ROBERT N. ENFIELD No. 1 BUNNEL-FEDERAL: Elevation: 4100' DF

1-29-65: Building location and moving in cable tool.

1-30-65: Rigged up cable tool. Spudded, 3:00 p.m.

1-31-65: Drilling at 2' in lime.

2- 1-65: Drilling at 7' in lime.

2- 2-65: Drilling at 25' in lime.

2- 3-65: Drilling at 35' in lime.

2- 4-65: Drilling at 45' in lime.

2- 5-65: Drilling at 50' in lime.

2- 7-65: Drilling at 65' in lime.

2- 9-65: Drilling at 85' in lime and anhydrite.

2-10-65: Drilling at 90' in lime.

2-11-65: Drilling at 100' in lime.

2-12-65: Drilling at 110' in hard lime, dry hole.

2-13-65: Drilling at 115' in lime.

2-14-65: Drilling at 120' in hard lime.

2-15-65: Drilling at 123' in hard lime.

2-16-65: Drilling at 130' in hard lime.

2-17-65: Drilling at 135' in hard lime.

2-18-65: Drilling at 145' in lime.

2-19-65: Drilling at 150' in lime.

2-20-65: Drilling at 155' in hard lime.

2-21-65: Drilling at 160' in lime.

2-22-65: Drilling at 165' in lime.

2-23-65: Drilling at 170' in lime.

2-24-65: Drilling at 175' in lime.

2-25-65: Drilling at 185' in lime.

2-26-65: Drilling at 195' in hard line.

2-27-65: Drilling at 210' in lime, some gravel, no water.

2-28-65: Drilling at 215' in lime - 12½" hole.

3- 1-65: Drilling 12½" hole at 225' in lime. Hit a crevice; lost all fluid out of hole; hole is dry, no water in crevice. Anticipate possible crooked hole trouble.

3- 2-65: Drilling at 230' in lime.

3- 3-65: Drilling at 235' in lime.

3- 4-65: Drilling at 240' in lime. No indication that hole is going crooked. Just now far enough past crevice that hole is holding some water.

3- 5-65: Drilling at 255' in lime.

3- 6-65: Drilling at 270' in lime.

3- 7-65: Drilling at 285' in lime.

3- 9-65: Drilling at 315' in lime

3-10-65: Drilling at 330' in lime.

Robert N. Enfield
Exhibit No. 4
Indian Basin Field
Eddy County, NM
Case No. 8177

May 9, 1984

CASE 8177

ROBERT N. ENFIELD NO. 1 BUNNEL-FEDERAL:

3-11-65: Drilling at 335' in lime.

3-13-65: Drilling at 345' in lime. Hole is dry.

3-15-65: Drilling at 385' in lime. Hole is still dry.

3-16-65: Drilling at 400' in lime. Hole dry.

3-17-65: Drilling at 415' in lime.

3-18-65: Drilling at 420' in very hard lime.

3-19-65: T.D. 420', fishing.

3-19-65: Temporarily suspended operation. TD 427'

7-24-65: 13-3/8" at 222', 200 sax cement, 2% Calcium Chloride, 1/4# Flow Seal per sack. WOC.

7-25-65: 603'. Totco, 450', 1½°.

7-26-65: 1,125'. Totco, 950', 2%.

7-27-65: T.D. 1532'. Getting ready to run intermediate casing at that depth.

7-28-65: T.D. 1532'. Set 8-5/8" csg. at 1532' w/775 sax cement: (300 sax of 50-50 Poz., 8% gel, 2% ca-ch; 425 sax 50-50 Poz, 4% gel, 2% ca-chl; 50 sax neat) Plugged down at 5:00 a.m. 7/28/65. Cement did not circulate. Prep to go down back side. 775 / 250 / 1025

7-29-65: T.D. 1532'. WOC. Set 250 sacks neat, 7 sacks cal-chl. by stages.

7-30-65: T.D. 1532'. Prep to commence drilling.

7-31-65: Tested 8-5/8" with 1500#. Held okay. T.D. 2,000'. Totco at 1825' - 1½°.

8- 1-65: Drilling with water at 2985' in sandy lime. Totco at 2680' - 1½°.

8- 2-65: Drilling at 3240' in lime and chert. Totco at 3130' - ½°.

8- 3-65: Drilling at 3665' in lime. Totco at 3378' - 1°; 3530' --2°; 3620' - 2°.

8- 4-65: Drilling at 3965' in lime. Totco at 3950' - 2-3/4°.

8- 5-65: T.D. 4220' in lime. Making a trip for hole in drill pipe. Totco: 4007' - 3°; 4078' - 3°; 4179' - 3°.

8- 6-65: Drilling with water at 4565', lime. Totco, 4540' - 4°.

8-9-65: Drilling at 5600' in lime and shale. Totco, 5530': 2¼°. Mud: 34 Visc., 8.4 weight, water loss - 10, filter cake - 1/32. Mudded up at 5200'.

8-10-65: Drilling at 5915' in lime. Totco, 5700' - 3°. MUD: Visc., 34; wt., 8.7; water loss, 12; filter cake, 1/32.

8-11-65: Drilling at 6295' in lime. Totco, 6120' - 2½°. MUD: Visc - 35, wt - 28, wl - 28, filter cake - 1/32.

T.D. 6325', prep to DST the Wolfcamp. Interval: 6050' - 6325'. Tool open at 3:30 P.M.

8-12-65: Drilling at 6460' in lime. Totco, (?) 5320' - 2° (Assume 6420')

DST No. 1, 6050' - 6325', Wolfcamp. Tool open one hr. Gas to surface in 10 min. Too small to measure. Estimated 30-40,000 CFPD. Continued to gas throughout - TSTM. Rec. 830' slight oil and highly gas cut mud plus 220' slight oil and gas and salt water cut mud. Pressures: 60" initial shut-in, 2363#. Flow pressure, 330-488. 60" FSI, 2297#. Hydrostatic, 2930- 2930#, in & out.

T/Bone Spring, 2830' (+1370')

T/Wolfcamp (Grn) Shale, 5280' (+1180')

ROBERT N. ENFIELD NO. 1 BUNNEL-FEDERAL:

8-13-65: Drilling at 6745' in lime and shale. Totco at 6740' - 1°. MUD: visc., 35; wt., 8.7; water loss, 8; filter cake, 1/32.

8-16-65: T.D. 7400'. Prep. to DST #2, interval from 7000' to 7400', (Cisco-Canyon). Tool open: 2 hrs. GTS: 4 min. Est. 900 MCF, decreasing to 600 MCF. Recovered 300' heavy gas cut mud. Pressures: 1 hr ISI, 2867#; FP, 240-270#; 2 hr FSI, 3021#.

8-17-65: T.D. 7500'. Prep to DST #3, 7395'-7500'. Tool will be open about 3:30 P.M.

8-18-65: T.D. 7500'. Expect to Commence logging at 11:00 A.M. DST #3, 7395' - 7500'. Initial shut-in, 1 hr. No pressure; tool failed. Flow pressure: open one hour. Small to fair blow thruout test. Recovered 45' of gas cut mud. FP, 45-45#. 60" FSIP, 1054#. Hydro. head, 3503#, in & out.

Sample top/Cisco-Canyon lime, 6990'.

8-19-65: T.D. 7500'. Circulating. WOO. Ran Schlumberger logs: Electrical Log Induction, Gamma-Ray Density, Sidewall Neutron porosity Log. Went back in hole with drill pipe, prep to lay down drill pipe.

Log top/ Cisco Canyon, 6990'.

8-20-65: T.D. 7500'. WOC. Set 4½" casing at 7500' with 350 sacks Incor Poz with 2% gel.

8-23-65: T.D. 7500'. Prep to perforate 7442-48, 7408-18, 7310-36 (vo. 7330) with one shot per foot.

8-24-65: T.D. 7500'. Plug back, 7365'. Testing above perforations with 500 gallons acid.

8-25-65: T.D.7500'. Testing. Perforated 7320-30 (note correction), 7408-18, 7442-48 with 1 jet shot per foot. Went in hole with 2" tbg. Set retrievable plug at 7460'. Set packer at 7385'. Acidized perfs 7408-18 and 7442-48 w/500 gals. Swabbed back acid water and acid gas. No shows. Pulled retrievable plug up to 7365'. Pulled packer to 7302'. Acidized perfs 7320-30 with 500 gals. Swabbed back acid water and well started flowing gas at estimated rate of 500 MCFD. Re-acidized perfs 7320-30 with 2500 gallons acid. Swabbed and started flowing at estimated rate of 1500 MCFD. Re-acidized perfs 7320-30 with 10,000 gals. retarded acid. Swabbing back acid water.

8-26-65: T.D. 7500'. Plug back T.D., 7365'. Testing. Swabbed perfs 7320-30 of acid water. Well started flowing an estimated 600 MCFPD. Now testing tubing and packer for a leak.

8-27-65: T.D. 7500. PB T.D., 7365'. Prep to run tracer survey. Lowered packer and tested in blank pipe. Showed packer leakage. Pulled packer, bridge plug, and tubing. Perforated 7260-88' with one jet shot per foot. Went back in hole with BP, Pkr & tbg. Set BP at 7302'. Set Pkr at 7239'. Acidized perfs 7260-88' with 1,000 gals. Formation started taking fluid immediately. Maximum treating pressure, 3600#. Initial Shut Down Pressure, 2300#. Treatment pressure indicated possible communication. After swabbing acid water, well started flowing at 600 MCFPD. Lowered BP to 7365'. Set Pkr at 7302'. Pumped water into perfs 7320-30'. Water communicated and flowed out annulus.

8-28-65: T.D. 7500'. Ran tracer survey. Survey showed communication from 7330-7156'. Pulled bridge plug, packer, & 2" tbg. Squeezed with 200 sacks through perfs 7260-88', 7320-30', 7408-18', & 7442-88'. Tested w/5,000#. Held okay.

8-29-65: WOC.

8-30-65: Prep to drill out cement.

ROBERT N. ENFIELD NO. 1 BUNNEL FEDERAL:

8-31-65: T.D. 7500'. PB TD, 7450'. Prep to swab. Drilled out cement to 7450'. Pressured up with 2,000# at 7300', 7375', 7450'. Pressured up w/3800# @ 7450'. Held okay. Ran correlation log to drilled out TD 7438' by log. Perforated one jet shot per foot at 7323'-24'-25'. Perforated one jet shot per ft. at 7266-68-70-72-74-76-78-80. Ran BP, pkr and 2" tbg in hole. Set BP @ 7383'. Spotted acid @ 7320'. Set pkr at 7293'. Started pumping 500 gals. acid into perfs 7323-24-25'. Formation started taking fluid at 4400#. Broke back to 3800#. After 200 gals, acid communicated to upper perforations. Moved packer to 7246'. Pumped remaining 300 gals acid into formation @ 3000#. Five Min. shut-in press., 2500#.

9- 1-65: T.D. 7500'. PBTD, 7246'. Testing. Swabbed acid water from perfs 7323-24-25' and perfs 7266-68-70-72-74-76-78-80'. Swabbed dry. Set BP @ 7246 & pulled tbg to 7130'. Perf'd 7206-24- w/1 JSPF. Set pkr. @ 7157'. Acidized perfs 7206-24 w/500 gals. mud acid. Formation started taking fluid @ 2300#. Initial shut down pressure, 3600#. Swabbed acid water w/show gas. TSTM. Checking for leak in BP.

compl'd zone

9- 2-65: T.D. 7500'. PBTD, 7157'. Swabbing acid water & gas @ rate of about 400 MCFPD. Set BP @ 7157'. Perf'd 7126-33' w/1 JSPF. Spotted 500 gals. mud acid at 7133'. Set pkr @ 7030'. Pumped acid away. Swabbed back acid water and small amount of gas, TSTM. Re-acidized perfs 7126-33' w/2,000 gals. acid and now swabbing back and getting twice as much gas as before, estimated 400 to 500 MCFPD and looks as if it might still be improving slightly.

9- 3-65: T.D. 7500'. PBTD, 7157'. Shut in for 6-hour period. First hour built up to 675# surface pressure; in six hours, 1750#. Continued to flow at estimated rate of 500 MCFPD. Reacidized with 10,000 gals. retarded acid. Shut in for six hours. Started swabbing back acid water.

9-4-65: T.D. 7500'. PBTD, 7157'. Swabbed back acid water. Well kicked off and flowed 924 MCFPD. 1-hr. SIP, 975#.

9-5-65: Flowing well to clean up.

9-7-65: 18 hr. SIP 2250#. Flowed on 22/64" choke for one hr. FTP 500#. Est. vol. 1.5 MMCF.

9- 8-65: T.D. 7500'. PBTD, 7157'. Prep to reacidize perfs 7126-33'.

4:30 p.m.: Treated with 18,000 gals. of 15% retarded acid plus 8,000 gals. 2% acid overflush. Average injection rate of 5 bbls per min. Maximum treating pressure, 3900#. Initial shutdown pressure, 3000#. Shut-in. ~~Will commence swabbing at 5:30 tonight.~~

9-9-65: T.D. 7500'. PBTD, 7157' Opened well at 5:30 p.m. Acid water flowed back and well kicked off. Now flowing gas and acid water. Well still cleaning up.

9-10-65: T.D. 7500'. PBTD, 7157'. Testing. Well still cleaning up. Flowing gas and acid water through 3/4" choke at 75#.

9-13-65: T.D. 7500'. PBTD, 7157'. Same as above, but possibly a little less water. Samples have been taken, one last night and one this morning, to Western Co.

9-14-65: TD 7500'. PBTD, 7157'. Flowing gas and small amt. of water thru 3/4" choke at 80#. Flowed well on various choke sizes: 22/64" choke, 320#; 10/64" choke, 575#; 20/64" choke, 500#. Shut in pressure after one hour, 955#.

9-15-65: TD, 7500'. PBTD, 7157'. Flowing back acid water and distillate. Estimate 75% acid water and 25% distillate.

9-16-65: TD, 7500'. Pbtd, 7157'. Shut in. Waiting on potential. 18 hr. shut-in pressure, 2050#. Yesterday well flowing on 3/4" choke at 100#.

9-17-65: TD, 7500'. PBTD, 7157'. Shut in.

9-18-65 through 9-22-65: Shut in. Awaiting potential.

9-23-65: Flowing on potential test.

9-24-65: Shut in. 72-hr. shut in pressure, 2525#. Presently flowing on potential on 3/4" choke at 200#. Estimated 3,000,00 cubic feet per day.

9-27-65: Initial Potential: Flowed 2 million CFGPD thru 3/4" choke. Flowing tbg press, 130#. 4-Pt. test will be filed later when pipeline connection is made.

Completed 9-24-65. FINAL REPORT.

NEW MEXICO OIL CONSERVATION COMMISSION

Form C-122
Revised 12-1-55

MULTI-POINT BACK PRESSURE TEST FOR GAS WELLS

Pool Indian Basin Formation Cisco County Eddy

Initial x Annual Special Date of Test 2-25-66

Company Robert N. Enfield Lease Bunnel Federal Well No. I

Unit P Sec. I8 Twp. 2I s Rge. 23 e Purchaser None

Casing 4 I/2 Wt. II.6 I.D. 4.090 Set at 7500 Perf. 7I26 To 7I33

Tubing 2 3/8 Wt. 4.70 I.D. I.995 Set at 7038 Perf. None To -

Gas Pay: From 7I26 To 7I33 L 7I26 xG .6200 -GL 44I8 Bar.Press. I3.2

Producing Thru: Casing Tubing x Type Well Single
Single-Bradenhead-G. G. or G.O. Dual

Date of Completion: 9-24-65 Packer 7030 Reservoir Temp. I42°F

OBSERVED DATA

Tested Through ~~(Xxxxxx)~~ ~~(Xxxxx)~~ (Meter) Type Taps Flange

No.	Flow Data (Prover) (Line) Size	Flow Data (Choke) (Orifice) Size	Flow Data Press. psig	Flow Data Diff. h_w	Flow Data Temp. °F.	Tubing Data Press. DWT psig	Tubing Data Temp. °F.	Casing Data Press. psig	Casing Data Temp. °F.	Duration of Flow Hr.
SI						2324		Pkr	-	72.0
1.	4"	I0/64 I.50	780	I	I00	I976	60	-	-	3.0
2.	4"	II/64 I.50	790	2	I00	I865	60	-	-	3.0
3.	4"	I3/64 I.50	800	6	99	I542	60	-	-	4.0
4.	4"	I5/64 I.50	800	20	98	I465	62	-	-	6.0
5.										

FLOW CALCULATIONS

No.	Coefficient (24-Hour)	$\sqrt{h_w p_f}$	Pressure psia	Flow Temp. Factor F_t	Gravity Factor F_g	Compress. Factor F_{pv}	Rate of Flow Q-MCFPD @ 15.025 psia
1.	I3.99	28.I64	793.2	.9636	.9837	I.053	393.27
2.	I3.99	40.074	803.2	.9636	.9837	I.055	560.65
3.	I3.99	69.838	8I3.2	.9645	.9837	I.058	980.76
4.	I3.99	I27.528	8I3.2	.9653	.9837	I.058	I792.40
5.							

PRESSURE CALCULATIONS

Gas Liquid Hydrocarbon Ratio Dry Gas cf/bbl. Specific Gravity Separator Gas .6200
Gravity of Liquid Hydrocarbons - deg. Specific Gravity Flowing Fluid -
P_c 9.936 $(1-e^{-s})$ .262 P_c 2337.2 P_c^2 5462.5

No.	~~P_w~~ P_t (psia)	P_t^2	F_cQ	$(F_cQ)^2$	$\frac{(F_cQ)^2}{(1-e^{-s})}$	P_w^2	$P_c^2-P_w^2$	Cal. P_w	$\frac{P_w}{P_c}$
1.	I989.2	3956.9	3.908	I5.27	4.00	3960.9	I50I.6	-	-
2.	I878.2	3527.6	5.57I	3I.04	8.I3	3535.7	I926.8	-	-
3.	I555.2	24I8.6	9.745	94.97	24.88	2443.5	30I9.0	-	-
4.	I478.2	2I85.I	I7.809	3I7.I6	83.I0	2268.2	3I94.3	-	-
5.									

Absolute Potential: 2060 MCFPD; n I.29

COMPANY Robert N. Enfield

ADDRESS P. O. Box 807 Roswell, New Mexico

AGENT and TITLE COLEMAN PETROLEUM ENGINEERING COMPANY Joe A. Coleman

WITNESSED Lee Harvard

COMPANY Robert N. Enfield

REMARKS

CASE 8177

P6/6