

Well Name: **Leffler 2TD**

Surface Location: Leffler 2XD Pad Sec.2-T6N-R66W  
 North American Datum 1983 US State Plane 1983 Colorado Northern Zone

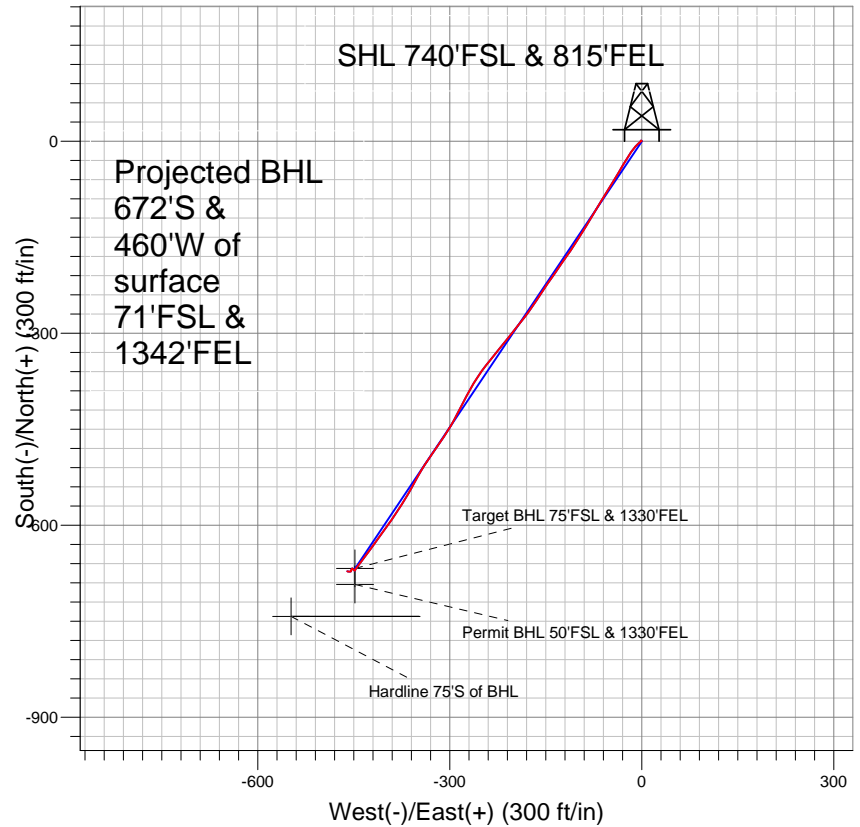
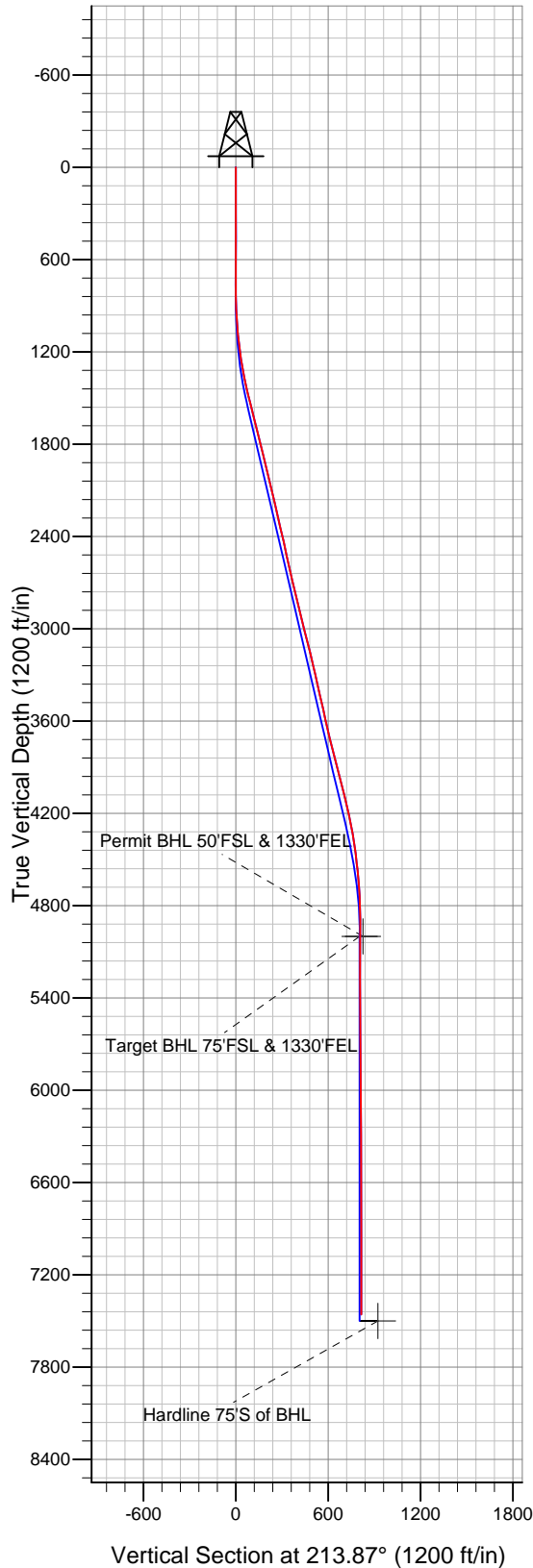
Ground Elevation: 4835.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1430341.55	3211854.39	40° 30' 43.884 N	104° 44' 17.016 W

Original Well Elev WELL @ 4848.0ft (Original Well Elev)

Slot

## PETROLEUM DEVELOPMENT CORP Weld County CO



### LEGEND

- Leffler 2TD, Wellbore #1, Plan#1 (7-1-10) V0
- Wellbore #1
- Survey #1

## Final Survey Plot

Projected Final Survey -  
 7547'MD & 7458'TVD @ 815' VS  
 0.1 deg Inc 235.5 deg AZ

Project: SEC.2-T6N-R66W  
 Site: Leffler 2XD Pad Sec.2-T6N-R66W  
 Well: Leffler 2TD  
 Plan: Wellbore #1



## **Directional**

# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.2-T6N-R66W**

**Leffler 2XD Pad Sec.2-T6N-R66W**

**Leffler 2TD**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**24 January, 2011**

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Leffler 2TD
<b>Project:</b>	SEC.2-T6N-R66W	<b>TVD Reference:</b>	WELL @ 4848.0ft (Original Well Elev)
<b>Site:</b>	Leffler 2XD Pad Sec.2-T6N-R66W	<b>MD Reference:</b>	WELL @ 4848.0ft (Original Well Elev)
<b>Well:</b>	Leffler 2TD	<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.2-T6N-R66W, 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

<b>Site</b>	Leffler 2XD Pad Sec.2-T6N-R66W		
<b>Site Position:</b>		<b>Northing:</b>	1,430,363.43ft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,211,854.20ft
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	"
		<b>Latitude:</b>	40° 30' 44.100 N
		<b>Longitude:</b>	104° 44' 17.016 W
		<b>Grid Convergence:</b>	0.49 °

<b>Well</b>	Leffler 2TD		
<b>Well Position</b>	<b>+N/-S</b>	0.0 ft	<b>Northing:</b> 1,430,341.55 ft
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b> 3,211,854.39 ft
<b>Position Uncertainty</b>	0.0 ft	<b>Wellhead Elevation:</b>	ft
		<b>Latitude:</b>	40° 30' 43.884 N
		<b>Longitude:</b>	104° 44' 17.016 W
		<b>Ground Level:</b>	4,835.0ft

<b>Wellbore</b>	Wellbore #1		
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>
	IGRF2010	1/14/2011	8.92
			<b>Dip Angle (°)</b>
			67.16
			<b>Field Strength (nT)</b>
			53,237

<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>
	0.0	0.0	0.0
			<b>Direction (°)</b>
			213.87

<b>Survey Program</b>	<b>Date</b> 1/24/2011		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>
699.0	7,547.0	Survey #1 (Wellbore #1)	MWD
			<b>Description</b>
			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
699.0	0.20	309.30	699.0	0.8	-0.9	-0.1	0.03	0.03	0.00
792.0	0.30	302.40	792.0	1.0	-1.3	-0.1	0.11	0.11	-7.42
885.0	1.40	195.60	885.0	0.0	-1.8	1.0	1.63	1.18	-114.84
978.0	3.30	229.90	977.9	-2.8	-4.1	4.6	2.46	2.04	36.88
1,071.0	5.40	224.60	1,070.6	-7.6	-9.3	11.5	2.30	2.26	-5.70
1,165.0	7.10	215.10	1,164.1	-15.5	-15.7	21.6	2.11	1.81	-10.11
1,258.0	9.10	211.40	1,256.1	-26.5	-22.8	34.7	2.22	2.15	-3.98
1,351.0	10.90	210.20	1,347.7	-40.4	-31.1	50.9	1.95	1.94	-1.29
1,444.0	12.70	211.30	1,438.8	-56.7	-40.8	69.8	1.95	1.94	1.18
1,537.0	14.30	211.70	1,529.2	-75.2	-52.2	91.5	1.72	1.72	0.43
1,630.0	14.20	211.20	1,619.3	-94.8	-64.1	114.4	0.17	-0.11	-0.54

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Leffler 2TD
<b>Project:</b>	SEC.2-T6N-R66W	<b>TVD Reference:</b>	WELL @ 4848.0ft (Original Well Elev)
<b>Site:</b>	Leffler 2XD Pad Sec.2-T6N-R66W	<b>MD Reference:</b>	WELL @ 4848.0ft (Original Well Elev)
<b>Well:</b>	Leffler 2TD	<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)
1,723.0	14.00	210.80	1,709.5	-114.2	-75.8	137.0	0.24	-0.22	-0.43
1,817.0	13.90	211.70	1,800.8	-133.5	-87.6	159.7	0.25	-0.11	0.96
1,910.0	13.90	211.80	1,891.0	-152.5	-99.3	182.0	0.03	0.00	0.11
2,003.0	13.90	214.80	1,981.3	-171.2	-111.6	204.3	0.77	0.00	3.23
2,096.0	13.40	214.60	2,071.7	-189.3	-124.1	226.3	0.54	-0.54	-0.22
2,189.0	12.50	215.20	2,162.3	-206.3	-136.0	247.1	0.98	-0.97	0.65
2,282.0	13.40	213.90	2,252.9	-223.5	-147.8	268.0	1.02	0.97	-1.40
2,375.0	13.20	213.80	2,343.5	-241.3	-159.7	289.3	0.22	-0.22	-0.11
2,468.0	12.40	213.10	2,434.1	-258.5	-171.1	310.0	0.88	-0.86	-0.75
2,561.0	12.40	219.00	2,525.0	-274.6	-182.8	329.9	1.36	0.00	6.34
2,654.0	13.20	218.20	2,615.7	-290.7	-195.7	350.4	0.88	0.86	-0.86
2,748.0	12.50	218.20	2,707.3	-307.1	-208.6	371.3	0.74	-0.74	0.00
2,841.0	13.50	219.00	2,797.9	-323.5	-221.6	392.1	1.09	1.08	0.86
2,934.0	14.50	219.70	2,888.2	-340.9	-235.9	414.5	1.09	1.08	0.75
3,028.0	14.50	215.50	2,979.2	-359.5	-250.3	438.0	1.12	0.00	-4.47
3,121.0	13.70	210.90	3,069.4	-378.4	-262.7	460.6	1.48	-0.86	-4.95
3,214.0	13.80	208.20	3,159.7	-397.7	-273.6	482.6	0.70	0.11	-2.90
3,308.0	13.60	207.00	3,251.0	-417.4	-283.9	504.8	0.37	-0.21	-1.28
3,401.0	12.10	208.10	3,341.7	-435.7	-293.4	525.3	1.63	-1.61	1.18
3,494.0	12.90	212.30	3,432.5	-453.1	-303.6	545.4	1.30	0.86	4.52
3,588.0	13.30	214.60	3,524.0	-470.9	-315.3	566.7	0.70	0.43	2.45
3,680.0	13.40	214.10	3,613.6	-488.4	-327.3	587.9	0.17	0.11	-0.54
3,774.0	12.70	214.10	3,705.1	-506.0	-339.2	609.2	0.74	-0.74	0.00
3,867.0	13.40	208.50	3,795.7	-523.9	-350.1	630.1	1.55	0.75	-6.02
3,960.0	14.80	209.10	3,885.9	-543.8	-361.0	652.7	1.51	1.51	0.65
4,053.0	14.70	211.80	3,975.9	-564.2	-373.0	676.3	0.75	-0.11	2.90
4,146.0	14.90	213.90	4,065.8	-584.1	-385.9	700.1	0.62	0.22	2.26
4,239.0	13.10	215.80	4,156.0	-602.6	-398.7	722.6	2.00	-1.94	2.04
4,333.0	10.90	216.10	4,248.0	-618.4	-410.2	742.1	2.34	-2.34	0.32
4,426.0	9.70	215.80	4,339.5	-631.9	-420.0	758.7	1.29	-1.29	-0.32
4,518.0	8.00	216.10	4,430.4	-643.4	-428.3	772.9	1.85	-1.85	0.33
4,612.0	6.70	216.00	4,523.6	-653.1	-435.3	784.9	1.38	-1.38	-0.11
4,704.0	5.30	218.00	4,615.1	-660.8	-441.1	794.5	1.54	-1.52	2.17
4,798.0	3.90	216.90	4,708.8	-666.7	-445.7	802.0	1.49	-1.49	-1.17
4,891.0	1.40	197.80	4,801.7	-670.4	-448.0	806.2	2.81	-2.69	-20.54
4,984.0	0.70	295.00	4,894.7	-671.2	-448.8	807.4	1.77	-0.75	104.52
5,089.2	0.90	312.73	4,999.8	-670.4	-450.0	807.4	0.30	0.19	16.86
<b>Permit BHL 50'FSL &amp; 1330'FEL</b>									
5,089.4	0.90	312.75	5,000.0	-670.4	-450.0	807.4	0.30	0.22	12.85
<b>Target BHL 75'FSL &amp; 1330'FEL</b>									
5,171.0	1.10	321.40	5,081.6	-669.3	-451.0	807.1	0.30	0.24	10.59
5,357.0	0.30	333.00	5,267.6	-667.5	-452.3	806.3	0.43	-0.43	6.24
5,543.0	0.40	207.30	5,453.6	-667.6	-452.8	806.7	0.34	0.05	-67.58
5,729.0	0.90	211.10	5,639.6	-669.5	-453.9	808.8	0.27	0.27	2.04
5,916.0	0.50	150.30	5,826.6	-671.4	-454.2	810.6	0.42	-0.21	-32.51
6,102.0	0.30	290.50	6,012.6	-672.0	-454.3	811.1	0.41	-0.11	75.38
6,288.0	0.30	204.30	6,198.6	-672.2	-454.9	811.7	0.22	0.00	-46.34
6,474.0	0.40	262.30	6,384.6	-672.8	-455.8	812.6	0.19	0.05	31.18
6,660.0	0.40	293.00	6,570.6	-672.6	-457.0	813.2	0.11	0.00	16.51
6,847.0	0.20	235.90	6,757.6	-672.5	-457.9	813.6	0.18	-0.11	-30.53
7,033.0	0.40	293.90	6,943.6	-672.4	-458.8	814.0	0.18	0.11	31.18
7,220.0	0.10	254.70	7,130.6	-672.2	-459.5	814.2	0.18	-0.16	-20.96
7,406.0	0.20	290.90	7,316.6	-672.1	-460.0	814.4	0.07	0.05	19.46

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Leffler 2TD
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<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
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Survey									
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7,499.0	0.10	235.50	7,409.6	-672.1	-460.2	814.5	0.18	-0.11	-59.57
7,547.0	0.10	235.50	7,457.6	-672.2	-460.3	814.6	0.00	0.00	0.00
Hardline 75'S of BHL									

Checked By: _____	Approved By: _____	Date: _____
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