

30-041-20489

REPORT OF

***SUB-SURFACE
DIRECTIONAL
SURVEY***

API #

PETROLEUM DEVELOPMENT CORPORATION

MOUNTAIN FEDERAL NO. 4

ROOSEVELT COUNTY, NEW MEXICO

8-30-7-32

JOB NUMBER

430-1650

430-1650

TYPE OF SURVEY

Gyroscopic

Steering Tool

DATE

October 23, 1993

October 30, 1993

SURVEY BY TIM STEPHENS/RON COLLINS

OFFICE: MIDLAND, TX

BHL per PK 598/20 1225/E

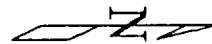
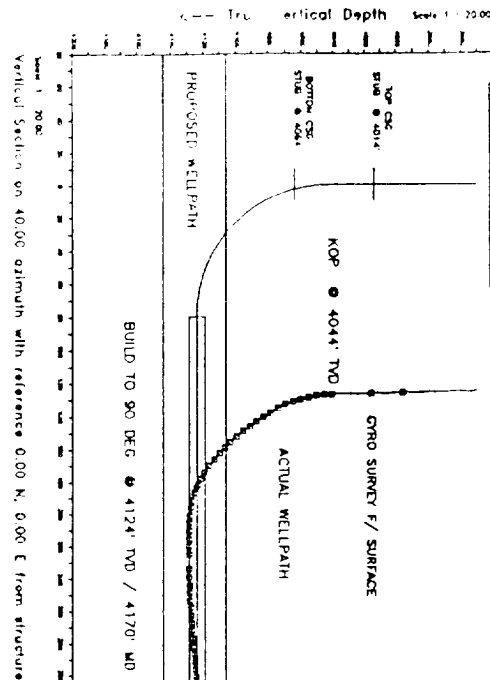
A-30-7-32

PETROLEUM DEVELOPMENT CORPORATION

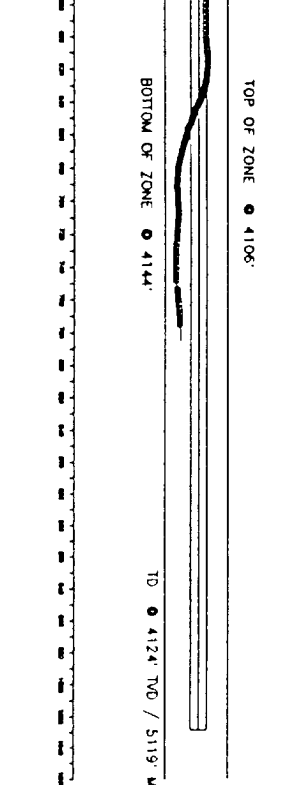
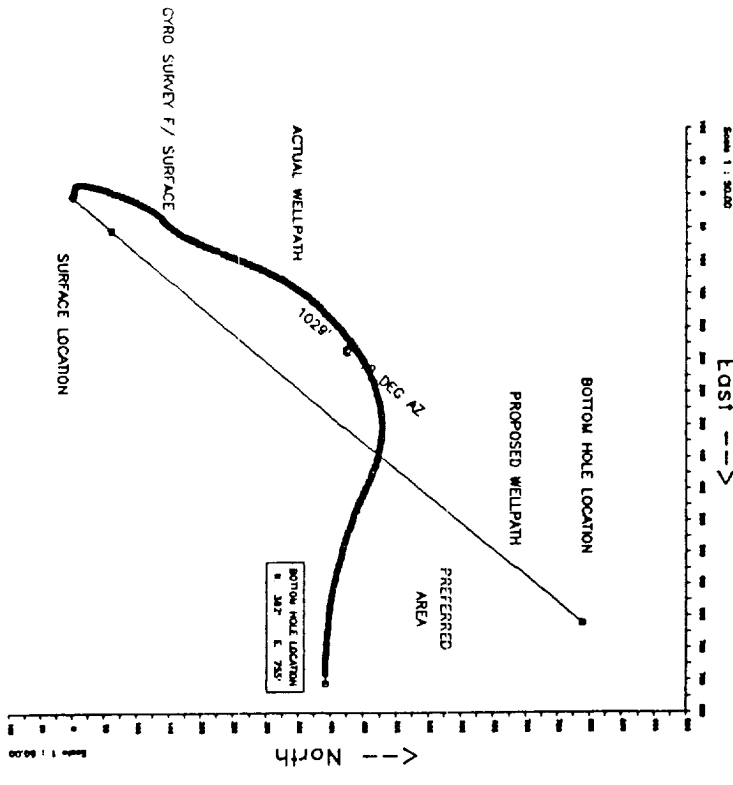
Structure : MOUNTAIN FEDERAL #4	Well : #4					
Field : TOM TOM	Location : CHAVES COUNTY, NEW MEXICO					
WELL PROFILE DATA						
Point	MD	INC	Dr	TVD	North	East
Top on	0	0.00	40.00	0	0	0
KOP	4044	0.00	40.00	4044	0	0
End of Build	4170	90.00	40.00	4124	51	51
Current	5119	90.00	40.00	4124	788	661

HORIZONTAL LENGTH - 962'
VERTICAL SECTION - 786'
CLOSURE - 851'

71.6 DEG / 100 FT BUR



WELL PROFILE
& EXHIBIT 101



PETROLEUM DEVELOPMENT CORPORATION
MOUNTAIN FEDERAL #4, #4
TOM TOM, CHAVES COUNTY, NEW MEXICO

SURVEY LISTING Page 1
Your ref : GYRO SURVEY
Last revised : 1-Nov-93

Measured Depth	Inclin. Degrees	Azimuth Degrees	True Vert. Depth	R E C T A N G U L A R C O O R D I N A T E S			Dogleg Deg/100Ft	Vert Sect
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	0.00	
100.00	0.87	20.00	100.00	0.71 N	0.26 E	0.87	-0.26	
200.00	0.90	275.51	199.99	1.50 N	0.26 W	1.40	0.26	
300.00	0.89	288.63	299.98	1.82 N	1.78 W	0.20	1.78	
400.00	0.99	278.33	399.96	2.20 N	3.37 W	0.20	3.37	
500.00	0.79	278.26	499.95	2.42 N	4.91 W	0.20	4.91	
600.00	0.69	298.24	599.94	2.81 N	6.12 W	0.27	6.12	
700.00	0.80	284.05	699.94	3.26 N	7.33 W	0.21	7.33	
800.00	0.58	260.98	799.93	3.35 N	8.50 W	0.35	8.50	
900.00	0.63	263.78	899.92	3.21 N	9.55 W	0.06	9.55	
1000.00	1.07	278.29	999.91	3.29 N	11.02 W	0.49	11.02	
1100.00	1.41	292.80	1099.89	3.90 N	13.08 W	0.46	13.08	
1200.00	1.79	320.67	1199.85	5.58 N	15.20 W	0.85	15.20	
1300.00	1.89	333.02	1299.80	8.26 N	16.94 W	0.41	16.94	
1400.00	1.80	348.26	1399.75	11.27 N	18.01 W	0.50	18.01	
1500.00	1.72	1.16	1499.70	14.31 N	18.30 W	0.40	18.30	
1600.00	1.81	7.10	1599.65	17.37 N	18.07 W	0.20	18.07	
1700.00	1.99	12.60	1699.60	20.64 N	17.50 W	0.26	17.50	
1800.00	3.02	13.31	1799.50	24.89 N	16.51 W	1.03	16.51	
1900.00	3.25	11.50	1899.35	30.24 N	15.34 W	0.25	15.34	
2000.00	3.40	11.53	1999.18	35.92 N	14.18 W	0.15	14.18	
2100.00	3.56	11.69	2099.00	41.86 N	12.96 W	0.16	12.96	
2200.00	3.49	15.03	2198.81	47.84 N	11.54 W	0.22	11.54	
2300.00	3.46	18.80	2298.63	53.64 N	9.78 W	0.23	9.78	
2400.00	3.59	21.33	2398.44	59.41 N	7.67 W	0.20	7.67	
2500.00	3.81	21.17	2498.23	65.43 N	5.33 W	0.22	5.33	
2600.00	3.88	22.14	2598.00	71.66 N	2.86 W	0.10	2.86	
2700.00	4.06	23.38	2697.76	78.04 N	0.18 W	0.20	0.18	
2800.00	4.26	22.08	2797.50	84.73 N	2.62 E	0.22	-2.62	
2900.00	4.35	20.85	2897.22	91.72 N	5.37 E	0.13	-5.37	
3000.00	4.30	24.97	2996.93	98.66 N	8.30 E	0.31	-8.30	
3100.00	4.03	23.20	3096.67	105.29 N	11.27 E	0.30	-11.27	
3200.00	3.82	25.22	3196.43	111.53 N	14.07 E	0.25	-14.07	
3300.00	3.74	26.68	3296.22	117.46 N	16.96 E	0.12	-16.96	
3400.00	3.25	31.89	3396.03	122.78 N	19.92 E	0.58	-19.92	
3500.00	2.90	35.85	3495.89	127.24 N	22.90 E	0.41	-22.90	
3600.00	2.35	44.61	3595.78	130.75 N	25.82 E	0.68	-25.82	
3700.00	1.82	41.72	3695.72	133.40 N	28.31 E	0.54	-28.31	
3800.00	1.23	24.05	3795.68	135.56 N	29.81 E	0.75	-29.81	
3900.00	1.13	54.71	3895.66	137.11 N	31.05 E	0.63	-31.05	
4000.00	1.04	28.69	3995.64	138.48 N	32.29 E	0.50	-32.29	
4020.00	0.73	49.20	4015.64	138.72 N	32.47 E	2.19	-32.47	

All data is in feet unless otherwise stated
Coordinates from structure and TVD from wellhead.
Vertical section is from wellhead on azimuth 270.00 degrees.
Declination is 0.00 degrees, Convergence is 0.00 degrees.
Calculation uses the minimum curvature method.
Presented by Baker Hughes INTEQ

PETROLEUM DEVELOPMENT CORPORATION
MOUNTAIN FEDERAL #4, #4
TOM TOM, CHAVES COUNTY, NEW MEXICO

SURVEY LISTING Page 1
Your ref : STEERING TOOL SURVEY
Last revised : 1-Nov-93

Measured Depth	Inclin. Degrees	Azimuth Degrees	True Vert. Depth	R E C T A N G U L A R C O O R D I N A T E S		Dogleg Deg/100Ft	Vert Sect	
4020.00	0.73	49.20	4015.64	138.72 N	32.47 E	0.00	127.14	GYRO SURVEY F/ SURFACE
4044.00	2.23	79.02	4039.63	138.91 N	33.04 E	6.84	127.65	SHORT RADIUS KOP
4045.00	2.30	79.40	4040.63	138.92 N	33.08 E	6.84	127.68	
4050.00	5.40	72.10	4045.62	139.01 N	33.41 E	62.64	127.96	
4052.00	6.67	69.73	4047.61	139.08 N	33.60 E	64.92	128.14	GIH W/ SRAB MOTOR W/ 71' RAD SETT
4055.00	8.60	67.50	4050.58	139.22 N	33.98 E	64.92	128.49	
4060.00	12.70	65.00	4055.49	139.60 N	34.82 E	82.50	129.32	
4065.00	15.60	60.00	4060.34	140.17 N	35.90 E	62.89	130.45	
4070.00	19.30	49.90	4065.11	141.04 N	37.12 E	95.38	131.90	
4075.00	22.70	43.20	4069.78	142.27 N	38.41 E	83.15	133.67	
4080.00	27.10	40.90	4074.31	143.84 N	39.81 E	90.09	135.78	
4085.00	30.40	38.80	4078.70	145.68 N	41.35 E	69.01	138.18	
4090.00	32.30	36.70	4082.97	147.74 N	42.94 E	43.83	140.78	
4095.00	32.70	36.80	4087.18	149.89 N	44.55 E	8.07	143.46	
4100.00	33.10	38.30	4091.38	152.05 N	46.21 E	18.15	146.18	
4105.00	35.30	39.20	4095.52	154.24 N	47.97 E	45.15	148.98	
4110.00	38.80	37.90	4099.51	156.59 N	49.84 E	71.73	152.00	
4115.00	42.50	36.10	4103.30	159.20 N	51.80 E	77.62	155.25	
4120.00	45.40	32.90	4106.90	162.06 N	53.76 E	73.04	158.70	
4125.00	48.40	31.10	4110.32	165.15 N	55.70 E	65.50	162.32	
4130.00	51.80	29.20	4113.52	168.47 N	57.62 E	73.98	166.09	
4135.00	55.20	27.80	4116.50	172.00 N	59.54 E	71.62	170.03	
4140.00	58.80	26.10	4119.22	175.74 N	61.44 E	77.44	174.12	
4145.00	62.80	24.60	4121.66	179.68 N	63.30 E	84.17	178.34	
4149.00	65.50	23.90	4123.40	182.96 N	64.78 E	69.31	181.80	
4151.00	67.03	23.56	4124.21	184.64 N	65.52 E	78.18	183.56	GIH W/ 42' RAD SRAB MOTOR
4152.00	67.80	23.40	4124.59	185.49 N	65.89 E	78.18	184.44	
4155.00	70.50	22.60	4125.66	188.07 N	66.98 E	93.38	187.12	
4160.00	76.70	22.80	4127.07	192.49 N	68.83 E	124.06	191.70	
4165.00	82.80	23.20	4127.96	197.02 N	70.75 E	122.25	196.40	
4168.00	84.66	23.32	4128.29	199.76 N	71.93 E	62.13	199.26	GIH W/ SRAH MOTOR
4170.00	85.90	23.40	4128.45	201.59 N	72.72 E	62.13	201.17	
4175.00	87.00	23.30	4128.76	206.17 N	74.70 E	22.09	205.95	
4180.00	88.30	23.30	4128.97	210.76 N	76.68 E	26.00	210.74	
4185.00	89.20	23.20	4129.08	215.35 N	78.65 E	18.11	215.52	
4190.00	90.60	23.30	4129.08	219.94 N	80.62 E	28.07	220.31	
4195.00	91.00	23.00	4129.01	224.54 N	82.59 E	10.00	225.10	
4205.00	91.70	22.00	4128.78	233.78 N	86.41 E	12.20	234.63	
4210.00	91.80	21.60	4128.63	238.42 N	88.27 E	8.24	239.38	
4215.00	91.40	21.30	4128.49	243.07 N	90.10 E	10.00	244.12	
4220.00	91.80	21.10	4128.35	247.73 N	91.90 E	8.94	248.85	
4225.00	92.30	21.40	4128.17	252.38 N	93.72 E	11.66	253.58	
4230.00	92.80	21.60	4127.94	257.03 N	95.55 E	10.77	258.32	
4235.00	93.30	21.90	4127.68	261.67 N	97.40 E	11.66	263.06	
4240.00	93.70	22.20	4127.37	266.30 N	99.27 E	9.99	267.80	
4245.00	94.10	22.60	4127.03	270.91 N	101.17 E	11.30	272.56	
4250.00	94.50	22.80	4126.66	275.51 N	103.10 E	8.94	277.32	
4255.00	95.20	23.20	4126.24	280.09 N	105.04 E	16.11	282.08	
4260.00	95.80	23.50	4125.76	284.66 N	107.02 E	13.40	286.85	
4265.00	95.90	23.90	4125.25	289.22 N	109.01 E	8.20	291.63	

All data is in feet unless otherwise stated
Coordinates from structure and TVD from wellhead.
Vertical section is from N 0.00 E 0.00 on azimuth 40.00 degrees.
Declination is 0.00 degrees, Convergence is 0.00 degrees.
Calculation uses the minimum curvature method.
Presented by Baker Hughes INTEQ

PETROLEUM DEVELOPMENT CORPORATION
MOUNTAIN FEDERAL #4, #4
TOM TOM, CHAVES COUNTY, NEW MEXICO

SURVEY LISTING Page 2
Your ref : STEERING TOOL SURVEY
Last revised : 1-Nov-93

Measured Depth	Inclin. Degrees	Azimuth Degrees	True Vert. Depth	R E C T A N G U L A R C O O R D I N A T E S			Dogleg Deg/100Ft	Vert Sect
4270.00	95.60	24.60	4124.75	293.75 N	111.06 E	15.17	296.41	
4275.00	95.60	25.20	4124.26	298.27 N	113.15 E	11.94	301.22	
4280.00	95.60	26.00	4123.77	302.75 N	115.30 E	15.92	306.04	
4285.00	95.60	26.60	4123.28	307.22 N	117.51 E	11.94	310.87	
4290.00	95.60	27.20	4122.80	311.65 N	119.76 E	11.94	315.72	
4295.00	95.50	27.90	4122.31	316.06 N	122.06 E	14.08	320.58	
4300.00	95.30	28.50	4121.84	320.45 N	124.41 E	12.60	325.45	
4305.00	95.40	29.40	4121.37	324.81 N	126.82 E	18.03	330.34	
4310.00	95.70	30.50	4120.89	329.12 N	129.31 E	22.70	335.24	
4315.00	95.80	33.10	4120.39	333.35 N	131.93 E	51.78	340.16	
4320.00	95.20	33.90	4119.91	337.50 N	134.68 E	19.94	345.11	
4325.00	94.30	34.00	4119.50	341.63 N	137.46 E	18.11	350.06	
4330.00	92.80	33.80	4119.19	345.77 N	140.24 E	30.26	355.02	
4335.00	91.70	33.40	4118.99	349.94 N	143.01 E	23.41	359.99	
4340.00	90.70	33.30	4118.89	354.11 N	145.75 E	20.10	364.95	
4345.00	87.90	35.80	4118.95	358.23 N	148.59 E	75.07	369.93	
4350.00	87.70	36.40	4119.14	362.26 N	151.53 E	12.64	374.91	
4355.00	87.70	37.30	4119.34	366.26 N	154.53 E	17.98	379.90	
4360.00	87.80	38.20	4119.54	370.21 N	157.59 E	18.10	384.90	
4365.00	88.50	40.50	4119.70	374.08 N	160.76 E	48.06	389.89	
4370.00	89.30	42.00	4119.79	377.84 N	164.05 E	33.99	394.89	
4375.00	89.70	43.80	4119.84	381.50 N	167.46 E	36.88	399.88	
4380.00	89.80	45.10	4119.86	385.07 N	170.96 E	26.08	404.87	
4385.00	89.30	46.40	4119.90	388.56 N	174.54 E	27.86	409.84	
4390.00	89.30	46.30	4119.96	392.01 N	178.16 E	2.00	414.81	
4395.00	89.80	45.10	4120.00	395.50 N	181.73 E	26.00	419.79	
4400.00	89.30	46.40	4120.04	398.99 N	185.32 E	27.86	424.76	
4405.00	89.30	46.30	4120.10	402.44 N	188.93 E	2.00	429.73	
4410.00	89.10	47.00	4120.17	405.87 N	192.57 E	14.56	434.70	
4415.00	89.30	47.20	4120.24	409.27 N	196.23 E	5.66	439.66	
4420.00	89.70	48.50	4120.28	412.63 N	199.94 E	27.20	444.61	
4425.00	90.90	50.30	4120.26	415.88 N	203.73 E	43.26	449.54	
4430.00	91.30	51.20	4120.16	419.04 N	207.60 E	19.69	454.45	
4435.00	91.30	51.80	4120.05	422.16 N	211.52 E	12.00	459.35	
4440.00	90.50	52.10	4119.97	425.24 N	215.45 E	17.09	464.24	
4445.00	90.10	52.60	4119.94	428.29 N	219.41 E	12.81	469.13	
4450.00	90.10	52.80	4119.93	431.32 N	223.39 E	4.00	474.00	
4455.00	89.90	53.20	4119.93	434.33 N	227.38 E	8.94	478.88	
4460.00	89.90	54.10	4119.94	437.30 N	231.41 E	18.00	483.73	
4465.00	90.20	55.10	4119.94	440.19 N	235.48 E	20.88	488.57	
4470.00	90.40	56.30	4119.91	443.01 N	239.62 E	24.33	493.39	
4475.00	90.10	57.40	4119.89	445.74 N	243.80 E	22.80	498.17	
4480.00	90.20	59.00	4119.88	448.38 N	248.05 E	32.06	502.92	
4485.00	90.40	60.70	4119.85	450.89 N	252.37 E	34.23	507.62	
4490.00	90.50	62.00	4119.81	453.29 N	256.76 E	26.08	512.28	
4495.00	90.30	63.30	4119.78	455.58 N	261.20 E	26.30	516.90	
4500.00	90.50	64.70	4119.74	457.77 N	265.70 E	28.28	521.46	
4505.00	90.50	65.60	4119.70	459.88 N	270.23 E	18.00	525.99	
4510.00	90.30	67.00	4119.66	461.88 N	274.81 E	28.28	530.47	
4515.00	90.30	68.20	4119.64	463.79 N	279.43 E	24.00	534.90	

All data is in feet unless otherwise stated
Coordinates from structure and TVD from wellhead.
Vertical section is from N 0.00 E 0.00 on azimuth 40.00 degrees.
Declination is 0.00 degrees, Convergence is 0.00 degrees.
Calculation uses the minimum curvature method.
Presented by Baker Hughes INTEQ

PETROLEUM DEVELOPMENT CORPORATION
MOUNTAIN FEDERAL #4, #4
TOM TOM, CHAVES COUNTY, NEW MEXICO

SURVEY LISTING Page 3
Your ref : STEERING TOOL SURVEY
Last revised : 1-Nov-93

Measured Depth	Inclin. Degrees	Azimuth Degrees	True Vert. Depth	R E C T A N G U L A R C O O R D I N A T E S		Dogleg Deg/100Ft	Vert Sect
4520.00	90.20	69.20	4119.62	465.61 N	284.09 E	20.10	539.29
4525.00	90.10	70.50	4119.60	467.33 N	288.79 E	26.08	543.62
4530.00	90.10	71.60	4119.59	468.95 N	293.52 E	22.00	547.91
4535.00	90.20	72.70	4119.58	470.48 N	298.27 E	22.09	552.14
4540.00	90.30	74.00	4119.56	471.92 N	303.06 E	26.08	556.32
4545.00	90.40	75.70	4119.53	473.22 N	307.89 E	34.06	560.42
4550.00	90.60	77.40	4119.48	474.39 N	312.75 E	34.23	564.44
4555.00	90.50	78.60	4119.44	475.43 N	317.64 E	24.08	568.38
4560.00	89.90	79.50	4119.42	476.38 N	322.55 E	21.63	572.26
4565.00	89.50	81.50	4119.44	477.20 N	327.48 E	40.79	576.06
4570.00	89.30	83.00	4119.50	477.88 N	332.44 E	30.26	579.76
4575.00	89.10	84.50	4119.57	478.42 N	337.41 E	30.26	583.37
4580.00	89.30	86.10	4119.64	478.83 N	342.39 E	32.24	586.89
4585.00	89.90	87.50	4119.67	479.11 N	347.38 E	30.46	590.31
4590.00	90.80	89.50	4119.64	479.24 N	352.38 E	43.86	593.62
4595.00	91.50	91.20	4119.54	479.21 N	357.38 E	36.76	596.81
4600.00	92.10	92.90	4119.38	479.03 N	362.37 E	36.04	599.89
4605.00	92.40	94.60	4119.19	478.70 N	367.36 E	34.50	602.84
4610.00	92.70	96.40	4118.96	478.22 N	372.33 E	36.46	605.67
4615.00	92.90	98.50	4118.72	477.58 N	377.28 E	42.14	608.36
4620.00	92.70	100.20	4118.48	476.77 N	382.21 E	34.19	610.90
4625.00	92.30	101.60	4118.26	475.82 N	387.11 E	29.09	613.33
4630.00	91.00	103.00	4118.11	474.76 N	392.00 E	38.20	615.66
4635.00	89.20	104.20	4118.10	473.58 N	396.86 E	43.27	617.88
4640.00	88.00	105.00	4118.23	472.32 N	401.69 E	28.84	620.02
4645.00	87.10	105.90	4118.44	470.99 N	406.51 E	25.44	622.10
4650.00	86.70	107.00	4118.71	469.58 N	411.30 E	23.38	624.09
4655.00	86.50	108.10	4119.01	468.07 N	416.06 E	22.32	626.00
4660.00	86.50	107.80	4119.31	466.53 N	420.80 E	5.99	627.87
4665.00	86.20	109.00	4119.63	464.96 N	425.54 E	24.69	629.71
4670.00	85.50	109.10	4119.99	463.33 N	430.25 E	14.14	631.49
4675.00	85.20	113.80	4120.40	461.51 N	434.89 E	93.88	633.08
4680.00	84.80	114.10	4120.84	459.49 N	439.44 E	9.99	634.46
4685.00	84.10	114.60	4121.32	457.44 N	443.97 E	17.18	635.80
4690.00	85.30	114.60	4121.78	455.36 N	448.50 E	24.00	637.12
4695.00	83.70	114.80	4122.26	453.28 N	453.02 E	32.25	638.43
4700.00	83.20	114.80	4122.83	451.20 N	457.53 E	10.00	639.74
4705.00	82.70	114.60	4123.44	449.13 N	462.04 E	10.76	641.04
4710.00	82.90	114.30	4124.07	447.07 N	466.56 E	7.17	642.37
4715.00	82.80	113.70	4124.69	445.06 N	471.09 E	12.07	643.74
4720.00	82.80	112.70	4125.32	443.10 N	475.65 E	19.84	645.18
4725.00	83.00	112.00	4125.94	441.22 N	480.24 E	14.46	646.68
4730.00	82.90	111.00	4126.55	439.40 N	484.85 E	19.95	648.25
4735.00	82.80	110.00	4127.17	437.66 N	489.50 E	19.94	649.91
4740.00	82.60	109.70	4127.81	435.97 N	494.16 E	7.17	651.62
4745.00	82.70	109.40	4128.45	434.32 N	498.84 E	6.28	653.35
4750.00	82.70	109.10	4129.08	432.68 N	503.52 E	5.95	655.11
4755.00	82.80	108.70	4129.71	431.07 N	508.21 E	8.18	656.89
4760.00	83.00	108.60	4130.33	429.49 N	512.91 E	4.46	658.70
4765.00	83.00	108.30	4130.94	427.92 N	517.62 E	5.96	660.52

All data is in feet unless otherwise stated
Coordinates from structure and TVD from wellhead.
Vertical section is from N 0.00 E 0.00 on azimuth 40.00 degrees.
Declination is 0.00 degrees, Convergence is 0.00 degrees.
Calculation uses the minimum curvature method.
Presented by Baker Hughes INTEQ

PETROLEUM DEVELOPMENT CORPORATION
MOUNTAIN FEDERAL #4, #4
TOM TOM, CHAVES COUNTY, NEW MEXICO

SURVEY LISTING Page 4
Your ref : STEERING TOOL SURVEY
Last revised : 1-Nov-93

Measured Depth	Inclin. Degrees	Azimuth Degrees	True Vert. Depth	R E C T A N G U L A R C O O R D I N A T E S		Dogleg Deg/100Ft	Vert Sect
4770.00	83.00	107.90	4131.55	426.37 N	522.34 E	7.94	662.37
4775.00	83.00	107.50	4132.16	424.86 N	527.06 E	7.94	664.26
4780.00	83.20	107.10	4132.76	423.39 N	531.80 E	8.89	666.17
4785.00	83.60	106.00	4133.34	421.98 N	536.57 E	23.27	668.15
4790.00	83.60	100.10	4133.89	420.85 N	541.40 E	117.26	670.40
4795.00	83.90	105.70	4134.44	419.74 N	546.25 E	111.50	672.66
4800.00	84.20	105.40	4134.96	418.41 N	551.04 E	8.46	674.72
4805.00	84.80	104.90	4135.44	417.11 N	555.84 E	15.59	676.81
4810.00	85.70	104.40	4135.85	415.85 N	560.66 E	20.57	678.95
4815.00	86.70	104.10	4136.18	414.62 N	565.50 E	20.88	681.11
4820.00	87.40	103.80	4136.44	413.42 N	570.34 E	15.23	683.31
4825.00	88.10	103.40	4136.64	412.24 N	575.20 E	16.12	685.53
4830.00	88.90	103.00	4136.77	411.10 N	580.07 E	17.89	687.78
4835.00	89.60	102.80	4136.83	409.99 N	584.94 E	14.56	690.06
4840.00	90.10	102.60	4136.84	408.89 N	589.82 E	10.77	692.35
4845.00	91.00	102.40	4136.80	407.80 N	594.70 E	13.44	694.66
4850.00	91.90	102.20	4136.67	406.74 N	599.58 E	13.44	696.98
4855.00	92.40	101.90	4136.48	405.70 N	604.47 E	11.66	699.33
4860.00	92.10	101.30	4136.29	404.69 N	609.36 E	13.41	701.70
4865.00	91.00	100.80	4136.15	403.73 N	614.27 E	24.16	704.12
4870.00	90.20	100.10	4136.10	402.83 N	619.18 E	21.26	706.59
4875.00	89.10	99.50	4136.13	401.98 N	624.11 E	25.06	709.10
4880.00	88.00	99.10	4136.26	401.17 N	629.04 E	23.41	711.66
4885.00	87.40	97.60	4136.46	400.44 N	633.99 E	32.29	714.28
4890.00	87.50	96.80	4136.68	399.82 N	638.94 E	16.11	716.98
4895.00	87.80	96.40	4136.88	399.24 N	643.90 E	9.99	719.73
4900.00	88.00	95.70	4137.07	398.72 N	648.87 E	14.55	722.52
4905.00	88.00	95.20	4137.24	398.24 N	653.85 E	9.99	725.36
4910.00	88.00	94.90	4137.42	397.80 N	658.83 E	6.00	728.22
4915.00	88.30	94.60	4137.58	397.39 N	663.81 E	8.48	731.10
4920.00	88.60	94.70	4137.71	396.98 N	668.79 E	6.32	734.00
4925.00	89.20	94.70	4137.81	396.57 N	673.77 E	12.00	736.88
4930.00	89.90	94.80	4137.85	396.16 N	678.75 E	14.14	739.77
4935.00	91.00	94.70	4137.81	395.74 N	683.74 E	22.09	742.66
4940.00	92.00	94.70	4137.68	395.34 N	688.72 E	20.00	745.54
4945.00	92.80	94.80	4137.47	394.92 N	693.70 E	16.12	748.43
4955.00	93.10	94.70	4136.95	394.10 N	703.65 E	3.16	754.19
4960.00	93.20	94.40	4136.68	393.70 N	708.62 E	6.32	757.09
4965.00	93.00	94.30	4136.41	393.32 N	713.60 E	4.47	760.00
4970.00	92.90	93.70	4136.15	392.97 N	718.58 E	12.15	762.93
4975.00	92.70	92.90	4135.91	392.68 N	723.57 E	16.47	765.92
4980.00	92.50	92.00	4135.68	392.47 N	728.56 E	18.42	768.96
4985.00	92.20	91.00	4135.48	392.34 N	733.55 E	20.86	772.07
4990.00	92.20	90.50	4135.28	392.27 N	738.55 E	9.99	775.23
5006.00	92.14	88.90	4134.68	392.36 N	754.54 E	10.00	785.57 TD. PROJECTED F/ PREVIOUS SURVEY

All data is in feet unless otherwise stated
Coordinates from structure and TVD from wellhead.
Vertical section is from N 0.00 E 0.00 on azimuth 40.00 degrees.
Declination is 0.00 degrees, Convergence is 0.00 degrees.
Calculation uses the minimum curvature method.
Presented by Baker Hughes INTEQ



2105 Market Street Midland, Texas 79703
915-694-9517 Fax 915-694-5648

SURVEY CERTIFICATION SHEET

STATE OF TEXAS
COUNTY OF MIDLAND

I, Tim Stephens, in the employ of Baker Hughes INTEQ did on the days of October 23, 1993 thru October 23, 1993 conduct or supervise the taking of a Gyroscopic survey by the method of magnetic orientation from a depth of 0 feet to 4020 feet, with recordings of inclination and direction being obtained at approximate intervals of 100 feet.

This survey was conducted at the request of Petroleum Development for their Mountain Federal No. 4, Roosevelt County, State of New Mexico.

The data for this survey and the calculation were obtained and performed by me according to standards and procedures as set forth by Baker Hughes INTEQ and is true and correct to the best of my knowledge.

Tim Stephens
Directional Supervisor/Surveyor



2105 Market Street Midland, Texas 79703
915-694-9517 Fax 915-694-5648

SURVEY CERTIFICATION SHEET

STATE OF TEXAS
COUNTY OF MIDLAND

I, Ron Collins, in the employ of Baker Hughes INTEQ did on the days of October 23, 1993 thru October 30, 1993 conduct or supervise the taking of a Steering Tool survey by the method of magnetic orientation from a depth of 4020 feet to 4990 feet, with recordings of inclination and direction being obtained at approximate intervals of 5 feet.

This survey was conducted at the request of Petroleum Development for their Mountain Federal No. 4, Roosevelt County, State of New Mexico.

The data for this survey and the calculation were obtained and performed by me according to standards and procedures as set forth by Baker Hughes INTEQ and is true and correct to the best of my knowledge.

A handwritten signature in cursive script, appearing to read "Ron Collins".

Directional Supervisor/Surveyor