

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Carmichael 26M-223**  
Surface Location: Carmichael 26M-223 Pad Sec.26-T7N-R63W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone  
Ground Elevation: 4769.0  
+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.0 0.0 1445815.50 3306228.20 40.551940 -104.397980  
RKB Ensign 32 - 15' WELL @ 4784.0ft (RKB Ensign 32 - 15')

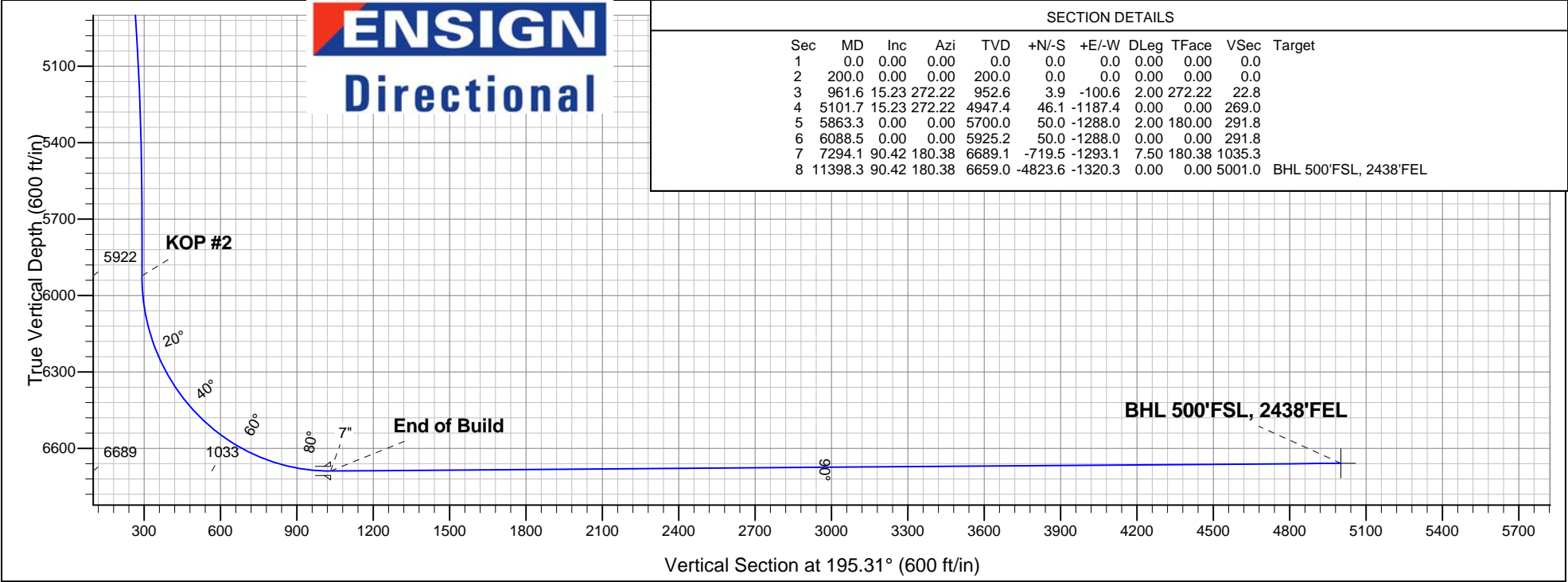
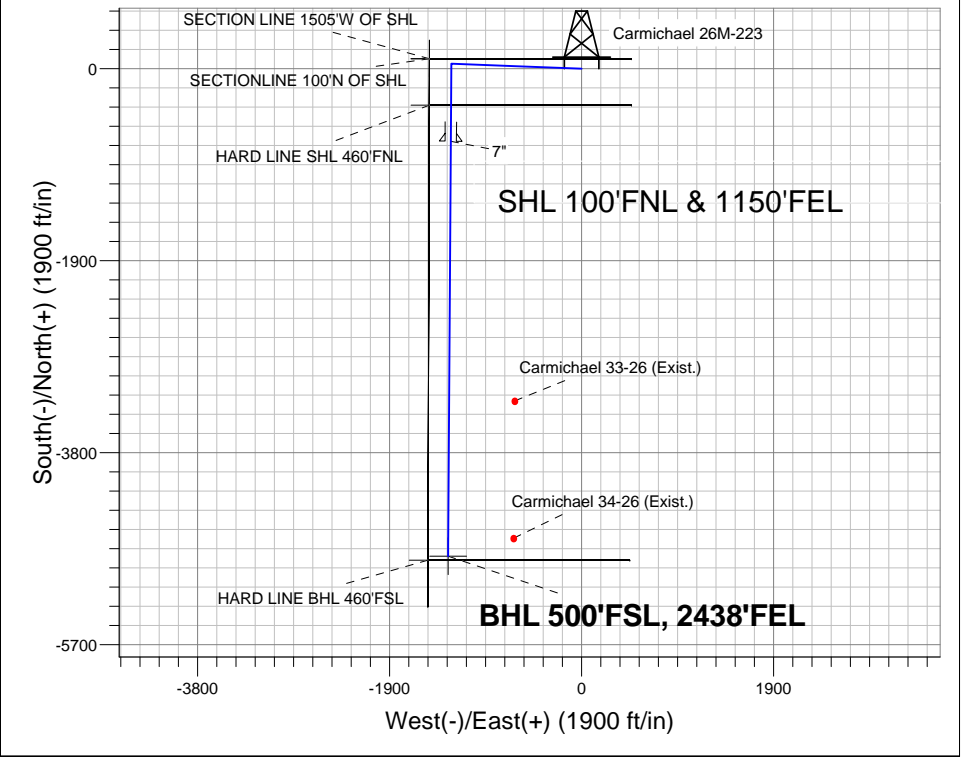
WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)								
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
HARD LINE BHL 460'FSL	1.0	-4863.6	-1522.3	1440933.53	3304766.51	40.538590	-104.403457	Polygon
HARD LINE SHL 460'FNL	1.0	-360.0	-1504.8	1445436.85	3304728.04	40.550952	-104.403395	Polygon
SECTION LINE 1505'W OF SHL	1.0	100.0	-1504.8	1445896.80	3304722.34	40.552214	-104.403395	Polygon
SECTIONLINE 100'N OF SHL	1.0	100.0	-1504.8	1445896.80	3304722.32	40.552214	-104.403395	Polygon
BHL 500'FSL, 2438'FEL	6659.0	-4823.6	-1320.3	1440976.06	3304968.03	40.538700	-104.402730	Point

Azimuths to True North  
Magnetic North: 8.61°

Magnetic Field  
Strength: 53197.4snT  
Dip Angle: 67.22°  
Date: 12/15/2011  
Model: IGRF2010

ANNOTATIONS		
TVD	MD	Annotation
200.0	200.0	KOP #1
5922.5	6085.8	KOP #2
6689.1	7291.5	End of Build

Carmichael 26M-223 Pad Sec.26-T7N-R63W  
Carmichael 26M-223  
Plan #1 (12-14-11)  
12:02, December 27 2011





# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.26-T7N-R63W**

**Carmichael 26M-223 Pad Sec.26-T7N-R63W**

**Carmichael 26M-223**

**Wellbore #1**

**Plan: Plan #1 (12-14-11)**

## **Standard Planning Report**

**27 December, 2011**

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Carmichael 26M-223
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Project:</b>	SEC.26-T7N-R63W	<b>MD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Site:</b>	Carmichael 26M-223 Pad Sec.26-T7N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	Carmichael 26M-223	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (12-14-11)		

<b>Project</b>	SEC.26-T7N-R63W, 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						Carmichael 26M-223 Pad Sec.26-T7N-R63W											
Site Position:						Northing:			1,445,815.52 ft			Latitude:			40.551940		
From:			Lat/Long			Easting:			3,306,228.20 ft			Longitude:			-104.397980		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.71 °		

Well	Carmichael 26M-223					
Well Position	+N/-S	0.0 ft	Northing:	1,445,815.50 ft	Latitude:	40.551940
	+E/-W	0.0 ft	Easting:	3,306,228.20 ft	Longitude:	-104.397980
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,769.0 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	12/15/2011	8.61	67.22	53,197

<b>Design</b>	Plan #1 (12-14-11)			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<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	195.31

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
961.6	15.23	272.22	952.6	3.9	-100.6	2.00	2.00	0.00	272.22	
5,101.7	15.23	272.22	4,947.4	46.1	-1,187.4	0.00	0.00	0.00	0.00	
5,863.3	0.00	0.00	5,700.0	50.0	-1,288.0	2.00	-2.00	0.00	180.00	
6,088.5	0.00	0.00	5,925.2	50.0	-1,288.0	0.00	0.00	0.00	0.00	
7,294.1	90.42	180.38	6,689.1	-719.5	-1,293.1	7.50	7.50	0.00	180.38	
11,398.3	90.42	180.38	6,659.0	-4,823.6	-1,320.3	0.00	0.00	0.00	0.00	BHL 500'FSL, 2438

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Carmichael 26M-223
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Project:</b>	SEC.26-T7N-R63W	<b>MD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Site:</b>	Carmichael 26M-223 Pad Sec.26-T7N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	Carmichael 26M-223	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (12-14-11)		

## Planned 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	0.00	1.0	0.0	0.0	0.0	0.00	0.00	0.00
SECTIONLINE 100'N OF SHL - HARD LINE SHL 460'FNL - HARD LINE BHL 460'FSL - SECTION LINE 1505'W OF SHL									
40.0	0.00	0.00	40.0	0.0	0.0	0.0	0.00	0.00	0.00
80.0	0.00	0.00	80.0	0.0	0.0	0.0	0.00	0.00	0.00
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	0.00
160.0	0.00	0.00	160.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP #1									
240.0	0.80	272.22	240.0	0.0	-0.3	0.1	2.00	2.00	0.00
280.0	1.60	272.22	280.0	0.0	-1.1	0.3	2.00	2.00	0.00
320.0	2.40	272.22	320.0	0.1	-2.5	0.6	2.00	2.00	0.00
360.0	3.20	272.22	359.9	0.2	-4.5	1.0	2.00	2.00	0.00
400.0	4.00	272.22	399.8	0.3	-7.0	1.6	2.00	2.00	0.00
440.0	4.80	272.22	439.7	0.4	-10.0	2.3	2.00	2.00	0.00
480.0	5.60	272.22	479.6	0.5	-13.7	3.1	2.00	2.00	0.00
520.0	6.40	272.22	519.3	0.7	-17.8	4.0	2.00	2.00	0.00
560.0	7.20	272.22	559.1	0.9	-22.6	5.1	2.00	2.00	0.00
600.0	8.00	272.22	598.7	1.1	-27.9	6.3	2.00	2.00	0.00
640.0	8.80	272.22	638.3	1.3	-33.7	7.6	2.00	2.00	0.00
680.0	9.60	272.22	677.8	1.6	-40.1	9.1	2.00	2.00	0.00
720.0	10.40	272.22	717.1	1.8	-47.0	10.7	2.00	2.00	0.00
760.0	11.20	272.22	756.4	2.1	-54.5	12.3	2.00	2.00	0.00
800.0	12.00	272.22	795.6	2.4	-62.6	14.2	2.00	2.00	0.00
840.0	12.80	272.22	834.7	2.8	-71.1	16.1	2.00	2.00	0.00
880.0	13.60	272.22	873.6	3.1	-80.3	18.2	2.00	2.00	0.00
920.0	14.40	272.22	912.4	3.5	-89.9	20.4	2.00	2.00	0.00
960.0	15.20	272.22	951.1	3.9	-100.1	22.7	2.00	2.00	0.00
961.6	15.23	272.22	952.6	3.9	-100.6	22.8	2.00	2.00	0.00
1,000.0	15.23	272.22	989.7	4.3	-110.6	25.1	0.00	0.00	0.00
1,040.0	15.23	272.22	1,028.3	4.7	-121.1	27.4	0.00	0.00	0.00
1,080.0	15.23	272.22	1,066.9	5.1	-131.6	29.8	0.00	0.00	0.00
1,120.0	15.23	272.22	1,105.5	5.5	-142.1	32.2	0.00	0.00	0.00
1,160.0	15.23	272.22	1,144.1	5.9	-152.6	34.6	0.00	0.00	0.00
1,200.0	15.23	272.22	1,182.7	6.3	-163.1	37.0	0.00	0.00	0.00
1,240.0	15.23	272.22	1,221.3	6.7	-173.7	39.3	0.00	0.00	0.00
1,280.0	15.23	272.22	1,259.9	7.1	-184.2	41.7	0.00	0.00	0.00
1,320.0	15.23	272.22	1,298.5	7.6	-194.7	44.1	0.00	0.00	0.00
1,360.0	15.23	272.22	1,337.1	8.0	-205.2	46.5	0.00	0.00	0.00
1,400.0	15.23	272.22	1,375.7	8.4	-215.7	48.9	0.00	0.00	0.00
1,440.0	15.23	272.22	1,414.3	8.8	-226.2	51.2	0.00	0.00	0.00
1,480.0	15.23	272.22	1,452.9	9.2	-236.7	53.6	0.00	0.00	0.00
1,520.0	15.23	272.22	1,491.4	9.6	-247.2	56.0	0.00	0.00	0.00
1,560.0	15.23	272.22	1,530.0	10.0	-257.7	58.4	0.00	0.00	0.00
1,600.0	15.23	272.22	1,568.6	10.4	-268.2	60.7	0.00	0.00	0.00
1,640.0	15.23	272.22	1,607.2	10.8	-278.7	63.1	0.00	0.00	0.00
1,680.0	15.23	272.22	1,645.8	11.2	-289.2	65.5	0.00	0.00	0.00
1,720.0	15.23	272.22	1,684.4	11.6	-299.7	67.9	0.00	0.00	0.00
1,760.0	15.23	272.22	1,723.0	12.0	-310.2	70.3	0.00	0.00	0.00
1,800.0	15.23	272.22	1,761.6	12.4	-320.7	72.6	0.00	0.00	0.00
1,840.0	15.23	272.22	1,800.2	12.9	-331.2	75.0	0.00	0.00	0.00
1,880.0	15.23	272.22	1,838.8	13.3	-341.7	77.4	0.00	0.00	0.00
1,920.0	15.23	272.22	1,877.4	13.7	-352.2	79.8	0.00	0.00	0.00

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<b>Project:</b>	SEC.26-T7N-R63W	<b>MD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Site:</b>	Carmichael 26M-223 Pad Sec.26-T7N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	Carmichael 26M-223	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (12-14-11)		

Planned 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)
1,960.0	15.23	272.22	1,916.0	14.1	-362.7	82.2	0.00	0.00	0.00
2,000.0	15.23	272.22	1,954.6	14.5	-373.2	84.5	0.00	0.00	0.00
2,040.0	15.23	272.22	1,993.2	14.9	-383.7	86.9	0.00	0.00	0.00
2,080.0	15.23	272.22	2,031.8	15.3	-394.2	89.3	0.00	0.00	0.00
2,120.0	15.23	272.22	2,070.4	15.7	-404.7	91.7	0.00	0.00	0.00
2,160.0	15.23	272.22	2,109.0	16.1	-415.2	94.0	0.00	0.00	0.00
2,200.0	15.23	272.22	2,147.6	16.5	-425.7	96.4	0.00	0.00	0.00
2,240.0	15.23	272.22	2,186.2	16.9	-436.2	98.8	0.00	0.00	0.00
2,280.0	15.23	272.22	2,224.7	17.3	-446.7	101.2	0.00	0.00	0.00
2,320.0	15.23	272.22	2,263.3	17.7	-457.2	103.6	0.00	0.00	0.00
2,360.0	15.23	272.22	2,301.9	18.2	-467.7	105.9	0.00	0.00	0.00
2,400.0	15.23	272.22	2,340.5	18.6	-478.2	108.3	0.00	0.00	0.00
2,440.0	15.23	272.22	2,379.1	19.0	-488.7	110.7	0.00	0.00	0.00
2,480.0	15.23	272.22	2,417.7	19.4	-499.2	113.1	0.00	0.00	0.00
2,520.0	15.23	272.22	2,456.3	19.8	-509.7	115.5	0.00	0.00	0.00
2,560.0	15.23	272.22	2,494.9	20.2	-520.2	117.8	0.00	0.00	0.00
2,600.0	15.23	272.22	2,533.5	20.6	-530.7	120.2	0.00	0.00	0.00
2,640.0	15.23	272.22	2,572.1	21.0	-541.2	122.6	0.00	0.00	0.00
2,680.0	15.23	272.22	2,610.7	21.4	-551.7	125.0	0.00	0.00	0.00
2,720.0	15.23	272.22	2,649.3	21.8	-562.2	127.3	0.00	0.00	0.00
2,760.0	15.23	272.22	2,687.9	22.2	-572.7	129.7	0.00	0.00	0.00
2,800.0	15.23	272.22	2,726.5	22.6	-583.2	132.1	0.00	0.00	0.00
2,840.0	15.23	272.22	2,765.1	23.0	-593.7	134.5	0.00	0.00	0.00
2,880.0	15.23	272.22	2,803.7	23.5	-604.2	136.9	0.00	0.00	0.00
2,920.0	15.23	272.22	2,842.3	23.9	-614.7	139.2	0.00	0.00	0.00
2,960.0	15.23	272.22	2,880.9	24.3	-625.2	141.6	0.00	0.00	0.00
3,000.0	15.23	272.22	2,919.5	24.7	-635.7	144.0	0.00	0.00	0.00
3,040.0	15.23	272.22	2,958.1	25.1	-646.2	146.4	0.00	0.00	0.00
3,080.0	15.23	272.22	2,996.6	25.5	-656.7	148.8	0.00	0.00	0.00
3,120.0	15.23	272.22	3,035.2	25.9	-667.2	151.1	0.00	0.00	0.00
3,160.0	15.23	272.22	3,073.8	26.3	-677.7	153.5	0.00	0.00	0.00
3,200.0	15.23	272.22	3,112.4	26.7	-688.2	155.9	0.00	0.00	0.00
3,240.0	15.23	272.22	3,151.0	27.1	-698.7	158.3	0.00	0.00	0.00
3,280.0	15.23	272.22	3,189.6	27.5	-709.2	160.6	0.00	0.00	0.00
3,320.0	15.23	272.22	3,228.2	27.9	-719.7	163.0	0.00	0.00	0.00
3,360.0	15.23	272.22	3,266.8	28.3	-730.2	165.4	0.00	0.00	0.00
3,400.0	15.23	272.22	3,305.4	28.8	-740.7	167.8	0.00	0.00	0.00
3,440.0	15.23	272.22	3,344.0	29.2	-751.2	170.2	0.00	0.00	0.00
3,480.0	15.23	272.22	3,382.6	29.6	-761.7	172.5	0.00	0.00	0.00
3,520.0	15.23	272.22	3,421.2	30.0	-772.2	174.9	0.00	0.00	0.00
3,560.0	15.23	272.22	3,459.8	30.4	-782.7	177.3	0.00	0.00	0.00
3,600.0	15.23	272.22	3,498.4	30.8	-793.2	179.7	0.00	0.00	0.00
3,640.0	15.23	272.22	3,537.0	31.2	-803.7	182.1	0.00	0.00	0.00
3,680.0	15.23	272.22	3,575.6	31.6	-814.2	184.4	0.00	0.00	0.00
3,720.0	15.23	272.22	3,614.2	32.0	-824.7	186.8	0.00	0.00	0.00
3,760.0	15.23	272.22	3,652.8	32.4	-835.2	189.2	0.00	0.00	0.00
3,800.0	15.23	272.22	3,691.4	32.8	-845.7	191.6	0.00	0.00	0.00
3,840.0	15.23	272.22	3,729.9	33.2	-856.2	193.9	0.00	0.00	0.00
3,880.0	15.23	272.22	3,768.5	33.6	-866.7	196.3	0.00	0.00	0.00
3,920.0	15.23	272.22	3,807.1	34.1	-877.2	198.7	0.00	0.00	0.00
3,960.0	15.23	272.22	3,845.7	34.5	-887.7	201.1	0.00	0.00	0.00
4,000.0	15.23	272.22	3,884.3	34.9	-898.2	203.5	0.00	0.00	0.00
4,040.0	15.23	272.22	3,922.9	35.3	-908.7	205.8	0.00	0.00	0.00

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<b>Project:</b>	SEC.26-T7N-R63W	<b>MD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Site:</b>	Carmichael 26M-223 Pad Sec.26-T7N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	Carmichael 26M-223	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (12-14-11)		

Planned 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)
4,080.0	15.23	272.22	3,961.5	35.7	-919.2	208.2	0.00	0.00	0.00
4,120.0	15.23	272.22	4,000.1	36.1	-929.7	210.6	0.00	0.00	0.00
4,160.0	15.23	272.22	4,038.7	36.5	-940.2	213.0	0.00	0.00	0.00
4,200.0	15.23	272.22	4,077.3	36.9	-950.7	215.4	0.00	0.00	0.00
4,240.0	15.23	272.22	4,115.9	37.3	-961.2	217.7	0.00	0.00	0.00
4,280.0	15.23	272.22	4,154.5	37.7	-971.7	220.1	0.00	0.00	0.00
4,320.0	15.23	272.22	4,193.1	38.1	-982.2	222.5	0.00	0.00	0.00
4,360.0	15.23	272.22	4,231.7	38.5	-992.7	224.9	0.00	0.00	0.00
4,400.0	15.23	272.22	4,270.3	38.9	-1,003.2	227.3	0.00	0.00	0.00
4,440.0	15.23	272.22	4,308.9	39.4	-1,013.7	229.6	0.00	0.00	0.00
4,480.0	15.23	272.22	4,347.5	39.8	-1,024.2	232.0	0.00	0.00	0.00
4,520.0	15.23	272.22	4,386.1	40.2	-1,034.7	234.4	0.00	0.00	0.00
4,560.0	15.23	272.22	4,424.7	40.6	-1,045.2	236.8	0.00	0.00	0.00
4,600.0	15.23	272.22	4,463.3	41.0	-1,055.7	239.1	0.00	0.00	0.00
4,640.0	15.23	272.22	4,501.8	41.4	-1,066.2	241.5	0.00	0.00	0.00
4,680.0	15.23	272.22	4,540.4	41.8	-1,076.7	243.9	0.00	0.00	0.00
4,720.0	15.23	272.22	4,579.0	42.2	-1,087.2	246.3	0.00	0.00	0.00
4,760.0	15.23	272.22	4,617.6	42.6	-1,097.7	248.7	0.00	0.00	0.00
4,800.0	15.23	272.22	4,656.2	43.0	-1,108.2	251.0	0.00	0.00	0.00
4,840.0	15.23	272.22	4,694.8	43.4	-1,118.7	253.4	0.00	0.00	0.00
4,880.0	15.23	272.22	4,733.4	43.8	-1,129.2	255.8	0.00	0.00	0.00
4,920.0	15.23	272.22	4,772.0	44.2	-1,139.7	258.2	0.00	0.00	0.00
4,960.0	15.23	272.22	4,810.6	44.7	-1,150.2	260.6	0.00	0.00	0.00
5,000.0	15.23	272.22	4,849.2	45.1	-1,160.7	262.9	0.00	0.00	0.00
5,040.0	15.23	272.22	4,887.8	45.5	-1,171.2	265.3	0.00	0.00	0.00
5,080.0	15.23	272.22	4,926.4	45.9	-1,181.7	267.7	0.00	0.00	0.00
5,101.7	15.23	272.22	4,947.4	46.1	-1,187.4	269.0	0.00	0.00	0.00
5,120.0	14.87	272.22	4,965.0	46.3	-1,192.2	270.1	2.00	-2.00	0.00
5,160.0	14.07	272.22	5,003.7	46.7	-1,202.2	272.3	2.00	-2.00	0.00
5,200.0	13.27	272.22	5,042.6	47.0	-1,211.6	274.5	2.00	-2.00	0.00
5,240.0	12.47	272.22	5,081.6	47.4	-1,220.5	276.5	2.00	-2.00	0.00
5,280.0	11.67	272.22	5,120.7	47.7	-1,228.9	278.4	2.00	-2.00	0.00
5,320.0	10.87	272.22	5,159.9	48.0	-1,236.7	280.1	2.00	-2.00	0.00
5,360.0	10.07	272.22	5,199.3	48.3	-1,243.9	281.8	2.00	-2.00	0.00
5,400.0	9.27	272.22	5,238.7	48.5	-1,250.6	283.3	2.00	-2.00	0.00
5,440.0	8.47	272.22	5,278.2	48.8	-1,256.8	284.7	2.00	-2.00	0.00
5,480.0	7.67	272.22	5,317.8	49.0	-1,262.4	286.0	2.00	-2.00	0.00
5,520.0	6.87	272.22	5,357.5	49.2	-1,267.5	287.1	2.00	-2.00	0.00
5,560.0	6.07	272.22	5,397.3	49.4	-1,272.0	288.1	2.00	-2.00	0.00
5,600.0	5.27	272.22	5,437.1	49.5	-1,275.9	289.0	2.00	-2.00	0.00
5,640.0	4.47	272.22	5,476.9	49.7	-1,279.3	289.8	2.00	-2.00	0.00
5,680.0	3.67	272.22	5,516.8	49.8	-1,282.1	290.4	2.00	-2.00	0.00
5,720.0	2.87	272.22	5,556.7	49.9	-1,284.4	290.9	2.00	-2.00	0.00
5,760.0	2.07	272.22	5,596.7	49.9	-1,286.1	291.3	2.00	-2.00	0.00
5,800.0	1.27	272.22	5,636.7	50.0	-1,287.3	291.6	2.00	-2.00	0.00
5,840.0	0.47	272.22	5,676.7	50.0	-1,287.9	291.7	2.00	-2.00	0.00
5,863.3	0.00	0.00	5,700.0	50.0	-1,288.0	291.8	2.00	-2.00	0.00
5,880.0	0.00	0.00	5,716.7	50.0	-1,288.0	291.8	0.00	0.00	0.00
5,920.0	0.00	0.00	5,756.7	50.0	-1,288.0	291.8	0.00	0.00	0.00
5,960.0	0.00	0.00	5,796.7	50.0	-1,288.0	291.8	0.00	0.00	0.00
6,000.0	0.00	0.00	5,836.7	50.0	-1,288.0	291.8	0.00	0.00	0.00
6,040.0	0.00	0.00	5,876.7	50.0	-1,288.0	291.8	0.00	0.00	0.00
6,080.0	0.00	0.00	5,916.7	50.0	-1,288.0	291.8	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Carmichael 26M-223
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Project:</b>	SEC.26-T7N-R63W	<b>MD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Site:</b>	Carmichael 26M-223 Pad Sec.26-T7N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	Carmichael 26M-223	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (12-14-11)		

## Planned 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)
6,085.8	0.00	0.00	5,922.5	50.0	-1,288.0	291.8	0.00	0.00	0.00
<b>KOP #2</b>									
6,088.5	0.00	0.00	5,925.2	50.0	-1,288.0	291.8	0.00	0.00	0.00
6,120.0	2.36	180.38	5,956.7	49.3	-1,288.0	292.4	7.50	7.50	0.00
6,160.0	5.36	180.38	5,996.6	46.7	-1,288.0	295.0	7.50	7.50	0.00
6,200.0	8.36	180.38	6,036.3	41.9	-1,288.1	299.6	7.50	7.50	0.00
6,240.0	11.36	180.38	6,075.7	35.0	-1,288.1	306.2	7.50	7.50	0.00
6,280.0	14.36	180.38	6,114.7	26.1	-1,288.2	314.8	7.50	7.50	0.00
6,320.0	17.36	180.38	6,153.2	15.2	-1,288.2	325.4	7.50	7.50	0.00
6,360.0	20.36	180.38	6,191.0	2.3	-1,288.3	337.9	7.50	7.50	0.00
6,400.0	23.36	180.38	6,228.1	-12.6	-1,288.4	352.3	7.50	7.50	0.00
6,440.0	26.36	180.38	6,264.4	-29.5	-1,288.5	368.5	7.50	7.50	0.00
6,480.0	29.36	180.38	6,299.8	-48.2	-1,288.6	386.6	7.50	7.50	0.00
6,520.0	32.36	180.38	6,334.1	-68.7	-1,288.8	406.4	7.50	7.50	0.00
6,560.0	35.36	180.38	6,367.3	-91.0	-1,288.9	428.0	7.50	7.50	0.00
6,600.0	38.36	180.38	6,399.3	-114.9	-1,289.1	451.1	7.50	7.50	0.00
6,640.0	41.36	180.38	6,430.0	-140.6	-1,289.3	475.9	7.50	7.50	0.00
6,680.0	44.36	180.38	6,459.3	-167.8	-1,289.4	502.2	7.50	7.50	0.00
6,720.0	47.36	180.38	6,487.2	-196.5	-1,289.6	529.9	7.50	7.50	0.00
6,760.0	50.36	180.38	6,513.5	-226.6	-1,289.8	559.0	7.50	7.50	0.00
6,800.0	53.36	180.38	6,538.2	-258.1	-1,290.0	589.4	7.50	7.50	0.00
6,840.0	56.36	180.38	6,561.2	-290.8	-1,290.3	621.0	7.50	7.50	0.00
6,880.0	59.36	180.38	6,582.5	-324.6	-1,290.5	653.8	7.50	7.50	0.00
6,920.0	62.36	180.38	6,602.0	-359.6	-1,290.7	687.5	7.50	7.50	0.00
6,960.0	65.36	180.38	6,619.6	-395.5	-1,290.9	722.2	7.50	7.50	0.00
7,000.0	68.36	180.38	6,635.3	-432.3	-1,291.2	757.8	7.50	7.50	0.00
7,040.0	71.36	180.38	6,649.1	-469.8	-1,291.4	794.0	7.50	7.50	0.00
7,080.0	74.36	180.38	6,660.8	-508.0	-1,291.7	831.0	7.50	7.50	0.00
7,120.0	77.36	180.38	6,670.6	-546.8	-1,292.0	868.5	7.50	7.50	0.00
7,160.0	80.36	180.38	6,678.3	-586.1	-1,292.2	906.4	7.50	7.50	0.00
7,200.0	83.36	180.38	6,684.0	-625.7	-1,292.5	944.6	7.50	7.50	0.00
7,240.0	86.36	180.38	6,687.6	-665.5	-1,292.7	983.1	7.50	7.50	0.00
7,280.0	89.36	180.38	6,689.1	-705.5	-1,293.0	1,021.7	7.50	7.50	0.00
7,291.5	90.23	180.38	6,689.1	-717.0	-1,293.1	1,032.9	7.50	7.50	0.00
<b>End of Build - 7"</b>									
7,294.1	90.42	180.38	6,689.1	-719.5	-1,293.1	1,035.3	7.50	7.50	0.00
7,320.0	90.42	180.38	6,688.9	-745.5	-1,293.3	1,060.4	0.00	0.00	0.00
7,360.0	90.42	180.38	6,688.6	-785.5	-1,293.5	1,099.0	0.00	0.00	0.00
7,400.0	90.42	180.38	6,688.3	-825.4	-1,293.8	1,137.7	0.00	0.00	0.00
7,440.0	90.42	180.38	6,688.0	-865.4	-1,294.1	1,176.3	0.00	0.00	0.00
7,480.0	90.42	180.38	6,687.7	-905.4	-1,294.3	1,215.0	0.00	0.00	0.00
7,520.0	90.42	180.38	6,687.4	-945.4	-1,294.6	1,253.6	0.00	0.00	0.00
7,560.0	90.42	180.38	6,687.1	-985.4	-1,294.9	1,292.3	0.00	0.00	0.00
7,600.0	90.42	180.38	6,686.8	-1,025.4	-1,295.1	1,330.9	0.00	0.00	0.00
7,640.0	90.42	180.38	6,686.5	-1,065.4	-1,295.4	1,369.6	0.00	0.00	0.00
7,680.0	90.42	180.38	6,686.3	-1,105.4	-1,295.6	1,408.2	0.00	0.00	0.00
7,720.0	90.42	180.38	6,686.0	-1,145.4	-1,295.9	1,446.9	0.00	0.00	0.00
7,760.0	90.42	180.38	6,685.7	-1,185.4	-1,296.2	1,485.5	0.00	0.00	0.00
7,800.0	90.42	180.38	6,685.4	-1,225.4	-1,296.4	1,524.2	0.00	0.00	0.00
7,840.0	90.42	180.38	6,685.1	-1,265.4	-1,296.7	1,562.8	0.00	0.00	0.00
7,880.0	90.42	180.38	6,684.8	-1,305.4	-1,297.0	1,601.5	0.00	0.00	0.00
7,920.0	90.42	180.38	6,684.5	-1,345.4	-1,297.2	1,640.1	0.00	0.00	0.00
7,960.0	90.42	180.38	6,684.2	-1,385.4	-1,297.5	1,678.8	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Carmichael 26M-223
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Project:</b>	SEC.26-T7N-R63W	<b>MD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Site:</b>	Carmichael 26M-223 Pad Sec.26-T7N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	Carmichael 26M-223	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (12-14-11)		

Planned 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)
8,000.0	90.42	180.38	6,683.9	-1,425.4	-1,297.8	1,717.4	0.00	0.00	0.00
8,040.0	90.42	180.38	6,683.6	-1,465.4	-1,298.0	1,756.1	0.00	0.00	0.00
8,080.0	90.42	180.38	6,683.3	-1,505.4	-1,298.3	1,794.7	0.00	0.00	0.00
8,120.0	90.42	180.38	6,683.0	-1,545.4	-1,298.6	1,833.4	0.00	0.00	0.00
8,160.0	90.42	180.38	6,682.7	-1,585.4	-1,298.8	1,872.0	0.00	0.00	0.00
8,200.0	90.42	180.38	6,682.4	-1,625.4	-1,299.1	1,910.7	0.00	0.00	0.00
8,240.0	90.42	180.38	6,682.2	-1,665.4	-1,299.4	1,949.3	0.00	0.00	0.00
8,280.0	90.42	180.38	6,681.9	-1,705.4	-1,299.6	1,988.0	0.00	0.00	0.00
8,320.0	90.42	180.38	6,681.6	-1,745.4	-1,299.9	2,026.6	0.00	0.00	0.00
8,360.0	90.42	180.38	6,681.3	-1,785.4	-1,300.1	2,065.3	0.00	0.00	0.00
8,400.0	90.42	180.38	6,681.0	-1,825.4	-1,300.4	2,103.9	0.00	0.00	0.00
8,440.0	90.42	180.38	6,680.7	-1,865.4	-1,300.7	2,142.6	0.00	0.00	0.00
8,480.0	90.42	180.38	6,680.4	-1,905.4	-1,300.9	2,181.2	0.00	0.00	0.00
8,520.0	90.42	180.38	6,680.1	-1,945.4	-1,301.2	2,219.9	0.00	0.00	0.00
8,560.0	90.42	180.38	6,679.8	-1,985.4	-1,301.5	2,258.5	0.00	0.00	0.00
8,600.0	90.42	180.38	6,679.5	-2,025.4	-1,301.7	2,297.2	0.00	0.00	0.00
8,640.0	90.42	180.38	6,679.2	-2,065.4	-1,302.0	2,335.8	0.00	0.00	0.00
8,680.0	90.42	180.38	6,678.9	-2,105.4	-1,302.3	2,374.5	0.00	0.00	0.00
8,720.0	90.42	180.38	6,678.6	-2,145.4	-1,302.5	2,413.1	0.00	0.00	0.00
8,760.0	90.42	180.38	6,678.3	-2,185.4	-1,302.8	2,451.8	0.00	0.00	0.00
8,800.0	90.42	180.38	6,678.0	-2,225.4	-1,303.1	2,490.4	0.00	0.00	0.00
8,840.0	90.42	180.38	6,677.8	-2,265.4	-1,303.3	2,529.1	0.00	0.00	0.00
8,880.0	90.42	180.38	6,677.5	-2,305.4	-1,303.6	2,567.7	0.00	0.00	0.00
8,920.0	90.42	180.38	6,677.2	-2,345.4	-1,303.9	2,606.4	0.00	0.00	0.00
8,960.0	90.42	180.38	6,676.9	-2,385.4	-1,304.1	2,645.0	0.00	0.00	0.00
9,000.0	90.42	180.38	6,676.6	-2,425.4	-1,304.4	2,683.7	0.00	0.00	0.00
9,040.0	90.42	180.38	6,676.3	-2,465.4	-1,304.6	2,722.3	0.00	0.00	0.00
9,080.0	90.42	180.38	6,676.0	-2,505.4	-1,304.9	2,761.0	0.00	0.00	0.00
9,120.0	90.42	180.38	6,675.7	-2,545.4	-1,305.2	2,799.6	0.00	0.00	0.00
9,160.0	90.42	180.38	6,675.4	-2,585.4	-1,305.4	2,838.3	0.00	0.00	0.00
9,200.0	90.42	180.38	6,675.1	-2,625.4	-1,305.7	2,876.9	0.00	0.00	0.00
9,240.0	90.42	180.38	6,674.8	-2,665.4	-1,306.0	2,915.6	0.00	0.00	0.00
9,280.0	90.42	180.38	6,674.5	-2,705.4	-1,306.2	2,954.2	0.00	0.00	0.00
9,320.0	90.42	180.38	6,674.2	-2,745.4	-1,306.5	2,992.9	0.00	0.00	0.00
9,360.0	90.42	180.38	6,673.9	-2,785.4	-1,306.8	3,031.5	0.00	0.00	0.00
9,400.0	90.42	180.38	6,673.6	-2,825.4	-1,307.0	3,070.2	0.00	0.00	0.00
9,440.0	90.42	180.38	6,673.4	-2,865.3	-1,307.3	3,108.8	0.00	0.00	0.00
9,480.0	90.42	180.38	6,673.1	-2,905.3	-1,307.6	3,147.5	0.00	0.00	0.00
9,520.0	90.42	180.38	6,672.8	-2,945.3	-1,307.8	3,186.1	0.00	0.00	0.00
9,560.0	90.42	180.38	6,672.5	-2,985.3	-1,308.1	3,224.7	0.00	0.00	0.00
9,600.0	90.42	180.38	6,672.2	-3,025.3	-1,308.4	3,263.4	0.00	0.00	0.00
9,640.0	90.42	180.38	6,671.9	-3,065.3	-1,308.6	3,302.0	0.00	0.00	0.00
9,680.0	90.42	180.38	6,671.6	-3,105.3	-1,308.9	3,340.7	0.00	0.00	0.00
9,720.0	90.42	180.38	6,671.3	-3,145.3	-1,309.2	3,379.3	0.00	0.00	0.00
9,760.0	90.42	180.38	6,671.0	-3,185.3	-1,309.4	3,418.0	0.00	0.00	0.00
9,800.0	90.42	180.38	6,670.7	-3,225.3	-1,309.7	3,456.6	0.00	0.00	0.00
9,840.0	90.42	180.38	6,670.4	-3,265.3	-1,309.9	3,495.3	0.00	0.00	0.00
9,880.0	90.42	180.38	6,670.1	-3,305.3	-1,310.2	3,533.9	0.00	0.00	0.00
9,920.0	90.42	180.38	6,669.8	-3,345.3	-1,310.5	3,572.6	0.00	0.00	0.00
9,960.0	90.42	180.38	6,669.5	-3,385.3	-1,310.7	3,611.2	0.00	0.00	0.00
10,000.0	90.42	180.38	6,669.3	-3,425.3	-1,311.0	3,649.9	0.00	0.00	0.00
10,040.0	90.42	180.38	6,669.0	-3,465.3	-1,311.3	3,688.5	0.00	0.00	0.00
10,080.0	90.42	180.38	6,668.7	-3,505.3	-1,311.5	3,727.2	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Carmichael 26M-223
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Project:</b>	SEC.26-T7N-R63W	<b>MD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Site:</b>	Carmichael 26M-223 Pad Sec.26-T7N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	Carmichael 26M-223	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (12-14-11)		

Planned 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)
10,120.0	90.42	180.38	6,668.4	-3,545.3	-1,311.8	3,765.8	0.00	0.00	0.00
10,160.0	90.42	180.38	6,668.1	-3,585.3	-1,312.1	3,804.5	0.00	0.00	0.00
10,200.0	90.42	180.38	6,667.8	-3,625.3	-1,312.3	3,843.1	0.00	0.00	0.00
10,240.0	90.42	180.38	6,667.5	-3,665.3	-1,312.6	3,881.8	0.00	0.00	0.00
10,280.0	90.42	180.38	6,667.2	-3,705.3	-1,312.9	3,920.4	0.00	0.00	0.00
10,320.0	90.42	180.38	6,666.9	-3,745.3	-1,313.1	3,959.1	0.00	0.00	0.00
10,360.0	90.42	180.38	6,666.6	-3,785.3	-1,313.4	3,997.7	0.00	0.00	0.00
10,400.0	90.42	180.38	6,666.3	-3,825.3	-1,313.7	4,036.4	0.00	0.00	0.00
10,440.0	90.42	180.38	6,666.0	-3,865.3	-1,313.9	4,075.0	0.00	0.00	0.00
10,480.0	90.42	180.38	6,665.7	-3,905.3	-1,314.2	4,113.7	0.00	0.00	0.00
10,520.0	90.42	180.38	6,665.4	-3,945.3	-1,314.4	4,152.3	0.00	0.00	0.00
10,560.0	90.42	180.38	6,665.1	-3,985.3	-1,314.7	4,191.0	0.00	0.00	0.00
10,600.0	90.42	180.38	6,664.9	-4,025.3	-1,315.0	4,229.6	0.00	0.00	0.00
10,640.0	90.42	180.38	6,664.6	-4,065.3	-1,315.2	4,268.3	0.00	0.00	0.00
10,680.0	90.42	180.38	6,664.3	-4,105.3	-1,315.5	4,306.9	0.00	0.00	0.00
10,720.0	90.42	180.38	6,664.0	-4,145.3	-1,315.8	4,345.6	0.00	0.00	0.00
10,760.0	90.42	180.38	6,663.7	-4,185.3	-1,316.0	4,384.2	0.00	0.00	0.00
10,800.0	90.42	180.38	6,663.4	-4,225.3	-1,316.3	4,422.9	0.00	0.00	0.00
10,840.0	90.42	180.38	6,663.1	-4,265.3	-1,316.6	4,461.5	0.00	0.00	0.00
10,880.0	90.42	180.38	6,662.8	-4,305.3	-1,316.8	4,500.2	0.00	0.00	0.00
10,920.0	90.42	180.38	6,662.5	-4,345.3	-1,317.1	4,538.8	0.00	0.00	0.00
10,960.0	90.42	180.38	6,662.2	-4,385.3	-1,317.4	4,577.5	0.00	0.00	0.00
11,000.0	90.42	180.38	6,661.9	-4,425.3	-1,317.6	4,616.1	0.00	0.00	0.00
11,040.0	90.42	180.38	6,661.6	-4,465.3	-1,317.9	4,654.8	0.00	0.00	0.00
11,080.0	90.42	180.38	6,661.3	-4,505.3	-1,318.2	4,693.4	0.00	0.00	0.00
11,120.0	90.42	180.38	6,661.0	-4,545.3	-1,318.4	4,732.1	0.00	0.00	0.00
11,160.0	90.42	180.38	6,660.7	-4,585.3	-1,318.7	4,770.7	0.00	0.00	0.00
11,200.0	90.42	180.38	6,660.5	-4,625.3	-1,318.9	4,809.4	0.00	0.00	0.00
11,240.0	90.42	180.38	6,660.2	-4,665.3	-1,319.2	4,848.0	0.00	0.00	0.00
11,280.0	90.42	180.38	6,659.9	-4,705.3	-1,319.5	4,886.7	0.00	0.00	0.00
11,320.0	90.42	180.38	6,659.6	-4,745.3	-1,319.7	4,925.3	0.00	0.00	0.00
11,360.0	90.42	180.38	6,659.3	-4,785.3	-1,320.0	4,964.0	0.00	0.00	0.00
11,398.3	90.42	180.38	6,659.0	-4,823.6	-1,320.3	5,001.0	0.00	0.00	0.00
BHL 500'FSL, 2438'FEL									

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Carmichael 26M-223
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Project:</b>	SEC.26-T7N-R63W	<b>MD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Site:</b>	Carmichael 26M-223 Pad Sec.26-T7N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	Carmichael 26M-223	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (12-14-11)		

## Targets

### Target Name

- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
BHL 500'FSL, 2438'FI	0.00	0.00	6,659.0	-4,823.6	-1,320.3	1,440,976.06	3,304,968.03	40.538700	-104.402730
- plan hits target center									
- Point									
SECTIONLINE 100'N	0.00	0.00	1.0	100.0	-1,504.8	1,445,896.80	3,304,722.32	40.552214	-104.403395
- plan misses target center by 1508.1ft at 1.0ft MD (1.0 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1			1.0	0.0	0.0	1,445,896.80	3,304,722.32		
Point 2			1.0	0.0	2,000.0	1,445,921.66	3,306,722.11		
HARD LINE SHL 460'	0.00	0.00	1.0	-360.0	-1,504.8	1,445,436.85	3,304,728.04	40.550952	-104.403395
- plan misses target center by 1547.3ft at 1.0ft MD (1.0 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1			1.0	0.0	0.0	1,445,436.85	3,304,728.04		
Point 2			1.0	0.0	2,000.0	1,445,461.71	3,306,727.82		
HARD LINE BHL 460'	0.00	0.00	1.0	-4,863.6	-1,522.3	1,440,933.53	3,304,766.51	40.538590	-104.403457
- plan misses target center by 5096.3ft at 1.0ft MD (1.0 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1			1.0	0.0	0.0	1,440,933.53	3,304,766.51		
Point 2			1.0	0.0	2,000.0	1,440,958.38	3,306,766.29		
SECTION LINE 1505'	0.00	0.00	1.0	100.0	-1,504.8	1,445,896.80	3,304,722.34	40.552214	-104.403395
- plan misses target center by 1508.1ft at 1.0ft MD (1.0 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1			1.0	0.0	0.0	1,445,896.80	3,304,722.34		
Point 2			1.0	-5,423.6	-17.0	1,440,473.58	3,304,772.74		

## Casing Points

Measured Depth	Vertical Depth	Name	Casing Diameter	Hole Diameter
(ft)	(ft)		(")	(")
7,291.5	6,689.1	7"	7	8-3/4

## Plan Annotations

Measured Depth	Vertical Depth	Local Coordinates	Comment
(ft)	(ft)	+N/-S (ft) +E/-W (ft)	
200.0	200.0	0.0 0.0	KOP #1
6,085.8	5,922.5	50.0 -1,288.0	KOP #2
7,291.5	6,689.1	-717.0 -1,293.1	End of Build



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.26-T7N-R63W**

**Carmichael 26M-223 Pad Sec.26-T7N-R63W**

**Carmichael 26M-223**

**Wellbore #1**

**Plan #1 (12-14-11)**

## **Anticollision Report**

**27 December, 2011**



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Carmichael 26M-223
<b>Project:</b>	SEC.26-T7N-R63W	<b>TVD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Reference Site:</b>	Carmichael 26M-223 Pad Sec.26-T7N-R63W	<b>MD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Carmichael 26M-223	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (12-14-11)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #1 (12-14-11)		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	Stations	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 1,000.0ft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma		

<b>Survey Tool Program</b>	<b>Date</b>	12/27/2011		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	11,398.3	Plan #1 (12-14-11) (Wellbore #1)	MWD	MWD - Standard

<b>Summary</b>						
<b>Site Name</b>	<b>Reference Measured Depth (ft)</b>	<b>Offset Measured Depth (ft)</b>	<b>Distance Between Centres (ft)</b>	<b>Distance Between Ellipses (ft)</b>	<b>Separation Factor</b>	<b>Warning</b>
<b>Offset Well - Wellbore - Design</b>						
Carmichael 26M-223 Pad Sec.26-T7N-R63W						
Carmichael 33-26 (Exist.) - Wellbore #1 - Design #1	9,856.5	6,649.3	651.4	571.0	8.107	CC, ES
Carmichael 33-26 (Exist.) - Wellbore #1 - Design #1	10,000.0	6,648.3	667.0	584.0	8.035	SF
Carmichael 41-26H Pad Sec.26-T7N-R63W						
Carmichael 34-26 (Exist.) - Wellbore #1 - Design #1	11,215.5	6,660.3	649.2	543.3	6.132	CC, ES
Carmichael 34-26 (Exist.) - Wellbore #1 - Design #1	11,300.0	6,659.7	654.7	547.2	6.092	SF
Carmichael 41-26H - Wellbore #1 - Plan #1 (9-14-11)	200.0	200.0	30.6	29.9	45.334	CC, ES
Carmichael 41-26H - Wellbore #1 - Plan #1 (9-14-11)	500.0	499.5	46.3	44.2	22.859	SF

<b>Offset Design</b>												
Carmichael 26M-223 Pad Sec.26-T7N-R63W - Carmichael 33-26 (Exist.) - Wellbore #1 - Design #1												
Survey Program: 0-MWD												
<b>Reference</b>	<b>Offset</b>	<b>Semi Major Axis</b>		<b>Distance</b>				<b>Warning</b>				
<b>Measured Depth (ft)</b>	<b>Vertical Depth (ft)</b>	<b>Measured Depth (ft)</b>	<b>Vertical Depth (ft)</b>	<b>Reference (ft)</b>	<b>Offset (ft)</b>	<b>Highside Toolface (°)</b>	<b>Offset Wellbore Centre +N/-S (ft)</b>	<b>Offset Wellbore Centre +E/-W (ft)</b>	<b>Between Centres (ft)</b>	<b>Between Ellipses (ft)</b>	<b>Minimum Separation (ft)</b>	<b>Separation Factor</b>
9,100.0	6,675.8	6,654.8	6,654.8	55.5	14.8	-90.49	-3,286.2	-658.7	998.3	931.8	66.47	15.018
9,200.0	6,675.1	6,654.1	6,654.1	57.2	14.8	-90.42	-3,286.2	-658.7	924.8	856.5	68.29	13.543
9,300.0	6,674.4	6,653.4	6,653.4	58.9	14.8	-90.36	-3,286.2	-658.7	856.7	786.6	70.11	12.220
9,400.0	6,673.6	6,652.6	6,652.6	60.6	14.8	-90.29	-3,286.2	-658.7	795.4	723.5	71.94	11.057
9,500.0	6,672.9	6,651.9	6,651.9	62.3	14.8	-90.23	-3,286.2	-658.7	742.6	668.8	73.77	10.066
9,600.0	6,672.2	6,651.2	6,651.2	64.1	14.8	-90.17	-3,286.2	-658.7	700.1	624.4	75.61	9.259
9,700.0	6,671.4	6,650.4	6,650.4	65.8	14.8	-90.10	-3,286.2	-658.7	669.9	592.5	77.45	8.649
9,800.0	6,670.7	6,649.7	6,649.7	67.6	14.8	-90.04	-3,286.2	-658.7	653.8	574.5	79.30	8.245
9,856.5	6,670.3	6,649.3	6,649.3	68.6	14.8	-90.00	-3,286.2	-658.7	651.4	571.0	80.35	8.107 CC, ES
9,900.0	6,670.0	6,649.0	6,649.0	69.4	14.8	-89.97	-3,286.2	-658.7	652.8	571.7	81.15	8.044
10,000.0	6,669.3	6,648.3	6,648.3	71.2	14.8	-89.91	-3,286.2	-658.7	667.0	584.0	83.01	8.035 SF
10,100.0	6,668.5	6,647.5	6,647.5	72.9	14.8	-89.84	-3,286.2	-658.7	695.4	610.5	84.87	8.194
10,200.0	6,667.8	6,646.8	6,646.8	74.7	14.8	-89.78	-3,286.2	-658.7	736.4	649.7	86.73	8.491
10,300.0	6,667.1	6,646.1	6,646.1	76.5	14.8	-89.71	-3,286.2	-658.7	788.0	699.4	88.59	8.895
10,400.0	6,666.3	6,645.3	6,645.3	78.3	14.8	-89.65	-3,286.2	-658.7	848.3	757.9	90.46	9.378
10,500.0	6,665.6	6,644.6	6,644.6	80.2	14.8	-89.59	-3,286.2	-658.7	915.6	823.3	92.33	9.917
10,600.0	6,664.9	6,643.9	6,643.9	82.0	14.8	-89.52	-3,286.2	-658.7	988.4	894.2	94.20	10.493

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

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<b>Project:</b>	SEC.26-T7N-R63W	<b>TVD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Reference Site:</b>	Carmichael 26M-223 Pad Sec.26-T7N-R63W	<b>MD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Carmichael 26M-223	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (12-14-11)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Carmichael 41-26H Pad Sec.26-T7N-R63W - Carmichael 34-26 (Exist.) - Wellbore #1 - Design #1												<b>Offset Site Error:</b>	0.0 ft
Survey Program: 0-MWD												<b>Offset Well Error:</b>	0.0 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,500.0	6,665.6	6,665.6	6,665.6	80.2	14.9	-90.46	-4,645.1	-669.9	966.1	873.7	92.44	10.452	
10,600.0	6,664.9	6,664.9	6,664.9	82.0	14.9	-90.40	-4,645.1	-669.9	894.6	800.3	94.31	9.486	
10,700.0	6,664.1	6,664.1	6,664.1	83.8	14.9	-90.33	-4,645.1	-669.9	829.0	732.8	96.18	8.619	
10,800.0	6,663.4	6,663.4	6,663.4	85.6	14.9	-90.27	-4,645.1	-669.9	770.8	672.7	98.06	7.860	
10,900.0	6,662.7	6,662.7	6,662.7	87.4	14.9	-90.20	-4,645.1	-669.9	721.8	621.9	99.94	7.223	
11,000.0	6,661.9	6,661.9	6,661.9	89.3	14.9	-90.14	-4,645.1	-669.9	684.0	582.2	101.82	6.718	
11,100.0	6,661.2	6,661.2	6,661.2	91.1	14.9	-90.07	-4,645.1	-669.9	659.4	555.7	103.70	6.359	
11,200.0	6,660.5	6,660.5	6,660.5	93.0	14.9	-90.01	-4,645.1	-669.9	649.4	543.8	105.58	6.151	
11,215.5	6,660.3	6,660.3	6,660.3	93.2	14.9	-90.00	-4,645.1	-669.9	649.2	543.3	105.87	6.132 CC, ES	
11,300.0	6,659.7	6,659.7	6,659.7	94.8	14.9	-89.95	-4,645.1	-669.9	654.7	547.2	107.46	6.092 SF	
11,398.3	6,659.0	6,659.0	6,659.0	96.6	14.9	-89.88	-4,645.1	-669.9	674.4	565.1	109.32	6.170	
11,399.0	6,659.0	6,659.0	6,659.0	96.7	14.9	-89.88	-4,645.1	-669.9	674.6	565.3	109.33	6.171	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Carmichael 26M-223
<b>Project:</b>	SEC.26-T7N-R63W	<b>TVD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Reference Site:</b>	Carmichael 26M-223 Pad Sec.26-T7N-R63W	<b>MD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Carmichael 26M-223	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (12-14-11)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Carmichael 41-26H Pad Sec.26-T7N-R63W - Carmichael 41-26H - Wellbore #1 - Plan #1 (9-14-11)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	0.0	0.0	0.0	0.0	89.98	0.0	30.6	30.6					
100.0	100.0	100.0	100.0	0.1	0.1	89.98	0.0	30.6	30.6	30.3	0.22	136.001		
200.0	200.0	200.0	200.0	0.3	0.3	89.98	0.0	30.6	30.6	29.9	0.67	45.334 CC, ES		
300.0	300.0	300.0	300.0	0.6	0.6	177.88	0.0	30.6	32.3	31.2	1.12	28.840		
400.0	399.8	399.8	399.8	0.8	0.8	178.17	0.0	30.6	37.5	36.0	1.57	23.927		
500.0	499.5	499.5	499.5	1.0	1.0	178.51	0.0	30.6	46.3	44.2	2.02	22.859 SF		
600.0	598.7	598.7	598.7	1.3	1.2	178.82	0.0	30.6	58.4	56.0	2.48	23.556		
700.0	697.5	697.5	697.5	1.7	1.5	179.06	0.0	30.6	74.1	71.1	2.94	25.191		
800.0	795.6	795.6	795.6	2.0	1.7	179.25	0.0	30.6	93.2	89.8	3.40	27.376		
900.0	893.1	893.1	893.1	2.5	1.9	179.39	0.0	30.6	115.6	111.8	3.87	29.903		
961.6	952.6	952.6	952.6	2.8	2.0	179.46	0.0	30.6	131.2	127.0	4.15	31.576		
1,000.0	989.7	989.7	989.7	3.0	2.1	179.50	0.0	30.6	141.3	136.9	4.34	32.584		
1,100.0	1,086.2	1,086.2	1,086.2	3.5	2.3	179.58	0.0	30.6	167.5	162.7	4.81	34.819		
1,200.0	1,182.7	1,182.7	1,182.7	4.1	2.5	179.63	0.0	30.6	193.8	188.5	5.29	36.618		
1,300.0	1,279.2	1,279.2	1,279.2	4.6	2.8	179.68	0.0	30.6	220.1	214.3	5.78	38.092		
1,400.0	1,375.7	1,375.7	1,375.7	5.2	3.0	179.71	0.0	30.6	246.4	240.1	6.27	39.320		
1,500.0	1,472.1	1,472.1	1,472.1	5.7	3.2	179.74	0.0	30.6	272.6	265.9	6.76	40.358		
1,600.0	1,568.6	1,568.6	1,568.6	6.3	3.4	179.76	0.0	30.6	298.9	291.7	7.25	41.246		
1,700.0	1,665.1	1,665.1	1,665.1	6.9	3.6	179.78	0.0	30.6	325.2	317.4	7.74	42.013		
1,800.0	1,761.6	1,761.6	1,761.6	7.4	3.8	179.80	0.0	30.6	351.5	343.2	8.23	42.683		
1,900.0	1,858.1	1,858.1	1,858.1	8.0	4.1	179.81	0.0	30.6	377.7	369.0	8.73	43.272		
2,000.0	1,954.6	1,954.6	1,954.6	8.6	4.3	179.82	0.0	30.6	404.0	394.8	9.23	43.793		
2,100.0	2,051.1	2,051.1	2,051.1	9.1	4.5	179.84	0.0	30.6	430.3	420.5	9.72	44.259		
2,200.0	2,147.6	2,147.6	2,147.6	9.7	4.7	179.84	0.0	30.6	456.5	446.3	10.22	44.676		
2,300.0	2,244.0	2,244.0	2,244.0	10.2	4.9	179.85	0.0	30.6	482.8	472.1	10.72	45.053		
2,400.0	2,340.5	2,340.5	2,340.5	10.8	5.1	179.86	0.0	30.6	509.1	497.9	11.21	45.395		
2,500.0	2,437.0	2,437.0	2,437.0	11.4	5.4	179.87	0.0	30.6	535.4	523.6	11.71	45.705		
2,600.0	2,533.5	2,533.5	2,533.5	11.9	5.6	179.87	0.0	30.6	561.6	549.4	12.21	45.990		
2,700.0	2,630.0	2,630.0	2,630.0	12.5	5.8	179.88	0.0	30.6	587.9	575.2	12.71	46.250		
2,800.0	2,726.5	2,726.5	2,726.5	13.1	6.0	179.88	0.0	30.6	614.2	601.0	13.21	46.490		
2,900.0	2,823.0	2,823.0	2,823.0	13.6	6.2	179.89	0.0	30.6	640.4	626.7	13.71	46.712		
3,000.0	2,919.5	2,919.5	2,919.5	14.2	6.4	179.89	0.0	30.6	666.7	652.5	14.21	46.917		
3,100.0	3,015.9	3,015.9	3,015.9	14.8	6.7	179.90	0.0	30.6	693.0	678.3	14.71	47.107		
3,200.0	3,112.4	3,112.4	3,112.4	15.4	6.9	179.90	0.0	30.6	719.3	704.0	15.21	47.285		
3,300.0	3,208.9	3,208.9	3,208.9	15.9	7.1	179.90	0.0	30.6	745.5	729.8	15.71	47.450		
3,400.0	3,305.4	3,305.4	3,305.4	16.5	7.3	179.91	0.0	30.6	771.8	755.6	16.21	47.605		
3,500.0	3,401.9	3,401.9	3,401.9	17.1	7.5	179.91	0.0	30.6	798.1	781.4	16.71	47.750		
3,600.0	3,498.4	3,498.4	3,498.4	17.6	7.8	179.91	0.0	30.6	824.3	807.1	17.21	47.886		
3,700.0	3,594.9	3,594.9	3,594.9	18.2	8.0	179.92	0.0	30.6	850.6	832.9	17.72	48.014		
3,800.0	3,691.4	3,691.4	3,691.4	18.8	8.2	179.92	0.0	30.6	876.9	858.7	18.22	48.134		
3,900.0	3,787.8	3,787.8	3,787.8	19.3	8.4	179.92	0.0	30.6	903.2	884.4	18.72	48.248		
4,000.0	3,884.3	3,884.3	3,884.3	19.9	8.6	179.92	0.0	30.6	929.4	910.2	19.22	48.355		
4,100.0	3,980.8	3,980.8	3,980.8	20.5	8.8	179.93	0.0	30.6	955.7	936.0	19.72	48.457		
4,200.0	4,077.3	4,077.3	4,077.3	21.0	9.1	179.93	0.0	30.6	982.0	961.8	20.22	48.553		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Carmichael 26M-223
<b>Project:</b>	SEC.26-T7N-R63W	<b>TVD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Reference Site:</b>	Carmichael 26M-223 Pad Sec.26-T7N-R63W	<b>MD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Carmichael 26M-223	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (12-14-11)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4784.0ft (RKB Ensign 32 - 1 Coordinates are relative to: Carmichael 26M-223  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000 °  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.71°



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Carmichael 26M-223
<b>Project:</b>	SEC.26-T7N-R63W	<b>TVD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Reference Site:</b>	Carmichael 26M-223 Pad Sec.26-T7N-R63W	<b>MD Reference:</b>	WELL @ 4784.0ft (RKB Ensign 32 - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Carmichael 26M-223	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (12-14-11)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4784.0ft (RKB Ensign 32 - 1 Coordinates are relative to: Carmichael 26M-223  
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