



NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

October 16, 1996

CF 4138 R-3769
3391 R-3059

Devon Energy Corporation
20 North Broadway, Suite 1500
Oklahoma City, Oklahoma 73102-8260

Attn: Mr. Ernie L. Buttross, Jr.

WFX 678
PDEV0020600678
WFX 664
PDEV0020600664

**RE: Injection Pressure Increase,
East Shugart Unit Waterflood Project,
Eddy County, New Mexico**

Dear Mr. Buttross:

Reference is made to your request dated September 12, 1996 to increase the surface injection pressure on three wells in the above referenced waterflood project. This request is based on step rate tests conducted between July 18 and 22, 1996. Your request has been reviewed by my staff and we feel an increase in injection pressure is justified at this time.

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

Well and Location	Maximum Surface Injection Pressure
East Shugart Unit Well No.9, Unit Letter H, Section 35	990 PSIG
East Shugart Unit Well No.24, Unit Letter N, Section 35	915 PSIG
East Shugart Unit Well No.33, Unit Letter A, Section 34	1475 PSIG
Located Township 18 South, Range 31 East, Eddy 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/BES

cc: Oil Conservation Division - Artesia

PSI-X

N/R



20 North Broadway, Suite 1500
Oklahoma City, Oklahoma 73102-8260

Telephone: 405/235-3611
FAX 405/552-4550

September 12, 1996

State of New Mexico
Oil Conservation Division
2040 S. Pacheco
Santa Fe, New Mexico 87505

Attention: William J. LeMay
Director

**RE: Injection Pressure Increase
East Shugart Unit #9, #24, & #33
Sec 34 & 35, T18S, R31E
Eddy County, New Mexico**

9-990 H 35 18 31
24-915 N 35 18 31
33 1475 A 34 18 31

Gentlemen:

The attached Step Rate Tests run on the above referenced injection wells indicate that the formation parting pressures have increased above what you have set as maximum injection pressures. Devon Energy Corporation, therefore, respectfully request that the maximum surface injection pressures be also increased.

If you have any questions, please give me a call at 405-552-4509.

Very truly your,

A handwritten signature in blue ink that reads "E. L. Buttross Jr.".

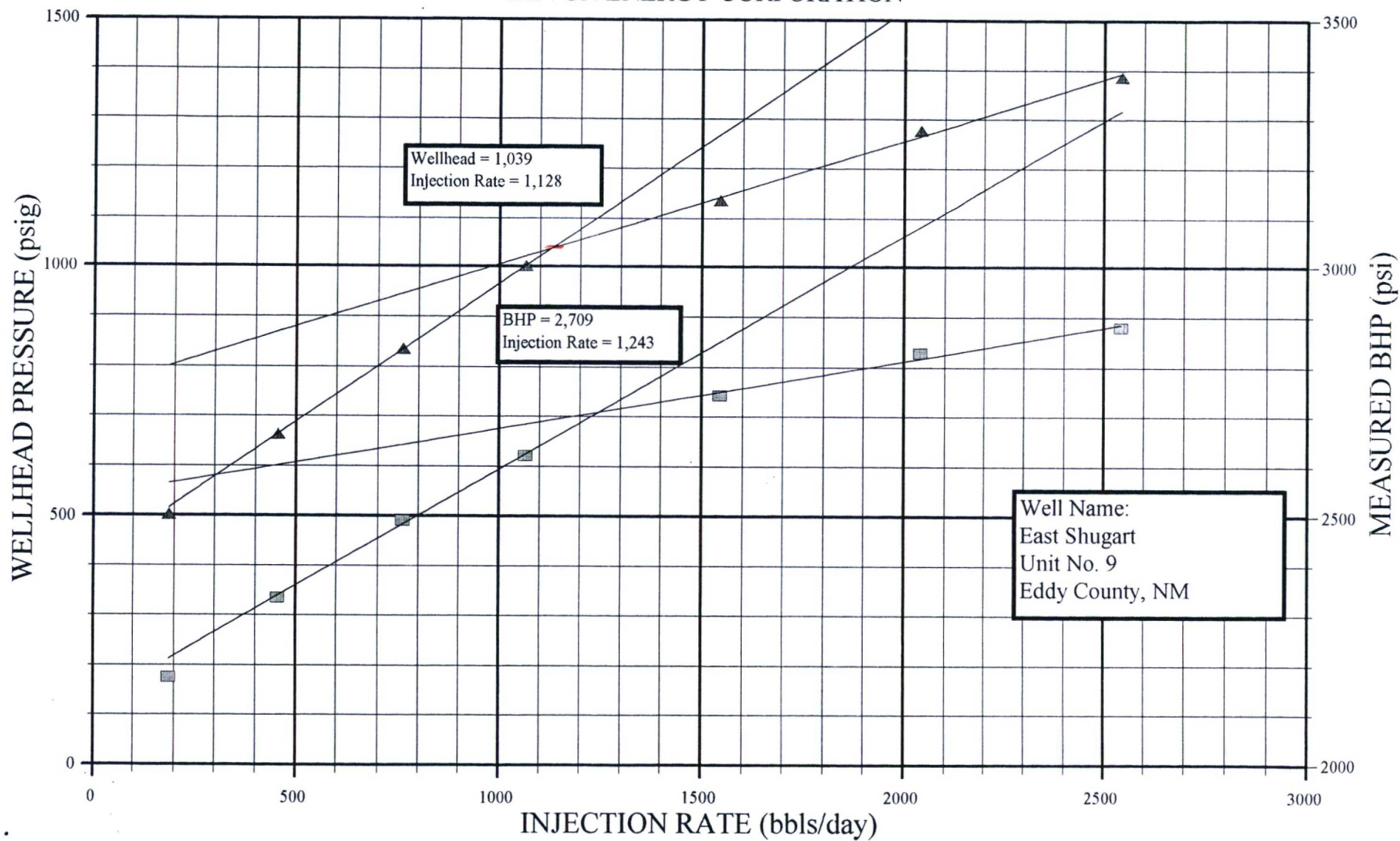
Ernie L. Buttross, Jr.
District Engineer

xc: File, Artesia

R-3769
3059
WVX 678 (9)
664 (33)

STEP RATE INJECTION TEST

DEVON ENERGY CORPORATION



▲ RECORDED WELLHEAD PRES.

■ BOTTOM HOLE PRESSURE at 3649

WEST-TEST, INC.

A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

STEP RATE INJECTION TEST

CLIENT: DEVON ENERGY CORPORATION

DATE: JULY 19, 1996

WELL NAME: EAST SHUGART UNIT NO. 9
EDDY COUNTY, NEW MEXICO

WO#: 96-14-0867

PERFS = 3404-3895

PACKER DEPTH = 3330

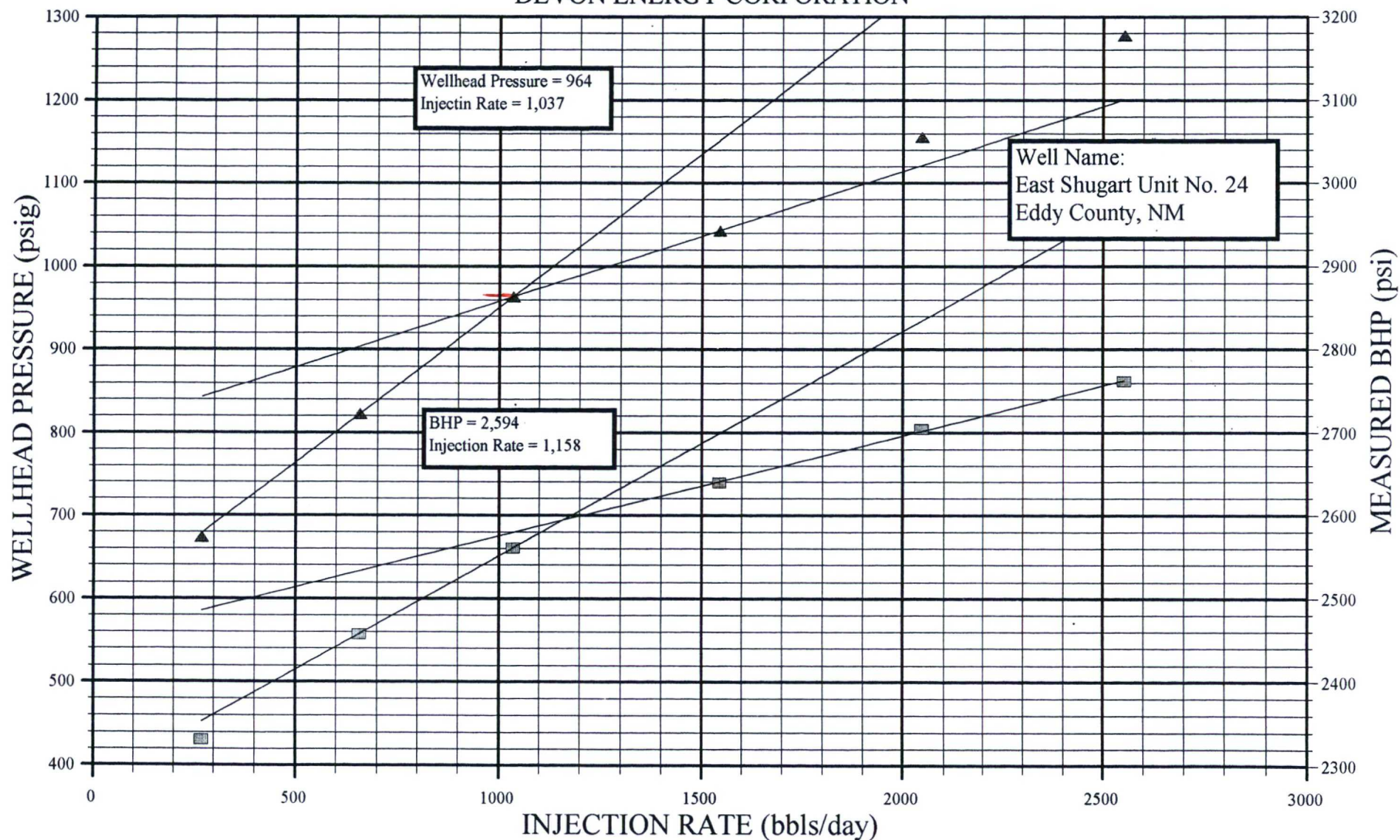
BHP GAUGE DEPTH = 3649

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	9:45	377.4				377.4		2045.4
	9:50	430.5	0.7	201.6	1.627	428.9	5.88	2105.8
	9:55	462.1	1.3	172.8	1.223	460.9	5.04	2128.5
	10:00	469.5	2.0	201.6	1.627	467.9	5.88	2145.2
	10:05	485.9	2.7	201.6	1.627	484.3	5.88	2157.3
	10:10	493.4	3.3	172.8	1.223	492.2	5.04	2166.3
	10:15	503.5	3.9	172.8	1.223	502.3	5.04	2175.4
				187.2				
	10:20	577.0	5.5	460.8	7.508	569.5	13.44	2237.4
	10:25	589.6	7.0	432.0	6.663	582.9	12.60	2264.6
2	10:30	631.5	8.6	460.8	7.508	624.0	13.44	2291.8
	10:35	656.8	10.2	460.8	7.508	649.3	13.44	2310.0
	10:40	641.5	11.8	460.8	7.508	634.0	13.44	2325.1
	10:45	661.7	13.4	460.8	7.508	654.2	13.44	2335.7
				456.0				
	10:50	746.7	16.1	777.6	19.766	726.9	22.68	2397.7
	10:55	770.7	18.8	777.6	19.766	750.9	22.68	2426.5
	11:00	799.8	21.4	748.8	18.433	781.4	21.84	2446.1
	11:05	806.2	24.0	748.8	18.433	787.8	21.84	2462.8
	11:10	825.2	26.7	777.6	19.766	805.4	22.68	2477.9
3	11:15	836.6	29.3	748.8	18.433	818.2	21.84	2491.5
				763.2				
	11:20	912.7	33.0	1065.6	35.405	877.3	31.08	2539.9
	11:25	944.4	36.7	1065.6	35.405	909.0	31.08	2562.6
	11:30	962.2	40.4	1065.6	35.405	926.8	31.08	2580.7
	11:35	976.1	44.1	1065.6	35.405	940.7	31.08	2595.9
	11:40	991.3	47.8	1065.6	35.405	955.9	31.08	2609.5
	11:45	1002.7	51.5	1065.6	35.405	967.3	31.08	2621.6
				1065.6				
				1065.6				

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	11:50	1076.2	56.8	1526.4	68.834	1007.4	44.52	2670.0
	11:55	1106.6	62.2	1555.2	71.256	1035.3	45.36	2689.6
	12:00	1110.4	67.6	1555.2	71.256	1039.1	45.36	2707.7
	12:05	1137.0	72.9	1526.4	68.834	1068.2	44.52	2721.3
	12:10	1128.1	78.3	1555.2	71.256	1056.8	45.36	2733.4
	12:15	1136.9	83.7	1555.2	71.256	1065.6	45.36	2744.0
				1545.6				
	12:20	1229.4	90.7	2016.0	115.167	1114.2	58.80	2777.2
	12:25	1244.6	97.8	2044.8	118.229	1126.4	59.64	2792.3
	12:30	1254.7	104.9	2044.8	118.229	1136.5	59.64	2804.4
	12:35	1262.3	112.0	2044.8	118.229	1144.1	59.64	2813.5
	12:40	1269.9	119.1	2044.8	118.229	1151.7	59.64	2822.6
	12:45	1278.7	126.2	2044.8	118.229	1160.5	59.64	2828.6
				2040.0				
6	12:50	1372.6	135.0	2534.4	175.868	1196.7	73.92	2852.8
	12:55	1378.9	143.9	2563.2	179.583	1199.3	74.76	2861.8
	1:00	1382.7	152.8	2563.2	179.583	1203.1	74.76	2869.4
	1:05	1390.4	161.5	2505.6	172.189	1218.2	73.08	2873.9
	1:10	1389.1	170.4	2563.2	179.583	1209.5	74.76	2878.4
	1:15	1387.7	179.2	2534.4	175.868	1211.8	73.92	2880.0
				2544.0				
7 FALLOFF	1:16	1140.6				1140.6		2831.6
	1:17	1133.0				1133.0		2828.6
	1:18	1125.4				1125.4		2819.5
	1:19	1117.8				1117.8		2813.4
	1:20	1112.7				1112.7		2807.4
	1:25	1087.3				1087.3		2783.2
	1:30	1069.6				1069.6		2765.1

STEP RATE INJECTION TEST

DEVON ENERGY CORPORATION



▲ RECORDED WELLHEAD PRES.

■ BOTTOM HOLE PRESSURE AT 3627

WEST-TEST, INC.
A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY
Hobbs, New Mexico

STEP RATE INJECTION TEST

CLIENT: DEVON ENERGY CORPORATION

DATE: JULY 22, 1996

WELL NAME: EAST SHUGART UNIT NO. 24
EDDY COUNTY, NEW MEXICO

WO#: 96-14-0868

PERFS = 3355-3899

PACKER DEPTH = 3260

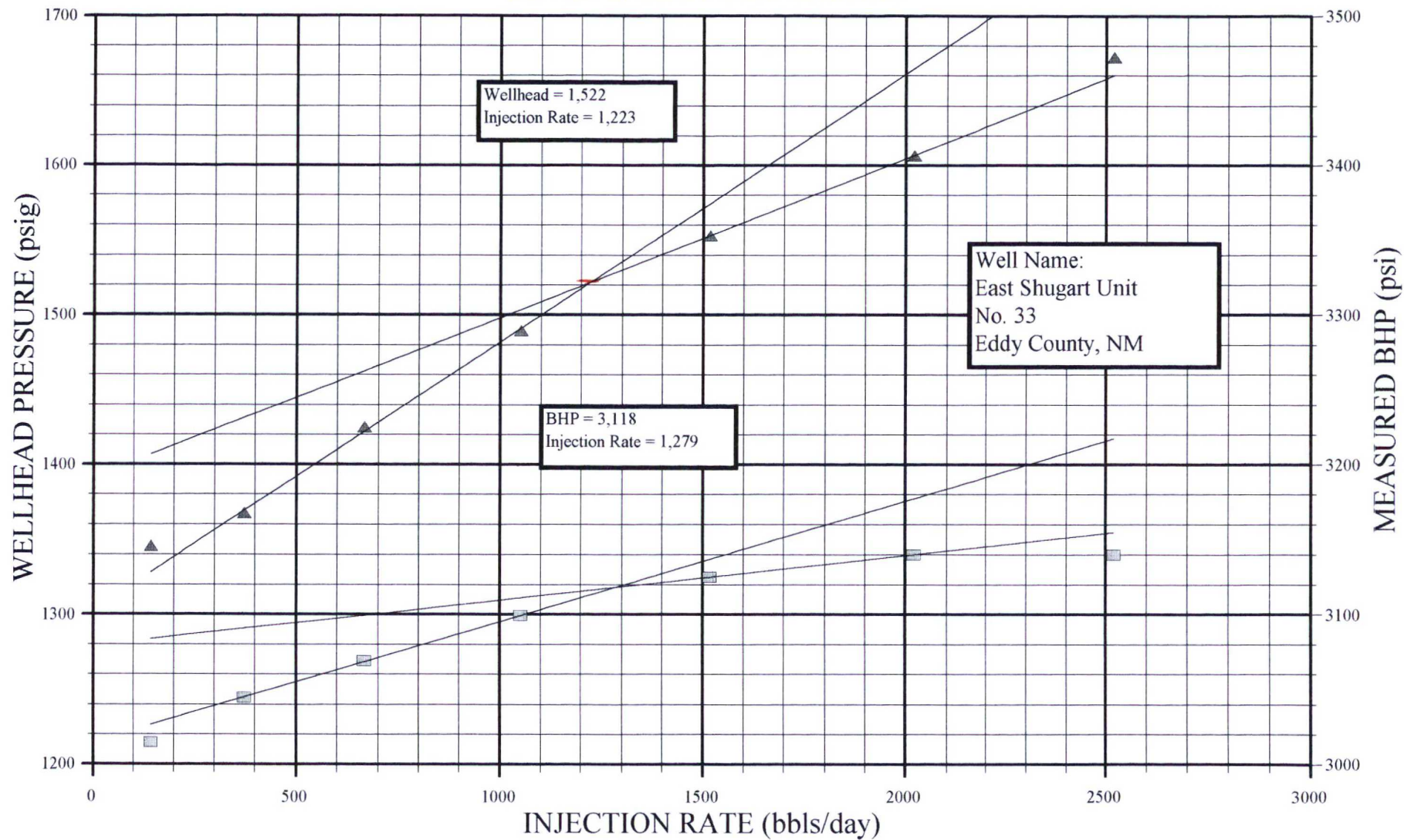
BHP GAUGE DEPTH = 3627

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	9:30	558.2				558.2		2208.7
	9:35	629.3	0.9	259.2	2.574	626.7	7.56	2284.3
	9:40	652.1	1.9	288.0	3.128	649.0	8.40	2297.9
	9:45	662.2	2.8	259.2	2.574	659.6	7.56	2310.0
	9:50	668.4	3.7	259.2	2.574	665.8	7.56	2319.1
	9:55	670.3	4.6	259.2	2.574	667.7	7.56	2325.1
	10:00	674.4	5.6	288.0	3.128	671.3	8.40	2331.1
				268.8				
	10:05	759.3	7.8	633.6	13.451	745.8	18.48	2396.1
	10:10	784.5	10.1	662.4	14.604	769.9	19.32	2420.3
2	10:15	786.9	12.4	662.4	14.604	772.3	19.32	2429.4
	10:20	803.2	14.7	662.4	14.604	788.6	19.32	2441.6
	10:25	819.6	17.0	662.4	14.604	805.0	19.32	2450.7
	10:30	823.3	19.3	662.4	14.604	808.7	19.32	2458.2
				657.6				
	10:35	907.0	22.8	1008.0	31.754	875.2	29.40	2506.6
	10:40	922.2	26.4	1036.8	33.452	888.7	30.24	2520.2
	10:45	931.0	30.1	1065.6	35.192	895.8	31.08	2532.4
	10:50	944.9	33.7	1036.8	33.452	911.4	30.24	2544.5
	10:55	953.7	37.3	1036.8	33.452	920.2	30.24	2553.5
3	11:00	963.8	40.9	1036.8	33.452	930.3	30.24	2561.1
				1036.8				
	11:05	1047.5	46.2	1526.4	68.419	979.1	44.52	2600.4
	11:10	1058.9	51.7	1584.0	73.272	985.6	46.20	2614.0
	11:15	1060.1	57.0	1526.4	68.419	991.7	44.52	2621.5
	11:20	1065.1	62.3	1526.4	68.419	996.7	44.52	2629.1
	11:25	1051.1	67.7	1555.2	70.827	980.3	45.36	2635.1
	11:30	1043.4	73.1	1555.2	70.827	972.6	45.36	2639.6
				1545.6				

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)/34.2637	(7) MEASURED BHP (psi)
5	11:35	1138.5	80.2	2044.8	117.516	1021.0	59.64	2666.8
	11:40	1138.5	87.3	2044.8	117.516	1021.0	59.64	2677.4
	11:45	1147.3	94.4	2044.8	117.516	1029.8	59.64	2686.4
	11:50	1157.4	101.5	2044.8	117.516	1039.9	59.64	2695.5
	11:55	1151.0	108.6	2044.8	117.516	1033.5	59.64	2700.0
	12:00	1156.0	115.7	2044.8	117.516	1038.5	59.64	2704.6
				2044.8				
	12:05	1253.6	124.6	2563.2	178.501	1075.1	74.76	2728.7
	12:10	1259.7	133.6	2592.0	182.229	1077.5	75.60	2737.8
	12:15	1272.1	142.4	2534.4	174.808	1097.3	73.92	2745.4
6	12:20	1259.2	151.3	2563.2	178.501	1080.7	74.76	2748.4
	12:25	1261.6	160.1	2534.4	174.808	1086.8	73.92	2753.0
	12:30	1278.0	168.9	2534.4	174.808	1103.2	73.92	2762.0
				2553.6				
	FALLOFF 12:31	1032.0				1032.0		2719.7
	12:32	1020.6				1020.6		2707.6
	12:33	1011.7				1011.7		2700.1
	12:34	1005.3				1005.3		2694.0
	12:35	1000.3				1000.3		2687.9
	12:40	981.2				981.2		2668.3
	12:45	969.8				969.8		2656.2

STEP RATE INJECTION TEST

DEVON ENERGY CORPORATION



▲ RECORDED WELLHEAD PRES.

■ BOTTOM HOLE PRESSURE AT 3628

WEST-TEST, INC.

A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

STEP RATE INJECTION TEST

CLIENT: DEVON ENERGY CORPORATION

DATE: JULY 18, 1996

WELL NAME: EAST SHUGART UNIT NO. 33
EDDY COUNTY, NEW MEXICO

WO#: 96-14-0869

PERFS = 3400-3857

PACKER DEPTH = 3298

BHP GAUGE DEPTH = 3628

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	9:50	1310.9				1310.9		2976.8
	9:55	1356.0	0.5	144.0	0.868	1355.1	4.20	3013.1
	10:00	1344.8	1.0	144.0	0.868	1343.9	4.20	3013.0
	10:05	1360.0	1.5	144.0	0.868	1359.1	4.20	3017.6
	10:10	1359.9	2.0	144.0	0.868	1359.0	4.20	3017.6
	10:15	1349.7	2.5	144.0	0.868	1348.8	4.20	3013.0
	10:20	1345.7	3.0	144.0	0.868	1344.8	4.20	3014.7
				144.0				
	10:25	1396.3	4.3	374.4	5.084	1391.2	10.92	3040.2
	10:30	1379.6	5.6	374.4	5.084	1374.5	10.92	3043.3
2	10:35	1368.0	6.9	374.4	5.084	1362.9	10.92	3043.3
	10:40	1378.1	8.1	345.6	4.384	1373.7	10.08	3044.8
	10:45	1378.0	9.4	374.4	5.084	1372.9	10.92	3044.8
	10:50	1367.8	10.7	374.4	5.084	1362.7	10.92	3044.8
				374.4				
	10:55	1431.1	13.0	662.4	14.608	1416.5	19.32	3084.2
	11:00	1439.9	15.3	662.4	14.608	1425.3	19.32	3090.3
	11:05	1443.6	17.6	662.4	14.608	1429.0	19.32	3085.7
	11:10	1438.5	20.0	691.2	15.804	1422.7	20.16	3085.8
	11:15	1430.8	22.3	662.4	14.608	1416.2	19.32	3084.3
3	11:20	1425.6	24.6	662.4	14.608	1411.0	19.32	3069.2
				667.2				
	11:25	1500.4	28.3	1065.6	35.202	1465.2	31.08	3111.5
	11:30	1504.1	32.0	1065.6	35.202	1468.9	31.08	3107.0
	11:35	1495.0	35.7	1065.6	35.202	1459.8	31.08	3102.0
	11:40	1498.6	39.3	1036.8	33.462	1465.1	30.24	3099.4
	11:45	1493.5	42.9	1036.8	33.462	1460.0	30.24	3099.4
	11:50	1489.7	46.5	1036.8	33.462	1456.2	30.24	3099.3
				1051.2				

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	11:55	1586.2	51.8	1526.4	68.438	1517.8	44.52	3143.2
	12:00	1555.9	57.1	1526.4	68.438	1487.5	44.52	3114.4
	12:05	1545.9	62.4	1526.4	68.438	1477.5	44.52	3106.9
	12:10	1551.0	67.6	1497.6	66.068	1484.9	43.68	3115.9
	12:15	1534.4	72.9	1526.4	68.438	1466.0	44.52	3108.3
	12:20	1553.3	78.1	1497.6	66.068	1487.2	43.68	3125.0
				1516.8				
	12:25	1660.9	85.1	2016.0	114.504	1546.4	58.80	3179.4
	12:30	1634.1	92.1	2016.0	114.504	1519.6	58.80	3158.2
	12:35	1639.1	99.1	2016.0	114.504	1524.6	58.80	3164.3
6	12:40	1630.1	106.1	2016.0	114.504	1515.6	58.80	3153.7
	12:45	1616.0	113.2	2044.8	117.548	1498.5	59.64	3147.7
	12:50	1607.0	120.2	2016.0	114.504	1492.5	58.80	3140.1
				2020.8				
	12:55	1707.0	129.0	2534.4	174.856	1532.1	73.92	3173.4
	1:00	1706.9	137.7	2505.6	171.198	1535.7	73.08	3177.9
	1:05	1704.4	146.4	2505.6	171.198	1533.2	73.08	3171.9
	1:10	1704.4	155.2	2534.4	174.856	1529.5	73.92	3171.9
	1:15	1671.4	163.9	2505.6	171.198	1500.2	73.08	3143.2
	1:20	1672.6	172.7	2534.4	174.856	1497.7	73.92	3140.1
FALLOFF				2520.0				
	1:21	1341.9				1341.9		3028.2
	1:22	1338.1				1338.1		3023.6
	1:23	1336.8				1336.8		3022.1
	1:24	1335.5				1335.5		3022.1
	1:25	1334.2				1334.2		3022.1
	1:30	1332.9				1332.9		3020.6
	1:35	1331.6				1331.6		3019.1