

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Richter 34U-303**

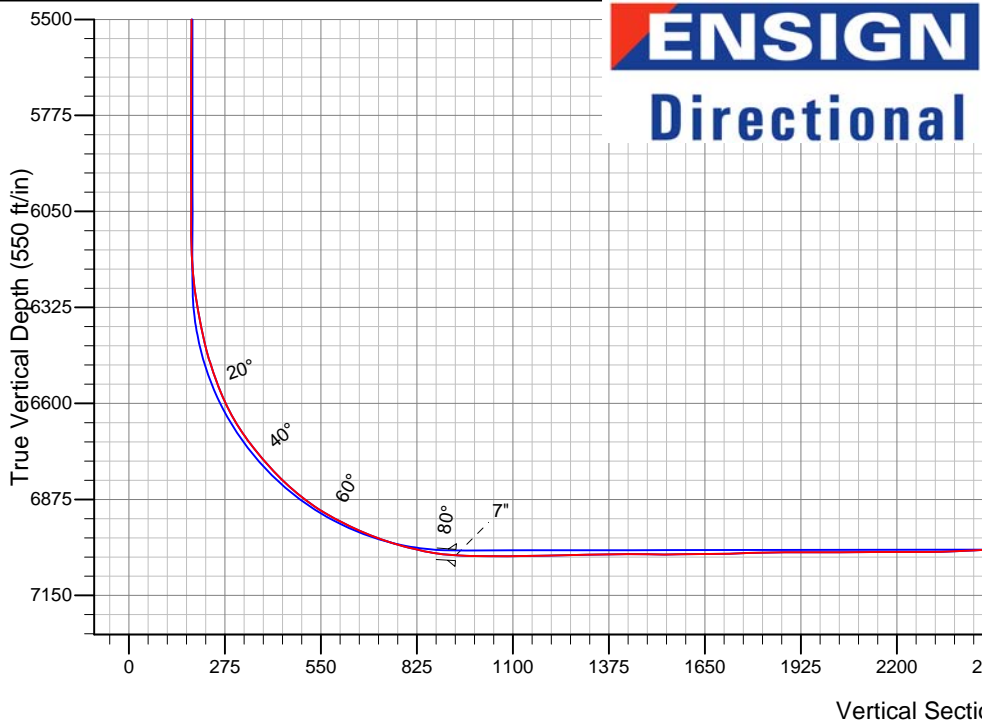
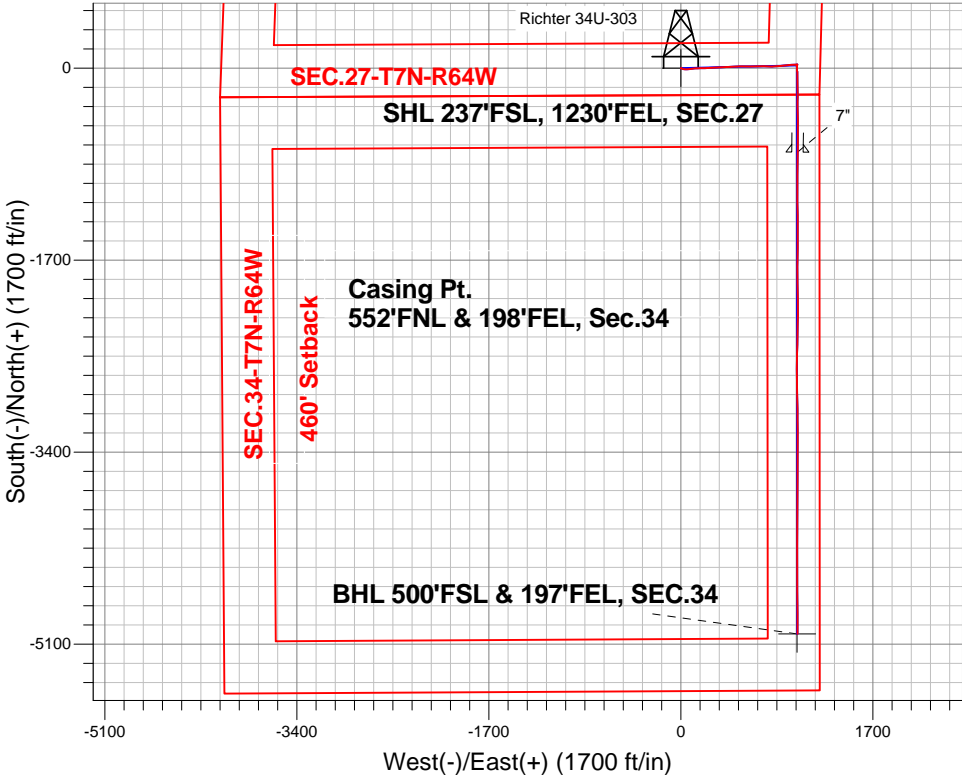
Surface Location: Richter 27T-HZ Pad Sec.27-T7N-R64W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4870.0

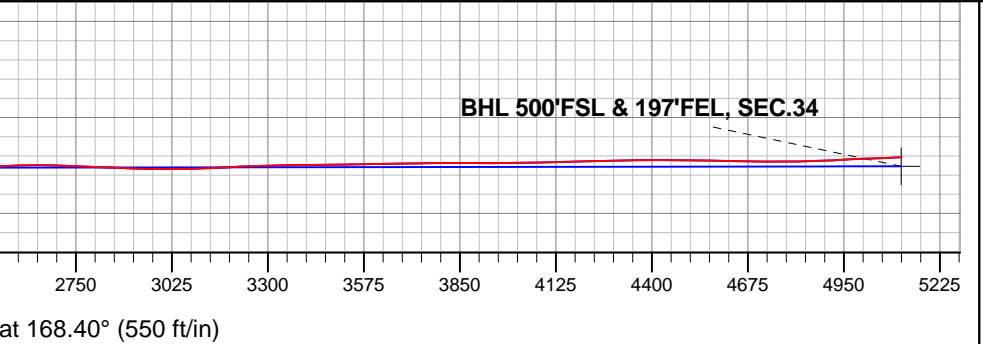
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1440181.33	3269278.69	40.537660	-104.531160	
RKB - 13.5' WELL @ 4883.5ft (RKB - 13.5')						

FINAL SURVEY

Projected Bottom Hole Location
11840'MD 6989'TVD 5010'S & 1032'E of SHL
92.9 degree Incl @ 179.8 degree AZM



Richter 27T-HZ Pad Sec.27-T7N-R64W Richter 34U-303 Wellbore #1 12:34, January 13 2014	ANNOTATIONS
	No annotation data is available.
LEGEND	
+ Richter 34U-303, Wellbore #1, Plan #4 (12-27-13)R V0	
□ Wellbore #1	
○ Survey #1	





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.27-T7N-R64W

Richter 27T-HZ Pad Sec.27-T7N-R64W

Richter 34U-303

Wellbore #1

Survey: Survey #1

Standard Survey Report

13 January, 2014

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Richter 34U-303
Project:	SEC.27-T7N-R64W	TVD Reference:	WELL @ 4883.5ft (RKB - 13.5')
Site:	Richter 27T-HZ Pad Sec.27-T7N-R64W	MD Reference:	WELL @ 4883.5ft (RKB - 13.5')
Well:	Richter 34U-303	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.27-T7N-R64W, Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Richter 27T-HZ Pad Sec.27-T7N-R64W				
Site Position:		Northing:	1,440,175.74 ft	Latitude:	40.537650
From:	Lat/Long	Easting:	3,269,098.08 ft	Longitude:	-104.531810
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.63 °

Well	Richter 34U-303					
Well Position	+N-S	0.0 ft	Northing:	1,440,181.33 ft	Latitude:	40.537660
	+E-W	0.0 ft	Easting:	3,269,278.69 ft	Longitude:	-104.531160
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,870.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/27/2013	8.41	67.11	52,960

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	168.40	

Survey Program	Date	1/13/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
163.0	11,840.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
SHL 237'FSL, 1230'FEL, SEC.27									
163.0	0.40	198.30	163.0	-0.5	-0.2	0.5	0.25	0.25	0.00
254.0	0.50	137.80	254.0	-1.1	0.0	1.1	0.51	0.11	-66.48
345.0	2.20	111.40	345.0	-2.1	1.9	2.4	1.94	1.87	-29.01
436.0	4.00	105.60	435.8	-3.6	6.6	4.8	2.01	1.98	-6.37
528.0	5.80	104.90	527.5	-5.6	14.1	8.3	1.96	1.96	-0.76
619.0	7.80	100.90	617.8	-8.0	24.7	12.8	2.26	2.20	-4.40
710.0	9.50	92.60	707.8	-9.5	38.2	17.0	2.31	1.87	-9.12
801.0	11.70	87.00	797.3	-9.3	54.9	20.2	2.67	2.42	-6.15
876.0	13.20	84.50	870.5	-8.1	71.1	22.2	2.12	2.00	-3.33
945.0	14.50	82.80	937.5	-6.3	87.5	23.7	1.97	1.88	-2.46

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Site:	Richter 27T-HZ Pad Sec.27-T7N-R64W	MD Reference:	WELL @ 4883.5ft (RKB - 13.5')
Well:	Richter 34U-303	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
994.0	15.30	85.10	984.8	-5.0	100.0	25.0	2.03	1.63	4.69
1,089.0	15.70	85.20	1,076.4	-2.8	125.3	28.0	0.42	0.42	0.11
1,184.0	15.40	86.30	1,167.9	-0.9	150.7	31.2	0.44	-0.32	1.16
1,279.0	14.90	87.90	1,259.6	0.3	175.5	35.0	0.69	-0.53	1.68
1,374.0	14.50	90.10	1,351.5	0.8	199.6	39.4	0.72	-0.42	2.32
1,470.0	13.30	88.20	1,444.7	1.1	222.6	43.7	1.34	-1.25	-1.98
1,565.0	13.40	91.00	1,537.1	1.2	244.6	48.0	0.69	0.11	2.95
1,660.0	14.20	85.90	1,629.4	1.9	267.2	51.9	1.53	0.84	-5.37
1,756.0	14.20	84.00	1,722.4	4.0	290.7	54.6	0.49	0.00	-1.98
1,851.0	14.10	83.30	1,814.6	6.5	313.7	56.7	0.21	-0.11	-0.74
1,946.0	14.00	89.60	1,906.7	8.0	336.7	59.9	1.61	-0.11	6.63
2,042.0	14.80	89.10	1,999.7	8.2	360.6	64.5	0.84	0.83	-0.52
2,137.0	14.80	87.50	2,091.6	9.0	384.8	68.6	0.43	0.00	-1.68
2,232.0	13.90	84.00	2,183.6	10.7	408.3	71.7	1.32	-0.95	-3.68
2,327.0	13.90	88.40	2,275.8	12.2	431.1	74.8	1.11	0.00	4.63
2,423.0	13.50	88.60	2,369.1	12.8	453.8	78.8	0.42	-0.42	0.21
2,518.0	14.70	89.80	2,461.2	13.1	476.9	83.1	1.30	1.26	1.26
2,613.0	14.10	84.20	2,553.2	14.3	500.5	86.7	1.60	-0.63	-5.89
2,708.0	15.00	89.30	2,645.2	15.6	524.3	90.2	1.65	0.95	5.37
2,804.0	14.90	88.60	2,737.9	16.1	549.1	94.7	0.22	-0.10	-0.73
2,899.0	13.80	91.00	2,830.0	16.2	572.6	99.3	1.32	-1.16	2.53
2,994.0	14.20	92.80	2,922.2	15.4	595.6	104.7	0.62	0.42	1.89
3,089.0	15.00	88.90	3,014.1	15.1	619.5	109.8	1.33	0.84	-4.11
3,184.0	14.90	87.50	3,105.9	15.8	644.0	114.0	0.39	-0.11	-1.47
3,280.0	13.50	88.90	3,198.9	16.6	667.5	118.0	1.50	-1.46	1.46
3,375.0	13.40	87.70	3,291.3	17.3	689.6	121.8	0.31	-0.11	-1.26
3,470.0	13.50	92.60	3,383.7	17.2	711.7	126.3	1.20	0.11	5.16
3,565.0	13.50	89.10	3,476.1	16.9	733.9	131.1	0.86	0.00	-3.68
3,661.0	12.70	92.60	3,569.6	16.6	755.6	135.8	1.17	-0.83	3.65
3,756.0	13.10	96.10	3,662.2	14.9	776.8	141.6	0.92	0.42	3.68
3,851.0	12.80	88.40	3,754.8	14.1	798.0	146.7	1.84	-0.32	-8.11
3,946.0	14.60	85.20	3,847.1	15.4	820.4	150.0	2.06	1.89	-3.37
4,041.0	15.10	85.80	3,938.9	17.3	844.7	153.0	0.55	0.53	0.63
4,136.0	15.50	85.20	4,030.6	19.3	869.7	156.1	0.45	0.42	-0.63
4,231.0	15.30	84.90	4,122.1	21.4	894.8	159.0	0.23	-0.21	-0.32
4,326.0	13.80	85.60	4,214.1	23.4	918.6	161.8	1.59	-1.58	0.74
4,422.0	10.90	82.90	4,307.9	25.4	939.0	164.0	3.08	-3.02	-2.81
4,517.0	10.40	82.60	4,401.2	27.6	956.5	165.3	0.53	-0.53	-0.32
4,612.0	9.60	86.60	4,494.8	29.2	972.9	167.1	1.11	-0.84	4.21
4,707.0	8.50	90.30	4,588.6	29.6	987.8	169.6	1.31	-1.16	3.89
4,802.0	7.80	88.70	4,682.6	29.8	1,001.3	172.3	0.77	-0.74	-1.68
4,897.0	6.60	84.20	4,776.9	30.5	1,013.1	174.0	1.39	-1.26	-4.74
4,991.0	4.70	80.10	4,870.4	31.7	1,022.3	174.6	2.07	-2.02	-4.36
5,086.0	2.70	89.10	4,965.2	32.4	1,028.4	175.1	2.19	-2.11	9.47
5,181.0	0.60	218.10	5,060.2	32.0	1,030.3	175.9	3.28	-2.21	135.79
5,276.0	0.70	194.20	5,155.2	31.1	1,029.9	176.7	0.30	0.11	-25.16
5,371.0	0.90	206.30	5,250.2	29.8	1,029.4	177.8	0.27	0.21	12.74
5,466.0	0.60	248.70	5,345.2	29.0	1,028.6	178.5	0.64	-0.32	44.63
5,562.0	0.80	227.60	5,441.2	28.3	1,027.6	178.9	0.34	0.21	-21.98
5,657.0	0.50	338.00	5,536.2	28.3	1,027.0	178.9	1.14	-0.32	116.21
5,752.0	0.30	318.00	5,631.2	28.9	1,026.7	178.3	0.25	-0.21	-21.05
5,847.0	0.20	308.60	5,726.2	29.1	1,026.4	177.9	0.11	-0.11	-9.89
5,943.0	0.10	329.60	5,822.2	29.3	1,026.2	177.7	0.12	-0.10	21.88
6,038.0	0.10	196.30	5,917.2	29.3	1,026.1	177.7	0.19	0.00	-140.32

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Well:	Richter 34U-303	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,133.0	0.20	208.10	6,012.2	29.1	1,026.0	177.9	0.11	0.11	12.42
6,228.0	0.40	241.00	6,107.2	28.8	1,025.7	178.1	0.27	0.21	34.63
6,324.0	3.70	171.70	6,203.1	25.5	1,025.8	181.3	3.73	3.44	-72.19
6,419.0	9.10	170.70	6,297.5	15.1	1,027.5	191.9	5.69	5.68	-1.05
6,466.0	10.60	176.80	6,343.8	7.1	1,028.3	199.9	3.88	3.19	12.98
6,514.0	11.50	179.40	6,390.9	-2.1	1,028.6	208.9	2.14	1.88	5.42
6,561.0	14.30	179.10	6,436.7	-12.6	1,028.8	219.3	5.96	5.96	-0.64
6,609.0	17.60	178.40	6,482.8	-25.8	1,029.1	232.2	6.89	6.88	-1.46
6,656.0	20.40	180.10	6,527.3	-41.1	1,029.2	247.2	6.07	5.96	3.62
6,705.0	22.80	178.40	6,572.8	-59.1	1,029.5	265.0	5.06	4.90	-3.47
6,752.0	26.90	177.70	6,615.5	-78.8	1,030.2	284.4	8.75	8.72	-1.49
6,800.0	31.80	178.70	6,657.3	-102.3	1,030.9	307.6	10.26	10.21	2.08
6,847.0	36.10	178.90	6,696.3	-128.6	1,031.4	333.4	9.15	9.15	0.43
6,895.0	39.80	179.30	6,734.1	-158.1	1,031.9	362.4	7.73	7.71	0.83
6,942.0	41.80	179.80	6,769.7	-188.8	1,032.1	392.5	4.31	4.26	1.06
6,990.0	44.30	179.40	6,804.8	-221.6	1,032.4	424.7	5.24	5.21	-0.83
7,037.0	48.90	180.10	6,837.1	-255.7	1,032.5	458.2	9.85	9.79	1.49
7,086.0	52.40	180.70	6,868.1	-293.6	1,032.2	495.2	7.21	7.14	1.22
7,133.0	56.20	180.70	6,895.5	-331.7	1,031.8	532.5	8.09	8.09	0.00
7,181.0	61.10	178.90	6,920.5	-372.7	1,031.9	572.7	10.70	10.21	-3.75
7,228.0	64.50	178.40	6,942.0	-414.5	1,032.9	613.8	7.30	7.23	-1.06
7,276.0	65.20	178.90	6,962.4	-457.9	1,033.9	656.5	1.74	1.46	1.04
7,323.0	68.80	178.40	6,980.7	-501.2	1,035.0	699.1	7.72	7.66	-1.06
7,371.0	73.20	179.10	6,996.4	-546.5	1,035.9	743.7	9.27	9.17	1.46
7,418.0	75.30	181.40	7,009.1	-591.8	1,035.7	788.0	6.49	4.47	4.89
7,466.0	77.40	181.60	7,020.5	-638.4	1,034.5	833.4	4.39	4.38	0.42
7,513.0	81.40	181.40	7,029.1	-684.6	1,033.3	878.4	8.52	8.51	-0.43
7,542.0	84.60	181.00	7,032.6	-713.3	1,032.7	906.5	11.12	11.03	-1.38
7,573.0	86.48	180.71	7,035.0	-744.2	1,032.3	936.7	6.12	6.05	-0.92
7"									
7,618.0	89.20	180.30	7,036.7	-789.2	1,031.9	980.6	6.12	6.05	-0.92
7,666.0	89.30	180.00	7,037.4	-837.2	1,031.7	1,027.6	0.66	0.21	-0.63
7,758.0	90.60	180.90	7,037.5	-929.2	1,031.0	1,117.6	1.72	1.41	0.98
7,849.0	91.80	180.30	7,035.5	-1,020.2	1,030.1	1,206.5	1.47	1.32	-0.66
7,945.0	90.70	179.30	7,033.5	-1,116.1	1,030.4	1,300.6	1.55	-1.15	-1.04
8,040.0	90.70	179.10	7,032.3	-1,211.1	1,031.7	1,393.9	0.21	0.00	-0.21
8,135.0	89.40	179.60	7,032.2	-1,306.1	1,032.8	1,487.2	1.47	-1.37	0.53
8,230.0	90.80	180.00	7,032.0	-1,401.1	1,033.1	1,580.3	1.53	1.47	0.42
8,326.0	90.60	179.40	7,030.9	-1,497.1	1,033.6	1,674.4	0.66	-0.21	-0.63
8,421.0	91.60	181.00	7,029.0	-1,592.1	1,033.3	1,767.4	1.99	1.05	1.68
8,516.0	91.20	181.70	7,026.7	-1,687.0	1,031.1	1,859.9	0.85	-0.42	0.74
8,611.0	89.20	178.90	7,026.4	-1,782.0	1,030.6	1,952.9	3.62	-2.11	-2.95
8,707.0	90.80	178.90	7,026.4	-1,878.0	1,032.4	2,047.3	1.67	1.67	0.00
8,802.0	90.10	179.60	7,025.6	-1,973.0	1,033.6	2,140.6	1.04	-0.74	0.74
8,897.0	90.00	179.30	7,025.6	-2,068.0	1,034.6	2,233.8	0.33	-0.11	-0.32
8,992.0	91.00	180.90	7,024.7	-2,163.0	1,034.4	2,326.8	1.99	1.05	1.68
9,088.0	93.60	180.70	7,020.9	-2,258.9	1,033.1	2,420.5	2.72	2.71	-0.21
9,183.0	92.90	181.00	7,015.5	-2,353.7	1,031.6	2,513.1	0.80	-0.74	0.32
9,278.0	91.20	181.60	7,012.1	-2,448.6	1,029.5	2,605.6	1.90	-1.79	0.63
9,373.0	88.20	180.70	7,012.6	-2,543.6	1,027.6	2,698.3	3.30	-3.16	-0.95
9,468.0	87.60	180.70	7,016.1	-2,638.5	1,026.4	2,791.0	0.63	-0.63	0.00
9,564.0	87.80	179.60	7,019.9	-2,734.4	1,026.2	2,885.0	1.16	0.21	-1.15
9,659.0	89.30	179.10	7,022.3	-2,829.4	1,027.3	2,978.2	1.66	1.58	-0.53

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
9,754.0	90.80	178.20	7,022.3	-2,924.4	1,029.5	3,071.7	1.84	1.58	-0.95
9,849.0	93.60	180.10	7,018.6	-3,019.3	1,030.9	3,164.9	3.56	2.95	2.00
9,945.0	91.60	179.60	7,014.2	-3,115.2	1,031.2	3,258.9	2.15	-2.08	-0.52
10,040.0	91.50	178.60	7,011.7	-3,210.1	1,032.6	3,352.2	1.06	-0.11	-1.05
10,135.0	89.80	179.80	7,010.6	-3,305.1	1,034.0	3,445.5	2.19	-1.79	1.26
10,230.0	91.50	180.90	7,009.5	-3,400.1	1,033.4	3,538.5	2.13	1.79	1.16
10,326.0	90.30	180.50	7,008.0	-3,496.1	1,032.2	3,632.2	1.32	-1.25	-0.42
10,421.0	91.50	180.00	7,006.5	-3,591.0	1,031.8	3,725.2	1.37	1.26	-0.53
10,516.0	90.30	179.40	7,005.0	-3,686.0	1,032.3	3,818.3	1.41	-1.26	-0.63
10,611.0	89.30	180.50	7,005.4	-3,781.0	1,032.4	3,911.4	1.56	-1.05	1.16
10,706.0	91.30	181.70	7,004.9	-3,876.0	1,030.6	4,004.1	2.46	2.11	1.26
10,802.0	90.70	180.30	7,003.2	-3,972.0	1,028.9	4,097.7	1.59	-0.63	-1.46
10,897.0	91.60	179.80	7,001.3	-4,067.0	1,028.8	4,190.8	1.08	0.95	-0.53
10,992.0	91.30	180.30	6,998.9	-4,161.9	1,028.7	4,283.8	0.61	-0.32	0.53
11,087.0	90.60	179.80	6,997.3	-4,256.9	1,028.6	4,376.8	0.91	-0.74	-0.53
11,183.0	89.50	179.40	6,997.2	-4,352.9	1,029.3	4,471.0	1.22	-1.15	-0.42
11,278.0	89.20	179.60	6,998.3	-4,447.9	1,030.1	4,564.2	0.38	-0.32	0.21
11,373.0	88.50	180.30	7,000.2	-4,542.9	1,030.2	4,657.2	1.04	-0.74	0.74
11,468.0	89.90	180.00	7,001.5	-4,637.9	1,030.0	4,750.2	1.51	1.47	-0.32
11,564.0	91.40	179.60	7,000.4	-4,733.9	1,030.3	4,844.3	1.62	1.56	-0.42
11,659.0	93.40	179.80	6,996.5	-4,828.8	1,030.8	4,937.4	2.12	2.11	0.21
11,754.0	91.40	179.40	6,992.5	-4,923.7	1,031.5	5,030.5	2.15	-2.11	-0.42
11,783.0	92.90	179.80	6,991.4	-4,952.6	1,031.7	5,058.9	5.35	5.17	1.38
11,838.4	92.90	179.80	6,988.6	-5,008.0	1,031.9	5,113.2	0.00	0.00	0.00
BHL 500'FSL & 200'FEL, SEC.34									
11,840.0	92.90	179.80	6,988.5	-5,009.6	1,031.9	5,114.7	0.00	0.00	0.00

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,573.0	7,035.0	7"	7	7-1/2

Checked By: _____	Approved By: _____	Date: _____
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