smith:

This office is in receipt of your application for preliminary approval of the proposed Thistle Unit, Lea County, New Mexico.

We have also received an amended Exhibit which includes the E/2SW/4 of Section 20, Township 23 South, Range 33 East.

After careful consideration of your proposed application, we question why the above mentioned 80.00 acres should be included in the unit boundary and can this acreage be effectively controlled?

Before we can grant preliminary approval to the proposed Thistle Unit we would like further justification for keeping Tract No. 2, E/2SW/4, Sec. 20-23S-33E, 80.00 Acres in the unit. It is our opinion that if this acreage can not be effectively controlled then it should be eliminated.

If you have any questions, or if we may be of further help, please contact Pete Martinez at (505) 827-5791.

Very truly yours,

RAY B. POWELL
COMMISSIONER OF PUBLIC LANDS

BY: *Floyd O. Prando*
FLOYD O. PRANDO, Director
Oil/Gas and Minerals Division
(505) 827-5744
RBP/FOP/pm
cc: Reader File
BLM-Roswell Attn: Mr. Armando Lopez
OCD-Santa Fe