

State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
Santa Fe, New Mexico 87505



OIL CONSERVATION DIVISION



February 8, 1995

B
PMX-167
PDEV0020700167

Texaco Exploration and Production, Inc.
P. O. Box 730
Hobbs, New Mexico 88241-0730

Attention: Terry L. Frazier

**RE: Injection Pressure Increase
Vacuum Grayburg San Andres Unit
Pressure Maintenance Project
Lea County, New Mexico**

Dear Mr. Frazier:

Reference is made to your request dated January 12, 1995, to increase the surface injection pressure on three wells within the Vacuum Grayburg San Andres Unit Pressure Maintenance Project. This request is based on step rate tests conducted on these wells during November, 1995. The results of the tests have been reviewed by my staff and we feel an increase in injection pressure on these wells is justified at this time.

You are therefore authorized to increase the surface injection pressure on the following wells:

Well and Location	Maximum Injection Surface Pressure
VGSAU No. 148 Unit D, Section 1, Township 18 South, Range 34 East, NMPM;	1650 PSIG
VGSAU No. 149 Unit C, Section 1, Township 18 South, Range 34 East, NMPM;	1845 PSIG

VILLAGRA BUILDING - 408 Galisteo
Forestry and Resources Conservation Division
P.O. Box 1948 87504-1948
827-5830
Park and Recreation Division
P.O. Box 1147 87504-1147
827-7465

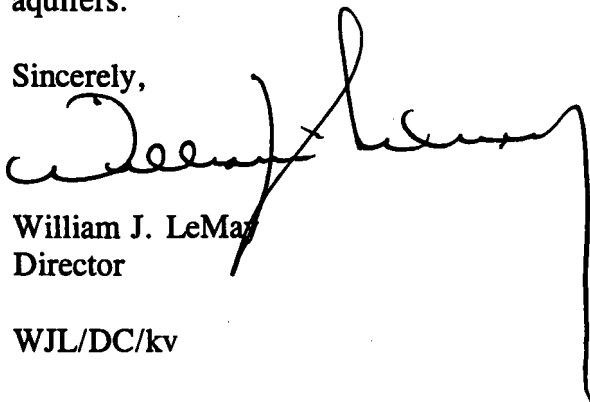
2040 South Pacheco
Office of the Secretary
827-5950
Administrative Services
827-5925
Energy Conservation & Management
827-5900
Mining and Minerals
827-5970
Oil Conservation
827-7131

Injection Pressure Increase
Texaco Exploration and Production, Inc.
February 8, 1995
Page 2

Well and Location	Maximum Injection Surface Pressure
VGSAU No. 150 Unit G, Section 1, Township 18 South, Range 34 East, NMPM.	1610 PSIG
All wells located in Lea County, New Mexico.	

The Division Director may rescind this injection pressure increase if it becomes apparent that the injected water is not being confined to the injection zone or is endangering any fresh water aquifers.

Sincerely,



William J. LeMay
Director

WJL/DC/kv

cc: Oil Conservation Division - Hobbs
File: PMX-167
R. Brown
D. Catanach

NO WAITING PERIOD

COMPANY: Texas Exploration and Production, Inc.
ADDRESS: P.O. Box 730
CITY, STATE, ZIP: Hobbs, New Mexico 88241-0730
ATTENTION: Terry L. Frazier

Re: Injection Pressure Increase
Vacuum Crayburg San Andres Unit
Pressure Maintenance Project
Lea County, New Mexico

Dear Sir:

Reference is made to your request dated January 12, 1995, to increase the surface injection pressure on three wells within the Vacuum Crayburg San Andres Unit Pressure Maintenance Project. This request is based on step rate tests conducted on these wells during November, 1995. The results of the tests have been reviewed by my staff and we feel an increase in injection pressure on these wells is justified at this time.

You are therefore authorized to increase the surface injection pressure on the following wells:

<u>Well & Location</u>	<u>Maximum Injection Surface Pressure</u>
<u>VGSAL No. 148</u> <u>Unit D, Section 1, T-18 South, R-34E & L NPM</u>	<u>1650 PSIG</u>
<u>VGSAL No. 149</u> <u>Unit C, Section 1, T-18 South, R-34E & L NPM</u>	<u>1845 PSIG</u>
<u>VGSAL No. 150</u> <u>Unit G, Section 1, T-18 South, R-34E & L NPM</u>	<u>1610 PSIG</u>
<u>All in Lea County, New Mexico</u>	

The Division Director may rescind this injection pressure increase if it becomes apparent that the injected water is not being confined to the injection zone or is endangering any fresh water aquifers.

xc: T. ~~GALLEGOS~~ D. CATANACH FILE- PMX-167 OCD- Hobbs
R. Brown



Texaco E & P

PO Box 730
Hobbs NM 88241-0730
505 393 7191

OIL CONSERVATION DIVISION

RECEIVED

'95 JAN 20 AM 8 52

January 12, 1995

Mr. David R. Catanach
New Mexico Energy, Minerals, and Natural Resources Department
Oil Conservation Division
State Land Office Building
310 Old Santa Fe Trail
P.O. Box 2088
Sante Fe, New Mexico 87504

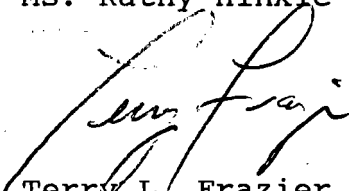
SUBJECT: REQUEST FOR INCREASED SURFACE INJECTION PRESSURE ON
SELECTED WELLS IN THE VACUUM GRAYBURG SAN ANDRES UNIT
LEA COUNTY, NEW MEXICO

Mr. David Catanach:

Texaco Exploration and Production, Inc. requests that the surface injection pressure limit be increased for the three wells on the attached list. The requested increases are based on step rate tests which are attached for your review.

The increases in surface injection pressure are necessary to maintain adequate injection rates, thus insuring the optimum performance of the waterflood.

If you have any questions or require additional information, please contact Ms. Kathy Hinkle at (505) 397-0427.


Terry L. Frazier
Hobbs Area Manager

KJH

cc: Mr. Jerry Sexton
Oil Conservation Division
P.O. Box 1980
Hobbs, NM 88240

DMX-167

Vacuum Grayburg San Andres Unit
Texaco Exploration and Production, Inc.
Lea County, New Mexico

<u>Well</u>	<u>Present Allow. Inj. Press. (PSIG)</u>	<u>Observed Surface Parting Press. (PSIG)</u>	<u>Requested Allow. Inj. Press. (PSIG)</u>
VGSAU No. 148	850	1700	1650
VGSAU No. 149	826	1895	1845
VGSAU No. 150	827	1660	1610

148- D- 1A-34
149- C- 1- 1A-34
150 G- 1- 1A-34

WEST-TEST, INC.

A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY
Hobbs, New Mexico

STEP RATE INJECTION TEST

CLIENT: TEXACO EXPLORATION AND PRODUCTION

DATE: NOVEMBER 15, 1994

WELL NAME: VACUUM GRAYBURG SAN ANDRES UNIT NO. 150
LEA COUNTY, NEW MEXICO

WO#: 94-14-1844

PERFS = 4137-4519

PACKER DEPTH = 4074

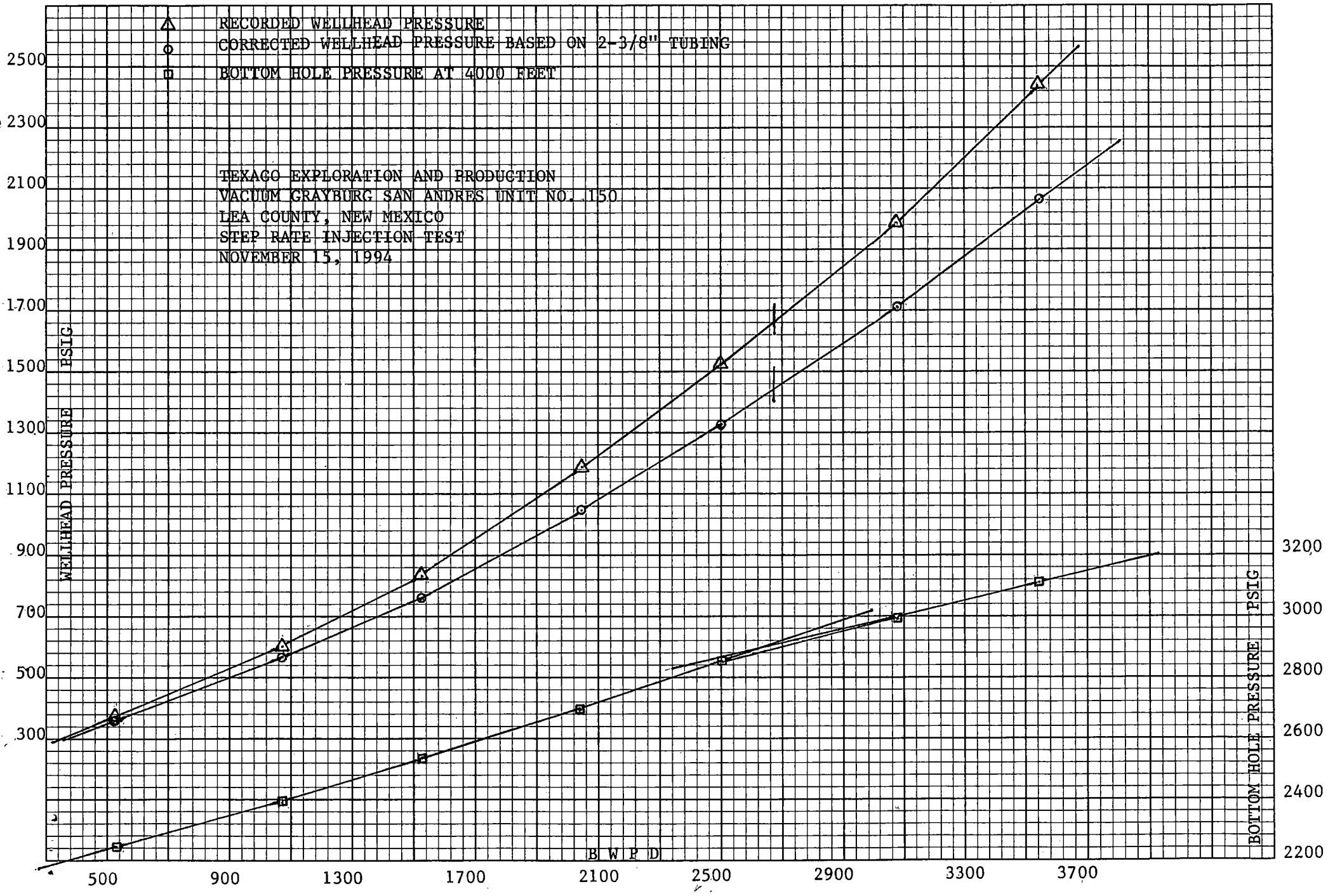
BHP GAUGE DEPTH = 4000

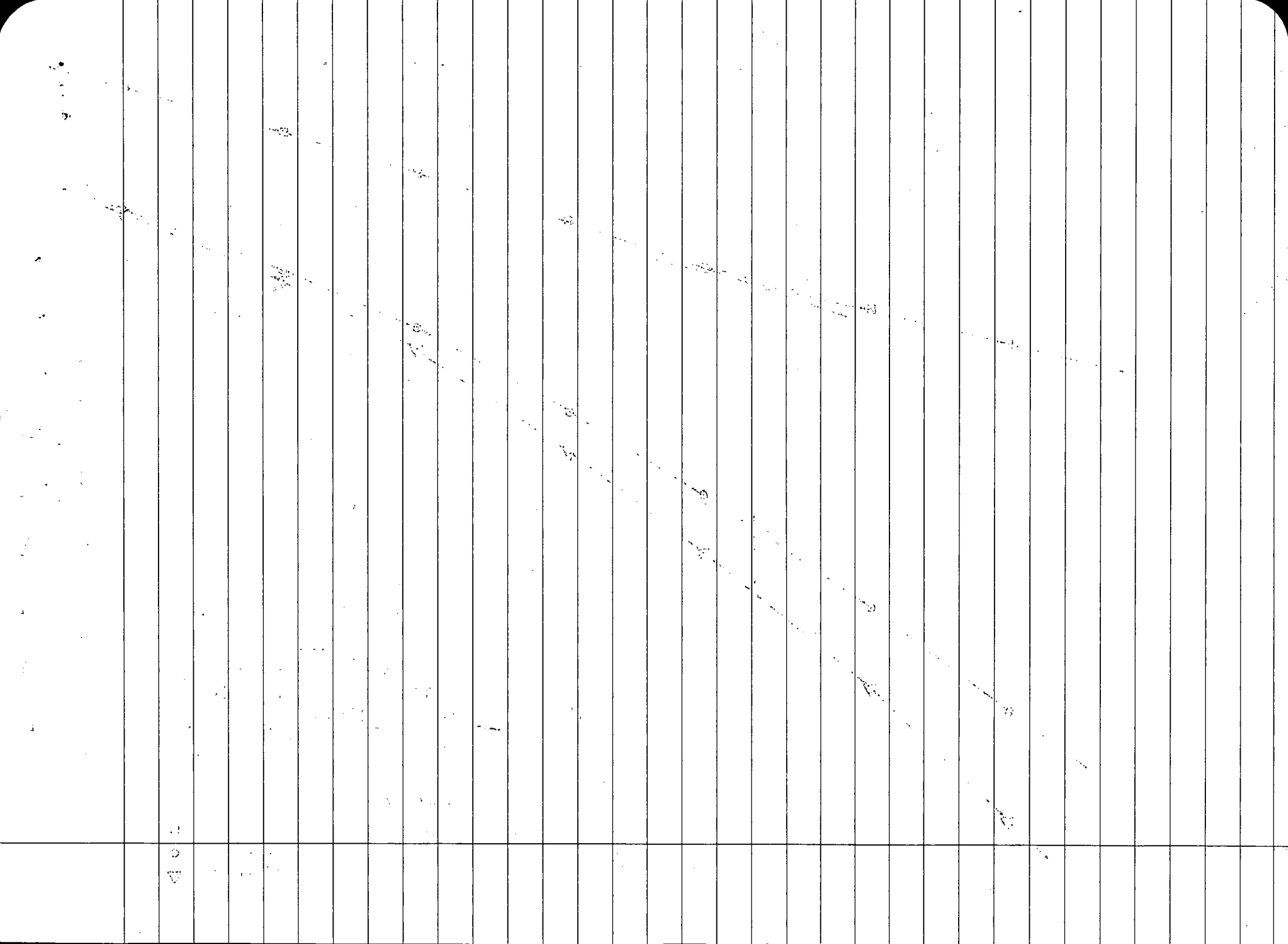
STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psi)	(5) CORRECTED TUBING PRESS. (psi) (1)-(4)	(6) INJECTION RATE (gpm) (3)/24.2857	(7) MEASURED BHP (psi)
1	8:50	222.0				222.0		2108.0
	8:55	336.9	1.8	518.4	10.234	326.7	15.12	2195.8
	9:00	345.7	3.6	518.4	10.234	335.5	15.12	2215.5
	9:05	354.6	5.5	547.2	11.310	343.3	15.96	2224.4
	9:10	362.1	7.4	547.2	11.310	350.8	15.96	2232.2
	9:15	372.3	9.2	518.4	10.234	362.1	15.12	2237.3
	9:20	377.3	11.1	547.2	11.310	366.0	15.96	2240.6
				532.8				
	9:25	529.3	14.8	1065.6	38.811	490.5	31.08	2318.6
	9:30	544.6	18.5	1065.6	38.811	505.8	31.08	2346.6
2	9:35	558.6	22.3	1094.4	40.774	517.8	31.92	2365.1
	9:40	572.6	26.0	1065.6	38.811	533.8	31.08	2375.0
	9:45	587.9	29.7	1065.6	38.811	549.1	31.08	2382.5
	9:50	596.8	33.5	1094.4	40.774	556.0	31.92	2391.4
				1075.2				
	9:55	779.5	38.7	1497.6	72.843	706.7	43.68	2460.0
	10:00	807.5	44.0	1526.4	75.456	732.0	44.52	2489.1
	10:05	815.2	49.3	1526.4	75.456	739.7	44.52	2503.4
	10:10	824.1	54.7	1555.2	78.110	746.0	45.36	2515.2
	10:15	831.7	60.0	1526.4	75.456	756.2	44.52	2526.6
3	10:20	830.4	65.4	1555.2	78.110	752.3	45.36	2531.5
				1531.2				
	10:25	1104.0	72.8	2131.2	139.914	964.1	62.16	2621.0
	10:30	1106.5	79.6	1958.4	119.653	986.8	57.12	2642.0
	10:35	1123.1	86.6	2016.0	126.244	996.9	58.80	2657.7
	10:40	1137.2	93.7	2044.8	129.601	1007.6	59.64	2671.5
	10:45	1153.8	100.9	2073.6	132.998	1020.8	60.48	2683.8
	10:50	1181.9	108.1	2073.6	132.998	1048.9	60.48	2694.5
				2049.6				

STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psi)	(5) CORRECTED TUBING PRESS. (psi) (1)-(4)	(6) INJECTION RATE (gpm) (3)/34.2857	(7) MEASURED BHP (psi)
5	10:55	1471.3	116.8	2505.6	188.752	1282.5	73.08	2773.7
	11:00	1490.4	125.5	2505.6	188.752	1301.6	73.08	2794.1
	11:05	1500.6	134.2	2505.6	188.752	1311.8	73.08	2808.3
	11:10	1503.1	142.9	2505.6	188.752	1314.3	73.08	2824.5
	11:15	1518.4	151.5	2476.8	184.758	1333.6	72.24	2835.6
	11:20	1520.9	160.2	2505.6	188.752	1332.1	73.08	2843.2
				2500.8				
	11:25	1970.2	170.6	2995.2	262.599	1707.6	87.36	2942.3
	11:30	1984.0	181.4	3110.4	281.588	1702.4	90.72	2964.0
	11:35	2014.4	192.2	3110.4	281.588	1732.8	90.72	2980.2
6	11:40	1974.2	203.0	3110.4	281.588	1692.6	90.72	2987.5
	11:45	1964.8	213.6	3052.8	272.017	1692.8	89.04	2996.1
	11:50	1981.0	224.3	3081.6	276.784	1704.2	89.88	2997.9
				3081.6				
	11:55	2351.1	236.4	3484.8	347.483	2003.6	101.64	3060.8
7	12:00	2377.7	248.5	3484.8	347.483	2030.2	101.64	3075.4
	12:05	2404.4	260.8	3542.4	358.183	2046.2	103.32	3093.8
	12:10	2420.8	273.2	3571.2	363.589	2057.2	104.16	3105.6
	12:15	2439.8	285.6	3571.2	363.589	2076.2	104.16	3114.6
	12:20	2429.3	298.1	3600.0	369.032	2060.3	105.00	3113.8
				3542.4				
FALLOFF	12:21	974.2				974.2		2863.5
	12:22	923.1				923.1		2807.0
	12:23	883.4				883.4		2764.2
	12:24	852.7				852.7		2730.4
	12:25	827.1				827.1		2701.0
	12:30	734.8				734.8		2598.9
	12:35	673.3				673.3		2530.6

- △ RECORDED WELLHEAD PRESSURE
- CORRECTED WELLHEAD PRESSURE BASED ON 2-3/8" TUBING
- BOTTOM HOLE PRESSURE AT 4000 FEET

TEXAGG EXPLORATION AND PRODUCTION
 VACUUM GRAYBURG SAN ANDRES UNIT NO. 150
 LEA COUNTY, NEW MEXICO
 STEP RATE INJECTION TEST
 NOVEMBER 15, 1994





WEST-TEST, INC.

A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY
Hobbs, New Mexico

STEP RATE INJECTION TEST

CLIENT: TEXACO EXPLORATION AND PRODUCTION

DATE: NOVEMBER 11, 1994

WELL NAME: VACUUM GRAYBURG SAN ANDRES UNIT NO. 148
LEA COUNTY, NEW MEXICO

WO#: 94-14-1842

PERFS = 4320-4710

PACKER DEPTH = 4145

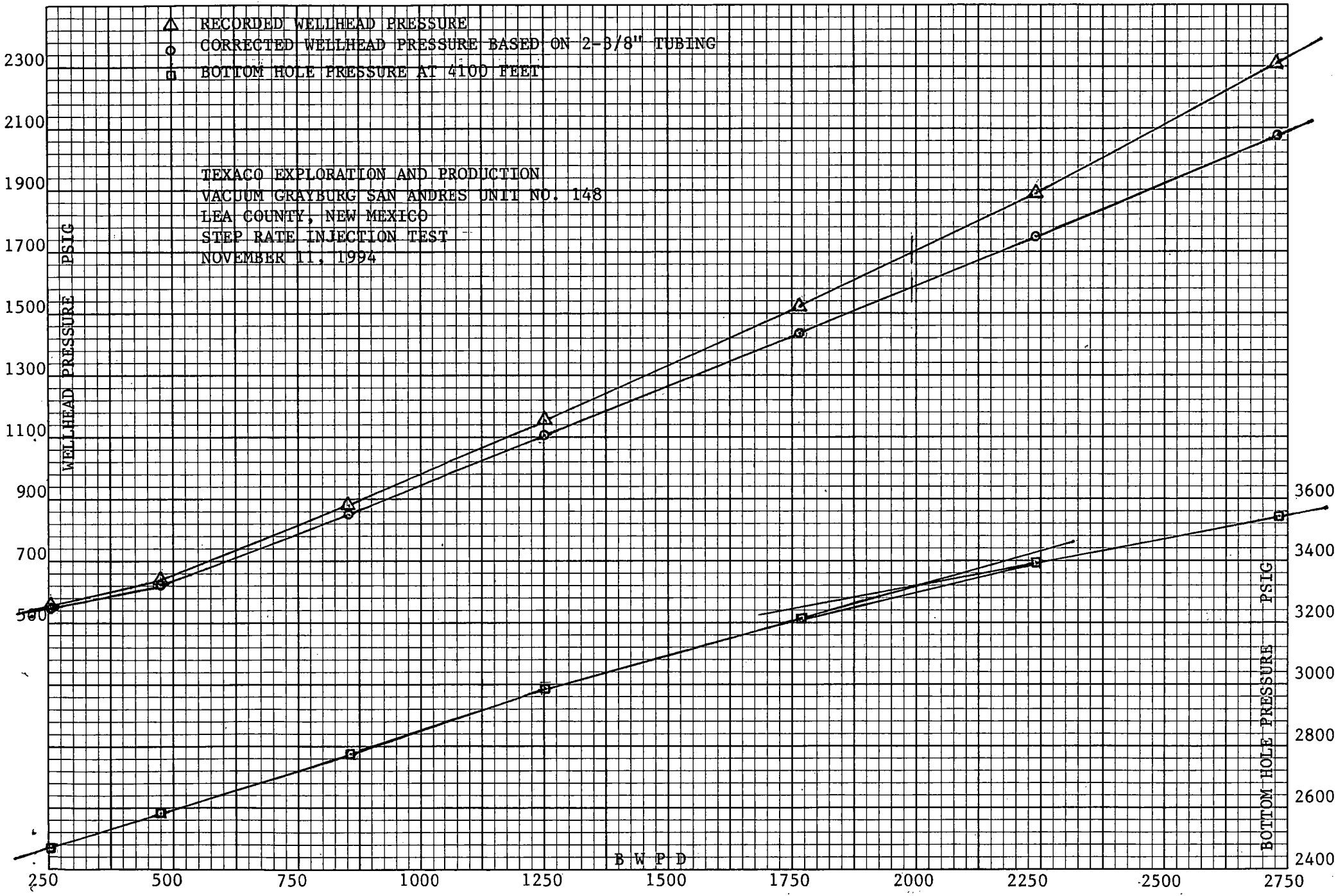
BHP GAUGE DEPTH = 4100

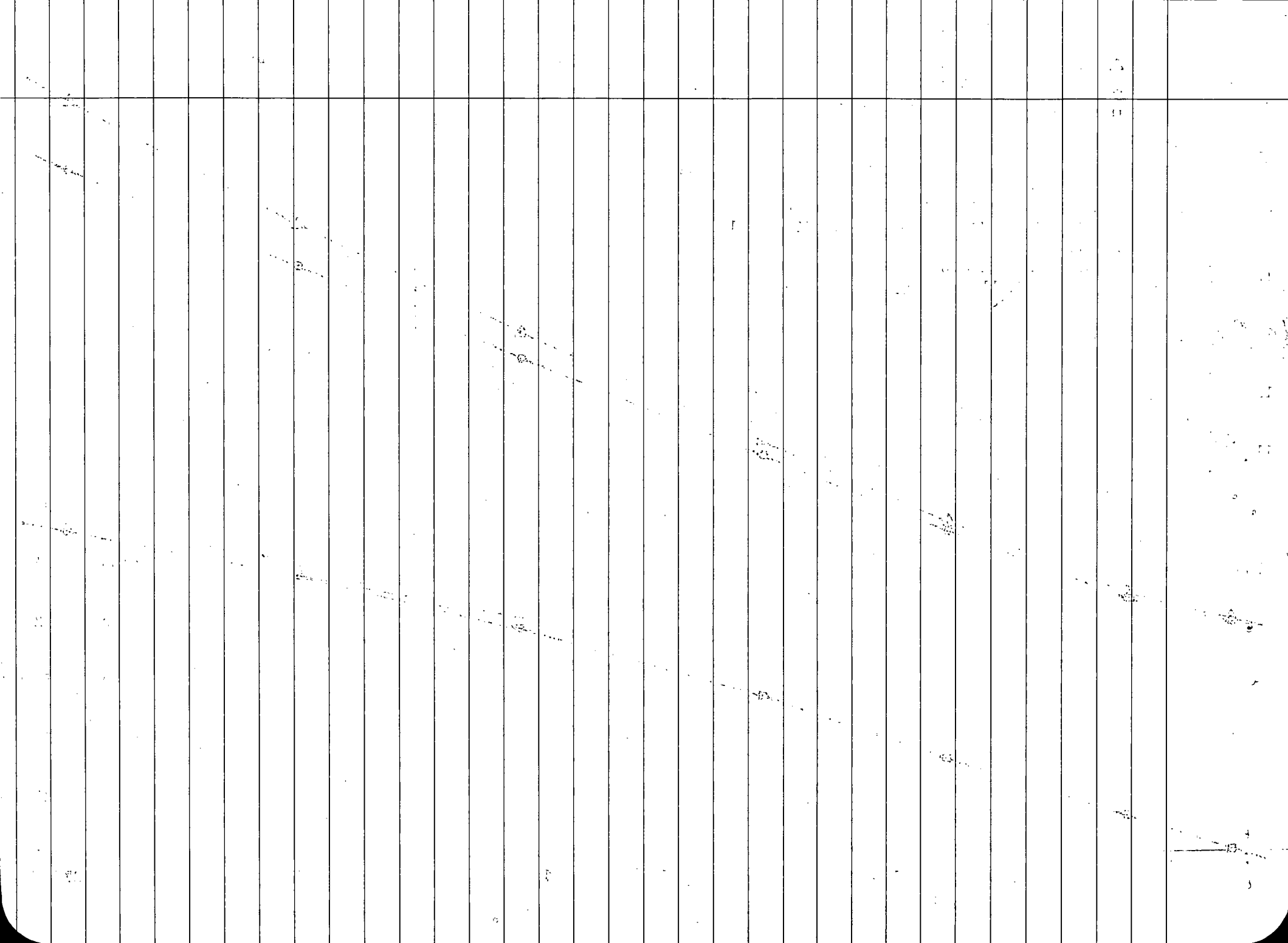
STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psi)	(5) CORRECTED TUBING PRESS. (psi) (1)-(4)	(6) INJECTION RATE (gpm) (3)/24.2857	(7) MEASURED BHP (psi)
1	8:55	361.2				361.2		2324.3
	9:00	463.2	0.9	259.2	2.910	460.3	7.56	2422.0
	9:05	475.8	1.8	259.2	2.910	472.9	7.56	2439.9
	9:10	514.1	2.7	259.2	2.910	511.2	7.56	2452.4
	9:15	492.3	3.6	259.2	2.910	489.4	7.56	2460.8
	9:20	535.7	4.5	259.2	2.910	532.8	7.56	2469.1
	9:25	552.3	5.3	230.4	2.340	550.0	6.72	2469.8
				254.4				
	9:30	593.2	7.0	489.6	9.437	583.8	14.28	2527.9
	9:35	605.9	8.7	489.6	9.437	596.5	14.28	2545.6
2	9:40	627.6	10.3	460.8	8.436	619.2	13.44	2555.1
	9:45	627.5	11.9	460.8	8.436	619.1	13.44	2562.8
	9:50	642.7	13.5	460.8	8.436	634.3	13.44	2570.1
	9:55	635.0	15.2	489.6	9.437	625.6	14.28	2580.5
				475.2				
	10:00	817.7	18.2	864.0	26.989	790.7	25.20	2687.5
3	10:05	812.4	21.2	864.0	26.989	785.4	25.20	2717.7
	10:10	864.7	24.2	864.0	26.989	837.7	25.20	2735.2
	10:15	847.9	27.2	864.0	26.989	820.9	25.20	2751.7
	10:20	851.6	30.1	835.2	25.348	826.3	24.36	2763.1
	10:25	883.5	33.1	864.0	26.989	856.5	25.20	2773.8
				859.2				
4	10:30	1088.0	37.4	1238.4	52.532	1035.5	36.12	2894.1
	10:35	1114.7	41.8	1267.2	54.814	1059.9	36.96	2918.2
	10:40	1131.3	46.2	1267.2	54.814	1076.5	36.96	2943.1
	10:45	1141.5	50.5	1238.4	52.532	1089.0	36.12	2957.5
	10:50	1138.9	54.9	1267.2	54.814	1084.1	36.96	2972.7
	10:55	1154.3	59.2	1238.4	52.532	1101.8	36.12	2985.9
				1252.8				

STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psi)	(5) CORRECTED TUBING PRESS. (psi) (1)-(4)	(6) INJECTION RATE (gpm) (3)/24.2857	(7) MEASURED BHP (psi)
5	11:00	1442.4	65.3	1756.8	100.315	1342.1	51.24	3113.4
	11:05	1475.7	71.5	1785.6	103.378	1372.3	52.08	3145.0
	11:10	1477.1	77.7	1785.6	103.378	1373.7	52.08	3165.8
	11:15	1489.9	83.8	1756.8	100.315	1389.6	51.24	3180.0
	11:20	1497.6	90.0	1785.6	103.378	1394.2	52.08	3196.8
	11:25	1528.4	96.1	1756.8	100.315	1428.1	51.24	3212.1
				1771.2				
	11:30	1829.2	104.0	2275.2	161.851	1667.3	66.36	3336.1
	11:35	1844.6	111.7	2217.6	154.352	1690.2	64.68	3355.5
	11:40	1863.7	119.5	2246.4	158.081	1705.6	65.52	3379.9
6	11:45	1881.5	127.3	2246.4	158.081	1723.4	65.52	3373.4
	11:50	1890.3	135.1	2246.4	158.081	1732.2	65.52	3384.6
	11:55	1896.7	142.8	2217.6	154.352	1742.3	64.68	3396.6
				2241.6				
	12:00	2231.2	152.3	2736.0	227.664	2003.5	79.80	3511.0
7	12:05	2242.7	161.8	2736.0	227.664	2015.0	79.80	3534.4
	12:10	2306.8	171.3	2736.0	227.664	2079.1	79.80	3553.5
FALLOFF	12:11	1182.2				1182.2		3195.5
	12:12	1142.5				1142.5		3151.2
	12:13	1110.5				1110.5		3117.6
	12:14	1082.4				1082.4		3088.6
	12:15	1059.3				1059.3		3062.5
	12:20	974.8				974.8		2970.3
	12:25	921.1				921.1		2910.9

- △ RECORDED WELLHEAD PRESSURE
- CORRECTED WELLHEAD PRESSURE BASED ON 2-3/8" TUBING
- BOTTOM HOLE PRESSURE AT 4100 FEET

TEXACO EXPLORATION AND PRODUCTION
 VACUUM GRAYBURG SAN ANDRES UNIT NO. 148
 LEA COUNTY, NEW MEXICO
 STEP RATE INJECTION TEST
 NOVEMBER 11, 1994





A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY
Hobbs, New Mexico

STEP RATE INJECTION TEST

CLIENT: TEXACO EXPLORATION AND PRODUCTION

DATE: NOVEMBER 14, 1994

WELL NAME: VACUUM GRAYBURG SAN ANDRES UNIT NO. 149
LEA COUNTY, NEW MEXICO

WO#: 94-14-1843

PERFS = 4132-4698

PACKER DEPTH = 4040

BHP GAUGE DEPTH = 4000

STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psi)	(5) CORRECTED TUBING PRESS. (psi) (1)-(4)	(6) INJECTION RATE (gpm) (3)/34.2857	(7) MEASURED BHP (psi)
1	9:05	186.9				186.9		2069.1
	9:10	412.7	2.5	720.0	43.111	369.6	21.00	2238.2
	9:15	432.8	5.1	748.8	46.355	386.4	21.84	2268.9
	9:20	433.8	7.7	748.8	46.355	387.4	21.84	2282.8
	9:25	457.8	10.2	720.0	43.111	414.7	21.00	2297.9
	9:30	472.9	12.6	691.2	39.975	432.9	20.16	2307.6
	9:35	486.8	15.3	777.6	49.707	437.1	22.68	2326.3
				734.4				
	9:40	746.0	20.2	1411.2	149.713	596.3	41.16	2452.6
	9:45	765.0	25.1	1411.2	149.713	615.3	41.16	2482.0
2	9:50	776.4	29.8	1353.6	138.605	637.8	39.48	2494.4
	9:55	840.1	34.9	1468.8	161.214	678.9	42.84	2521.1
	10:00	859.2	40.0	1468.8	161.214	698.0	42.84	2536.4
	10:05	884.7	45.0	1440.0	155.414	729.3	42.00	2550.0
				1425.6				
	10:10	1344.0	52.6	2188.8	337.211	1006.8	63.84	2696.6
	10:15	1354.2	60.3	2217.6	345.465	1008.7	64.68	2714.1
	10:20	1361.9	68.0	2217.6	345.465	1016.4	64.68	2728.8
	10:25	1376.0	75.7	2217.6	345.465	1030.5	64.68	2749.1
	10:30	1383.6	83.4	2217.6	345.465	1038.1	64.68	2762.9
3	10:35	1398.9	91.2	2246.4	353.811	1045.1	65.52	2774.9
				2217.6				
	10:40	1890.6	101.2	2880.0	560.269	1330.3	84.00	2893.8
	10:45	1934.0	111.2	2880.0	560.269	1373.7	84.00	2917.0
	10:50	1912.2	121.3	2908.8	570.678	1341.5	84.84	2926.5
	10:55	1940.2	131.3	2880.0	560.269	1379.9	84.00	2941.1
	11:00	1954.2	141.5	2937.6	581.175	1373.0	85.68	2956.1
	11:05	1938.8	151.5	2880.0	560.269	1378.5	84.00	2965.7
				2894.4				

STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psi)	(5) CORRECTED TUBING PRESS. (psi) (1) - (4)	(6) INJECTION RATE (gpm) (3)/34.2637	(7) MEASURED BHP (psi)
5	11:10	2659.5	164.1	3628.8	859.176	1800.3	105.84	3080.7
	11:15	2599.0	176.7	3628.8	859.176	1739.8	105.84	3102.0
	11:20	2614.3	189.4	3657.6	871.834	1742.5	106.68	3124.3
	11:25	2668.2	202.3	3715.2	897.403	1770.8	108.36	3153.5
	11:30	2656.5	215.2	3715.2	897.403	1759.1	108.36	3156.4
	11:35	2611.5	228.0	3686.4	884.576	1726.9	107.52	3170.2
FALLOFF				3672.0				
	11:36	1030.4				1030.4		2922.6
	11:37	962.6				962.6		2850.1
	11:38	912.8				912.8		2796.0
	11:39	875.7				875.7		2755.3
	11:40	846.3				846.3		2722.0
	11:45	746.6				746.6		2608.8
	11:50	686.5				686.5		2539.5

- △ RECORDED WELLHEAD PRESSURE
- CORRECTED WELLHEAD PRESSURE BASED ON 2-3/8" CEMENT LINED TUBING
- BOTTOM HOLE PRESSURE AT 4000 FEET

TEXACO EXPLORATION AND PRODUCTION
 VACUUM CRAYBURG SAN ANDRES UNIT NO. 149
 LEA COUNTY, NEW MEXICO
 STEP RATE INJECTION TEST
 NOVEMBER 14, 1994

