

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: Leffler 24-1H
Surface Location: Leffler 24-1H Pad Sec.1-T6N-R66W
North American Datum 1983 , US State Plane 1983Colorado Northern Zone
Ground Elevation: 4816.0

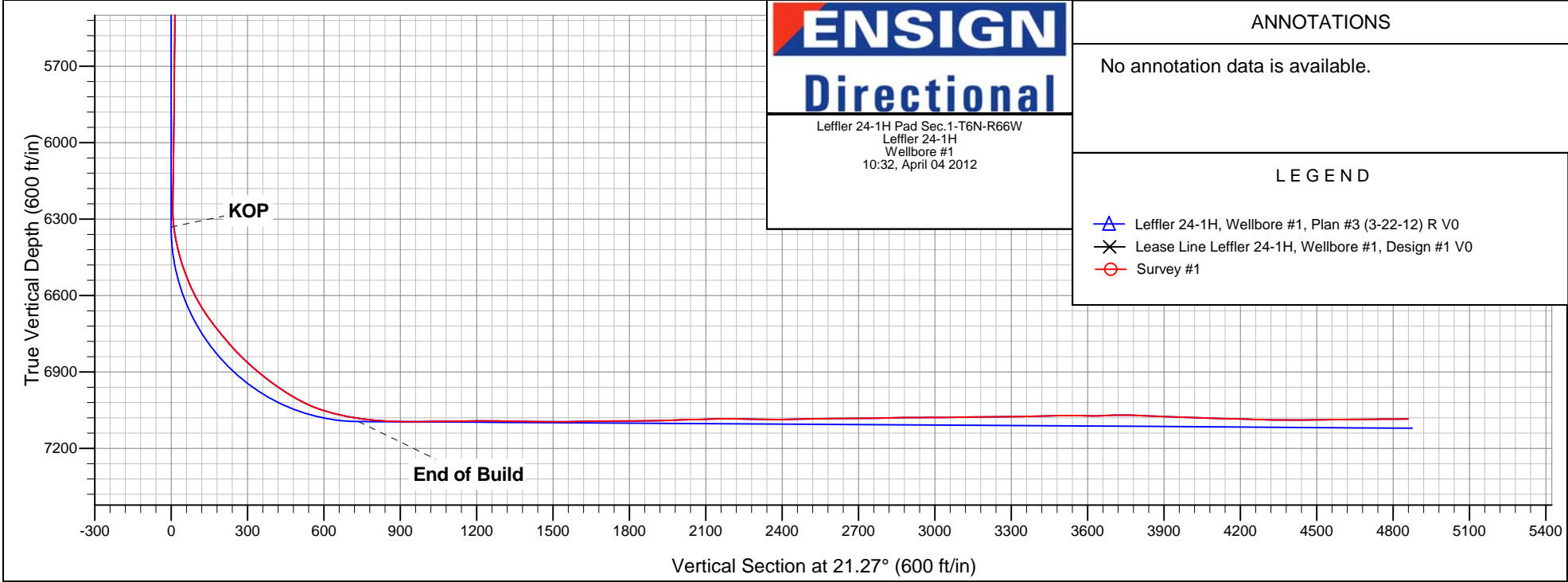
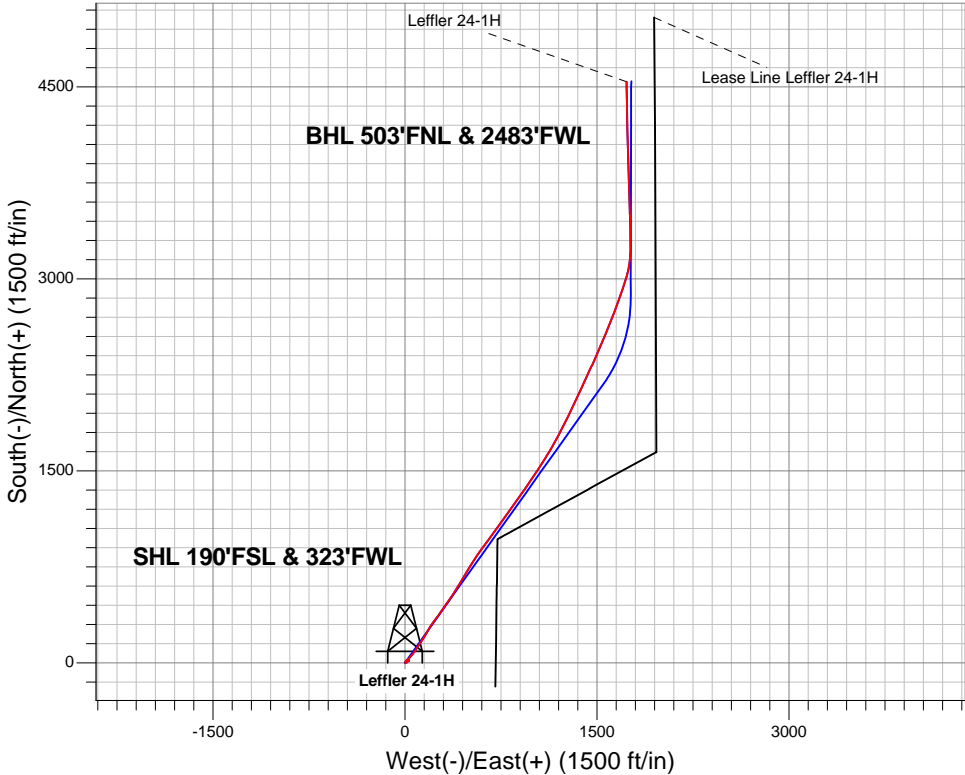
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1429809.12	3213060.21	40.510700	-104.733740	

RKB Ensign 32 - 15' WELL @ 4831.0ft (RKB Ensign 32 - 15')

FINAL SURVEY

Projected Bottom Hole Location
11729' MD 7085' TVD 4540' N & 1731' E of SHL

90.60 degree Incl @ 359.20 degree AZM





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.1-T6N-R66W

Leffler 24-1H Pad Sec.1-T6N-R66W

Leffler 24-1H

Wellbore #1

Survey: Survey #1

Standard Survey Report

04 April, 2012

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Leffler 24-1H
Project:	SEC.1-T6N-R66W	TVD Reference:	WELL @ 4831.0ft (RKB Ensign 32 - 15')
Site:	Leffler 24-1H Pad Sec.1-T6N-R66W	MD Reference:	WELL @ 4831.0ft (RKB Ensign 32 - 15')
Well:	Leffler 24-1H	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.1-T6N-R66W, Weld County, Colorado		
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	Leffler 24-1H Pad Sec.1-T6N-R66W				
Site Position:		Northing:	1,429,809.13ft	Latitude:	40.510700
From:	Lat/Long	Easting:	3,213,060.21 ft	Longitude:	-104.733740
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.50 °

Well	Leffler 24-1H					
Well Position	+N-S	0.0 ft	Northing:	1,429,809.12 ft	Latitude:	40.510700
	+E-W	0.0 ft	Easting:	3,213,060.21 ft	Longitude:	-104.733740
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,816.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/22/2012	8.75	67.12	53,112

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 (°)	
	7,121.0	0.0	0.0	21.27	

Survey Program	Date	4/4/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
941.0	11,729.0	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	0.00	1.0	0.0	0.0	0.0	0.00	0.00	0.00	
SECTION LINE 190'S OF SHL										
1.1	0.00	34.50	1.1	0.0	0.0	0.0	0.00	0.00	0.00	
SHL HARDLINE 460'FSL, 460'FWL										
28.5	0.02	34.50	28.5	0.0	0.0	0.0	0.08	0.08	0.00	
BHL HARDLINE 460'FNL & 371' EAST										
941.0	0.70	34.50	941.0	4.7	3.3	5.6	0.07	0.07	0.00	
1,033.0	0.80	29.10	1,033.0	5.8	3.9	6.8	0.13	0.11	-5.87	
1,125.0	0.80	34.80	1,125.0	6.9	4.6	8.0	0.09	0.00	6.20	
1,216.0	0.50	34.10	1,216.0	7.7	5.2	9.0	0.33	-0.33	-0.77	
1,308.0	0.30	11.30	1,308.0	8.3	5.4	9.7	0.27	-0.22	-24.78	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Leffler 24-1H
Project:	SEC.1-T6N-R66W	TVD Reference:	WELL @ 4831.0ft (RKB Ensign 32 - 15')
Site:	Leffler 24-1H Pad Sec.1-T6N-R66W	MD Reference:	WELL @ 4831.0ft (RKB Ensign 32 - 15')
Well:	Leffler 24-1H	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)
1,309.0	0.30	11.30	1,309.0	8.3	5.4	9.7	0.00	0.00	0.00
1,402.0	0.70	26.50	1,401.9	9.0	5.7	10.5	0.45	0.43	16.34
1,496.0	0.50	355.40	1,495.9	9.9	5.9	11.4	0.40	-0.21	-33.09
1,589.0	0.50	16.10	1,588.9	10.7	6.0	12.2	0.19	0.00	22.26
1,683.0	0.40	325.60	1,682.9	11.4	6.0	12.8	0.42	-0.11	-53.72
1,776.0	0.70	37.90	1,775.9	12.1	6.1	13.5	0.74	0.32	77.74
1,869.0	0.60	31.00	1,868.9	13.0	6.7	14.5	0.14	-0.11	-7.42
1,961.0	0.40	34.60	1,960.9	13.7	7.2	15.3	0.22	-0.22	3.91
2,055.0	0.60	337.90	2,054.9	14.4	7.2	16.0	0.54	0.21	-60.32
2,148.0	1.10	41.50	2,147.9	15.5	7.6	17.2	1.07	0.54	68.39
2,241.0	1.30	64.70	2,240.9	16.6	9.1	18.8	0.56	0.22	24.95
2,334.0	1.20	59.70	2,333.9	17.6	10.9	20.3	0.16	-0.11	-5.38
2,427.0	1.40	54.10	2,426.8	18.7	12.7	22.0	0.25	0.22	-6.02
2,520.0	1.40	61.80	2,519.8	19.9	14.6	23.9	0.20	0.00	8.28
2,614.0	1.30	61.40	2,613.8	21.0	16.5	25.6	0.11	-0.11	-0.43
2,707.0	1.10	63.20	2,706.8	21.9	18.3	27.0	0.22	-0.22	1.94
2,800.0	1.00	42.60	2,799.8	22.9	19.6	28.4	0.42	-0.11	-22.15
2,892.0	0.90	48.00	2,891.7	24.0	20.7	29.8	0.15	-0.11	5.87
2,986.0	0.80	71.00	2,985.7	24.7	21.9	30.9	0.38	-0.11	24.47
3,078.0	0.70	46.80	3,077.7	25.3	22.9	31.8	0.36	-0.11	-26.30
3,172.0	0.50	77.70	3,171.7	25.7	23.7	32.6	0.40	-0.21	32.87
3,265.0	0.50	75.50	3,264.7	25.9	24.5	33.0	0.02	0.00	-2.37
3,357.0	1.20	6.80	3,356.7	27.0	25.0	34.2	1.22	0.76	-74.67
3,451.0	0.90	0.50	3,450.7	28.7	25.1	35.9	0.34	-0.32	-6.70
3,545.0	0.40	302.80	3,544.7	29.6	24.8	36.6	0.81	-0.53	-61.38
3,638.0	0.70	232.90	3,637.7	29.5	24.1	36.2	0.73	0.32	-75.16
3,731.0	1.00	198.30	3,730.7	28.3	23.4	34.9	0.62	0.32	-37.20
3,825.0	1.10	204.60	3,824.7	26.7	22.8	33.2	0.16	0.11	6.70
3,918.0	0.90	157.00	3,917.6	25.3	22.7	31.8	0.89	-0.22	-51.18
4,011.0	0.50	113.60	4,010.6	24.4	23.3	31.2	0.69	-0.43	-46.67
4,104.0	0.40	156.60	4,103.6	24.0	23.8	31.0	0.37	-0.11	46.24
4,197.0	0.60	132.20	4,196.6	23.3	24.3	30.6	0.31	0.22	-26.24
4,290.0	1.60	115.60	4,289.6	22.5	25.9	30.3	1.12	1.08	-17.85
4,382.0	1.80	110.40	4,381.6	21.4	28.4	30.2	0.27	0.22	-5.65
4,476.0	1.50	108.30	4,475.5	20.5	30.9	30.3	0.33	-0.32	-2.23
4,569.0	1.30	153.20	4,568.5	19.2	32.6	29.7	1.17	-0.22	48.28
4,662.0	1.10	207.60	4,661.5	17.4	32.6	28.1	1.19	-0.22	58.49
4,756.0	1.40	236.10	4,755.5	16.0	31.2	26.2	0.72	0.32	30.32
4,850.0	2.20	248.60	4,849.4	14.7	28.6	24.1	0.94	0.85	13.30
4,944.0	1.40	251.00	4,943.4	13.7	25.8	22.1	0.85	-0.85	2.55
5,036.0	1.10	225.50	5,035.4	12.7	24.2	20.6	0.68	-0.33	-27.72
5,129.0	1.40	221.90	5,128.3	11.2	22.8	18.7	0.33	0.32	-3.87
5,222.0	0.90	234.70	5,221.3	9.9	21.4	17.0	0.60	-0.54	13.76
5,315.0	0.70	233.40	5,314.3	9.2	20.4	15.9	0.22	-0.22	-1.40
5,408.0	0.60	272.70	5,407.3	8.9	19.4	15.3	0.48	-0.11	42.26
5,502.0	0.90	270.20	5,501.3	8.9	18.2	14.9	0.32	0.32	-2.66
5,595.0	0.60	229.90	5,594.3	8.6	17.1	14.2	0.63	-0.32	-43.33
5,688.0	0.70	209.20	5,687.3	7.8	16.4	13.2	0.27	0.11	-22.26
5,781.0	0.40	216.20	5,780.3	7.0	16.0	12.3	0.33	-0.32	7.53
5,874.0	0.70	229.50	5,873.3	6.4	15.3	11.5	0.35	0.32	14.30
5,968.0	0.70	215.00	5,967.3	5.5	14.6	10.4	0.19	0.00	-15.43
6,061.0	0.90	215.60	6,060.3	4.5	13.8	9.2	0.22	0.22	0.65
6,154.0	0.80	211.30	6,153.2	3.3	13.1	7.8	0.13	-0.11	-4.62

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Leffler 24-1H
Project:	SEC.1-T6N-R66W	TVD Reference:	WELL @ 4831.0ft (RKB Ensign 32 - 15')
Site:	Leffler 24-1H Pad Sec.1-T6N-R66W	MD Reference:	WELL @ 4831.0ft (RKB Ensign 32 - 15')
Well:	Leffler 24-1H	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)
6,190.0	0.70	215.90	6,189.2	2.9	12.8	7.4	0.32	-0.28	12.78
6,221.0	0.70	205.70	6,220.2	2.6	12.6	7.0	0.40	0.00	-32.90
6,252.0	0.60	193.60	6,251.2	2.3	12.5	6.7	0.55	-0.32	-39.03
6,283.0	2.20	52.00	6,282.2	2.5	12.9	7.0	8.70	5.16	-456.78
6,314.0	5.00	34.40	6,313.2	4.0	14.1	8.8	9.61	9.03	-56.77
6,345.0	8.00	26.50	6,344.0	7.0	15.9	12.3	10.08	9.68	-25.48
6,376.0	10.80	25.30	6,374.5	11.6	18.1	17.3	9.05	9.03	-3.87
6,407.0	12.80	26.70	6,404.9	17.3	20.9	23.7	6.52	6.45	4.52
6,438.0	14.90	31.90	6,435.0	23.7	24.5	31.0	7.87	6.77	16.77
6,469.0	17.60	35.40	6,464.7	30.9	29.3	39.5	9.26	8.71	11.29
6,499.0	19.80	38.10	6,493.2	38.6	35.1	48.7	7.88	7.33	9.00
6,531.0	22.00	40.00	6,523.1	47.5	42.3	59.6	7.19	6.88	5.94
6,562.0	24.30	41.90	6,551.6	56.7	50.3	71.1	7.80	7.42	6.13
6,593.0	26.40	39.30	6,579.6	66.8	58.9	83.6	7.67	6.77	-8.39
6,624.0	28.80	37.90	6,607.0	78.0	67.9	97.3	8.02	7.74	-4.52
6,655.0	31.10	35.80	6,633.9	90.4	77.1	112.2	8.15	7.42	-6.77
6,686.0	33.50	32.80	6,660.1	104.1	86.5	128.3	9.31	7.74	-9.68
6,717.0	35.80	32.30	6,685.6	118.9	95.9	145.6	7.48	7.42	-1.61
6,748.0	37.90	32.00	6,710.4	134.7	105.8	163.9	6.80	6.77	-0.97
6,779.0	39.20	33.60	6,734.7	150.9	116.3	182.8	5.28	4.19	5.16
6,810.0	39.90	34.30	6,758.6	167.3	127.3	202.1	2.68	2.26	2.26
6,841.0	40.90	33.50	6,782.2	183.9	138.5	221.7	3.63	3.23	-2.58
6,872.0	42.90	32.30	6,805.2	201.3	149.8	241.9	6.95	6.45	-3.87
6,903.0	44.90	29.90	6,827.6	219.7	160.9	263.1	8.39	6.45	-7.74
6,934.0	46.60	29.90	6,849.2	239.0	171.9	285.1	5.48	5.48	0.00
6,965.0	48.30	30.10	6,870.2	258.8	183.3	307.6	5.50	5.48	0.65
6,997.0	49.90	32.30	6,891.1	279.4	195.9	331.5	7.21	5.00	6.88
7,028.0	51.20	34.50	6,910.8	299.4	209.1	354.9	6.90	4.19	7.10
7,059.0	54.00	35.70	6,929.6	319.6	223.2	378.8	9.54	9.03	3.87
7,090.0	55.60	36.50	6,947.5	340.0	238.1	403.3	5.58	5.16	2.58
7,121.0	56.70	36.80	6,964.8	360.7	253.5	428.1	3.64	3.55	0.97
7,152.0	57.70	35.60	6,981.6	381.7	268.9	453.3	4.58	3.23	-3.87
7,183.0	59.80	35.10	6,997.7	403.3	284.2	479.0	6.91	6.77	-1.61
7,214.0	62.80	34.70	7,012.5	425.6	299.8	505.4	9.74	9.68	-1.29
7,245.0	65.60	33.40	7,026.0	448.8	315.4	532.6	9.79	9.03	-4.19
7,276.0	69.00	34.10	7,038.0	472.5	331.3	560.5	11.16	10.97	2.26
7,307.0	72.00	34.60	7,048.3	496.7	347.8	589.0	9.80	9.68	1.61
7,338.0	74.50	34.20	7,057.3	521.1	364.6	617.9	8.16	8.06	-1.29
7,369.0	76.20	34.60	7,065.1	545.9	381.5	647.1	5.62	5.48	1.29
7,400.0	77.70	34.20	7,072.1	570.8	398.6	676.5	5.00	4.84	-1.29
7,431.0	80.30	32.00	7,078.0	596.3	415.2	706.3	10.90	8.39	-7.10
7,462.0	82.70	30.70	7,082.6	622.5	431.1	736.5	8.78	7.74	-4.19
7,504.0	84.40	30.90	7,087.3	658.3	452.5	777.6	4.08	4.05	0.48
7,535.0	84.70	29.20	7,090.3	685.0	467.9	808.1	5.54	0.97	-5.48
7,567.0	86.40	29.90	7,092.8	712.8	483.7	839.7	5.74	5.31	2.19
7,599.0	87.30	32.00	7,094.5	740.2	500.1	871.2	7.13	2.81	6.56
7,631.0	88.70	32.10	7,095.6	767.3	517.1	902.6	4.39	4.38	0.31
7,663.0	90.50	34.20	7,095.9	794.1	534.6	933.9	8.64	5.63	6.56
7,694.0	91.00	34.00	7,095.4	819.7	552.0	964.1	1.74	1.61	-0.65
7,726.0	91.20	33.80	7,094.8	846.3	569.8	995.3	0.88	0.63	-0.63
7,758.0	90.40	35.20	7,094.4	872.7	587.9	1,026.5	5.04	-2.50	4.38
7,790.0	89.80	36.60	7,094.3	898.6	606.7	1,057.4	4.76	-1.88	4.38
7,822.0	90.50	36.50	7,094.2	924.3	625.7	1,088.3	2.21	2.19	-0.31

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Leffler 24-1H
Project:	SEC.1-T6N-R66W	TVD Reference:	WELL @ 4831.0ft (RKB Ensign 32 - 15')
Site:	Leffler 24-1H Pad Sec.1-T6N-R66W	MD Reference:	WELL @ 4831.0ft (RKB Ensign 32 - 15')
Well:	Leffler 24-1H	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)
7,855.0	90.80	35.30	7,093.9	951.0	645.1	1,120.2	3.75	0.91	-3.64
7,887.0	91.20	35.20	7,093.3	977.2	663.6	1,151.3	1.29	1.25	-0.31
7,919.0	91.60	36.00	7,092.5	1,003.2	682.2	1,182.3	2.79	1.25	2.50
7,950.0	90.50	35.80	7,092.0	1,028.3	700.4	1,212.3	3.61	-3.55	-0.65
7,981.0	88.60	37.10	7,092.2	1,053.2	718.8	1,242.2	7.43	-6.13	4.19
8,013.0	89.40	36.00	7,092.8	1,078.9	737.8	1,273.1	4.25	2.50	-3.44
8,045.0	88.70	36.90	7,093.3	1,104.6	756.8	1,303.9	3.56	-2.19	2.81
8,077.0	89.00	35.80	7,093.9	1,130.4	775.8	1,334.8	3.56	0.94	-3.44
8,108.0	89.40	35.30	7,094.4	1,155.6	793.8	1,364.9	2.07	1.29	-1.61
8,140.0	89.40	35.90	7,094.7	1,181.7	812.4	1,395.9	1.87	0.00	1.88
8,172.0	89.40	35.60	7,095.0	1,207.6	831.1	1,426.8	0.94	0.00	-0.94
8,203.0	89.60	35.30	7,095.3	1,232.9	849.1	1,456.9	1.16	0.65	-0.97
8,235.0	89.70	34.70	7,095.5	1,259.1	867.5	1,488.0	1.90	0.31	-1.88
8,267.0	90.00	35.00	7,095.6	1,285.3	885.8	1,519.1	1.33	0.94	0.94
8,299.0	90.60	35.20	7,095.4	1,311.5	904.2	1,550.2	1.98	1.88	0.63
8,330.0	90.60	34.70	7,095.1	1,336.9	921.9	1,580.3	1.61	0.00	-1.61
8,362.0	91.30	34.90	7,094.6	1,363.2	940.2	1,611.4	2.28	2.19	0.63
8,394.0	91.60	34.50	7,093.8	1,389.5	958.4	1,642.5	1.56	0.94	-1.25
8,425.0	90.30	34.40	7,093.2	1,415.1	975.9	1,672.7	4.21	-4.19	-0.32
8,457.0	89.70	33.60	7,093.2	1,441.6	993.8	1,703.9	3.12	-1.88	-2.50
8,489.0	89.80	34.40	7,093.4	1,468.1	1,011.7	1,735.1	2.52	0.31	2.50
8,521.0	90.00	34.00	7,093.4	1,494.6	1,029.7	1,766.3	1.40	0.63	-1.25
8,553.0	90.90	33.50	7,093.2	1,521.2	1,047.5	1,797.5	3.22	2.81	-1.56
8,585.0	90.90	31.70	7,092.7	1,548.2	1,064.7	1,828.9	5.62	0.00	-5.63
8,616.0	90.60	32.30	7,092.3	1,574.4	1,081.1	1,859.4	2.16	-0.97	1.94
8,648.0	91.20	31.70	7,091.8	1,601.6	1,098.1	1,890.8	2.65	1.88	-1.88
8,680.0	91.30	30.50	7,091.1	1,629.0	1,114.6	1,922.3	3.76	0.31	-3.75
8,712.0	91.60	30.60	7,090.3	1,656.5	1,130.9	1,953.9	0.99	0.94	0.31
8,744.0	92.30	30.90	7,089.2	1,684.0	1,147.2	1,985.4	2.38	2.19	0.94
8,776.0	91.40	29.20	7,088.2	1,711.7	1,163.2	2,017.0	6.01	-2.81	-5.31
8,808.0	91.30	28.60	7,087.4	1,739.7	1,178.7	2,048.7	1.90	-0.31	-1.88
8,840.0	92.10	28.80	7,086.4	1,767.7	1,194.1	2,080.5	2.58	2.50	0.63
8,872.0	91.10	27.70	7,085.6	1,795.9	1,209.2	2,112.2	4.64	-3.13	-3.44
8,904.0	91.80	27.90	7,084.7	1,824.2	1,224.1	2,144.0	2.27	2.19	0.63
8,936.0	90.90	27.00	7,084.0	1,852.6	1,238.9	2,175.8	3.98	-2.81	-2.81
8,968.0	88.80	25.30	7,084.1	1,881.3	1,253.0	2,207.7	8.44	-6.56	-5.31
9,000.0	88.60	26.30	7,084.8	1,910.1	1,266.9	2,239.6	3.19	-0.63	3.13
9,032.0	89.00	24.90	7,085.5	1,939.0	1,280.7	2,271.5	4.55	1.25	-4.38
9,064.0	89.10	26.20	7,086.0	1,967.9	1,294.5	2,303.4	4.07	0.31	4.06
9,096.0	89.30	25.20	7,086.4	1,996.7	1,308.4	2,335.3	3.19	0.63	-3.13
9,128.0	89.90	25.60	7,086.7	2,025.6	1,322.1	2,367.2	2.25	1.88	1.25
9,160.0	90.60	25.00	7,086.5	2,054.5	1,335.8	2,399.1	2.88	2.19	-1.88
9,192.0	90.70	26.10	7,086.2	2,083.4	1,349.6	2,431.0	3.45	0.31	3.44
9,224.0	91.10	25.10	7,085.7	2,112.2	1,363.4	2,462.9	3.37	1.25	-3.13
9,256.0	91.60	25.70	7,084.9	2,141.1	1,377.1	2,494.8	2.44	1.56	1.88
9,288.0	90.40	24.80	7,084.4	2,170.1	1,390.8	2,526.7	4.69	-3.75	-2.81
9,320.0	90.50	25.20	7,084.1	2,199.1	1,404.3	2,558.7	1.29	0.31	1.25
9,352.0	91.00	23.90	7,083.7	2,228.2	1,417.6	2,590.6	4.35	1.56	-4.06
9,384.0	91.40	23.90	7,083.0	2,257.4	1,430.6	2,622.6	1.25	1.25	0.00
9,416.0	90.20	24.50	7,082.6	2,286.6	1,443.7	2,654.5	4.19	-3.75	1.88
9,448.0	90.20	25.20	7,082.5	2,315.7	1,457.1	2,686.5	2.19	0.00	2.19
9,479.0	90.30	24.20	7,082.3	2,343.8	1,470.1	2,717.4	3.24	0.32	-3.23
9,511.0	90.30	25.00	7,082.2	2,372.9	1,483.4	2,749.4	2.50	0.00	2.50
9,543.0	91.00	24.10	7,081.8	2,402.0	1,496.7	2,781.3	3.56	2.19	-2.81

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Leffler 24-1H
Project:	SEC.1-T6N-R66W	TVD Reference:	WELL @ 4831.0ft (RKB Ensign 32 - 15')
Site:	Leffler 24-1H Pad Sec.1-T6N-R66W	MD Reference:	WELL @ 4831.0ft (RKB Ensign 32 - 15')
Well:	Leffler 24-1H	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)
9,575.0	91.60	24.80	7,081.1	2,431.1	1,509.9	2,813.2	2.88	1.88	2.19
9,607.0	91.00	22.60	7,080.3	2,460.4	1,522.8	2,845.2	7.12	-1.88	-6.88
9,639.0	91.20	22.20	7,079.7	2,490.0	1,535.0	2,877.2	1.40	0.63	-1.25
9,671.0	90.20	22.10	7,079.3	2,519.6	1,547.1	2,909.2	3.14	-3.13	-0.31
9,703.0	90.10	21.50	7,079.2	2,549.4	1,558.9	2,941.2	1.90	-0.31	-1.88
9,735.0	90.20	21.80	7,079.2	2,579.1	1,570.7	2,973.2	0.99	0.31	0.94
9,767.0	90.30	22.30	7,079.0	2,608.8	1,582.8	3,005.2	1.59	0.31	1.56
9,799.0	90.30	22.20	7,078.9	2,638.4	1,594.9	3,037.2	0.31	0.00	-0.31
9,830.0	90.60	22.00	7,078.6	2,667.1	1,606.5	3,068.2	1.16	0.97	-0.65
9,862.0	90.50	21.90	7,078.3	2,696.8	1,618.5	3,100.2	0.44	-0.31	-0.31
9,868.2	90.52	21.61	7,078.3	2,702.5	1,620.8	3,106.3	4.70	0.31	-4.69
ANGLE PT									
9,894.0	90.60	20.40	7,078.0	2,726.6	1,630.0	3,132.2	4.70	0.31	-4.69
9,926.0	91.20	20.45	7,077.5	2,756.6	1,641.2	3,164.2	1.88	1.88	0.16
9,958.0	91.50	21.20	7,076.7	2,786.5	1,652.6	3,196.1	2.52	0.94	2.34
9,990.0	91.10	21.00	7,076.0	2,816.3	1,664.1	3,228.1	1.40	-1.25	-0.63
10,022.0	90.50	20.20	7,075.6	2,846.3	1,675.4	3,260.1	3.12	-1.88	-2.50
10,054.0	89.60	19.10	7,075.5	2,876.4	1,686.1	3,292.1	4.44	-2.81	-3.44
10,086.0	90.10	19.00	7,075.6	2,906.7	1,696.6	3,324.1	1.59	1.56	-0.31
10,117.0	90.80	19.10	7,075.4	2,936.0	1,706.7	3,355.1	2.28	2.26	0.32
10,148.0	91.50	18.60	7,074.8	2,965.3	1,716.7	3,386.0	2.77	2.26	-1.61
10,179.0	91.80	16.10	7,073.9	2,994.9	1,725.9	3,416.9	8.12	0.97	-8.06
10,211.0	92.10	14.70	7,072.8	3,025.7	1,734.4	3,448.8	4.47	0.94	-4.38
10,243.0	91.90	12.20	7,071.7	3,056.8	1,741.9	3,480.4	7.83	-0.63	-7.81
10,274.0	90.90	10.60	7,070.9	3,087.2	1,748.0	3,511.0	6.09	-3.23	-5.16
10,306.0	88.80	8.80	7,071.0	3,118.7	1,753.4	3,542.3	8.64	-6.56	-5.63
10,338.0	88.20	6.70	7,071.8	3,150.4	1,757.7	3,573.4	6.82	-1.88	-6.56
10,369.0	88.90	3.30	7,072.6	3,181.3	1,760.4	3,603.2	11.19	2.26	-10.97
10,401.0	91.00	2.00	7,072.6	3,213.3	1,761.9	3,633.5	7.72	6.56	-4.06
10,433.0	92.40	2.30	7,071.7	3,245.2	1,763.1	3,663.7	4.47	4.38	0.94
10,465.0	91.60	1.10	7,070.6	3,277.2	1,764.0	3,693.8	4.51	-2.50	-3.75
10,496.0	91.00	359.30	7,069.9	3,308.2	1,764.1	3,722.8	6.12	-1.94	-5.81
10,527.0	89.60	357.00	7,069.7	3,339.2	1,763.1	3,751.3	8.69	-4.52	-7.42
10,559.0	87.90	358.00	7,070.4	3,371.1	1,761.7	3,780.6	6.16	-5.31	3.13
10,591.0	87.60	357.60	7,071.7	3,403.1	1,760.5	3,809.9	1.56	-0.94	-1.25
10,623.0	87.80	358.70	7,072.9	3,435.0	1,759.5	3,839.3	3.49	0.63	3.44
10,655.0	88.00	357.90	7,074.1	3,467.0	1,758.5	3,868.7	2.58	0.63	-2.50
10,687.0	88.00	359.10	7,075.2	3,499.0	1,757.7	3,898.2	3.75	0.00	3.75
10,719.0	88.00	358.00	7,076.4	3,530.9	1,756.9	3,927.7	3.44	0.00	-3.44
10,751.0	88.00	357.90	7,077.5	3,562.9	1,755.7	3,957.1	0.31	0.00	-0.31
10,783.0	88.10	357.90	7,078.6	3,594.9	1,754.6	3,986.4	0.31	0.31	0.00
10,815.0	88.20	358.20	7,079.6	3,626.8	1,753.5	4,015.8	0.99	0.31	0.94
10,847.0	88.40	358.70	7,080.5	3,658.8	1,752.6	4,045.3	1.68	0.63	1.56
10,879.0	88.50	358.00	7,081.4	3,690.8	1,751.7	4,074.8	2.21	0.31	-2.19
10,911.0	88.40	358.60	7,082.3	3,722.7	1,750.7	4,104.2	1.90	-0.31	1.88
10,943.0	88.50	357.90	7,083.1	3,754.7	1,749.8	4,133.7	2.21	0.31	-2.19
10,976.0	88.40	358.30	7,084.0	3,787.7	1,748.7	4,164.0	1.25	-0.30	1.21
11,008.0	88.50	358.70	7,084.9	3,819.7	1,747.8	4,193.5	1.29	0.31	1.25
11,040.0	88.50	357.90	7,085.7	3,851.6	1,746.9	4,223.0	2.50	0.00	-2.50
11,072.0	88.60	357.90	7,086.5	3,883.6	1,745.7	4,252.3	0.31	0.31	0.00
11,104.0	88.80	358.30	7,087.3	3,915.6	1,744.7	4,281.7	1.40	0.63	1.25
11,136.0	89.10	359.10	7,087.9	3,947.6	1,743.9	4,311.3	2.67	0.94	2.50
11,168.0	89.40	358.30	7,088.3	3,979.6	1,743.2	4,340.8	2.67	0.94	-2.50

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Leffler 24-1H
Project:	SEC.1-T6N-R66W	TVD Reference:	WELL @ 4831.0ft (RKB Ensign 32 - 15')
Site:	Leffler 24-1H Pad Sec.1-T6N-R66W	MD Reference:	WELL @ 4831.0ft (RKB Ensign 32 - 15')
Well:	Leffler 24-1H	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)
11,200.0	89.40	358.10	7,088.6	4,011.5	1,742.2	4,370.3	0.62	0.00	-0.63
11,231.0	89.60	358.60	7,088.9	4,042.5	1,741.3	4,398.8	1.74	0.65	1.61
11,263.0	89.90	359.20	7,089.0	4,074.5	1,740.7	4,428.4	2.10	0.94	1.88
11,295.0	90.30	358.00	7,089.0	4,106.5	1,739.9	4,457.9	3.95	1.25	-3.75
11,327.0	90.30	358.10	7,088.8	4,138.5	1,738.8	4,487.4	0.31	0.00	0.31
11,359.0	90.90	358.30	7,088.5	4,170.5	1,737.8	4,516.8	1.98	1.88	0.63
11,390.0	91.20	358.40	7,087.9	4,201.5	1,736.9	4,545.3	1.02	0.97	0.32
11,422.0	91.00	359.90	7,087.3	4,233.4	1,736.4	4,575.0	4.73	-0.63	4.69
11,454.0	91.10	359.60	7,086.7	4,265.4	1,736.3	4,604.7	0.99	0.31	-0.94
11,486.0	90.40	359.90	7,086.3	4,297.4	1,736.2	4,634.5	2.38	-2.19	0.94
11,518.0	90.20	358.20	7,086.1	4,329.4	1,735.6	4,664.1	5.35	-0.63	-5.31
11,550.0	90.20	358.30	7,086.0	4,361.4	1,734.7	4,693.6	0.31	0.00	0.31
11,581.0	90.20	358.60	7,085.9	4,392.4	1,733.8	4,722.2	0.97	0.00	0.97
11,613.0	90.10	359.20	7,085.8	4,424.4	1,733.2	4,751.8	1.90	-0.31	1.88
11,645.0	90.30	358.70	7,085.7	4,456.4	1,732.6	4,781.4	1.68	0.63	-1.56
11,678.0	90.60	359.20	7,085.4	4,489.4	1,732.0	4,811.9	1.77	0.91	1.52
11,729.0	90.60	359.20	7,084.9	4,540.4	1,731.3	4,859.1	0.00	0.00	0.00
BHL 500'FNL, 2520'FWL									

Checked By: _____ Approved By: _____ Date: _____