

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Rieder 18T-341**

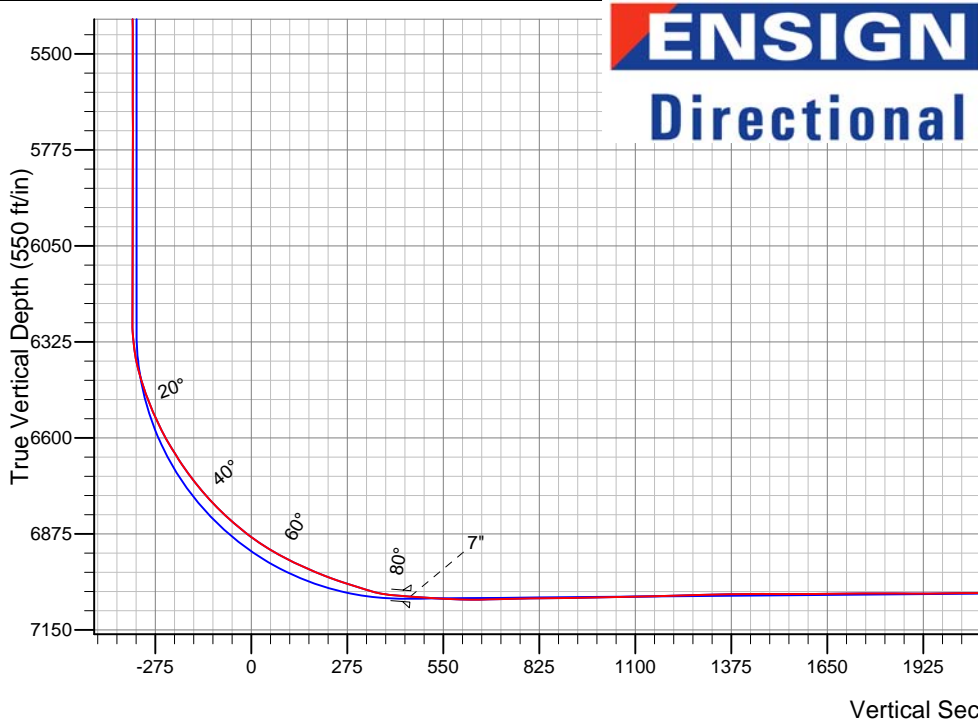
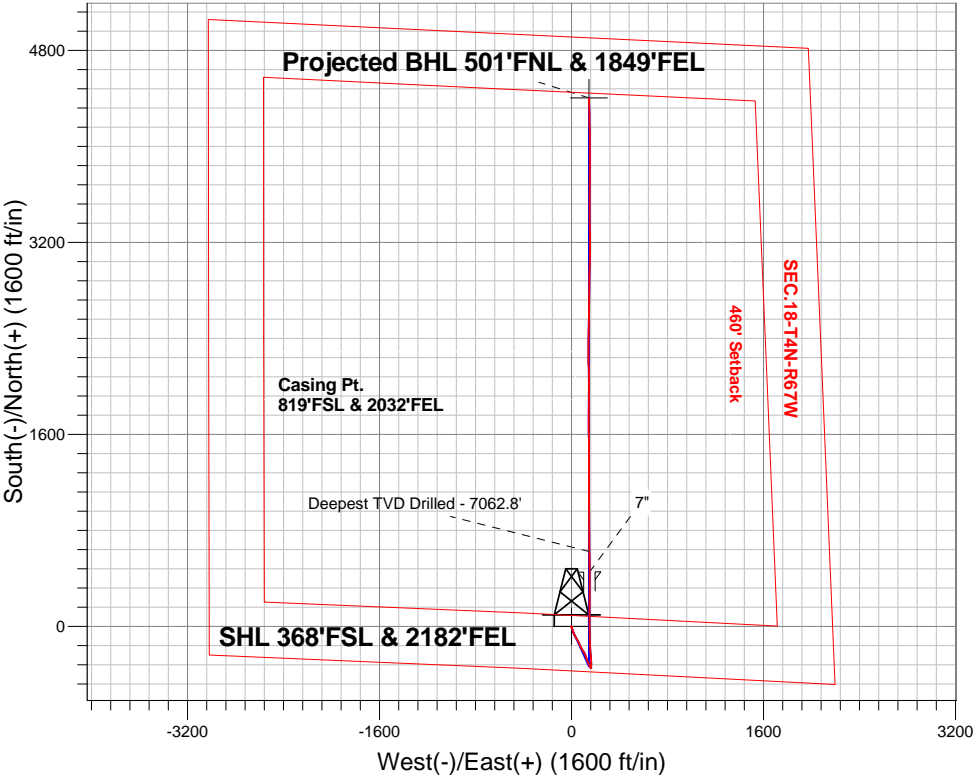
Surface Location: Rieder 4N67W18Q Pad Sec.18-T4N-R67W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4812.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1355266.86	3158710.52	40.307210	-104.930920	
Ensign Rig #134 RKB - 13' WELL @ 4825.0ft (Ensign Rig #134 RKB - 13')						

FINAL SURVEY

Projected Bottom Hole Location
11465'MD 7022'TVD 4404'N & 148'E of SHL
90.5 degree Incl @ 358.6 degree AZM



Rieder 4N67W18Q Pad Sec.18-T4N-R67W Rieder 18T-341 Wellbore #1	ANNOTATIONS		
	TVD	MD	Annotation
	7062.8	7684.0	Deepest TVD Drilled - 7062.8

LEGEND

- △ Rieder 18T-341, Wellbore #1, Plan #3 (6-09-15) V0
- Wellbore #1
- Survey #1

BHL 501'FNL & 1849'FEL



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.18-T4N-R67W

Rieder 4N67W18Q Pad Sec.18-T4N-R67W

Rieder 18T-341

Wellbore #1

Survey: Survey #1

Standard Survey Report

17 June, 2015

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18T-341
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4825.0ft (Ensign Rig #134 RKB - 13')
Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4825.0ft (Ensign Rig #134 RKB - 13')
Well:	Rieder 18T-341	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 2003.21 Single User Db

Project	SEC.18-T4N-R67W, 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		Rieder 4N67W18Q Pad Sec.18-T4N-R67W			
Site Position:		Northing:	1,355,266.69ft	Latitude:	40.307210
From:	Lat/Long	Easting:	3,158,679.84ft	Longitude:	-104.931030
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.37 °

Well	Rieder 18T-341					
Well Position	+N-S	0.0 ft	Northing:	1,355,266.86 ft	Latitude:	40.307210
	+E-W	0.0 ft	Easting:	3,158,710.52 ft	Longitude:	-104.930920
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,812.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/9/2015	8.41	66.81	52,646

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	1.89	

Survey Program	Date	6/17/2015			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
72.0	11,465.0	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	
1.0	0.00	175.80	1.0	0.0	0.0	0.0	0.28	0.28	0.00	
SHL 368'FSL & 2182'FEL										
72.0	0.20	175.80	72.0	-0.1	0.0	-0.1	0.28	0.28	0.00	
168.0	0.20	213.90	168.0	-0.4	-0.1	-0.4	0.14	0.00	39.69	
260.0	0.30	274.70	260.0	-0.5	-0.4	-0.6	0.29	0.11	66.09	
352.0	0.50	152.40	352.0	-0.9	-0.5	-0.9	0.77	0.22	-132.94	
444.0	0.80	168.20	444.0	-1.9	-0.1	-1.9	0.38	0.33	17.17	
537.0	0.60	203.70	537.0	-2.9	-0.2	-3.0	0.50	-0.22	38.17	
629.0	0.50	182.60	629.0	-3.8	-0.4	-3.8	0.24	-0.11	-22.93	
722.0	0.50	202.80	722.0	-4.6	-0.6	-4.6	0.19	0.00	21.72	
814.0	0.90	249.40	814.0	-5.2	-1.4	-5.2	0.72	0.43	50.65	

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Well:	Rieder 18T-341	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 2003.21 Single User Db

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)
899.0	0.90	233.40	899.0	-5.8	-2.6	-5.9	0.29	0.00	-18.82
986.0	0.70	257.10	986.0	-6.4	-3.6	-6.5	0.44	-0.23	27.24
1,078.0	1.10	77.30	1,077.9	-6.3	-3.3	-6.4	1.96	0.43	-195.44
1,170.0	0.70	72.00	1,169.9	-5.9	-1.9	-6.0	0.44	-0.43	-5.76
1,263.0	1.10	75.20	1,262.9	-5.5	-0.5	-5.5	0.43	0.43	3.44
1,355.0	0.70	46.90	1,354.9	-4.9	0.7	-4.9	0.64	-0.43	-30.76
1,447.0	1.10	48.30	1,446.9	-3.9	1.8	-3.9	0.44	0.43	1.52
1,540.0	0.60	81.70	1,539.9	-3.3	2.9	-3.2	0.74	-0.54	35.91
1,632.0	1.10	157.10	1,631.9	-4.0	3.8	-3.9	1.21	0.54	81.96
1,725.0	2.70	182.10	1,724.8	-7.0	4.0	-6.9	1.90	1.72	26.88
1,817.0	3.90	175.90	1,816.7	-12.3	4.2	-12.2	1.36	1.30	-6.74
1,910.0	5.80	170.80	1,909.3	-20.1	5.2	-19.9	2.09	2.04	-5.48
2,002.0	6.70	154.70	2,000.8	-29.5	8.2	-29.3	2.13	0.98	-17.50
2,094.0	7.80	162.20	2,092.1	-40.3	12.4	-39.9	1.57	1.20	8.15
2,187.0	7.50	163.30	2,184.2	-52.2	16.1	-51.6	0.36	-0.32	1.18
2,280.0	7.30	154.30	2,276.5	-63.3	20.4	-62.6	1.26	-0.22	-9.68
2,372.0	7.40	153.10	2,367.7	-73.9	25.6	-73.0	0.20	0.11	-1.30
2,465.0	7.30	150.80	2,459.9	-84.3	31.2	-83.3	0.33	-0.11	-2.47
2,560.0	7.10	152.60	2,554.2	-94.8	36.8	-93.6	0.32	-0.21	1.89
2,656.0	6.90	149.60	2,649.5	-105.1	42.5	-103.6	0.43	-0.21	-3.13
2,751.0	6.70	148.20	2,743.8	-114.7	48.3	-113.1	0.27	-0.21	-1.47
2,846.0	6.50	146.00	2,838.2	-123.9	54.2	-122.0	0.34	-0.21	-2.32
2,941.0	6.90	160.80	2,932.5	-133.7	59.1	-131.7	1.86	0.42	15.58
3,037.0	6.60	158.50	3,027.9	-144.3	63.0	-142.1	0.42	-0.31	-2.40
3,132.0	6.70	152.40	3,122.2	-154.3	67.6	-152.0	0.75	0.11	-6.42
3,227.0	6.20	150.60	3,216.6	-163.7	72.7	-161.2	0.57	-0.53	-1.89
3,323.0	8.50	153.80	3,311.8	-174.6	78.3	-171.9	2.43	2.40	3.33
3,418.0	8.10	151.10	3,405.8	-186.7	84.7	-183.8	0.59	-0.42	-2.84
3,513.0	7.80	148.70	3,499.9	-198.1	91.3	-195.0	0.47	-0.32	-2.53
3,608.0	7.80	146.60	3,594.1	-209.0	98.2	-205.6	0.30	0.00	-2.21
3,704.0	7.70	146.20	3,689.2	-219.8	105.3	-216.2	0.12	-0.10	-0.42
3,799.0	8.20	160.30	3,783.3	-231.4	111.2	-227.6	2.11	0.53	14.84
3,894.0	8.20	159.80	3,877.3	-244.2	115.8	-240.2	0.08	0.00	-0.53
3,989.0	7.70	159.80	3,971.4	-256.5	120.3	-252.4	0.53	-0.53	0.00
4,085.0	7.20	158.50	4,066.6	-268.1	124.7	-263.9	0.55	-0.52	-1.35
4,180.0	6.80	160.30	4,160.9	-279.0	128.8	-274.6	0.48	-0.42	1.89
4,275.0	6.20	158.00	4,255.3	-289.0	132.6	-284.5	0.69	-0.63	-2.42
4,370.0	6.00	156.10	4,349.7	-298.3	136.6	-293.6	0.30	-0.21	-2.00
4,465.0	6.20	154.00	4,444.2	-307.5	140.8	-302.7	0.32	0.21	-2.21
4,561.0	6.00	154.00	4,539.6	-316.6	145.3	-311.7	0.21	-0.21	0.00
4,656.0	5.90	152.00	4,634.1	-325.4	149.8	-320.3	0.24	-0.11	-2.11
4,751.0	5.30	151.50	4,728.7	-333.6	154.2	-328.3	0.63	-0.63	-0.53
4,846.0	3.30	158.90	4,823.4	-340.0	157.2	-334.6	2.18	-2.11	7.79
4,973.0	1.50	184.40	4,950.3	-345.0	158.4	-339.6	1.61	-1.42	20.08
5,068.0	0.90	85.40	5,045.3	-346.2	159.1	-340.8	1.96	-0.63	-104.21
5,163.0	0.80	86.50	5,140.3	-346.1	160.5	-340.7	0.11	-0.11	1.16
5,259.0	0.70	87.70	5,236.3	-346.1	161.7	-340.5	0.11	-0.10	1.25
5,354.0	0.90	53.90	5,331.2	-345.6	162.9	-340.0	0.53	0.21	-35.58
5,449.0	0.30	47.80	5,426.2	-345.0	163.7	-339.4	0.63	-0.63	-6.42
5,545.0	0.10	319.50	5,522.2	-344.8	163.8	-339.2	0.33	-0.21	-91.98
5,672.0	0.40	72.60	5,649.2	-344.5	164.2	-338.9	0.35	0.24	89.06
5,735.0	0.40	84.00	5,712.2	-344.4	164.6	-338.8	0.13	0.00	18.10
5,862.0	0.40	137.10	5,839.2	-344.7	165.4	-339.1	0.28	0.00	41.81
5,925.0	0.30	138.00	5,902.2	-345.0	165.6	-339.4	0.16	-0.16	1.43

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Well:	Rieder 18T-341	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 2003.21 Single User Db

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)
6,021.0	0.30	121.30	5,998.2	-345.3	166.0	-339.7	0.09	0.00	-17.40
6,116.0	1.00	272.40	6,093.2	-345.4	165.4	-339.8	1.34	0.74	159.05
6,179.0	1.10	264.20	6,156.2	-345.5	164.2	-339.9	0.29	0.16	-13.02
6,275.0	1.10	241.00	6,252.2	-346.0	162.5	-340.5	0.46	0.00	-24.17
6,370.0	7.90	7.40	6,346.9	-340.0	162.6	-334.4	9.05	7.16	133.05
6,465.0	17.90	1.60	6,439.4	-318.8	163.8	-313.3	10.60	10.53	-6.11
6,561.0	23.30	357.30	6,529.2	-285.1	163.3	-279.6	5.84	5.63	-4.48
6,656.0	30.40	354.20	6,614.0	-242.4	160.0	-237.0	7.62	7.47	-3.26
6,751.0	35.30	355.20	6,693.7	-191.1	155.3	-185.8	5.19	5.16	1.05
6,847.0	42.00	359.30	6,768.7	-131.2	152.6	-126.1	7.47	6.98	4.27
6,942.0	48.50	359.10	6,835.5	-63.8	151.6	-58.8	6.84	6.84	-0.21
7,037.0	54.80	359.30	6,894.4	10.7	150.6	15.6	6.63	6.63	0.21
7,133.0	63.00	359.80	6,944.0	92.8	149.9	97.7	8.55	8.54	0.52
7,228.0	67.10	1.00	6,984.1	178.9	150.6	183.8	4.47	4.32	1.26
7,323.0	72.50	359.80	7,016.8	268.0	151.2	272.8	5.81	5.68	-1.26
7,387.0	72.60	359.60	7,036.0	329.1	150.8	333.9	0.34	0.16	-0.31
7,450.0	83.40	359.40	7,049.1	390.6	150.3	395.3	17.15	17.14	-0.32
7,475.0	85.60	359.70	7,051.5	415.5	150.1	420.2	8.88	8.80	1.20
7,511.0	85.79	359.85	7,054.2	451.4	150.0	456.1	0.67	0.53	0.42
7"									
7,570.0	86.10	0.10	7,058.4	510.2	149.9	514.9	0.67	0.53	0.42
7,684.0	89.50	358.90	7,062.8	624.1	149.0	628.7	3.16	2.98	-1.05
Deepest TVD Drilled - 7062.8'									
7,760.0	91.50	0.00	7,062.1	700.1	148.2	704.6	3.00	2.63	1.45
7,855.0	91.40	359.80	7,059.7	795.1	148.1	799.5	0.24	-0.11	-0.21
7,950.0	90.30	359.10	7,058.3	890.1	147.1	894.4	1.37	-1.16	-0.74
8,046.0	91.40	0.10	7,056.9	986.1	146.5	990.3	1.55	1.15	1.04
8,141.0	91.50	359.10	7,054.5	1,081.0	145.8	1,085.2	1.06	0.11	-1.05
8,236.0	91.20	0.00	7,052.2	1,176.0	145.1	1,180.1	1.00	-0.32	0.95
8,331.0	91.60	359.30	7,049.9	1,271.0	144.5	1,275.0	0.85	0.42	-0.74
8,426.0	91.10	0.50	7,047.7	1,365.9	144.3	1,369.9	1.37	-0.53	1.26
8,521.0	90.50	0.20	7,046.3	1,460.9	144.9	1,464.9	0.71	-0.63	-0.32
8,616.0	89.20	359.10	7,046.6	1,555.9	144.3	1,559.8	1.79	-1.37	-1.16
8,712.0	90.70	0.50	7,046.7	1,651.9	144.0	1,655.7	2.14	1.56	1.46
8,807.0	90.90	359.40	7,045.3	1,746.9	143.9	1,750.7	1.18	0.21	-1.16
8,902.0	89.00	0.00	7,045.4	1,841.9	143.4	1,845.6	2.10	-2.00	0.63
8,997.0	90.70	1.00	7,045.7	1,936.9	144.2	1,940.6	2.08	1.79	1.05
9,092.0	90.80	0.10	7,044.4	2,031.9	145.1	2,035.5	0.95	0.11	-0.95
9,187.0	89.70	358.40	7,044.0	2,126.9	143.9	2,130.4	2.13	-1.16	-1.79
9,282.0	91.60	359.60	7,042.9	2,221.8	142.2	2,225.3	2.37	2.00	1.26
9,378.0	92.00	0.00	7,039.9	2,317.8	141.9	2,321.2	0.59	0.42	0.42
9,473.0	92.20	1.60	7,036.4	2,412.7	143.2	2,416.1	1.70	0.21	1.68
9,568.0	92.00	0.70	7,033.0	2,507.6	145.1	2,511.0	0.97	-0.21	-0.95
9,663.0	92.40	359.40	7,029.3	2,602.5	145.2	2,605.9	1.43	0.42	-1.37
9,758.0	90.20	0.70	7,027.2	2,697.5	145.3	2,700.8	2.69	-2.32	1.37
9,853.0	93.40	1.60	7,024.2	2,792.4	147.2	2,795.8	3.50	3.37	0.95
9,949.0	90.70	1.40	7,020.7	2,888.3	149.7	2,891.7	2.82	-2.81	-0.21
10,044.0	91.00	1.60	7,019.3	2,983.3	152.2	2,986.7	0.38	0.32	0.21
10,139.0	88.10	0.70	7,020.1	3,078.3	154.1	3,081.7	3.20	-3.05	-0.95
10,234.0	88.00	359.40	7,023.3	3,173.2	154.2	3,176.6	1.37	-0.11	-1.37
10,329.0	87.50	359.10	7,027.0	3,268.1	153.0	3,271.4	0.61	-0.53	-0.32
10,424.0	89.00	359.30	7,029.9	3,363.1	151.6	3,366.2	1.59	1.58	0.21
10,520.0	90.80	359.40	7,030.1	3,459.0	150.5	3,462.1	1.88	1.88	0.10

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10,615.0	90.40	0.90	7,029.1	3,554.0	150.8	3,557.1	1.63	-0.42	1.58
10,710.0	90.00	0.70	7,028.8	3,649.0	152.1	3,652.1	0.47	-0.42	-0.21
10,805.0	91.70	0.10	7,027.4	3,744.0	152.8	3,747.0	1.90	1.79	-0.63
10,900.0	91.20	0.70	7,025.0	3,839.0	153.4	3,841.9	0.82	-0.53	0.63
10,995.0	89.10	359.10	7,024.7	3,934.0	153.3	3,936.9	2.78	-2.21	-1.68
11,091.0	90.70	359.10	7,024.9	4,030.0	151.8	4,032.8	1.67	1.67	0.00
11,186.0	90.80	359.40	7,023.6	4,124.9	150.5	4,127.7	0.33	0.11	0.32
11,281.0	90.00	359.60	7,023.0	4,219.9	149.7	4,222.6	0.87	-0.84	0.21
11,376.0	89.90	358.40	7,023.1	4,314.9	148.0	4,317.5	1.27	-0.11	-1.26
11,410.0	90.50	358.60	7,022.9	4,348.9	147.1	4,351.4	1.86	1.76	0.59
11,465.0	90.50	358.60	7,022.5	4,403.9	145.8	4,406.3	0.00	0.00	0.00
BHL 500'FNL & 1850'FEL									

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,511.0	7,054.2	7"	7	7-1/2

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
7,684.0	7,062.8	624.1	149.0	Deepest TVD Drilled - 7062.8'

Checked By: _____	Approved By: _____	Date: _____
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