

# PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Moss 14-16H**

Surface Location: Moss 14-16H Pad Sec.16-T7N-R65W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

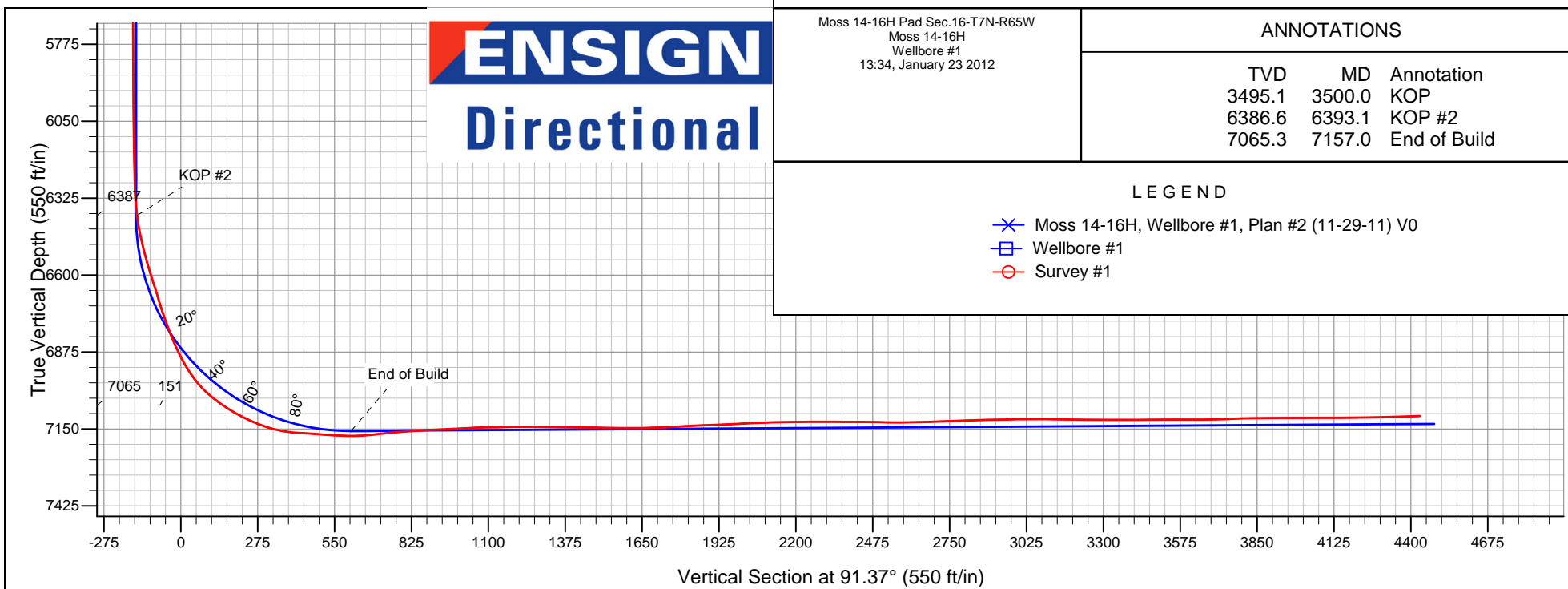
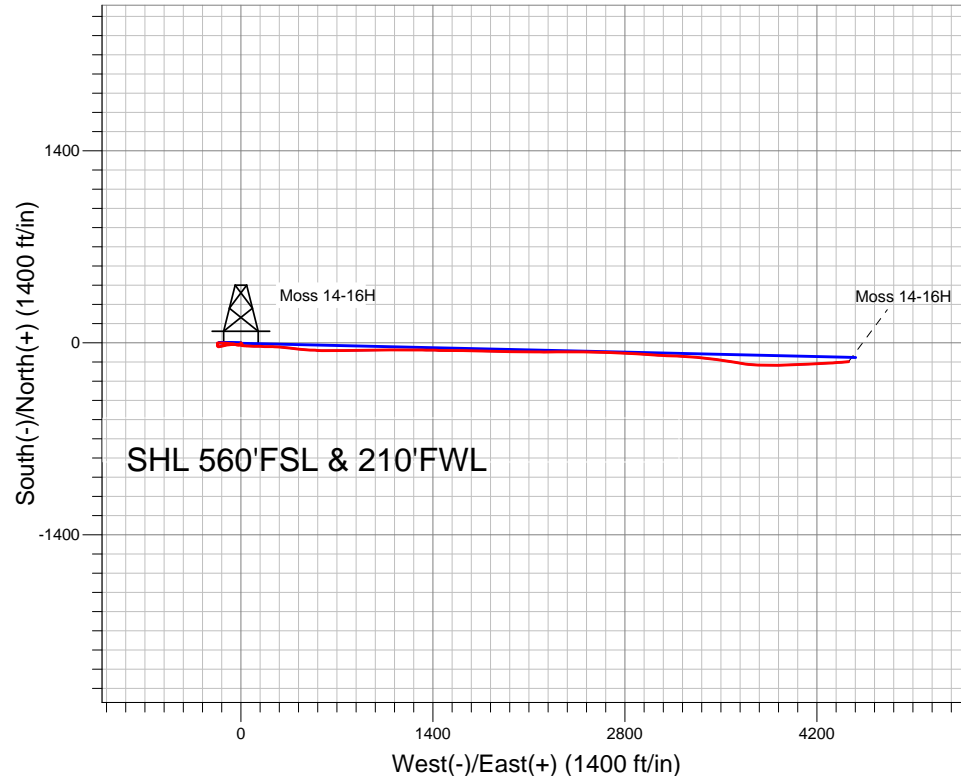
Ground Elevation: 4862.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1451141.98	3228698.11	40.568870	-104.676790	

RKB Ensign 32 - 15' WELL @ 4877.0ft (RKB Ensign 32 - 15')

## FINAL SURVEY

Projected Bottom Hole Location  
11468' MD 7104' TVD 139' S & 4431' E of  
SHL  
91.9 degree Incl @ 86.2 degree AZM



Moss 14-16H Pad Sec.16-T7N-R65W  
Moss 14-16H  
Wellbore #1  
13:34, January 23 2012

### ANNOTATIONS

TVD	MD	Annotation
3495.1	3500.0	KOP
6386.6	6393.1	KOP #2
7065.3	7157.0	End of Build

### LEGEND

- ✕ Moss 14-16H, Wellbore #1, Plan #2 (11-29-11) V0
- Wellbore #1
- Survey #1



## **Directional**

# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.16-T7N-R65W**

**Moss 14-16H Pad Sec.16-T7N-R65W**

**Moss 14-16H**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**23 January, 2012**

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Moss 14-16H
<b>Project:</b>	SEC.16-T7N-R65W	<b>TVD Reference:</b>	WELL @ 4877.0ft (RKB Ensign 32 - 15')
<b>Site:</b>	Moss 14-16H Pad Sec.16-T7N-R65W	<b>MD Reference:</b>	WELL @ 4877.0ft (RKB Ensign 32 - 15')
<b>Well:</b>	Moss 14-16H	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Landmark

<b>Project</b>	SEC.16-T7N-R65W, Weld County, CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

Site	Moss 14-16H Pad Sec.16-T7N-R65W				
Site Position:		Northing:	1,451,142.00ft	Latitude:	40.568870
From:	Lat/Long	Easting:	3,228,698.11 ft	Longitude:	-104.676790
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.53 °

Well	Moss 14-16H					
Well Position	+N-S	0.0 ft	Northing:	1,451,141.98 ft	Latitude:	40.568870
	+E-W	0.0 ft	Easting:	3,228,698.11 ft	Longitude:	-104.676790
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,862.0 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	12/28/2011	8.76	67.18	53,172

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	91.37	

<b>Survey Program</b>	<b>Date</b>	1/23/2012			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
945.0	11,468.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
1.0	0.00	0.00	1.0	0.0	0.0	0.0	0.00	0.00	0.00	
<b>WEST SECTION LINE</b>										
1.1	0.00	132.80	1.1	0.0	0.0	0.0	0.00	0.00	0.00	
<b>HARDLINE SHL 460'FSL, 460'FWL</b>										
28.2	0.03	132.80	28.2	0.0	0.0	0.0	0.10	0.10	0.00	
<b>HARDLINES BHL 460'FSL, 460'FEL</b>										
945.0	0.90	132.80	945.0	-5.0	5.4	5.6	0.10	0.10	0.00	
1,037.0	1.00	134.50	1,036.9	-6.1	6.5	6.7	0.11	0.11	1.85	
1,129.0	1.00	135.00	1,128.9	-7.2	7.7	7.9	0.01	0.00	0.54	
1,222.0	0.40	172.40	1,221.9	-8.1	8.3	8.5	0.78	-0.65	40.22	
1,315.0	0.90	250.40	1,314.9	-8.7	7.7	7.9	0.97	0.54	83.87	

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<b>Site:</b>	Moss 14-16H Pad Sec.16-T7N-R65W	<b>MD Reference:</b>	WELL @ 4877.0ft (RKB Ensign 32 - 15')
<b>Well:</b>	Moss 14-16H	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	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)
1,409.0	1.50	239.60	1,408.9	-9.6	5.9	6.1	0.68	0.64	-11.49
1,502.0	2.00	256.40	1,501.9	-10.6	3.3	3.5	0.76	0.54	18.06
1,595.0	2.20	259.10	1,594.8	-11.3	-0.1	0.2	0.24	0.22	2.90
1,689.0	2.30	260.80	1,688.7	-11.9	-3.7	-3.4	0.13	0.11	1.81
1,782.0	2.10	260.40	1,781.7	-12.5	-7.2	-6.9	0.22	-0.22	-0.43
1,875.0	1.80	251.20	1,874.6	-13.3	-10.3	-10.0	0.47	-0.32	-9.89
1,969.0	1.60	248.50	1,968.6	-14.2	-12.9	-12.5	0.23	-0.21	-2.87
2,062.0	2.30	263.40	2,061.5	-14.9	-16.0	-15.6	0.92	0.75	16.02
2,155.0	3.40	271.20	2,154.4	-15.1	-20.6	-20.2	1.25	1.18	8.39
2,248.0	4.00	278.00	2,247.2	-14.6	-26.5	-26.2	0.80	0.65	7.31
2,341.0	4.60	279.00	2,339.9	-13.5	-33.4	-33.1	0.65	0.65	1.08
2,434.0	5.40	277.40	2,432.6	-12.4	-41.5	-41.1	0.87	0.86	-1.72
2,527.0	5.00	274.60	2,525.2	-11.5	-49.8	-49.5	0.51	-0.43	-3.01
2,620.0	4.70	268.10	2,617.9	-11.3	-57.7	-57.4	0.67	-0.32	-6.99
2,713.0	4.50	263.40	2,710.6	-11.8	-65.1	-64.8	0.46	-0.22	-5.05
2,805.0	4.00	261.30	2,802.3	-12.7	-71.9	-71.5	0.57	-0.54	-2.28
2,899.0	4.90	261.40	2,896.0	-13.8	-79.1	-78.7	0.96	0.96	0.11
2,993.0	4.70	263.10	2,989.7	-14.9	-86.9	-86.5	0.26	-0.21	1.81
3,086.0	4.70	261.10	3,082.4	-15.9	-94.4	-94.0	0.18	0.00	-2.15
3,179.0	4.70	260.90	3,175.1	-17.1	-101.9	-101.5	0.02	0.00	-0.22
3,272.0	4.30	261.50	3,267.8	-18.2	-109.2	-108.7	0.43	-0.43	0.65
3,365.0	4.40	260.60	3,360.5	-19.3	-116.1	-115.6	0.13	0.11	-0.97
3,457.0	4.20	258.30	3,452.3	-20.6	-122.9	-122.4	0.29	-0.22	-2.50
3,500.0	4.06	258.95	3,495.1	-21.2	-125.9	-125.4	0.33	-0.32	1.52
<b>KOP</b>									
3,552.0	3.90	259.80	3,547.0	-21.9	-129.5	-128.9	0.33	-0.32	1.63
3,645.0	3.20	256.60	3,639.8	-23.0	-135.1	-134.5	0.78	-0.75	-3.44
3,739.0	2.50	244.90	3,733.7	-24.5	-139.5	-138.9	0.96	-0.74	-12.45
3,832.0	1.80	248.10	3,826.7	-25.9	-142.7	-142.1	0.76	-0.75	3.44
3,925.0	2.00	262.30	3,919.6	-26.7	-145.7	-145.0	0.55	0.22	15.27
4,018.0	2.70	261.80	4,012.5	-27.2	-149.5	-148.8	0.75	0.75	-0.54
4,111.0	3.30	261.20	4,105.4	-27.9	-154.3	-153.6	0.65	0.65	-0.65
4,204.0	2.50	264.10	4,198.3	-28.6	-158.9	-158.2	0.87	-0.86	3.12
4,297.0	1.90	268.50	4,291.2	-28.8	-162.5	-161.8	0.67	-0.65	4.73
4,391.0	1.50	293.50	4,385.2	-28.4	-165.2	-164.5	0.89	-0.43	26.60
4,484.0	1.60	289.80	4,478.1	-27.4	-167.5	-166.8	0.15	0.11	-3.98
4,577.0	0.90	331.00	4,571.1	-26.4	-169.1	-168.4	1.18	-0.75	44.30
4,670.0	1.30	336.80	4,664.1	-24.7	-169.9	-169.2	0.45	0.43	6.24
4,763.0	1.60	328.40	4,757.1	-22.7	-171.0	-170.4	0.39	0.32	-9.03
4,856.0	1.40	10.30	4,850.0	-20.4	-171.4	-170.9	1.17	-0.22	45.05
4,949.0	1.50	18.20	4,943.0	-18.2	-170.9	-170.4	0.24	0.11	8.49
5,043.0	1.40	12.20	5,037.0	-15.9	-170.2	-169.8	0.19	-0.11	-6.38
5,136.0	1.40	3.10	5,130.0	-13.6	-169.9	-169.6	0.24	0.00	-9.78
5,229.0	1.30	355.30	5,222.9	-11.4	-170.0	-169.6	0.22	-0.11	-8.39
5,322.0	1.10	358.70	5,315.9	-9.5	-170.1	-169.8	0.23	-0.22	3.66
5,415.0	1.00	356.20	5,408.9	-7.8	-170.1	-169.9	0.12	-0.11	-2.69
5,508.0	1.00	333.10	5,501.9	-6.3	-170.6	-170.4	0.43	0.00	-24.84
5,601.0	0.50	347.40	5,594.9	-5.1	-171.0	-170.8	0.57	-0.54	15.38
5,695.0	0.70	10.50	5,688.9	-4.2	-171.0	-170.9	0.33	0.21	24.57
5,788.0	0.50	38.60	5,781.9	-3.3	-170.6	-170.5	0.38	-0.22	30.22
5,881.0	0.60	35.50	5,874.9	-2.6	-170.1	-170.0	0.11	0.11	-3.33
5,975.0	0.60	43.80	5,968.9	-1.8	-169.5	-169.4	0.09	0.00	8.83
6,065.0	0.80	50.30	6,058.8	-1.1	-168.7	-168.6	0.24	0.22	7.22

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<b>Well:</b>	Moss 14-16H	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	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)
6,158.0	0.90	80.80	6,151.8	-0.6	-167.5	-167.4	0.49	0.11	32.80
6,251.0	1.30	90.90	6,244.8	-0.5	-165.7	-165.6	0.48	0.43	10.86
6,282.0	1.50	91.30	6,275.8	-0.5	-164.9	-164.9	0.65	0.65	1.29
6,313.0	2.50	94.60	6,306.8	-0.5	-163.8	-163.8	3.25	3.23	10.65
6,344.0	4.30	95.40	6,337.7	-0.7	-162.0	-161.9	5.81	5.81	2.58
6,375.0	6.40	94.40	6,368.6	-0.9	-159.1	-159.1	6.78	6.77	-3.23
6,393.1	7.57	94.01	6,386.6	-1.1	-156.9	-156.9	6.46	6.45	-2.15
<b>KOP #2</b>									
6,406.0	8.40	93.80	6,399.3	-1.2	-155.1	-155.1	6.46	6.45	-1.64
6,437.0	10.20	93.00	6,429.9	-1.5	-150.1	-150.1	5.82	5.81	-2.58
6,468.0	11.70	92.40	6,460.4	-1.8	-144.3	-144.2	4.85	4.84	-1.94
6,499.0	13.10	91.70	6,490.6	-2.0	-137.6	-137.5	4.54	4.52	-2.26
6,530.0	14.40	90.20	6,520.8	-2.2	-130.2	-130.2	4.35	4.19	-4.84
6,561.0	16.10	90.90	6,550.7	-2.2	-122.1	-122.0	5.52	5.48	2.26
6,592.0	17.20	94.00	6,580.4	-2.6	-113.2	-113.1	4.56	3.55	10.00
6,623.0	18.00	96.30	6,609.9	-3.5	-103.9	-103.8	3.42	2.58	7.42
6,654.0	17.10	96.90	6,639.5	-4.5	-94.6	-94.5	2.96	-2.90	1.94
6,685.0	17.30	96.50	6,669.1	-5.6	-85.5	-85.3	0.75	0.65	-1.29
6,716.0	17.20	97.90	6,698.7	-6.8	-76.4	-76.2	1.38	-0.32	4.52
6,747.0	18.20	97.90	6,728.2	-8.1	-67.0	-66.8	3.23	3.23	0.00
6,778.0	19.70	97.70	6,757.5	-9.4	-57.1	-56.8	4.84	4.84	-0.65
6,809.0	20.40	100.40	6,786.7	-11.1	-46.6	-46.3	3.74	2.26	8.71
6,840.0	21.90	100.10	6,815.6	-13.1	-35.6	-35.2	4.85	4.84	-0.97
6,871.0	24.10	98.20	6,844.1	-15.0	-23.6	-23.2	7.49	7.10	-6.13
6,902.0	26.20	98.80	6,872.2	-17.0	-10.6	-10.2	6.82	6.77	1.94
6,933.0	27.60	98.70	6,899.8	-19.1	3.3	3.7	4.52	4.52	-0.32
6,964.0	30.60	96.60	6,926.9	-21.1	18.2	18.7	10.22	9.68	-6.77
6,995.0	34.40	95.10	6,953.0	-22.8	34.8	35.3	12.53	12.26	-4.84
7,026.0	38.50	94.00	6,978.0	-24.2	53.1	53.7	13.39	13.23	-3.55
7,057.0	43.30	93.10	7,001.4	-25.5	73.4	74.0	15.60	15.48	-2.90
7,088.0	47.70	92.20	7,023.1	-26.5	95.5	96.1	14.34	14.19	-2.90
7,119.0	52.30	90.10	7,043.0	-26.9	119.2	119.8	15.72	14.84	-6.77
7,150.0	55.20	90.20	7,061.4	-27.0	144.2	144.8	9.36	9.35	0.32
7,157.0	55.81	90.29	7,065.3	-27.0	150.0	150.6	8.78	8.71	1.32
<b>End of Build</b>									
7,181.0	57.90	90.60	7,078.4	-27.2	170.1	170.7	8.78	8.71	1.28
7,212.0	60.60	90.80	7,094.3	-27.5	196.7	197.3	8.73	8.71	0.65
7,243.0	63.30	91.40	7,108.9	-28.0	224.1	224.7	8.88	8.71	1.94
7,274.0	65.70	93.00	7,122.2	-29.1	252.0	252.6	9.04	7.74	5.16
7,305.0	69.20	94.70	7,134.1	-31.1	280.6	281.2	12.37	11.29	5.48
7,337.0	72.80	96.00	7,144.5	-33.9	310.7	311.4	11.89	11.25	4.06
7,368.0	76.90	96.70	7,152.6	-37.2	340.4	341.2	13.40	13.23	2.26
7,406.0	81.60	97.60	7,159.7	-41.8	377.5	378.3	12.59	12.37	2.37
7,458.0	87.00	94.10	7,164.9	-47.1	428.9	429.9	12.36	10.38	-6.73
7,490.0	86.60	94.40	7,166.7	-49.5	460.8	461.8	1.56	-1.25	0.94
7,523.0	85.70	94.40	7,168.9	-52.0	493.6	494.7	2.73	-2.73	0.00
7,555.0	86.20	93.30	7,171.1	-54.1	525.4	526.6	3.77	1.56	-3.44
7,587.0	86.50	92.00	7,173.2	-55.6	557.3	558.5	4.16	0.94	-4.06
7,619.0	88.30	91.60	7,174.6	-56.6	589.3	590.5	5.76	5.63	-1.25
7,651.0	91.30	91.00	7,174.7	-57.3	621.3	622.5	9.56	9.38	-1.88
7,682.0	94.60	89.80	7,173.1	-57.6	652.2	653.4	11.33	10.65	-3.87
7,714.0	95.30	89.00	7,170.4	-57.2	684.1	685.3	3.31	2.19	-2.50
7,746.0	95.60	89.20	7,167.3	-56.7	716.0	717.1	1.13	0.94	0.63

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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)
7,778.0	96.20	89.10	7,164.0	-56.3	747.8	748.9	1.90	1.88	-0.31
7,810.0	95.40	89.00	7,160.8	-55.7	779.6	780.7	2.52	-2.50	-0.31
7,842.0	94.20	89.60	7,158.1	-55.3	811.5	812.6	4.19	-3.75	1.88
7,874.0	92.70	89.50	7,156.2	-55.1	843.4	844.5	4.70	-4.69	-0.31
7,906.0	92.70	89.30	7,154.7	-54.7	875.4	876.5	0.62	0.00	-0.63
7,938.0	92.90	89.30	7,153.1	-54.4	907.4	908.4	0.63	0.63	0.00
7,969.0	93.00	89.60	7,151.5	-54.1	938.3	939.3	1.02	0.32	0.97
8,001.0	93.20	89.30	7,149.8	-53.8	970.3	971.3	1.13	0.63	-0.94
8,032.0	93.60	89.00	7,148.0	-53.3	1,001.2	1,002.2	1.61	1.29	-0.97
8,063.0	93.00	89.80	7,146.2	-53.0	1,032.2	1,033.1	3.22	-1.94	2.58
8,095.0	91.70	90.10	7,144.9	-52.9	1,064.1	1,065.1	4.17	-4.06	0.94
8,126.0	90.90	89.60	7,144.2	-52.9	1,095.1	1,096.1	3.04	-2.58	-1.61
8,158.0	90.50	89.60	7,143.8	-52.6	1,127.1	1,128.1	1.25	-1.25	0.00
8,190.0	90.70	89.80	7,143.5	-52.5	1,159.1	1,160.0	0.88	0.63	0.63
8,222.0	91.10	90.60	7,142.9	-52.6	1,191.1	1,192.0	2.79	1.25	2.50
8,254.0	91.30	90.20	7,142.3	-52.8	1,223.1	1,224.0	1.40	0.63	-1.25
8,285.0	90.50	89.90	7,141.8	-52.8	1,254.1	1,255.0	2.76	-2.58	-0.97
8,317.0	89.10	90.70	7,141.9	-53.0	1,286.1	1,287.0	5.04	-4.38	2.50
8,350.0	88.80	90.90	7,142.5	-53.5	1,319.1	1,320.0	1.09	-0.91	0.61
8,382.0	88.80	90.50	7,143.2	-53.9	1,351.1	1,352.0	1.25	0.00	-1.25
8,414.0	88.80	91.20	7,143.8	-54.3	1,383.1	1,384.0	2.19	0.00	2.19
8,446.0	89.10	91.00	7,144.4	-54.9	1,415.1	1,416.0	1.13	0.94	-0.63
8,477.0	89.30	91.10	7,144.9	-55.5	1,446.1	1,447.0	0.72	0.65	0.32
8,509.0	89.40	90.80	7,145.2	-56.0	1,478.0	1,479.0	0.99	0.31	-0.94
8,541.0	89.10	91.00	7,145.6	-56.5	1,510.0	1,511.0	1.13	-0.94	0.63
8,573.0	89.30	90.60	7,146.1	-57.0	1,542.0	1,543.0	1.40	0.63	-1.25
8,604.0	89.10	90.30	7,146.5	-57.2	1,573.0	1,573.9	1.16	-0.65	-0.97
8,637.0	89.10	90.00	7,147.0	-57.3	1,606.0	1,606.9	0.91	0.00	-0.91
8,668.0	90.60	91.10	7,147.1	-57.6	1,637.0	1,637.9	6.00	4.84	3.55
8,700.0	92.20	91.10	7,146.3	-58.2	1,669.0	1,669.9	5.00	5.00	0.00
8,732.0	92.60	91.40	7,145.0	-58.9	1,701.0	1,701.9	1.56	1.25	0.94
8,764.0	92.60	91.10	7,143.6	-59.6	1,732.9	1,733.9	0.94	0.00	-0.94
8,796.0	92.90	91.10	7,142.0	-60.2	1,764.9	1,765.8	0.94	0.94	0.00
8,829.0	93.10	91.50	7,140.3	-61.0	1,797.8	1,798.8	1.35	0.61	1.21
8,861.0	92.20	91.00	7,138.8	-61.7	1,829.8	1,830.7	3.22	-2.81	-1.56
8,893.0	92.40	91.00	7,137.5	-62.2	1,861.8	1,862.7	0.63	0.63	0.00
8,925.0	92.50	91.30	7,136.2	-62.9	1,893.7	1,894.7	0.99	0.31	0.94
8,957.0	92.60	91.40	7,134.7	-63.6	1,925.7	1,926.7	0.44	0.31	0.31
8,988.0	92.70	91.10	7,133.3	-64.3	1,956.6	1,957.6	1.02	0.32	-0.97
9,020.0	92.70	91.50	7,131.8	-65.0	1,988.6	1,989.6	1.25	0.00	1.25
9,052.0	93.10	91.20	7,130.2	-65.8	2,020.6	2,021.5	1.56	1.25	-0.94
9,083.0	91.90	90.90	7,128.8	-66.4	2,051.5	2,052.5	3.99	-3.87	-0.97
9,115.0	91.90	90.40	7,127.8	-66.7	2,083.5	2,084.5	1.56	0.00	-1.56
9,146.0	92.20	90.90	7,126.7	-67.1	2,114.5	2,115.5	1.88	0.97	1.61
9,178.0	91.00	90.40	7,125.8	-67.4	2,146.5	2,147.5	4.06	-3.75	-1.56
9,210.0	90.90	90.30	7,125.2	-67.6	2,178.5	2,179.4	0.44	-0.31	-0.31
9,242.0	90.90	90.20	7,124.7	-67.8	2,210.4	2,211.4	0.31	0.00	-0.31
9,274.0	90.30	89.40	7,124.4	-67.7	2,242.4	2,243.4	3.12	-1.88	-2.50
9,307.0	90.00	89.40	7,124.3	-67.3	2,275.4	2,276.4	0.91	-0.91	0.00
9,339.0	89.90	89.20	7,124.3	-66.9	2,307.4	2,308.4	0.70	-0.31	-0.63
9,371.0	89.70	89.30	7,124.4	-66.5	2,339.4	2,340.4	0.70	-0.63	0.31
9,403.0	89.60	89.90	7,124.6	-66.3	2,371.4	2,372.3	1.90	-0.31	1.88
9,434.0	90.00	89.70	7,124.8	-66.2	2,402.4	2,403.3	1.44	1.29	-0.65

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Moss 14-16H
<b>Project:</b>	SEC.16-T7N-R65W	<b>TVD Reference:</b>	WELL @ 4877.0ft (RKB Ensign 32 - 15')
<b>Site:</b>	Moss 14-16H Pad Sec.16-T7N-R65W	<b>MD Reference:</b>	WELL @ 4877.0ft (RKB Ensign 32 - 15')
<b>Well:</b>	Moss 14-16H	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	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)
9,466.0	89.10	90.40	7,125.0	-66.2	2,434.4	2,435.3	3.56	-2.81	2.19
9,498.0	88.80	90.40	7,125.6	-66.4	2,466.4	2,467.3	0.94	-0.94	0.00
9,530.0	89.20	91.20	7,126.1	-66.9	2,498.4	2,499.3	2.79	1.25	2.50
9,562.0	89.70	90.80	7,126.5	-67.4	2,530.4	2,531.3	2.00	1.56	-1.25
9,594.0	90.20	91.70	7,126.5	-68.1	2,562.4	2,563.3	3.22	1.56	2.81
9,626.0	90.60	91.30	7,126.3	-69.0	2,594.4	2,595.3	1.77	1.25	-1.25
9,658.0	90.90	91.60	7,125.8	-69.8	2,626.4	2,627.3	1.33	0.94	0.94
9,690.0	91.30	91.40	7,125.2	-70.6	2,658.4	2,659.3	1.40	1.25	-0.63
9,722.0	91.90	92.00	7,124.3	-71.6	2,690.3	2,691.3	2.65	1.88	1.88
9,754.0	92.30	92.50	7,123.2	-72.8	2,722.3	2,723.3	2.00	1.25	1.56
9,786.0	92.40	92.00	7,121.8	-74.1	2,754.2	2,755.2	1.59	0.31	-1.56
9,819.0	91.80	92.90	7,120.6	-75.5	2,787.2	2,788.2	3.28	-1.82	2.73
9,851.0	92.30	92.60	7,119.5	-77.0	2,819.1	2,820.2	1.82	1.56	-0.94
9,883.0	91.20	93.40	7,118.5	-78.7	2,851.1	2,852.1	4.25	-3.44	2.50
9,914.0	91.30	93.70	7,117.8	-80.6	2,882.0	2,883.1	1.02	0.32	0.97
9,946.0	91.30	93.60	7,117.1	-82.6	2,913.9	2,915.1	0.31	0.00	-0.31
9,978.0	91.10	93.70	7,116.4	-84.7	2,945.9	2,947.0	0.70	-0.63	0.31
10,010.0	91.30	93.50	7,115.8	-86.7	2,977.8	2,979.0	0.88	0.63	-0.63
10,042.0	90.50	94.00	7,115.3	-88.8	3,009.7	3,011.0	2.95	-2.50	1.56
10,074.0	90.80	93.70	7,114.9	-90.9	3,041.6	3,042.9	1.33	0.94	-0.94
10,105.0	89.90	93.30	7,114.7	-92.8	3,072.6	3,073.9	3.18	-2.90	-1.29
10,137.0	88.90	92.40	7,115.1	-94.4	3,104.5	3,105.9	4.20	-3.13	-2.81
10,169.0	89.10	92.40	7,115.6	-95.8	3,136.5	3,137.9	0.63	0.63	0.00
10,200.0	89.00	92.40	7,116.1	-97.1	3,167.5	3,168.9	0.32	-0.32	0.00
10,232.0	88.80	92.40	7,116.7	-98.4	3,199.4	3,200.9	0.63	-0.63	0.00
10,264.0	89.50	93.30	7,117.2	-100.0	3,231.4	3,232.9	3.56	2.19	2.81
10,296.0	89.80	93.30	7,117.4	-101.8	3,263.3	3,264.8	0.94	0.94	0.00
10,328.0	89.60	94.30	7,117.6	-103.9	3,295.3	3,296.8	3.19	-0.63	3.13
10,360.0	89.80	94.50	7,117.7	-106.4	3,327.2	3,328.8	0.88	0.63	0.63
10,392.0	89.80	96.00	7,117.9	-109.3	3,359.0	3,360.7	4.69	0.00	4.69
10,424.0	90.40	96.70	7,117.8	-112.9	3,390.8	3,392.6	2.88	1.88	2.19
10,460.0	90.90	97.30	7,117.4	-117.3	3,426.6	3,428.4	2.17	1.39	1.67
10,492.0	90.40	98.10	7,117.0	-121.5	3,458.3	3,460.2	2.95	-1.56	2.50
10,524.0	90.50	97.70	7,116.8	-125.9	3,490.0	3,492.0	1.29	0.31	-1.25
10,556.0	90.00	97.80	7,116.6	-130.3	3,521.7	3,523.8	1.59	-1.56	0.31
10,588.0	89.50	98.20	7,116.8	-134.7	3,553.4	3,555.6	2.00	-1.56	1.25
10,620.0	89.80	99.30	7,117.0	-139.6	3,585.0	3,587.3	3.56	0.94	3.44
10,652.0	90.50	100.10	7,116.9	-145.0	3,616.5	3,619.0	3.32	2.19	2.50
10,684.0	90.60	99.00	7,116.6	-150.3	3,648.1	3,650.6	3.45	0.31	-3.44
10,715.0	90.80	97.60	7,116.2	-154.8	3,678.8	3,681.4	4.56	0.65	-4.52
10,747.0	92.10	95.70	7,115.4	-158.5	3,710.5	3,713.3	7.19	4.06	-5.94
10,779.0	92.70	94.70	7,114.1	-161.4	3,742.4	3,745.2	3.64	1.88	-3.13
10,811.0	91.80	92.60	7,112.8	-163.4	3,774.3	3,777.1	7.14	-2.81	-6.56
10,843.0	91.40	90.40	7,111.9	-164.2	3,806.3	3,809.1	6.99	-1.25	-6.88
10,874.0	90.80	89.80	7,111.3	-164.3	3,837.3	3,840.1	2.74	-1.94	-1.94
10,906.0	90.30	89.40	7,111.0	-164.1	3,869.3	3,872.1	2.00	-1.56	-1.25
10,938.0	90.60	89.00	7,110.8	-163.6	3,901.3	3,904.0	1.56	0.94	-1.25
10,970.0	90.30	88.60	7,110.5	-162.9	3,933.2	3,936.0	1.56	-0.94	-1.25
11,002.0	90.20	88.90	7,110.4	-162.2	3,965.2	3,968.0	0.99	-0.31	0.94
11,034.0	90.30	88.20	7,110.2	-161.4	3,997.2	3,999.9	2.21	0.31	-2.19
11,066.0	89.70	88.60	7,110.2	-160.5	4,029.2	4,031.9	2.25	-1.88	1.25
11,098.0	90.00	88.20	7,110.3	-159.6	4,061.2	4,063.9	1.56	0.94	-1.25
11,129.0	90.50	87.60	7,110.2	-158.5	4,092.2	4,094.8	2.52	1.61	-1.94
11,161.0	90.30	87.30	7,109.9	-157.1	4,124.1	4,126.7	1.13	-0.63	-0.94



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Moss 14-16H
<b>Project:</b>	SEC.16-T7N-R65W	<b>TVD Reference:</b>	WELL @ 4877.0ft (RKB Ensign 32 - 15')
<b>Site:</b>	Moss 14-16H Pad Sec.16-T7N-R65W	<b>MD Reference:</b>	WELL @ 4877.0ft (RKB Ensign 32 - 15')
<b>Well:</b>	Moss 14-16H	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	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)	
11,193.0	90.50	87.40	7,109.7	-155.6	4,156.1	4,158.6	0.70	0.63	0.31	
11,225.0	90.60	86.90	7,109.4	-154.0	4,188.1	4,190.6	1.59	0.31	-1.56	
11,257.0	90.30	86.70	7,109.2	-152.2	4,220.0	4,222.5	1.13	-0.94	-0.63	
11,289.0	90.90	86.60	7,108.8	-150.4	4,252.0	4,254.3	1.90	1.88	-0.31	
11,321.0	91.40	86.80	7,108.2	-148.5	4,283.9	4,286.2	1.68	1.56	0.63	
11,353.0	91.50	86.10	7,107.4	-146.5	4,315.8	4,318.1	2.21	0.31	-2.19	
11,385.0	91.70	86.30	7,106.5	-144.4	4,347.7	4,350.0	0.88	0.63	0.63	
11,416.0	91.90	86.20	7,105.5	-142.4	4,378.7	4,380.8	0.72	0.65	-0.32	
11,468.0	91.90	86.20	7,103.8	-138.9	4,430.5	4,432.6	0.00	0.00	0.00	
BHL 560'FSL, 500'FEL										

Survey Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
3,500.0	3,495.1	-21.2	-125.9	KOP	
6,393.1	6,386.6	-1.1	-156.9	KOP #2	
7,157.0	7,065.3	-27.0	150.0	End of Build	

Checked By: _____	Approved By: _____	Date: _____
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