

Well Name: **Knieval 23-12D**

Surface Location: Knieval 23-12D Pad Sec.12-T6N-R67W  
North American Datum 1983 US State Plane 1983 Colorado Northern Zone

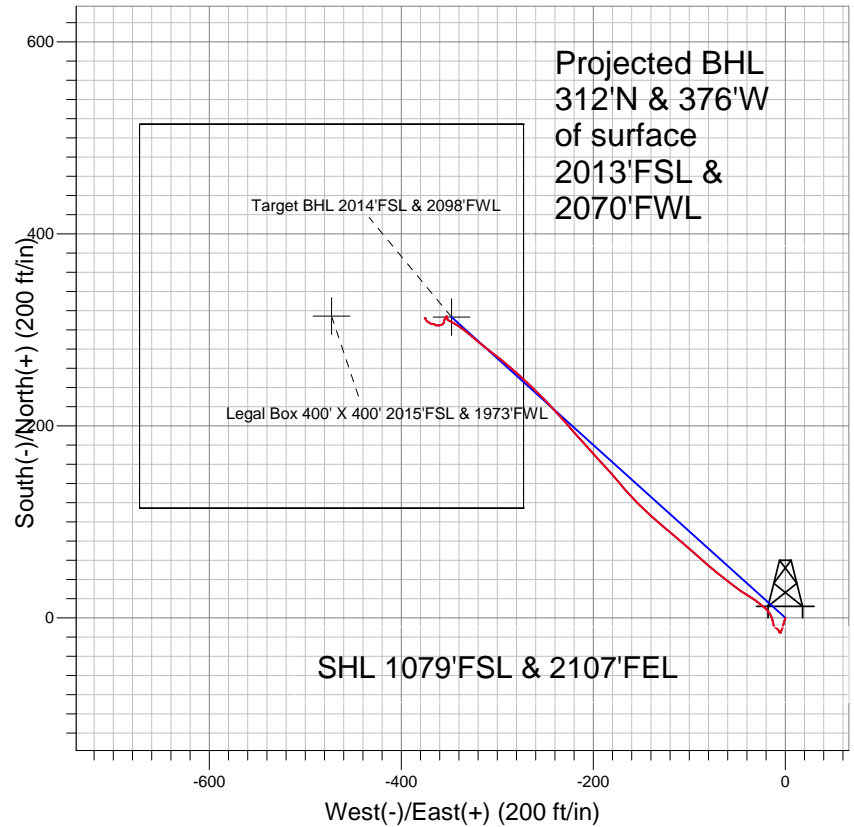
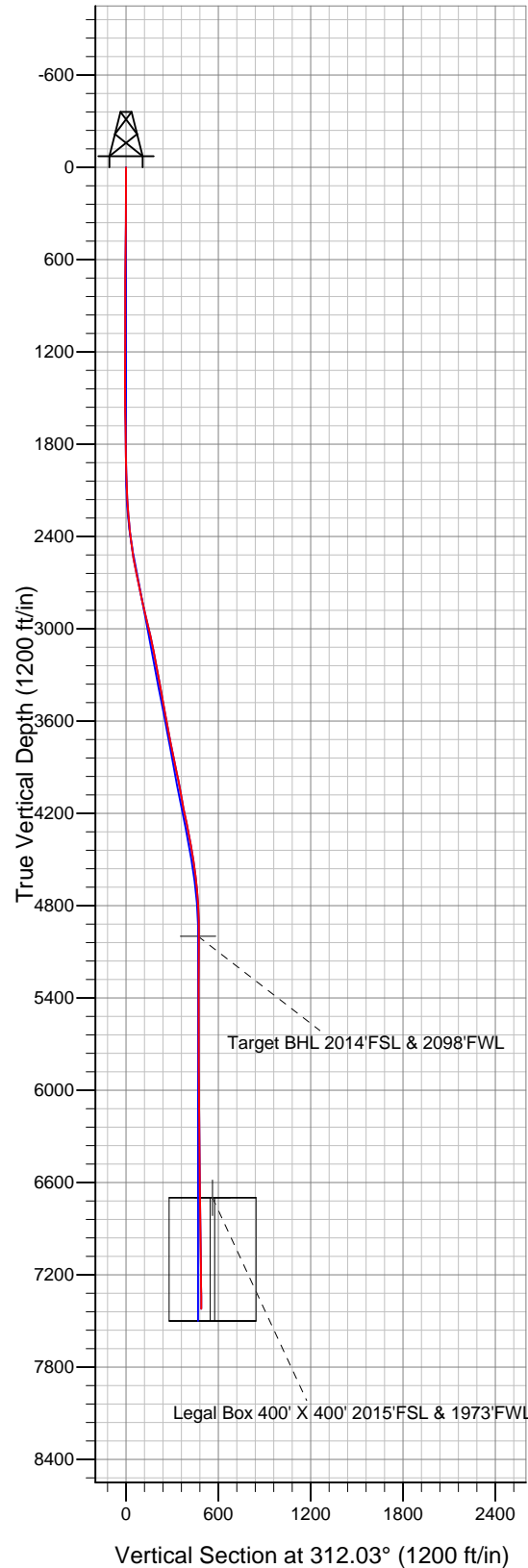
Ground Elevation: 4866.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1425300.55	3182868.18	40.498990	-104.842440

Original Well Elev WELL @ 4879.0ft (Original Well Elev)

Slot

**PETROLEUM DEVELOPMENT CORP Weld County CO**



**LEGEND**

- △ Knieval 23-12D, Wellbore #1, Plan #3 (2-15-11) V0
- Wellbore #1
- Survey #1

**Final Survey Plot**

Projected Final Survey -  
7465'MD & 7421'TVD @ 488'VS  
0.3 deg Inc 256.1 deg AZ

Project: SEC.12-T6N-R67W  
Site: Knieval 23-12D Pad Sec.12-T6N-R67W  
Well: Knieval 23-12D  
Plan: Wellbore #1



## **Directional**

# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.12-T6N-R67W**

**Knieval 23-12D Pad Sec.12-T6N-R67W**

**Knieval 23-12D**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**03 June, 2011**

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Knievel 23-12D
<b>Project:</b>	SEC.12-T6N-R67W	<b>TVD Reference:</b>	WELL @ 4879.0ft (Original Well Elev)
<b>Site:</b>	Knievel 23-12D Pad Sec.12-T6N-R67W	<b>MD Reference:</b>	WELL @ 4879.0ft (Original Well Elev)
<b>Well:</b>	Knievel 23-12D	<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.12-T6N-R67W, Weld County, Colorado		
<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	Knievel 23-12D Pad Sec.12-T6N-R67W				
Site Position:		Northing:	1,425,300.57 ft	Latitude:	40.498990
From:	Lat/Long	Easting:	3,182,868.18 ft	Longitude:	-104.842440
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.42 °

Well	Knievel 23-12D					
Well Position	+N-S	0.0 ft	Northing:	1,425,300.55 ft	Latitude:	40.498990
	+E-W	0.0 ft	Easting:	3,182,868.18 ft	Longitude:	-104.842440
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,866.0 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	2/21/2011	8.96	67.13	53,208

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	312.03	

<b>Survey Program</b>	<b>Date</b> 6/3/2011			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
738.0	7,465.0	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
738.0	2.00	196.40	737.9	-12.4	-3.6	-5.6	0.27	0.27	0.00
833.0	1.20	282.30	832.8	-13.7	-5.1	-5.4	2.38	-0.84	90.42
928.0	0.40	190.40	927.8	-13.8	-6.1	-4.7	1.34	-0.84	-96.74
1,023.0	0.30	212.10	1,022.8	-14.4	-6.3	-5.0	0.17	-0.11	22.84
1,118.0	0.40	124.10	1,117.8	-14.8	-6.2	-5.3	0.52	0.11	-92.63
1,213.0	0.40	129.80	1,212.8	-15.2	-5.6	-6.0	0.04	0.00	6.00
1,308.0	0.40	101.90	1,307.8	-15.5	-5.0	-6.6	0.20	0.00	-29.37
1,403.0	0.20	119.20	1,402.8	-15.6	-4.6	-7.0	0.23	-0.21	18.21
1,497.0	0.80	307.30	1,496.8	-15.3	-5.0	-6.6	1.06	0.64	-182.87
1,593.0	0.80	322.30	1,592.8	-14.4	-5.9	-5.2	0.22	0.00	15.63
1,687.0	0.60	330.20	1,686.8	-13.4	-6.5	-4.1	0.24	-0.21	8.40

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Knievel 23-12D
<b>Project:</b>	SEC.12-T6N-R67W	<b>TVD Reference:</b>	WELL @ 4879.0ft (Original Well Elev)
<b>Site:</b>	Knievel 23-12D Pad Sec.12-T6N-R67W	<b>MD Reference:</b>	WELL @ 4879.0ft (Original Well Elev)
<b>Well:</b>	Knievel 23-12D	<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)
1,782.0	1.10	315.80	1,781.8	-12.3	-7.4	-2.7	0.57	0.53	-15.16
1,877.0	0.80	316.10	1,876.8	-11.2	-8.5	-1.2	0.32	-0.32	0.32
1,972.0	1.80	294.90	1,971.7	-10.1	-10.3	0.9	1.15	1.05	-22.32
2,067.0	2.30	345.00	2,066.7	-7.6	-12.2	4.0	1.89	0.53	52.74
2,162.0	3.50	348.70	2,161.6	-2.9	-13.2	7.9	1.28	1.26	3.89
2,257.0	5.00	333.00	2,256.3	3.6	-15.7	14.1	1.98	1.58	-16.53
2,352.0	6.20	310.30	2,350.9	10.6	-21.5	23.1	2.63	1.26	-23.89
2,447.0	7.90	306.10	2,445.1	17.8	-30.7	34.7	1.87	1.79	-4.42
2,542.0	8.80	301.30	2,539.1	25.4	-42.2	48.3	1.20	0.95	-5.05
2,636.0	12.10	308.00	2,631.6	35.2	-56.1	65.2	3.74	3.51	7.13
2,731.0	11.80	309.40	2,724.5	47.5	-71.4	84.9	0.44	-0.32	1.47
2,826.0	12.10	311.50	2,817.4	60.3	-86.4	104.5	0.56	0.32	2.21
2,921.0	13.70	310.50	2,910.0	74.2	-102.4	125.7	1.70	1.68	-1.05
3,016.0	13.20	310.50	3,002.4	88.5	-119.2	147.8	0.53	-0.53	0.00
3,111.0	11.90	310.20	3,095.2	101.9	-134.9	168.4	1.37	-1.37	-0.32
3,206.0	11.10	315.50	3,188.3	114.7	-148.8	187.4	1.39	-0.84	5.58
3,301.0	10.30	315.40	3,281.6	127.3	-161.2	205.0	0.84	-0.84	-0.11
3,396.0	9.90	321.60	3,375.1	139.7	-172.2	221.5	1.22	-0.42	6.53
3,491.0	10.30	317.50	3,468.7	152.4	-183.0	238.0	0.87	0.42	-4.32
3,586.0	10.30	317.20	3,562.1	164.9	-194.6	254.9	0.06	0.00	-0.32
3,681.0	10.80	318.00	3,655.5	177.7	-206.3	272.2	0.55	0.53	0.84
3,776.0	11.60	319.60	3,748.7	191.6	-218.4	290.5	0.90	0.84	1.68
3,871.0	11.70	317.50	3,841.8	206.0	-231.1	309.6	0.46	0.11	-2.21
3,966.0	11.80	317.70	3,934.8	220.3	-244.2	328.9	0.11	0.11	0.21
4,061.0	10.70	314.60	4,027.9	233.7	-257.0	347.3	1.32	-1.16	-3.26
4,156.0	10.20	312.60	4,121.4	245.6	-269.5	364.6	0.65	-0.53	-2.11
4,251.0	11.40	312.10	4,214.7	257.5	-282.6	382.4	1.27	1.26	-0.53
4,346.0	11.30	308.20	4,307.8	269.6	-296.9	401.0	0.81	-0.11	-4.11
4,441.0	10.80	307.20	4,401.1	280.7	-311.3	419.2	0.56	-0.53	-1.05
4,536.0	9.40	311.80	4,494.6	291.3	-324.2	435.8	1.70	-1.47	4.84
4,631.0	6.90	305.80	4,588.6	299.8	-334.6	449.3	2.78	-2.63	-6.32
4,726.0	5.20	303.70	4,683.1	305.5	-342.8	459.2	1.80	-1.79	-2.21
4,821.0	4.00	292.10	4,777.8	309.2	-349.5	466.6	1.59	-1.26	-12.21
4,916.0	2.80	4.00	4,872.7	312.7	-352.4	471.1	4.32	-1.26	75.68
5,011.0	1.80	224.70	4,967.6	314.0	-353.2	472.6	4.55	-1.05	-146.63
5,043.3	1.58	216.20	4,999.9	313.3	-353.9	472.6	1.03	-0.68	-26.31
Target BHL 2014'FSL & 2098'FWL									
5,106.0	1.30	192.80	5,062.6	311.9	-354.5	472.2	1.03	-0.45	-37.32
5,201.0	1.00	203.50	5,157.6	310.1	-355.1	471.4	0.39	-0.32	11.26
5,296.0	0.90	190.00	5,252.6	308.6	-355.6	470.7	0.26	-0.11	-14.21
5,391.0	0.70	190.10	5,347.6	307.3	-355.8	470.0	0.21	-0.21	0.11
5,486.0	0.70	234.00	5,442.5	306.3	-356.4	469.8	0.55	0.00	46.21
5,581.0	1.10	246.80	5,537.5	305.6	-357.7	470.3	0.47	0.42	13.47
5,676.0	1.60	249.30	5,632.5	304.8	-359.8	471.3	0.53	0.53	2.63
5,771.0	0.70	302.00	5,727.5	304.7	-361.5	472.5	1.37	-0.95	55.47
5,866.0	0.20	279.40	5,822.5	305.0	-362.1	473.2	0.55	-0.53	-23.79
5,961.0	0.50	250.50	5,917.5	304.9	-362.7	473.5	0.36	0.32	-30.42
6,056.0	0.50	260.70	6,012.5	304.7	-363.5	474.0	0.09	0.00	10.74
6,151.0	0.30	338.00	6,107.5	304.8	-364.0	474.5	0.55	-0.21	81.37
6,246.0	0.20	334.90	6,202.5	305.2	-364.2	474.8	0.11	-0.11	-3.26
6,341.0	0.30	275.40	6,297.5	305.4	-364.5	475.2	0.28	0.11	-62.63
6,436.0	0.60	295.40	6,392.5	305.6	-365.2	475.9	0.35	0.32	21.05
6,531.0	0.80	281.20	6,487.5	306.0	-366.3	476.9	0.28	0.21	-14.95

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<b>Site:</b>	Knievel 23-12D Pad Sec.12-T6N-R67W	<b>MD Reference:</b>	WELL @ 4879.0ft (Original Well Elev)
<b>Well:</b>	Knievel 23-12D	<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)
6,626.0	0.90	278.50	6,582.5	306.2	-367.7	478.1	0.11	0.11	-2.84
6,721.0	0.90	280.40	6,677.4	306.5	-369.1	479.4	0.03	0.00	2.00
6,745.5	1.03	289.35	6,702.0	306.6	-369.5	479.7	0.82	0.54	36.48
<b>Legal Box 400' X 400' 2015'FSL &amp; 1973'FWL</b>									
6,816.0	1.50	304.90	6,772.4	307.3	-370.9	481.2	0.82	0.66	22.07
6,911.0	1.20	313.10	6,867.4	308.7	-372.6	483.5	0.37	-0.32	8.63
7,006.0	1.00	308.60	6,962.4	309.9	-374.0	485.3	0.23	-0.21	-4.74
7,101.0	0.50	1.70	7,057.4	310.8	-374.6	486.4	0.85	-0.53	55.89
7,196.0	0.40	9.20	7,152.4	311.6	-374.6	486.8	0.12	-0.11	7.89
7,291.0	0.30	335.50	7,247.4	312.1	-374.6	487.2	0.24	-0.11	-35.47
7,386.0	0.40	275.90	7,342.4	312.4	-375.1	487.7	0.38	0.11	-62.74
7,465.0	0.30	256.10	7,421.4	312.4	-375.5	488.1	0.20	-0.13	-25.06

Checked By: _____	Approved By: _____	Date: _____
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