

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: Schaefer 10E-223

Surface Location: Schaefer Pad Sec.10-T6N-R63W
North American Datum 1983 , US State Plane 1983Colorado Northern Zone

Ground Elevation: 4697.0

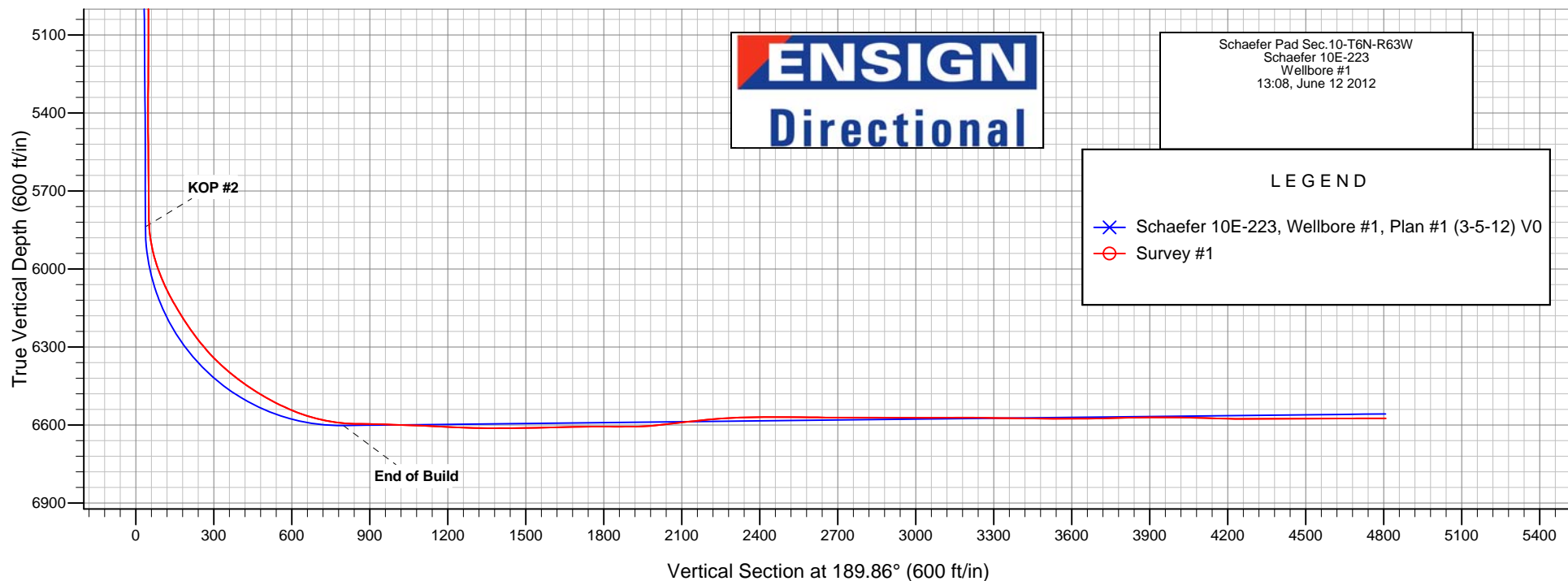
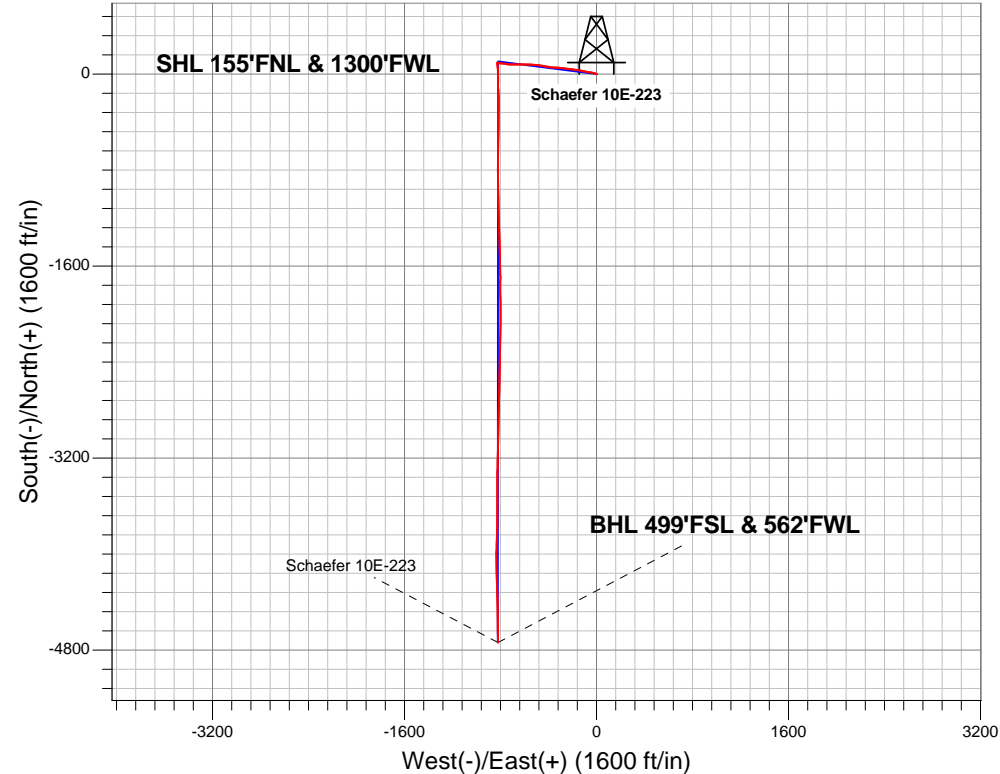
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1429803.08	3298215.30	40.508260	-104.427510	

RKB Ensign 32 - 15' WELL @ 4712.0ft (RKB Ensign 32 - 15')

FINAL SURVEY

Projected Bottom Hole Location
11135'MD 6575'TVD 4737'S & 822'W of SHL

90.10 degree Incl @ 179.50 degree AZM





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.10-T6N-R63W

Schaefer Pad Sec.10-T6N-R63W

Schaefer 10E-223

Wellbore #1

Survey: Survey #1

Standard Survey Report

12 June, 2012

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Schaefer 10E-223
Project:	SEC.10-T6N-R63W	TVD Reference:	WELL @ 4712.0ft (RKB Ensign 32 - 15')
Site:	Schaefer Pad Sec.10-T6N-R63W	MD Reference:	WELL @ 4712.0ft (RKB Ensign 32 - 15')
Well:	Schaefer 10E-223	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.10-T6N-R63W, Weld County, CO		
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		Schaefer Pad Sec.10-T6N-R63W			
Site Position:		Northing:	1,429,803.09ft	Latitude:	40.508260
From:	Lat/Long	Easting:	3,298,215.30ft	Longitude:	-104.427510
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.69 °

Well	Schaefer 10E-223					
Well Position	+N-S	0.0 ft	Northing:	1,429,803.08 ft	Latitude:	40.508260
	+E-W	0.0 ft	Easting:	3,298,215.30 ft	Longitude:	-104.427510
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,697.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/23/2012	8.56	67.16	53,126

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 (°)	
	6,557.0	0.0	0.0	189.86	

Survey Program	Date 6/12/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
144.0	11,135.0	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
HARDLINE 460'FWL - SECTION LINE 155'N OF SHL - HARDLINE SHL 460'FNL - HARDLINE BHL 460'FSL									
144.0	0.30	83.80	144.0	0.0	0.4	-0.1	0.21	0.21	0.00
236.0	0.40	236.00	236.0	-0.1	0.3	0.1	0.74	0.11	165.44
328.0	0.70	282.50	328.0	-0.2	-0.5	0.2	0.56	0.33	50.54
420.0	2.20	290.70	420.0	0.6	-2.7	-0.1	1.64	1.63	8.91
512.0	4.00	293.90	511.8	2.5	-7.3	-1.2	1.96	1.96	3.48
603.0	4.80	288.80	602.6	5.0	-13.8	-2.6	0.98	0.88	-5.60
695.0	5.70	288.30	694.2	7.7	-21.7	-3.9	0.98	0.98	-0.54
787.0	6.20	283.20	785.7	10.3	-30.9	-4.8	0.79	0.54	-5.54
873.0	7.10	278.40	871.1	12.1	-40.7	-4.9	1.23	1.05	-5.58
942.0	7.00	277.40	939.6	13.3	-49.1	-4.7	0.23	-0.14	-1.45

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Schaefer 10E-223
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Site:	Schaefer Pad Sec.10-T6N-R63W	MD Reference:	WELL @ 4712.0ft (RKB Ensign 32 - 15')
Well:	Schaefer 10E-223	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)
1,034.0	8.60	280.30	1,030.7	15.2	-61.4	-4.5	1.79	1.74	3.15
1,125.0	10.40	281.10	1,120.5	18.0	-76.2	-4.7	1.98	1.98	0.88
1,218.0	11.30	280.30	1,211.8	21.3	-93.4	-4.9	0.98	0.97	-0.86
1,311.0	12.20	280.00	1,302.9	24.6	-112.0	-5.0	0.97	0.97	-0.32
1,404.0	12.90	280.20	1,393.6	28.1	-131.9	-5.1	0.75	0.75	0.22
1,497.0	13.60	279.30	1,484.2	31.7	-152.9	-5.1	0.78	0.75	-0.97
1,590.0	13.50	278.70	1,574.6	35.1	-174.4	-4.8	0.19	-0.11	-0.65
1,682.0	12.70	277.40	1,664.2	38.1	-195.1	-4.1	0.93	-0.87	-1.41
1,775.0	11.80	277.60	1,755.1	40.6	-214.6	-3.3	0.97	-0.97	0.22
1,868.0	11.40	276.40	1,846.2	42.9	-233.2	-2.4	0.50	-0.43	-1.29
1,961.0	10.90	277.20	1,937.4	45.1	-251.1	-1.4	0.56	-0.54	0.86
2,055.0	10.20	277.10	2,029.8	47.2	-268.1	-0.6	0.74	-0.74	-0.11
2,148.0	9.70	276.80	2,121.4	49.1	-284.1	0.2	0.54	-0.54	-0.32
2,241.0	9.30	275.70	2,213.1	50.8	-299.3	1.2	0.47	-0.43	-1.18
2,334.0	8.80	273.50	2,305.0	52.0	-313.9	2.5	0.65	-0.54	-2.37
2,427.0	9.30	273.80	2,396.8	52.9	-328.5	4.1	0.54	0.54	0.32
2,520.0	9.40	275.10	2,488.6	54.1	-343.6	5.5	0.25	0.11	1.40
2,613.0	9.10	273.70	2,580.4	55.3	-358.5	7.0	0.40	-0.32	-1.51
2,706.0	9.30	276.20	2,672.2	56.5	-373.3	8.2	0.48	0.22	2.69
2,800.0	9.60	275.30	2,764.9	58.1	-388.7	9.3	0.36	0.32	-0.96
2,893.0	10.30	278.70	2,856.5	60.1	-404.6	10.1	0.98	0.75	3.66
2,986.0	10.70	280.00	2,947.9	62.8	-421.3	10.3	0.50	0.43	1.40
3,079.0	10.10	280.60	3,039.4	65.8	-437.8	10.1	0.66	-0.65	0.65
3,172.0	10.00	280.40	3,131.0	68.8	-453.8	10.0	0.11	-0.11	-0.22
3,265.0	9.50	280.80	3,222.6	71.7	-469.3	9.8	0.54	-0.54	0.43
3,358.0	9.30	277.30	3,314.4	74.1	-484.3	10.0	0.65	-0.22	-3.76
3,451.0	8.60	275.10	3,406.3	75.6	-498.6	10.9	0.84	-0.75	-2.37
3,543.0	8.10	273.70	3,497.3	76.7	-512.0	12.1	0.59	-0.54	-1.52
3,636.0	9.80	273.70	3,589.2	77.6	-526.4	13.7	1.83	1.83	0.00
3,730.0	10.90	272.40	3,681.6	78.5	-543.3	15.7	1.20	1.17	-1.38
3,823.0	12.10	271.50	3,772.8	79.1	-561.8	18.3	1.30	1.29	-0.97
3,917.0	13.00	270.70	3,864.5	79.5	-582.2	21.4	0.98	0.96	-0.85
4,011.0	13.10	270.40	3,956.1	79.7	-603.4	24.8	0.13	0.11	-0.32
4,102.0	13.30	270.30	4,044.7	79.8	-624.2	28.3	0.22	0.22	-0.11
4,195.0	13.00	269.70	4,135.2	79.8	-645.4	31.9	0.35	-0.32	-0.65
4,288.0	12.00	269.50	4,226.0	79.7	-665.5	35.5	1.08	-1.08	-0.22
4,381.0	11.70	269.50	4,317.1	79.5	-684.6	38.9	0.32	-0.32	0.00
4,475.0	11.80	271.90	4,409.1	79.8	-703.7	41.9	0.53	0.11	2.55
4,568.0	11.10	274.50	4,500.2	80.8	-722.2	44.1	0.93	-0.75	2.80
4,661.0	10.20	276.30	4,591.6	82.4	-739.3	45.4	1.03	-0.97	1.94
4,755.0	9.40	278.10	4,684.3	84.4	-755.1	46.2	0.91	-0.85	1.91
4,847.0	8.40	278.20	4,775.1	86.4	-769.2	46.6	1.09	-1.09	0.11
4,940.0	7.70	278.00	4,867.2	88.2	-782.1	47.0	0.75	-0.75	-0.22
5,034.0	7.30	273.30	4,960.4	89.5	-794.3	47.9	0.78	-0.43	-5.00
5,127.0	5.50	276.60	5,052.8	90.3	-804.7	48.8	1.97	-1.94	3.55
5,221.0	4.20	285.20	5,146.5	91.7	-812.5	48.8	1.58	-1.38	9.15
5,314.0	3.30	286.20	5,239.3	93.4	-818.3	48.2	0.97	-0.97	1.08
5,407.0	2.20	286.00	5,332.2	94.6	-822.6	47.7	1.18	-1.18	-0.22
5,501.0	1.70	276.50	5,426.1	95.3	-825.7	47.6	0.63	-0.53	-10.11
5,594.0	0.70	243.80	5,519.1	95.2	-827.6	48.0	1.26	-1.08	-35.16
5,687.0	0.50	187.70	5,612.1	94.5	-828.2	48.7	0.64	-0.22	-60.32
5,780.0	0.70	164.90	5,705.1	93.6	-828.1	49.6	0.33	0.22	-24.52
5,845.0	0.70	148.80	5,770.1	92.8	-827.8	50.3	0.30	0.00	-24.77
5,876.0	0.80	154.00	5,801.1	92.5	-827.6	50.6	0.39	0.32	16.77

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Well:	Schaefer 10E-223	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)
5,907.0	2.90	168.00	5,832.1	91.5	-827.3	51.5	6.88	6.77	45.16
5,938.0	6.30	172.40	5,863.0	89.1	-826.9	53.9	11.02	10.97	14.19
5,969.0	10.00	173.60	5,893.7	84.7	-826.4	58.1	11.95	11.94	3.87
6,000.0	13.10	175.30	5,924.0	78.5	-825.8	64.1	10.06	10.00	5.48
6,031.0	15.70	175.70	5,954.1	70.8	-825.2	71.5	8.39	8.39	1.29
6,062.0	18.70	174.80	5,983.7	61.7	-824.4	80.4	9.72	9.68	-2.90
6,093.0	21.40	174.90	6,012.8	51.1	-823.5	90.7	8.71	8.71	0.32
6,124.0	23.50	176.70	6,041.4	39.3	-822.6	102.1	7.13	6.77	5.81
6,155.0	25.40	178.00	6,069.7	26.5	-822.0	114.7	6.37	6.13	4.19
6,186.0	27.60	178.50	6,097.4	12.7	-821.6	128.2	7.13	7.10	1.61
6,217.0	30.20	178.00	6,124.5	-2.3	-821.2	142.9	8.42	8.39	-1.61
6,248.0	31.60	177.90	6,151.1	-18.2	-820.6	158.5	4.52	4.52	-0.32
6,279.0	32.30	178.90	6,177.4	-34.6	-820.1	174.5	2.83	2.26	3.23
6,310.0	33.30	180.90	6,203.5	-51.4	-820.1	191.1	4.76	3.23	6.45
6,341.0	34.90	181.60	6,229.2	-68.8	-820.5	208.3	5.31	5.16	2.26
6,372.0	36.90	181.10	6,254.3	-86.9	-820.9	226.2	6.52	6.45	-1.61
6,403.0	38.90	178.10	6,278.7	-106.0	-820.8	245.0	8.77	6.45	-9.68
6,434.0	41.10	176.10	6,302.5	-125.9	-819.8	264.4	8.22	7.10	-6.45
6,465.0	43.60	175.80	6,325.4	-146.7	-818.3	284.7	8.09	8.06	-0.97
6,496.0	45.60	177.20	6,347.5	-168.4	-817.0	305.8	7.19	6.45	4.52
6,527.0	47.80	178.10	6,368.7	-191.0	-816.0	327.9	7.40	7.10	2.90
6,558.0	49.80	179.60	6,389.1	-214.3	-815.6	350.8	7.41	6.45	4.84
6,589.0	52.20	180.20	6,408.6	-238.4	-815.5	374.5	7.89	7.74	1.94
6,620.0	54.00	180.60	6,427.3	-263.2	-815.7	399.0	5.90	5.81	1.29
6,651.0	55.40	181.60	6,445.2	-288.5	-816.2	424.0	5.23	4.52	3.23
6,682.0	56.40	181.70	6,462.6	-314.1	-816.9	449.4	3.24	3.23	0.32
6,713.0	58.80	180.30	6,479.2	-340.3	-817.4	475.2	8.63	7.74	-4.52
6,744.0	60.90	179.30	6,494.7	-367.1	-817.3	501.6	7.33	6.77	-3.23
6,775.0	63.10	179.10	6,509.3	-394.5	-816.9	528.5	7.12	7.10	-0.65
6,806.0	64.40	178.90	6,523.0	-422.3	-816.4	555.8	4.23	4.19	-0.65
6,837.0	66.20	180.20	6,536.0	-450.4	-816.2	583.5	6.94	5.81	4.19
6,868.0	68.50	181.30	6,547.9	-479.0	-816.6	611.8	8.11	7.42	3.55
6,899.0	71.20	181.80	6,558.6	-508.1	-817.4	640.6	8.84	8.71	1.61
6,930.0	73.90	182.30	6,567.9	-537.7	-818.4	669.9	8.84	8.71	1.61
6,961.0	76.40	181.60	6,575.8	-567.6	-819.4	699.6	8.35	8.06	-2.26
6,992.0	78.50	181.80	6,582.5	-597.8	-820.3	729.5	6.80	6.77	0.65
7,023.0	81.20	180.90	6,588.0	-628.4	-821.1	759.7	9.17	8.71	-2.90
7,054.0	83.90	180.90	6,592.0	-659.1	-821.5	790.0	8.71	8.71	0.00
7,078.0	86.10	180.00	6,594.1	-683.0	-821.7	813.6	9.90	9.17	-3.75
7,125.0	90.80	180.00	6,595.4	-730.0	-821.7	859.9	10.00	10.00	0.00
7,130.0	89.20	179.80	6,595.4	-735.0	-821.7	864.8	32.25	-32.00	-4.00
7,162.0	89.30	179.30	6,595.8	-767.0	-821.5	896.3	1.59	0.31	-1.56
7,194.0	88.10	179.50	6,596.5	-798.9	-821.1	927.8	3.80	-3.75	0.63
7,226.0	88.00	179.60	6,597.6	-830.9	-820.9	959.2	0.44	-0.31	0.31
7,258.0	87.80	179.40	6,598.8	-862.9	-820.6	990.7	0.88	-0.63	-0.63
7,290.0	87.80	179.20	6,600.0	-894.9	-820.2	1,022.1	0.62	0.00	-0.63
7,323.0	87.90	179.60	6,601.3	-927.9	-819.9	1,054.6	1.25	0.30	1.21
7,355.0	87.90	179.10	6,602.4	-959.8	-819.5	1,086.0	1.56	0.00	-1.56
7,387.0	87.70	179.10	6,603.7	-991.8	-819.0	1,117.4	0.63	-0.63	0.00
7,419.0	87.90	179.30	6,604.9	-1,023.8	-818.6	1,148.8	0.88	0.63	0.63
7,451.0	87.70	179.00	6,606.1	-1,055.7	-818.1	1,180.3	1.13	-0.63	-0.94
7,482.0	87.20	178.40	6,607.5	-1,086.7	-817.4	1,210.6	2.52	-1.61	-1.94
7,514.0	87.30	178.70	6,609.0	-1,118.7	-816.6	1,242.0	0.99	0.31	0.94

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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)
7,546.0	87.50	178.20	6,610.5	-1,150.6	-815.7	1,273.3	1.68	0.63	-1.56
7,579.0	88.50	178.30	6,611.6	-1,183.6	-814.7	1,305.6	3.05	3.03	0.30
7,611.0	89.70	178.40	6,612.1	-1,215.6	-813.8	1,337.0	3.76	3.75	0.31
7,643.0	90.00	178.20	6,612.2	-1,247.5	-812.8	1,368.3	1.13	0.94	-0.63
7,674.0	90.40	178.00	6,612.1	-1,278.5	-811.8	1,398.7	1.44	1.29	-0.65
7,706.0	90.40	178.20	6,611.9	-1,310.5	-810.7	1,430.0	0.62	0.00	0.63
7,738.0	90.10	178.00	6,611.8	-1,342.5	-809.7	1,461.3	1.13	-0.94	-0.63
7,770.0	90.80	178.70	6,611.5	-1,374.5	-808.8	1,492.7	3.09	2.19	2.19
7,802.0	91.30	178.70	6,610.9	-1,406.5	-808.0	1,524.1	1.56	1.56	0.00
7,834.0	91.10	178.70	6,610.2	-1,438.5	-807.3	1,555.5	0.63	-0.63	0.00
7,866.0	90.80	178.20	6,609.7	-1,470.4	-806.4	1,586.8	1.82	-0.94	-1.56
7,897.0	91.60	178.70	6,609.1	-1,501.4	-805.6	1,617.2	3.04	2.58	1.61
7,929.0	91.60	178.70	6,608.2	-1,533.4	-804.9	1,648.6	0.00	0.00	0.00
7,960.0	91.40	178.40	6,607.4	-1,564.4	-804.1	1,679.0	1.16	-0.65	-0.97
7,993.0	91.40	178.40	6,606.6	-1,597.4	-803.2	1,711.3	0.00	0.00	0.00
8,025.0	90.20	178.70	6,606.1	-1,629.3	-802.4	1,742.7	3.87	-3.75	0.94
8,057.0	89.90	178.90	6,606.1	-1,661.3	-801.7	1,774.1	1.13	-0.94	0.63
8,089.0	89.70	180.00	6,606.2	-1,693.3	-801.4	1,805.6	3.49	-0.63	3.44
8,121.0	90.00	180.50	6,606.3	-1,725.3	-801.5	1,837.1	1.82	0.94	1.56
8,153.0	90.10	180.40	6,606.2	-1,757.3	-801.8	1,868.7	0.44	0.31	-0.31
8,184.0	90.90	180.10	6,606.0	-1,788.3	-801.9	1,899.2	2.76	2.58	-0.97
8,216.0	90.20	180.20	6,605.7	-1,820.3	-802.0	1,930.8	2.21	-2.19	0.31
8,248.0	93.60	179.60	6,604.6	-1,852.3	-801.9	1,962.3	10.79	10.63	-1.88
8,281.0	95.60	179.50	6,602.0	-1,885.2	-801.7	1,994.6	6.07	6.06	-0.30
8,312.0	96.90	179.30	6,598.6	-1,916.0	-801.4	2,024.9	4.24	4.19	-0.65
8,344.0	96.10	179.20	6,595.0	-1,947.8	-800.9	2,056.2	2.52	-2.50	-0.31
8,375.0	96.40	179.00	6,591.6	-1,978.6	-800.5	2,086.5	1.16	0.97	-0.65
8,407.0	96.00	179.30	6,588.1	-2,010.4	-800.0	2,117.7	1.56	-1.25	0.94
8,439.0	96.00	179.50	6,584.8	-2,042.2	-799.6	2,149.0	0.62	0.00	0.63
8,470.0	95.90	180.30	6,581.6	-2,073.1	-799.6	2,179.4	2.59	-0.32	2.58
8,502.0	95.40	180.90	6,578.4	-2,104.9	-799.9	2,210.8	2.43	-1.56	1.88
8,534.0	94.30	181.00	6,575.7	-2,136.8	-800.5	2,242.3	3.45	-3.44	0.31
8,566.0	93.50	181.20	6,573.5	-2,168.7	-801.1	2,273.9	2.58	-2.50	0.63
8,597.0	92.60	181.00	6,571.9	-2,199.7	-801.7	2,304.5	2.97	-2.90	-0.65
8,630.0	91.90	181.40	6,570.6	-2,232.6	-802.4	2,337.1	2.44	-2.12	1.21
8,662.0	91.00	181.00	6,569.8	-2,264.6	-803.0	2,368.7	3.08	-2.81	-1.25
8,695.0	90.40	181.60	6,569.4	-2,297.6	-803.8	2,401.3	2.57	-1.82	1.82
8,727.0	89.90	181.50	6,569.3	-2,329.6	-804.6	2,433.0	1.59	-1.56	-0.31
8,758.0	89.80	181.50	6,569.4	-2,360.6	-805.5	2,463.6	0.32	-0.32	0.00
8,790.0	89.20	181.30	6,569.7	-2,392.6	-806.2	2,495.3	1.98	-1.88	-0.63
8,822.0	89.60	181.10	6,570.0	-2,424.6	-806.9	2,526.9	1.40	1.25	-0.63
8,855.0	89.80	181.60	6,570.2	-2,457.6	-807.7	2,559.6	1.63	0.61	1.52
8,887.0	89.60	181.60	6,570.3	-2,489.5	-808.6	2,591.2	0.63	-0.63	0.00
8,919.0	89.20	181.00	6,570.7	-2,521.5	-809.3	2,622.9	2.25	-1.25	-1.88
8,951.0	90.00	180.90	6,570.9	-2,553.5	-809.8	2,654.5	2.52	2.50	-0.31
8,983.0	89.90	181.20	6,570.9	-2,585.5	-810.4	2,686.1	0.99	-0.31	0.94
9,014.0	89.50	181.00	6,571.1	-2,616.5	-811.0	2,716.7	1.44	-1.29	-0.65
9,046.0	90.00	181.30	6,571.2	-2,648.5	-811.7	2,748.4	1.82	1.56	0.94
9,078.0	90.00	181.20	6,571.2	-2,680.5	-812.4	2,780.0	0.31	0.00	-0.31
9,111.0	89.70	180.60	6,571.3	-2,713.5	-812.9	2,812.6	2.03	-0.91	-1.82
9,142.0	90.10	181.20	6,571.4	-2,744.5	-813.4	2,843.2	2.33	1.29	1.94
9,174.0	89.90	181.00	6,571.4	-2,776.5	-814.0	2,874.9	0.88	-0.63	-0.63
9,206.0	89.40	180.90	6,571.6	-2,808.5	-814.5	2,906.5	1.59	-1.56	-0.31

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Schaefer 10E-223
Project:	SEC.10-T6N-R63W	TVD Reference:	WELL @ 4712.0ft (RKB Ensign 32 - 15')
Site:	Schaefer Pad Sec.10-T6N-R63W	MD Reference:	WELL @ 4712.0ft (RKB Ensign 32 - 15')
Well:	Schaefer 10E-223	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)
9,237.0	89.50	181.10	6,571.9	-2,839.5	-815.0	2,937.1	0.72	0.32	0.65
9,270.0	90.30	181.00	6,571.9	-2,872.5	-815.6	2,969.7	2.44	2.42	-0.30
9,301.0	90.30	181.10	6,571.8	-2,903.5	-816.2	3,000.3	0.32	0.00	0.32
9,334.0	90.20	181.40	6,571.6	-2,936.5	-816.9	3,033.0	0.96	-0.30	0.91
9,366.0	90.30	181.00	6,571.5	-2,968.4	-817.6	3,064.6	1.29	0.31	-1.25
9,398.0	89.90	181.30	6,571.4	-3,000.4	-818.2	3,096.2	1.56	-1.25	0.94
9,430.0	90.10	181.30	6,571.4	-3,032.4	-819.0	3,127.9	0.63	0.63	0.00
9,461.0	90.40	181.70	6,571.3	-3,063.4	-819.8	3,158.6	1.61	0.97	1.29
9,493.0	90.30	181.50	6,571.1	-3,095.4	-820.7	3,190.2	0.70	-0.31	-0.63
9,525.0	89.50	181.60	6,571.1	-3,127.4	-821.5	3,221.9	2.52	-2.50	0.31
9,557.0	89.10	181.70	6,571.5	-3,159.4	-822.5	3,253.6	1.29	-1.25	0.31
9,588.0	88.90	181.40	6,572.1	-3,190.4	-823.3	3,284.2	1.16	-0.65	-0.97
9,620.0	88.70	181.50	6,572.7	-3,222.3	-824.1	3,315.9	0.70	-0.63	0.31
9,652.0	88.80	181.00	6,573.4	-3,254.3	-824.8	3,347.5	1.59	0.31	-1.56
9,683.0	88.70	181.00	6,574.1	-3,285.3	-825.4	3,378.1	0.32	-0.32	0.00
9,715.0	89.10	180.60	6,574.7	-3,317.3	-825.8	3,409.7	1.77	1.25	-1.25
9,748.0	89.80	180.10	6,575.0	-3,350.3	-826.0	3,442.3	2.61	2.12	-1.52
9,779.0	90.10	180.20	6,575.1	-3,381.3	-826.1	3,472.8	1.02	0.97	0.32
9,811.0	89.90	180.00	6,575.1	-3,413.3	-826.1	3,504.4	0.88	-0.63	-0.63
9,843.0	90.20	180.30	6,575.0	-3,445.3	-826.2	3,535.9	1.33	0.94	0.94
9,875.0	89.80	179.70	6,575.0	-3,477.3	-826.2	3,567.4	2.25	-1.25	-1.88
9,908.0	89.50	179.50	6,575.2	-3,510.3	-826.0	3,599.9	1.09	-0.91	-0.61
9,939.0	90.20	180.40	6,575.3	-3,541.3	-826.0	3,630.4	3.68	2.26	2.90
9,971.0	90.10	179.50	6,575.2	-3,573.3	-825.9	3,662.0	2.83	-0.31	-2.81
10,003.0	90.90	180.20	6,575.0	-3,605.3	-825.9	3,693.5	3.32	2.50	2.19
10,035.0	91.40	180.40	6,574.3	-3,637.3	-826.0	3,725.0	1.68	1.56	0.63
10,067.0	91.00	179.90	6,573.7	-3,669.3	-826.1	3,756.6	2.00	-1.25	-1.56
10,099.0	91.40	180.20	6,573.0	-3,701.3	-826.1	3,788.1	1.56	1.25	0.94
10,131.0	91.50	180.20	6,572.2	-3,733.3	-826.2	3,819.6	0.31	0.31	0.00
10,163.0	91.30	181.20	6,571.4	-3,765.3	-826.6	3,851.2	3.19	-0.63	3.13
10,195.0	91.20	182.00	6,570.7	-3,797.2	-827.5	3,882.9	2.52	-0.31	2.50
10,227.0	90.50	182.60	6,570.2	-3,829.2	-828.8	3,914.6	2.88	-2.19	1.88
10,259.0	89.70	182.70	6,570.2	-3,861.2	-830.3	3,946.3	2.52	-2.50	0.31
10,290.0	89.00	181.70	6,570.5	-3,892.1	-831.5	3,977.0	3.94	-2.26	-3.23
10,323.0	89.10	181.30	6,571.1	-3,925.1	-832.3	4,009.7	1.25	0.30	-1.21
10,355.0	89.30	181.20	6,571.5	-3,957.1	-833.0	4,041.3	0.70	0.63	-0.31
10,386.0	89.00	181.30	6,572.0	-3,988.1	-833.7	4,072.0	1.02	-0.97	0.32
10,418.0	88.70	180.40	6,572.6	-4,020.1	-834.2	4,103.6	2.96	-0.94	-2.81
10,450.0	88.30	179.40	6,573.4	-4,052.1	-834.1	4,135.1	3.36	-1.25	-3.13
10,481.0	88.10	179.40	6,574.4	-4,083.1	-833.8	4,165.5	0.65	-0.65	0.00
10,513.0	88.30	179.00	6,575.4	-4,115.1	-833.4	4,197.0	1.40	0.63	-1.25
10,546.0	89.00	179.00	6,576.2	-4,148.0	-832.8	4,229.4	2.12	2.12	0.00
10,577.0	89.60	178.40	6,576.6	-4,179.0	-832.1	4,259.8	2.74	1.94	-1.94
10,608.0	90.20	177.30	6,576.6	-4,210.0	-830.9	4,290.1	4.04	1.94	-3.55
10,640.0	90.40	177.70	6,576.5	-4,242.0	-829.5	4,321.4	1.40	0.63	1.25
10,672.0	90.70	178.40	6,576.2	-4,274.0	-828.4	4,352.7	2.38	0.94	2.19
10,703.0	90.50	179.20	6,575.8	-4,304.9	-827.8	4,383.1	2.66	-0.65	2.58
10,736.0	90.30	178.60	6,575.6	-4,337.9	-827.2	4,415.5	1.92	-0.61	-1.82
10,768.0	90.40	178.70	6,575.4	-4,369.9	-826.4	4,446.9	0.44	0.31	0.31
10,800.0	90.40	179.30	6,575.2	-4,401.9	-825.8	4,478.3	1.87	0.00	1.88
10,832.0	90.20	178.70	6,575.0	-4,433.9	-825.3	4,509.7	1.98	-0.63	-1.88
10,864.0	90.20	178.80	6,574.9	-4,465.9	-824.6	4,541.1	0.31	0.00	0.31
10,896.0	90.20	178.80	6,574.8	-4,497.9	-823.9	4,572.6	0.00	0.00	0.00
10,928.0	90.20	179.40	6,574.7	-4,529.9	-823.4	4,604.0	1.87	0.00	1.88

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Schaefer 10E-223
Project:	SEC.10-T6N-R63W	TVD Reference:	WELL @ 4712.0ft (RKB Ensign 32 - 15')
Site:	Schaefer Pad Sec.10-T6N-R63W	MD Reference:	WELL @ 4712.0ft (RKB Ensign 32 - 15')
Well:	Schaefer 10E-223	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)
10,959.0	90.20	179.80	6,574.6	-4,560.9	-823.2	4,634.5	1.29	0.00	1.29
10,991.0	90.30	179.40	6,574.4	-4,592.9	-823.0	4,666.0	1.29	0.31	-1.25
11,023.0	90.20	179.40	6,574.3	-4,624.9	-822.6	4,697.4	0.31	-0.31	0.00
11,055.0	90.40	179.50	6,574.1	-4,656.9	-822.3	4,728.9	0.70	0.63	0.31
11,084.0	90.20	179.50	6,574.0	-4,685.9	-822.1	4,757.4	0.69	-0.69	0.00
11,134.3	90.10	179.50	6,573.8	-4,736.1	-821.6	4,806.9	0.20	-0.20	0.00
BHL 500'FSL & 560'FWL									
11,135.0	90.10	179.50	6,573.8	-4,736.9	-821.6	4,807.6	0.20	-0.20	0.00

Checked By: _____	Approved By: _____	Date: _____
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