

3D-DD5-20719

REPORT OF
SUB-SURFACE
DIRECTIONAL
SURVEY

API #

PETROLEUM DEVELOPMENT CORPORATION

STRANGE FEDERAL NO. 3

CHAVES COUNTY, NEW MEXICO

J-25-7-31

JOB NUMBER

430-1656

430-1656

TYPE OF SURVEY

GYROSCOPIC

MWD

DATE

NOVEMBER 26, 1993

DECEMBER 4, 1993

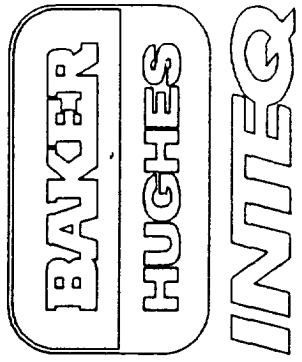
SURVEY BY TIM STEPHENS/RON COLLINS

OFFICE: MIDLAND, TX

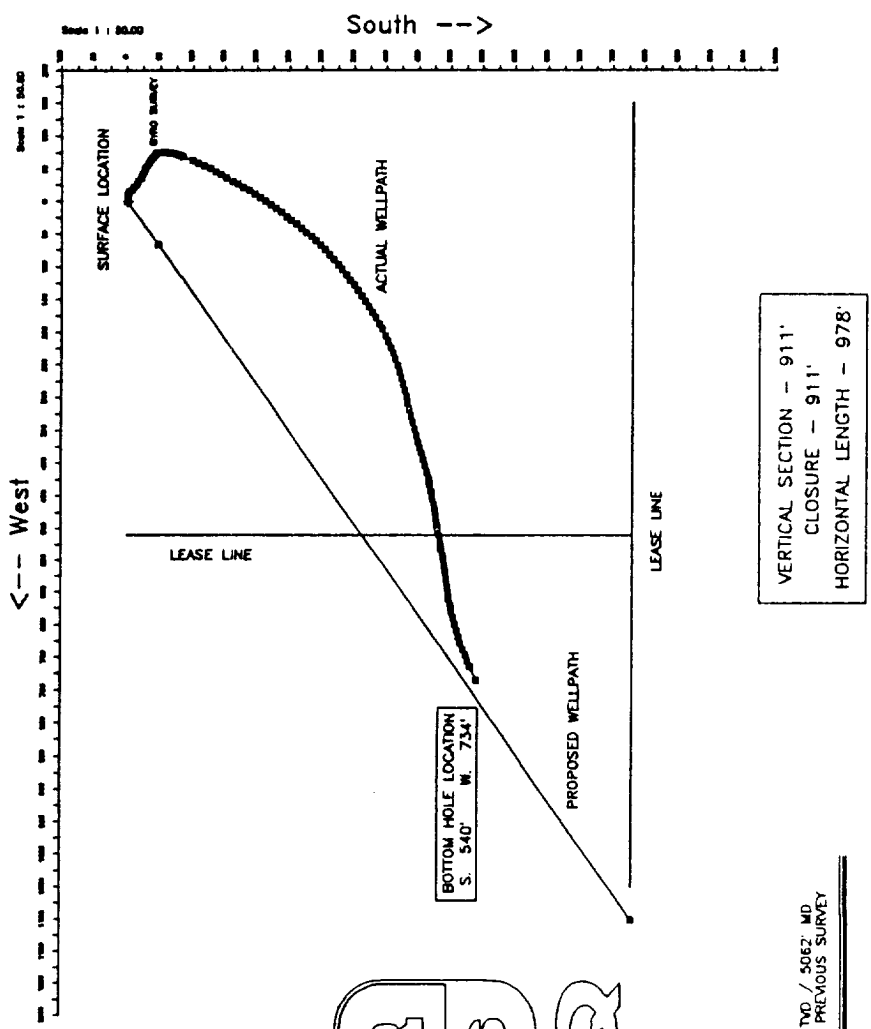
BHL per PK 156D/S & 2714/E

K-25-7-31

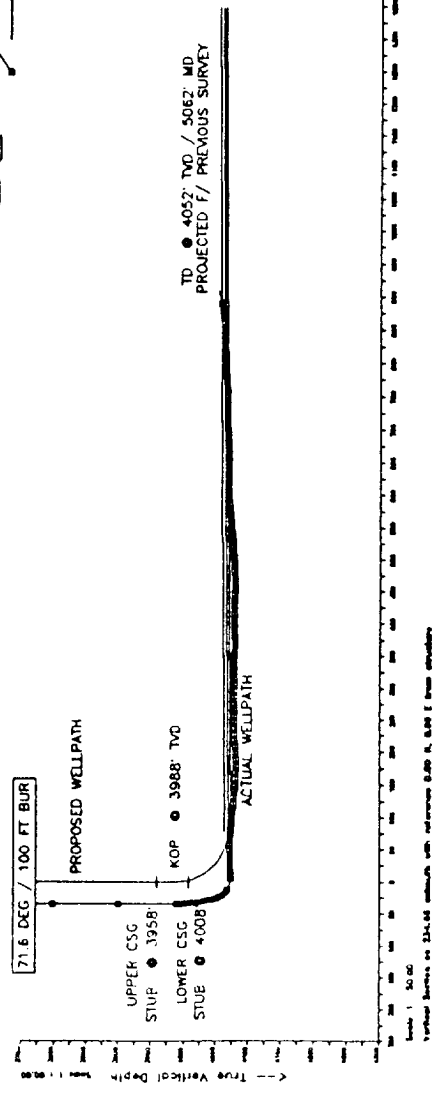
PETROLEUM DEVELOPEMENT CORPORATION									
Structure : STRANGE FEDERAL #3				Well : #3			Location : CHAVES COUNTY, NEW MEXICO		
Field : TOM TOM									
----- WELL PROFILE DATA -----									
Point	MD	INC	DIP	TVD	North	East			
Top of	0	0.00	0.00	0	0	0			
KOP	3988	0.00	234.66	3988	0	0			
End of Build	4114	90.45	234.66	4068	-47	-46			
Target	5383	90.45	234.66	4058	-780	-1100			



MAGNETIC DECLINATION
9 DEGREES EAST



VERTICAL SECTION - 911'
CLOSURE - 911'
HORIZONTAL LENGTH - 978'



Vertical Section is 234.66 meters with reference 8.80 ft, 8.80 ft from deviation

PETROLEUM DEVELOPEMENT CORPORATION

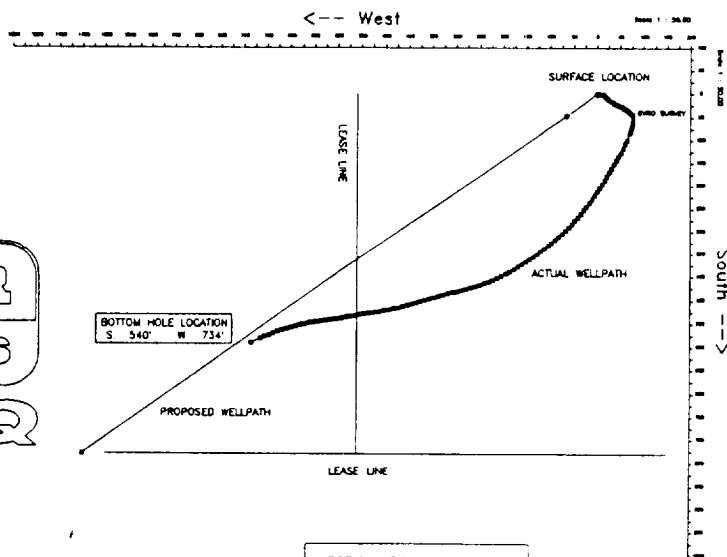
Structure : STRANDE FEDERAL #3 Well : #3
Field : TOM TOM Location : CHAVES COUNTY, NEW MEXICO

WELL PROFILE DATA

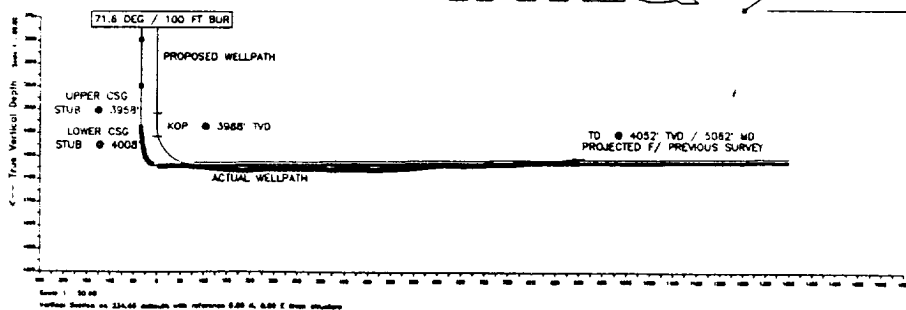
Point	MD	INC	Dr	TVD	North	East
Tie on	0	0.00	0.00	0	0	0
KOP	3988	0.00	234.66	3988	0	0
End of Bore	4114	90.43	234.66	4068	-67	-66
Target	5363	90.43	234.66	4058	-780	-1100



MAGNETIC DECLINATION
is 80000 SHUT



VERTICAL SECTION - 911'
CLOSURE - 911'
HORIZONTAL LENGTH - 978'



PETROLEUM DEVELOPEMENT CORPORATION
STRANGE FEDERAL #3

#3
slot #1
TOM TOM
CHAVES COUNTY, NEW MEXICO

S U R V E Y L I S T I N G

by
Baker Hughes INTEQ

Your ref :
Our ref : svy229
License :

Date printed : 9-Dec-93
Date created : 26-Oct-93
Last revised : 9-Dec-93

Field is centred on 0.000,0.000,0.00000,+
Structure is centred on 0.000,0.000,0.00000,N

Slot location is n0 0 0.000,w4 29 18.843
Slot Grid coordinates are N 0.000, E 0.000
Slot local coordinates are 0.00 N 0.00 E
Reference North is Grid North

PETROLEUM DEVELOPEMENT CORPORATION
STRANGE FEDERAL #3,#3
TOM TOM, CHAVES COUNTY, NEW MEXICO

SURVEY LISTING Page 1
Your ref :
Last revised : 9-Dec-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	0.37	25.56	100.00	0.29 N	0.14 E	0.37	-0.28	
200.00	0.20	36.07	200.00	0.72 N	0.38 E	0.18	-0.73	
300.00	0.25	75.94	300.00	0.92 N	0.70 E	0.16	-1.10	
400.00	0.40	86.28	400.00	0.99 N	1.26 E	0.16	-1.60	
500.00	0.44	85.96	499.99	1.04 N	1.99 E	0.04	-2.22	
600.00	0.53	85.82	599.99	1.10 N	2.83 E	0.09	-2.95	
700.00	0.58	85.59	699.98	1.18 N	3.80 E	0.05	-3.78	
800.00	0.65	97.63	799.98	1.14 N	4.86 E	0.15	-4.63	
900.00	0.76	98.37	899.97	0.97 N	6.08 E	0.11	-5.52	
1000.00	0.77	96.86	999.96	0.79 N	7.40 E	0.02	-6.50	
1100.00	0.82	99.53	1099.95	0.59 N	8.78 E	0.06	-7.50	
1200.00	0.65	113.78	1199.94	0.24 N	10.00 E	0.25	-8.30	
1300.00	0.80	136.72	1299.94	0.49 S	11.00 E	0.32	-8.69	
1400.00	1.25	120.25	1399.92	1.55 S	12.42 E	0.53	-9.24	
1500.00	2.06	124.31	1499.88	3.11 S	14.85 E	0.82	-10.31	
1600.00	2.81	136.82	1599.79	5.91 S	18.01 E	0.91	-11.27	
1700.00	3.28	127.98	1699.65	9.46 S	21.94 E	0.66	-12.43	
1800.00	3.40	126.76	1799.48	13.00 S	26.57 E	0.14	-14.16	
1900.00	3.51	124.91	1899.30	16.52 S	31.46 E	0.16	-16.10	
2000.00	3.29	118.53	1999.12	19.64 S	36.49 E	0.44	-18.40	
2100.00	3.13	115.42	2098.96	22.19 S	41.48 E	0.24	-21.00	
2200.00	2.60	113.36	2198.84	24.26 S	46.02 E	0.54	-23.51	
2300.00	2.29	115.26	2298.75	26.01 S	49.91 E	0.32	-25.67	
2400.00	2.03	117.64	2398.68	27.68 S	53.29 E	0.27	-27.46	
2500.00	2.20	115.60	2498.61	29.34 S	56.59 E	0.18	-29.19	
2600.00	1.83	120.91	2598.54	30.98 S	59.69 E	0.41	-30.77	
2700.00	1.66	121.83	2698.50	32.57 S	62.29 E	0.17	-31.98	
2800.00	1.40	126.48	2798.46	34.06 S	64.50 E	0.29	-32.92	
2900.00	1.16	127.49	2898.44	35.40 S	66.29 E	0.24	-33.60	
3000.00	1.06	135.12	2998.42	36.67 S	67.75 E	0.18	-34.05	
3100.00	1.00	135.17	3098.40	37.95 S	69.01 E	0.06	-34.35	
3200.00	0.99	135.30	3198.39	39.18 S	70.24 E	0.01	-34.63	
3300.00	0.76	140.31	3298.38	40.30 S	71.27 E	0.24	-34.82	
3400.00	0.65	135.65	3398.37	41.22 S	72.09 E	0.12	-34.96	
3500.00	0.85	133.21	3498.36	42.13 S	73.02 E	0.20	-35.20	
3600.00	0.68	130.11	3598.35	43.02 S	74.02 E	0.17	-35.49	
3700.00	0.76	148.10	3698.34	43.97 S	74.82 E	0.24	-35.60	
3800.00	0.73	156.41	3798.34	45.12 S	75.43 E	0.11	-35.43	
3900.00	0.53	152.06	3898.33	46.11 S	75.90 E	0.20	-35.24	
3975.00	1.18	167.51	3973.32	47.17 S	76.23 E	0.91	-34.90	GYRO SURVEY F/ SURFACE
3988.00	1.70	265.80	3986.32	47.31 S	76.07 E	16.96	-34.68	SHORT RADIUS KOP
3990.00	2.90	173.80	3988.32	47.37 S	76.04 E	170.60	-34.63	
3995.00	6.70	169.80	3993.30	47.78 S	76.11 E	76.25	-34.45	
4000.00	10.30	168.20	3998.24	48.50 S	76.25 E	72.15	-34.14	POH W/ 40' ANGLE BUILD MOTOR
4005.00	12.20	175.40	4003.15	49.47 S	76.38 E	47.19	-33.70	
4010.00	12.50	177.00	4008.03	50.54 S	76.46 E	9.10	-33.14	
4015.00	12.30	182.60	4012.91	51.61 S	76.46 E	24.37	-32.52	
4020.00	12.50	184.20	4017.80	52.68 S	76.40 E	7.95	-31.85	
4025.00	12.80	191.40	4022.68	53.76 S	76.25 E	32.08	-31.10	POH W/ 64' MOTOR-NOT BUILDING

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 234.66 degrees.
Declination is 0.00 degrees, Convergence is 0.00 degrees.
Calculation uses the minimum curvature method.
Presented by Baker Hughes INTEQ

PETROLEUM DEVELOPEMENT CORPORATION
STRANGE FEDERAL #3, #3
TOM TOM, CHAVES COUNTY, NEW MEXICO

SURVEY LISTING Page 2
Your ref :
Last revised : 9-Dec-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
4030.00	13.00	192.20	4027.55	54.85 S	76.02 E	5.36	-30.28
4035.00	13.50	191.40	4032.42	55.98 S	75.78 E	10.65	-29.44
4040.00	15.10	189.80	4037.26	57.19 S	75.56 E	32.96	-28.56
4045.00	20.00	186.60	4042.03	58.68 S	75.35 E	99.85	-27.52
4050.00	25.00	185.00	4046.65	60.58 S	75.16 E	100.74	-26.26
4055.00	32.10	185.00	4051.04	62.96 S	74.95 E	142.00	-24.72
4060.00	39.00	186.60	4055.10	65.85 S	74.65 E	139.24	-22.80
4065.00	45.20	191.40	4058.81	69.16 S	74.12 E	139.64	-20.46
4070.00	51.30	196.20	4062.14	72.78 S	73.22 E	141.41	-17.64
4075.00	57.30	198.60	4065.06	76.65 S	72.01 E	126.16	-14.40
4080.00	63.60	200.20	4067.52	80.75 S	70.56 E	129.03	-10.85
4084.00	69.60	201.80	4069.11	84.17 S	69.25 E	154.42	-7.80
4100.00	90.10	203.40	4071.91	98.63 S	63.22 E	128.50	5.48
4110.00	91.30	203.40	4071.79	107.81 S	59.25 E	12.00	14.03
4120.00	90.90	203.40	4071.60	116.98 S	55.28 E	4.00	22.58
4130.00	91.40	207.40	4071.40	126.02 S	50.99 E	40.30	31.30
4140.00	91.80	209.80	4071.12	134.79 S	46.21 E	24.32	40.27
4150.00	89.80	210.60	4070.98	143.43 S	41.18 E	21.54	49.38
4160.00	88.90	210.60	4071.09	152.04 S	36.09 E	9.00	58.51
4170.00	88.00	209.80	4071.36	160.68 S	31.06 E	12.04	67.60
4180.00	86.70	209.80	4071.82	169.35 S	26.09 E	13.00	76.67
4190.00	85.00	209.80	4072.55	178.00 S	21.14 E	17.00	85.72
4200.00	83.60	209.80	4073.54	186.64 S	16.19 E	14.00	94.75
4210.00	87.80	211.40	4074.29	195.22 S	11.12 E	44.93	103.85
4220.00	83.20	212.20	4075.08	203.69 S	5.87 E	46.68	113.03
4230.00	83.90	213.80	4076.20	212.02 S	0.45 E	17.37	122.27
4240.00	85.20	214.60	4077.15	220.25 S	5.14 W	15.24	131.59
4250.00	85.70	215.40	4077.94	228.42 S	10.86 W	9.41	140.98
4260.00	85.90	216.20	4078.68	236.51 S	16.69 W	8.22	150.42
4270.00	86.40	217.00	4079.35	244.52 S	22.64 W	9.42	159.90
4280.00	87.60	218.60	4079.87	252.41 S	28.76 W	19.98	169.46
4290.00	89.20	218.60	4080.15	260.22 S	35.00 W	16.00	179.07
4300.00	91.20	219.40	4080.11	267.99 S	41.29 W	21.54	188.70
4310.00	93.30	220.20	4079.72	275.67 S	47.69 W	22.47	198.35
4320.00	94.00	221.80	4079.08	283.20 S	54.23 W	17.43	208.05
4330.00	93.10	223.40	4078.46	290.54 S	60.99 W	18.33	217.81
4340.00	92.40	224.20	4077.99	297.76 S	67.90 W	10.62	227.62
4350.00	91.80	225.80	4077.62	304.82 S	74.97 W	17.08	237.47
4360.00	90.20	227.40	4077.44	311.69 S	82.23 W	22.62	247.37
4370.00	89.10	229.00	4077.51	318.36 S	89.69 W	19.42	257.30
4380.00	88.50	230.60	4077.72	324.81 S	97.32 W	17.08	267.27
4390.00	88.90	231.40	4077.94	331.10 S	105.09 W	8.94	277.24
4400.00	90.20	232.20	4078.02	337.28 S	112.95 W	15.26	287.23
4410.00	90.60	232.20	4077.95	343.41 S	120.85 W	4.00	297.22
4420.00	90.00	233.00	4077.90	349.48 S	128.80 W	10.00	307.22
4430.00	89.40	233.80	4077.95	355.45 S	136.82 W	10.00	317.21
4440.00	89.50	234.60	4078.05	361.30 S	144.93 W	8.06	327.21
4450.00	89.60	235.40	4078.12	367.03 S	153.12 W	8.06	337.21
4460.00	88.30	236.10	4078.31	372.66 S	161.39 W	14.76	347.21
4470.00	88.60	237.80	4078.58	378.11 S	169.77 W	17.26	357.20

EOC. POH W/ 40' RADIUS MOTOR

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 234.66 degrees.
Declination is 0.00 degrees, Convergence is 0.00 degrees.
Calculation uses the minimum curvature method.
Presented by Baker Hughes INTEQ

PETROLEUM DEVELOPEMENT CORPORATION
STRANGE FEDERAL #3,#3
TOM TOM,CHAVES COUNTY, NEW MEXICO

SURVEY LISTING Page 3
Your ref :
Last revised : 9-Dec-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
4480.00	89.60	239.40	4078.74	383.32 S	178.30 W	18.87	367.17
4490.00	91.20	241.00	4078.67	388.29 S	186.98 W	22.63	377.12
4498.00	92.30	242.60	4078.42	392.07 S	194.02 W	24.26	385.06
4510.00	92.00	242.10	4077.97	397.63 S	204.65 W	4.86	396.94
4520.00	90.90	245.00	4077.72	402.08 S	213.60 W	31.01	406.82
4530.00	89.10	245.80	4077.72	406.25 S	222.69 W	19.70	416.64
4540.00	88.20	247.40	4077.95	410.22 S	231.86 W	18.35	426.42
4550.00	88.30	249.80	4078.26	413.86 S	241.17 W	24.01	436.12
4560.00	88.60	251.40	4078.53	417.18 S	250.60 W	16.27	445.73
4570.00	89.40	253.00	4078.70	420.24 S	260.12 W	17.89	455.26
4580.00	90.10	254.60	4078.75	423.03 S	269.72 W	17.46	464.71
4590.00	90.50	254.60	4078.70	425.69 S	279.36 W	4.00	474.11
4600.00	91.40	255.40	4078.53	428.27 S	289.02 W	12.04	483.49
4610.00	92.20	256.20	4078.22	430.73 S	298.71 W	11.31	492.81
4620.00	92.80	255.40	4077.78	433.18 S	308.39 W	9.99	502.13
4630.00	93.80	255.40	4077.20	435.69 S	318.05 W	10.00	511.46
4640.00	93.50	254.60	4076.57	438.28 S	327.69 W	8.53	520.82
4650.00	94.10	254.60	4075.90	440.93 S	337.31 W	6.00	530.20
4660.00	94.50	254.60	4075.16	443.57 S	346.93 W	4.00	539.58
4670.00	95.30	253.80	4074.30	446.29 S	356.51 W	11.29	548.96
4680.00	95.30	253.00	4073.38	449.13 S	366.06 W	7.96	558.39
4690.00	95.20	252.20	4072.46	452.11 S	375.56 W	8.03	567.87
4700.00	95.70	253.00	4071.51	455.09 S	385.06 W	9.40	577.34
4710.00	94.90	255.40	4070.59	457.80 S	394.64 W	25.20	586.72
4720.00	94.50	255.40	4069.77	460.31 S	404.28 W	4.00	596.04
4730.00	93.20	255.40	4069.10	462.82 S	413.94 W	13.00	605.37
4740.00	90.30	256.20	4068.79	465.28 S	423.62 W	30.08	614.69
4750.00	87.20	256.20	4069.01	467.66 S	433.33 W	31.00	623.99
4760.00	87.00	257.80	4069.52	469.91 S	443.06 W	16.10	633.23
4770.00	88.60	258.60	4069.90	471.95 S	452.84 W	17.88	642.39
4780.00	90.50	261.00	4069.98	473.72 S	462.68 W	30.61	651.44
4790.00	91.90	261.80	4069.77	475.22 S	472.57 W	16.12	660.37
4800.00	92.40	261.00	4069.39	476.71 S	482.45 W	9.43	669.29
4810.00	93.10	261.00	4068.92	478.27 S	492.32 W	7.00	678.24
4820.00	92.70	259.40	4068.41	479.97 S	502.16 W	16.47	687.26
4830.00	92.60	258.60	4067.95	481.88 S	511.96 W	8.05	696.36
4840.00	92.40	259.40	4067.51	483.78 S	521.77 W	8.24	705.46
4850.00	91.50	260.20	4067.17	485.55 S	531.61 W	12.04	714.51
4860.00	90.90	260.20	4066.96	487.26 S	541.46 W	6.00	723.53
4870.00	90.00	261.80	4066.88	488.82 S	551.33 W	18.36	732.49
4880.00	89.10	261.00	4066.96	490.32 S	561.22 W	12.04	741.42
4890.00	90.60	260.20	4066.99	491.95 S	571.09 W	17.00	750.41
4900.00	93.70	261.00	4066.61	493.58 S	580.94 W	32.01	759.40
4910.00	95.00	261.80	4065.85	495.07 S	590.80 W	15.25	768.30
4920.00	95.70	261.80	4064.92	496.49 S	600.66 W	7.00	777.16
4930.00	93.00	259.40	4064.16	498.12 S	610.49 W	36.08	786.13
4940.00	89.70	258.60	4063.93	500.03 S	620.30 W	33.96	795.23
4950.00	91.40	257.80	4063.83	502.07 S	630.09 W	18.79	804.40
4960.00	92.60	256.20	4063.48	504.32 S	639.83 W	19.99	813.64
4970.00	92.10	255.40	4063.07	506.77 S	649.52 W	9.43	822.96

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 234.66 degrees.
Declination is 0.00 degrees, Convergence is 0.00 degrees.
Calculation uses the minimum curvature method.
Presented by Baker Hughes INTEQ

PETROLEUM DEVELOPEMENT CORPORATION
 STRANGE FEDERAL #3,#3
 TOM TOM, CHAVES COUNTY, NEW MEXICO

SURVEY LISTING Page 4
 Your ref :
 Last revised : 9-Dec-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	
4980.00	89.80	252.20	4062.91	509.56 S	659.12 W	39.40	832.41	
4990.00	91.50	250.60	4062.79	512.75 S	668.59 W	23.34	841.98	
5000.00	95.60	249.80	4062.17	516.13 S	677.98 W	41.77	851.60	
5010.00	97.40	249.00	4061.04	519.62 S	687.28 W	19.68	861.20	
5020.00	99.00	248.20	4059.62	523.24 S	696.50 W	17.85	870.81	
5030.00	98.90	245.80	4058.06	527.10 S	705.59 W	23.73	880.46	
5040.00	100.00	245.80	4056.42	531.14 S	714.59 W	11.00	890.14	
5062.00	101.91	243.45	4052.24	540.39 S	734.10 W	13.61	911.41	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 234.66 degrees.
 Declination is 0.00 degrees, Convergence is 0.00 degrees.
 Calculation uses the minimum curvature method.
 Presented by Baker Hughes INTEQ

PETROLEUM DEVELOPEMENT CORPORATION
STRANGE FEDERAL #3,#3
TOM TOM,CHAVES COUNTY, NEW MEXICO

SURVEY LISTING Page 5
Your ref :
Last revised : 9-Dec-93

Comments in wellpath =====				
MD	TVD	Rectangular Coords.		Comment

3975.00	3973.32	47.17 S	76.23 E	GYRO SURVEY F/ SURFACE
3988.00	3986.32	47.31 S	76.07 E	SHORT RADIUS KOP
4000.00	3998.24	48.50 S	76.25 E	POH W/ 40' ANGLE BUILD MOTOR
4025.00	4022.68	53.76 S	76.25 E	POH W/ 64' MOTOR-NOT BUILDING
4084.00	4069.11	84.17 S	69.25 E	EOC. POH W/ 40' RADIUS MOTOR
5062.00	4052.24	540.39 S	734.10 W	PROJECTED F/ PREVIOUS SURVEY

All data is in feet unless otherwise stated
Coordinates from structure and TVD from wellhead.
Bottom hole distance is 911.55 on azimuth 233.64 degrees from wellhead.
Vertical section is from N 0.00 E 0.00 on azimuth 234.66 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 November 26, 1993 thru November 26, 1993 conduct or supervise the taking of a Gyroscopic survey by the method of magnetic orientation from a depth of 0 feet to 3975 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 Corporation for their Strange Federal No. 3, Chaves 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



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SURVEY CERTIFICATION SHEET

STATE OF TEXAS
COUNTY OF MIDLAND

I, Ron Collins, in the employ of Baker Hughes INTEQ did on the days of November 26, 1993 thru December 4, 1993 conduct or supervise the taking of a MWD survey by the method of magnetic orientation from a depth of 3988 feet to 5054 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 Corporation for their Strange Federal No. 3, Chaves 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", written over a horizontal line.

Directional Supervisor/Surveyor