

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Simonsen 1L-421**

Surface Location: Simonsen NENW-12 Pad Sec.12-T6N-R67W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

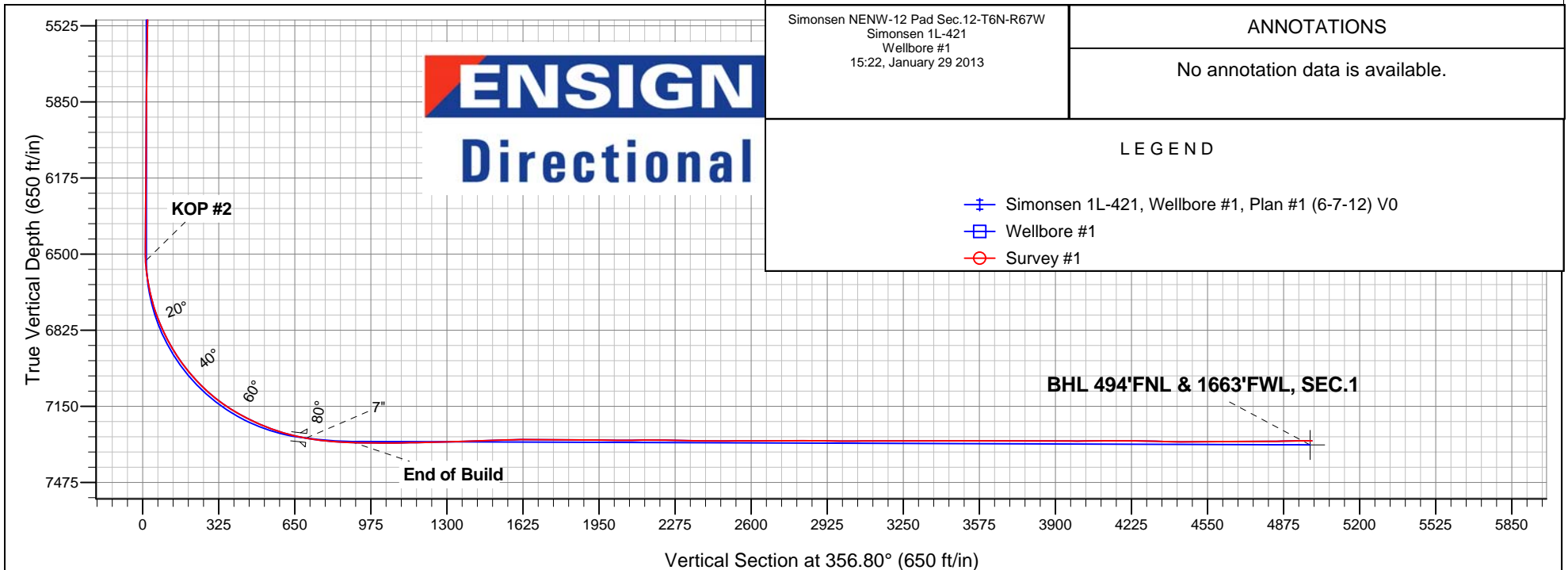
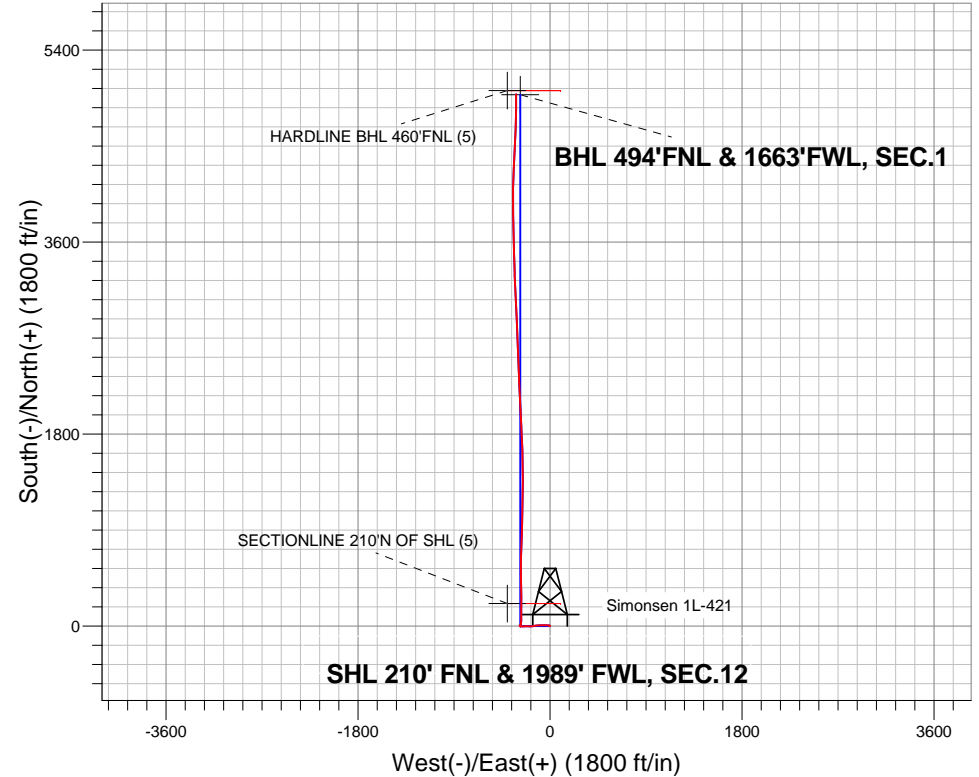
Ground Elevation: 4880.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1428710.68	3182392.41	40.508360	-104.844060	

RKB Ensign 32 - 15' WELL @ 4895.0ft (RKB Ensign 32 - 15')

FINAL SURVEY

Projected Bottom Hole Location
11954' MD 7297' TVD 4986' N & 315' W of SHL
90.6 degree Incl @ 0.2 degree AZM



ENSIGN
Directional

Simonsen NENW-12 Pad Sec.12-T6N-R67W
Simonsen 1L-421
Wellbore #1
15:22, January 29 2013

ANNOTATIONS

No annotation data is available.

LEGEND

- Simonsen 1L-421, Wellbore #1, Plan #1 (6-7-12) V0
- Wellbore #1
- Survey #1



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.12-T6N-R67W

Simonsen NENW-12 Pad Sec.12-T6N-R67W

Simonsen 1L-421

Wellbore #1

Survey: Survey #1

Standard Survey Report

29 January, 2013

Survey	Wellbore Data									
	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)
Main Wellbore	0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
	125.0	0.70	312.40	125.0	0.5	-0.6	0.5	0.56	0.56	0.00
	217.0	0.20	308.30	217.0	1.0	-1.1	1.1	0.54	-0.54	-4.46
	309.0	0.40	255.80	309.0	1.0	-1.5	1.1	0.35	0.22	-57.07
	401.0	0.20	328.60	401.0	1.1	-1.9	1.2	0.42	-0.22	79.13
	491.0	0.40	277.50	491.0	1.2	-2.3	1.4	0.35	0.22	-56.78
	583.0	0.10	184.10	583.0	1.2	-2.7	1.4	0.45	-0.33	-101.52
	675.0	0.10	26.80	675.0	1.2	-2.6	1.3	0.21	0.00	-170.98
	767.0	0.40	295.40	767.0	1.4	-2.9	1.6	0.45	0.33	-99.35
	888.0	0.40	295.40	888.0	1.8	-3.6	2.0	0.00	0.00	0.00
	974.0	0.40	31.50	974.0	2.2	-3.8	2.4	0.69	0.00	111.74
	1,065.0	0.40	33.30	1,065.0	2.7	-3.4	2.9	0.01	0.00	1.98

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Simonsen 1L-421
Project:	SEC.12-T6N-R67W	TVD Reference:	WELL @ 4895.0ft (RKB Ensign 32 - 15')
Site:	Simonsen NENW-12 Pad Sec.12-T6N-R67W	MD Reference:	WELL @ 4895.0ft (RKB Ensign 32 - 15')
Well:	Simonsen 1L-421	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)
1,157.0	0.20	44.50	1,157.0	3.1	-3.1	3.2	0.23	-0.22	12.17
1,251.0	0.50	340.70	1,251.0	3.6	-3.1	3.8	0.48	0.32	-67.87
1,346.0	0.30	332.80	1,346.0	4.2	-3.4	4.4	0.22	-0.21	-8.32
1,441.0	0.70	293.90	1,441.0	4.6	-4.0	4.9	0.53	0.42	-40.95
1,536.0	0.80	304.20	1,536.0	5.3	-5.1	5.5	0.18	0.11	10.84
1,631.0	1.50	267.60	1,630.9	5.6	-6.9	6.0	1.03	0.74	-38.53
1,726.0	2.60	269.30	1,725.9	5.5	-10.3	6.1	1.16	1.16	1.79
1,822.0	4.00	270.90	1,821.7	5.5	-15.8	6.4	1.46	1.46	1.67
1,917.0	4.70	273.30	1,916.4	5.8	-23.0	7.1	0.76	0.74	2.53
2,012.0	5.60	273.90	2,011.1	6.3	-31.5	8.1	0.95	0.95	0.63
2,107.0	6.60	271.90	2,105.5	6.8	-41.6	9.1	1.08	1.05	-2.11
2,202.0	6.30	270.50	2,199.9	7.1	-52.3	10.0	0.36	-0.32	-1.47
2,297.0	5.80	270.00	2,294.4	7.1	-62.3	10.6	0.53	-0.53	-0.53
2,392.0	5.50	267.50	2,388.9	6.9	-71.7	10.9	0.41	-0.32	-2.63
2,488.0	5.80	266.10	2,484.5	6.4	-81.1	10.9	0.34	0.31	-1.46
2,583.0	6.50	269.70	2,578.9	6.0	-91.3	11.1	0.84	0.74	3.79
2,678.0	6.70	268.10	2,673.3	5.8	-102.2	11.5	0.29	0.21	-1.68
2,773.0	6.80	267.40	2,767.6	5.4	-113.3	11.7	0.14	0.11	-0.74
2,869.0	6.00	263.70	2,863.0	4.6	-124.0	11.5	0.94	-0.83	-3.85
2,964.0	6.20	260.40	2,957.5	3.2	-134.0	10.6	0.42	0.21	-3.47
3,059.0	6.50	260.40	3,051.9	1.4	-144.3	9.5	0.32	0.32	0.00
3,154.0	5.60	257.90	3,146.4	-0.5	-154.2	8.1	0.99	-0.95	-2.63
3,250.0	5.60	264.50	3,241.9	-1.9	-163.4	7.2	0.67	0.00	6.88
3,345.0	4.70	261.50	3,336.5	-2.9	-171.9	6.7	0.99	-0.95	-3.16
3,440.0	4.40	260.10	3,431.2	-4.1	-179.3	5.9	0.34	-0.32	-1.47
3,535.0	4.40	267.50	3,526.0	-4.9	-186.6	5.5	0.60	0.00	7.79
3,631.0	4.00	277.00	3,621.7	-4.6	-193.6	6.2	0.83	-0.42	9.90
3,726.0	4.30	275.30	3,716.5	-3.9	-200.4	7.3	0.34	0.32	-1.79
3,821.0	4.70	274.20	3,811.2	-3.3	-207.8	8.3	0.43	0.42	-1.16
3,917.0	5.60	272.00	3,906.8	-2.8	-216.4	9.2	0.96	0.94	-2.29
4,012.0	5.80	268.50	4,001.3	-2.8	-225.9	9.8	0.42	0.21	-3.68
4,107.0	5.10	265.40	4,095.9	-3.3	-234.9	9.8	0.80	-0.74	-3.26
4,202.0	4.30	266.00	4,190.6	-3.9	-242.6	9.7	0.84	-0.84	0.63
4,297.0	4.70	263.60	4,285.3	-4.5	-250.0	9.4	0.47	0.42	-2.53
4,393.0	4.10	273.60	4,381.0	-4.8	-257.4	9.6	1.01	-0.63	10.42
4,488.0	4.50	284.00	4,475.7	-3.7	-264.4	11.1	0.92	0.42	10.95
4,583.0	3.10	298.70	4,570.5	-1.5	-270.3	13.5	1.78	-1.47	15.47
4,678.0	2.10	308.60	4,665.4	0.8	-273.9	16.1	1.15	-1.05	10.42
4,774.0	1.50	286.60	4,761.4	2.3	-276.4	17.7	0.94	-0.63	-22.92
4,869.0	1.60	273.60	4,856.3	2.7	-279.0	18.2	0.38	0.11	-13.68
4,963.0	0.50	326.90	4,950.3	3.1	-280.5	18.8	1.45	-1.17	56.70
5,058.0	0.60	308.20	5,045.3	3.8	-281.1	19.4	0.21	0.11	-19.68
5,154.0	0.30	326.70	5,141.3	4.3	-281.6	20.0	0.34	-0.31	19.27
5,248.0	0.30	338.00	5,235.3	4.7	-281.9	20.4	0.06	0.00	12.02
5,343.0	0.60	260.80	5,330.3	4.9	-282.5	20.6	0.64	0.32	-81.26
5,438.0	0.40	259.80	5,425.3	4.7	-283.3	20.5	0.21	-0.21	-1.05
5,533.0	0.60	170.40	5,520.3	4.2	-283.5	20.0	0.76	0.21	-94.11
5,628.0	1.10	160.30	5,615.3	2.8	-283.1	18.6	0.55	0.53	-10.63
5,722.0	1.00	131.80	5,709.3	1.5	-282.2	17.2	0.56	-0.11	-30.32
5,817.0	0.70	155.70	5,804.3	0.4	-281.4	16.1	0.48	-0.32	25.16
5,912.0	0.60	122.10	5,899.3	-0.4	-280.7	15.2	0.41	-0.11	-35.37
6,006.0	0.70	113.90	5,993.2	-0.9	-279.8	14.7	0.15	0.11	-8.72
6,101.0	0.70	128.70	6,088.2	-1.5	-278.8	14.0	0.19	0.00	15.58

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Site:	Simonsen NENW-12 Pad Sec.12-T6N-R67W	MD Reference:	WELL @ 4895.0ft (RKB Ensign 32 - 15')
Well:	Simonsen 1L-421	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)
6,196.0	0.50	144.60	6,183.2	-2.2	-278.1	13.3	0.27	-0.21	16.74
6,291.0	0.60	116.40	6,278.2	-2.8	-277.4	12.7	0.30	0.11	-29.68
6,386.0	0.50	117.00	6,373.2	-3.2	-276.6	12.2	0.11	-0.11	0.63
6,482.0	0.40	191.60	6,469.2	-3.7	-276.3	11.7	0.57	-0.10	77.71
6,513.0	0.30	8.40	6,500.2	-3.7	-276.3	11.7	2.26	-0.32	570.32
6,545.0	2.80	13.40	6,532.2	-2.9	-276.1	12.5	7.82	7.81	15.63
6,577.0	5.70	9.80	6,564.1	-0.6	-275.6	14.8	9.10	9.06	-11.25
6,608.0	8.50	7.60	6,594.9	3.2	-275.1	18.6	9.07	9.03	-7.10
6,640.0	10.60	8.70	6,626.4	8.5	-274.3	23.8	6.59	6.56	3.44
6,672.0	12.30	9.50	6,657.8	14.8	-273.3	30.0	5.34	5.31	2.50
6,703.0	14.50	8.10	6,687.9	21.9	-272.2	37.0	7.17	7.10	-4.52
6,735.0	16.80	5.40	6,718.8	30.4	-271.2	45.5	7.54	7.19	-8.44
6,767.0	19.20	2.60	6,749.2	40.3	-270.5	55.3	7.97	7.50	-8.75
6,799.0	21.50	1.10	6,779.2	51.4	-270.2	66.4	7.37	7.19	-4.69
6,830.0	23.30	359.20	6,807.9	63.2	-270.2	78.2	6.26	5.81	-6.13
6,862.0	25.50	359.20	6,837.0	76.4	-270.4	91.4	6.88	6.88	0.00
6,894.0	27.60	0.20	6,865.6	90.7	-270.4	105.7	6.71	6.56	3.13
6,925.0	29.70	0.40	6,892.8	105.6	-270.3	120.5	6.78	6.77	0.65
6,957.0	32.30	0.90	6,920.2	122.1	-270.2	136.9	8.16	8.13	1.56
6,989.0	34.40	0.50	6,947.0	139.7	-269.9	154.5	6.60	6.56	-1.25
7,020.0	36.80	1.30	6,972.2	157.7	-269.7	172.5	7.89	7.74	2.58
7,052.0	39.30	0.40	6,997.4	177.4	-269.4	192.2	8.00	7.81	-2.81
7,084.0	41.50	0.90	7,021.7	198.2	-269.1	212.9	6.95	6.88	1.56
7,115.0	43.50	0.50	7,044.6	219.1	-268.9	233.8	6.51	6.45	-1.29
7,147.0	45.80	0.20	7,067.4	241.6	-268.7	256.2	7.22	7.19	-0.94
7,179.0	48.00	358.90	7,089.2	265.0	-268.9	279.5	7.49	6.88	-4.06
7,211.0	50.70	359.20	7,110.1	289.2	-269.3	303.8	8.47	8.44	0.94
7,243.0	53.30	359.00	7,129.8	314.4	-269.7	329.0	8.14	8.13	-0.63
7,275.0	56.00	359.80	7,148.3	340.5	-270.0	355.1	8.68	8.44	2.50
7,307.0	58.50	359.90	7,165.6	367.4	-270.1	381.9	7.82	7.81	0.31
7,339.0	61.20	359.00	7,181.7	395.1	-270.3	409.6	8.78	8.44	-2.81
7,371.0	62.20	359.60	7,196.8	423.3	-270.7	437.7	3.53	3.13	1.88
7,402.0	64.10	0.00	7,210.8	450.9	-270.8	465.3	6.24	6.13	1.29
7,434.0	66.50	0.40	7,224.2	480.0	-270.7	494.4	7.59	7.50	1.25
7,466.0	68.50	359.70	7,236.5	509.6	-270.6	523.9	6.57	6.25	-2.19
7,497.0	70.30	358.90	7,247.4	538.6	-271.0	552.9	6.29	5.81	-2.58
7,529.0	72.10	359.20	7,257.7	568.9	-271.5	583.1	5.69	5.63	0.94
7,561.0	74.10	0.10	7,267.0	599.5	-271.7	613.7	6.80	6.25	2.81
7,592.0	76.40	359.80	7,274.9	629.5	-271.7	643.6	7.48	7.42	-0.97
7,624.0	78.20	1.00	7,281.9	660.7	-271.5	674.8	6.71	5.63	3.75
7,635.0	78.90	1.20	7,284.1	671.5	-271.3	685.5	6.61	6.36	1.82
7,684.0	82.80	1.20	7,291.9	719.8	-270.3	733.8	7.96	7.96	0.00
7,712.0	83.30	3.80	7,295.3	747.6	-269.1	761.4	9.39	1.79	9.29
7,744.0	84.40	4.00	7,298.7	779.3	-266.9	793.0	3.49	3.44	0.63
7,776.0	85.80	3.00	7,301.4	811.1	-265.0	824.7	5.37	4.38	-3.13
7,807.0	87.20	1.90	7,303.3	842.1	-263.6	855.4	5.74	4.52	-3.55
7,839.0	88.30	2.60	7,304.6	874.0	-262.4	887.3	4.07	3.44	2.19
7,871.0	88.70	1.20	7,305.4	906.0	-261.3	919.1	4.55	1.25	-4.38
7,902.0	89.30	1.70	7,306.0	937.0	-260.5	950.0	2.52	1.94	1.61
7,934.0	89.40	1.70	7,306.3	969.0	-259.6	981.9	0.31	0.31	0.00
7,966.0	89.70	0.50	7,306.6	1,000.9	-259.0	1,013.8	3.87	0.94	-3.75
7,998.0	90.20	0.30	7,306.6	1,032.9	-258.7	1,045.8	1.68	1.56	-0.63
8,029.0	90.50	0.30	7,306.4	1,063.9	-258.6	1,076.7	0.97	0.97	0.00
8,061.0	90.70	1.40	7,306.1	1,095.9	-258.1	1,108.6	3.49	0.63	3.44

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8,093.0	90.90	0.30	7,305.6	1,127.9	-257.6	1,140.5	3.49	0.63	-3.44
8,124.0	91.00	1.20	7,305.1	1,158.9	-257.2	1,171.5	2.92	0.32	2.90
8,156.0	91.20	0.50	7,304.5	1,190.9	-256.8	1,203.4	2.27	0.63	-2.19
8,188.0	91.30	1.40	7,303.8	1,222.9	-256.2	1,235.3	2.83	0.31	2.81
8,219.0	91.70	1.60	7,303.0	1,253.9	-255.4	1,266.2	1.44	1.29	0.65
8,251.0	92.00	1.40	7,302.0	1,285.9	-254.6	1,298.0	1.13	0.94	-0.63
8,283.0	92.00	1.10	7,300.8	1,317.8	-253.9	1,329.9	0.94	0.00	-0.94
8,315.0	92.10	0.70	7,299.7	1,349.8	-253.4	1,361.8	1.29	0.31	-1.25
8,346.0	91.30	359.90	7,298.8	1,380.8	-253.2	1,392.8	3.65	-2.58	-2.58
8,378.0	91.30	359.80	7,298.0	1,412.8	-253.3	1,424.7	0.31	0.00	-0.31
8,410.0	91.90	358.90	7,297.2	1,444.8	-253.7	1,456.7	3.38	1.88	-2.81
8,441.0	92.30	358.90	7,296.0	1,475.7	-254.3	1,487.6	1.29	1.29	0.00
8,473.0	92.40	358.90	7,294.7	1,507.7	-254.9	1,519.6	0.31	0.31	0.00
8,505.0	91.80	358.20	7,293.5	1,539.7	-255.7	1,551.5	2.88	-1.88	-2.19
8,536.0	91.20	358.90	7,292.7	1,570.6	-256.5	1,582.5	2.97	-1.94	2.26
8,568.0	90.40	358.10	7,292.3	1,602.6	-257.3	1,614.5	3.54	-2.50	-2.50
8,600.0	89.80	358.90	7,292.2	1,634.6	-258.1	1,646.5	3.12	-1.88	2.50
8,632.0	89.60	358.50	7,292.4	1,666.6	-258.9	1,678.5	1.40	-0.63	-1.25
8,663.0	89.70	358.20	7,292.6	1,697.6	-259.8	1,709.4	1.02	0.32	-0.97
8,695.0	89.20	356.80	7,292.9	1,729.6	-261.1	1,741.4	4.65	-1.56	-4.38
8,727.0	89.40	356.90	7,293.3	1,761.5	-262.9	1,773.4	0.70	0.63	0.31
8,758.0	89.50	356.50	7,293.6	1,792.5	-264.7	1,804.4	1.33	0.32	-1.29
8,789.0	89.70	357.50	7,293.8	1,823.4	-266.3	1,835.4	3.29	0.65	3.23
8,821.0	90.20	356.40	7,293.8	1,855.4	-268.0	1,867.4	3.78	1.56	-3.44
8,853.0	90.10	357.20	7,293.7	1,887.3	-269.8	1,899.4	2.52	-0.31	2.50
8,885.0	89.00	356.80	7,294.0	1,919.3	-271.5	1,931.4	3.66	-3.44	-1.25
8,916.0	88.70	356.70	7,294.6	1,950.2	-273.2	1,962.4	1.02	-0.97	-0.32
8,949.0	89.00	357.70	7,295.3	1,983.2	-274.8	1,995.4	3.16	0.91	3.03
8,980.0	89.60	356.60	7,295.6	2,014.1	-276.4	2,026.4	4.04	1.94	-3.55
9,012.0	90.30	357.50	7,295.7	2,046.1	-278.0	2,058.4	3.56	2.19	2.81
9,044.0	90.90	356.70	7,295.3	2,078.0	-279.7	2,090.4	3.12	1.88	-2.50
9,075.0	90.80	357.20	7,294.9	2,109.0	-281.3	2,121.4	1.64	-0.32	1.61
9,107.0	90.50	358.30	7,294.5	2,141.0	-282.6	2,153.4	3.56	-0.94	3.44
9,139.0	89.90	357.60	7,294.4	2,173.0	-283.7	2,185.4	2.88	-1.88	-2.19
9,171.0	90.00	358.40	7,294.4	2,204.9	-284.8	2,217.4	2.52	0.31	2.50
9,202.0	89.10	357.80	7,294.7	2,235.9	-285.8	2,248.4	3.49	-2.90	-1.94
9,234.0	88.50	358.70	7,295.3	2,267.9	-286.8	2,280.4	3.38	-1.88	2.81
9,266.0	88.80	357.20	7,296.1	2,299.9	-288.0	2,312.3	4.78	0.94	-4.69
9,297.0	88.70	357.50	7,296.8	2,330.8	-289.4	2,343.3	1.02	-0.32	0.97
9,329.0	88.90	357.90	7,297.4	2,362.8	-290.7	2,375.3	1.40	0.63	1.25
9,361.0	89.50	358.00	7,297.9	2,394.8	-291.8	2,407.3	1.90	1.88	0.31
9,392.0	89.80	357.50	7,298.1	2,425.7	-293.0	2,438.3	1.88	0.97	-1.61
9,424.0	90.10	358.00	7,298.1	2,457.7	-294.3	2,470.3	1.82	0.94	1.56
9,456.0	90.50	357.70	7,297.9	2,489.7	-295.5	2,502.3	1.56	1.25	-0.94
9,488.0	90.80	357.90	7,297.6	2,521.7	-296.7	2,534.3	1.13	0.94	0.63
9,519.0	89.90	357.50	7,297.4	2,552.6	-298.0	2,565.3	3.18	-2.90	-1.29
9,551.0	89.60	358.30	7,297.5	2,584.6	-299.1	2,597.3	2.67	-0.94	2.50
9,583.0	89.80	357.00	7,297.7	2,616.6	-300.5	2,629.3	4.11	0.63	-4.06
9,614.0	89.90	358.20	7,297.8	2,647.6	-301.8	2,660.3	3.88	0.32	3.87
9,646.0	90.20	356.90	7,297.7	2,679.5	-303.1	2,692.3	4.17	0.94	-4.06
9,678.0	90.20	357.40	7,297.6	2,711.5	-304.7	2,724.3	1.56	0.00	1.56
9,709.0	90.60	357.40	7,297.4	2,742.5	-306.1	2,755.3	1.29	1.29	0.00
9,741.0	91.00	357.80	7,297.0	2,774.4	-307.5	2,787.3	1.77	1.25	1.25

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Simonsen 1L-421
Project:	SEC.12-T6N-R67W	TVD Reference:	WELL @ 4895.0ft (RKB Ensign 32 - 15')
Site:	Simonsen NENW-12 Pad Sec.12-T6N-R67W	MD Reference:	WELL @ 4895.0ft (RKB Ensign 32 - 15')
Well:	Simonsen 1L-421	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)
9,773.0	90.00	357.60	7,296.7	2,806.4	-308.7	2,819.2	3.19	-3.13	-0.63
9,805.0	89.80	356.70	7,296.8	2,838.4	-310.3	2,851.2	2.88	-0.63	-2.81
9,836.0	88.90	357.30	7,297.1	2,869.3	-312.0	2,882.2	3.49	-2.90	1.94
9,868.0	88.70	356.70	7,297.8	2,901.3	-313.6	2,914.2	1.98	-0.63	-1.88
9,900.0	89.10	356.90	7,298.4	2,933.2	-315.4	2,946.2	1.40	1.25	0.63
9,931.0	89.70	358.20	7,298.7	2,964.2	-316.7	2,977.2	4.62	1.94	4.19
9,963.0	90.10	357.80	7,298.8	2,996.2	-317.9	3,009.2	1.77	1.25	-1.25
9,995.0	90.50	357.20	7,298.6	3,028.1	-319.3	3,041.2	2.25	1.25	-1.88
10,026.0	90.70	357.50	7,298.3	3,059.1	-320.7	3,072.2	1.16	0.65	0.97
10,058.0	90.10	357.60	7,298.1	3,091.1	-322.1	3,104.2	1.90	-1.88	0.31
10,090.0	89.90	357.40	7,298.1	3,123.0	-323.5	3,136.2	0.88	-0.63	-0.63
10,122.0	90.00	358.00	7,298.1	3,155.0	-324.7	3,168.2	1.90	0.31	1.88
10,153.0	90.50	357.40	7,297.9	3,186.0	-326.0	3,199.2	2.52	1.61	-1.94
10,185.0	91.00	357.30	7,297.5	3,217.9	-327.5	3,231.2	1.59	1.56	-0.31
10,217.0	90.60	357.50	7,297.1	3,249.9	-328.9	3,263.2	1.40	-1.25	0.63
10,248.0	89.30	357.50	7,297.1	3,280.9	-330.3	3,294.2	4.19	-4.19	0.00
10,280.0	89.10	358.20	7,297.6	3,312.9	-331.5	3,326.2	2.27	-0.63	2.19
10,311.0	89.50	357.90	7,297.9	3,343.8	-332.5	3,357.2	1.61	1.29	-0.97
10,343.0	89.80	357.80	7,298.1	3,375.8	-333.7	3,389.2	0.99	0.94	-0.31
10,375.0	90.10	358.50	7,298.2	3,407.8	-334.8	3,421.2	2.38	0.94	2.19
10,406.0	90.60	358.60	7,298.0	3,438.8	-335.5	3,452.1	1.64	1.61	0.32
10,438.0	89.80	358.80	7,297.9	3,470.8	-336.3	3,484.1	2.58	-2.50	0.63
10,470.0	89.60	359.40	7,298.0	3,502.8	-336.8	3,516.1	1.98	-0.63	1.88
10,502.0	89.90	359.20	7,298.2	3,534.8	-337.2	3,548.1	1.13	0.94	-0.63
10,533.0	90.00	358.90	7,298.2	3,565.8	-337.7	3,579.0	1.02	0.32	-0.97
10,565.0	90.30	359.20	7,298.1	3,597.8	-338.2	3,611.0	1.33	0.94	0.94
10,597.0	90.70	358.20	7,297.8	3,629.7	-338.9	3,643.0	3.37	1.25	-3.13
10,629.0	90.60	357.70	7,297.5	3,661.7	-340.1	3,675.0	1.59	-0.31	-1.56
10,661.0	89.50	358.00	7,297.4	3,693.7	-341.3	3,707.0	3.56	-3.44	0.94
10,693.0	89.60	358.10	7,297.7	3,725.7	-342.4	3,739.0	0.44	0.31	0.31
10,725.0	89.90	358.00	7,297.8	3,757.7	-343.5	3,771.0	0.99	0.94	-0.31
10,757.0	90.20	358.90	7,297.8	3,789.7	-344.3	3,803.0	2.96	0.94	2.81
10,788.0	90.50	359.50	7,297.6	3,820.6	-344.8	3,833.9	2.16	0.97	1.94
10,820.0	89.90	359.10	7,297.5	3,852.6	-345.1	3,865.9	2.25	-1.88	-1.25
10,852.0	89.50	359.30	7,297.7	3,884.6	-345.6	3,897.9	1.40	-1.25	0.63
10,883.0	89.30	0.10	7,298.0	3,915.6	-345.8	3,928.8	2.66	-0.65	2.58
10,915.0	89.40	0.30	7,298.4	3,947.6	-345.6	3,960.8	0.70	0.31	0.63
10,947.0	89.80	359.50	7,298.6	3,979.6	-345.7	3,992.7	2.80	1.25	-2.50
10,979.0	90.30	0.30	7,298.5	4,011.6	-345.8	4,024.7	2.95	1.56	2.50
11,010.0	90.20	1.10	7,298.4	4,042.6	-345.4	4,055.6	2.60	-0.32	2.58
11,042.0	90.40	0.40	7,298.2	4,074.6	-345.0	4,087.5	2.28	0.63	-2.19
11,074.0	90.70	0.50	7,297.9	4,106.6	-344.7	4,119.5	0.99	0.94	0.31
11,105.0	90.90	0.80	7,297.5	4,137.6	-344.4	4,150.4	1.16	0.65	0.97
11,137.0	90.50	1.80	7,297.1	4,169.6	-343.6	4,182.3	3.37	-1.25	3.13
11,169.0	89.20	2.20	7,297.2	4,201.6	-342.5	4,214.1	4.25	-4.06	1.25
11,200.0	89.20	2.50	7,297.6	4,232.6	-341.2	4,245.0	0.97	0.00	0.97
11,232.0	88.40	2.40	7,298.3	4,264.5	-339.9	4,276.8	2.52	-2.50	-0.31
11,264.0	87.90	2.80	7,299.3	4,296.5	-338.4	4,308.7	2.00	-1.56	1.25
11,296.0	88.40	2.50	7,300.4	4,328.4	-336.9	4,340.5	1.82	1.56	-0.94
11,327.0	88.80	2.50	7,301.1	4,359.4	-335.6	4,371.3	1.29	1.29	0.00
11,359.0	89.30	2.60	7,301.7	4,391.3	-334.2	4,403.1	1.59	1.56	0.31
11,391.0	89.60	2.40	7,302.0	4,423.3	-332.8	4,435.0	1.13	0.94	-0.63
11,422.0	89.90	2.60	7,302.1	4,454.3	-331.4	4,465.8	1.16	0.97	0.65

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Simonsen 1L-421
Project:	SEC.12-T6N-R67W	TVD Reference:	WELL @ 4895.0ft (RKB Ensign 32 - 15')
Site:	Simonsen NENW-12 Pad Sec.12-T6N-R67W	MD Reference:	WELL @ 4895.0ft (RKB Ensign 32 - 15')
Well:	Simonsen 1L-421	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)
11,454.0	90.20	2.80	7,302.1	4,486.2	-329.9	4,497.7	1.13	0.94	0.63
11,486.0	90.50	2.60	7,301.9	4,518.2	-328.4	4,529.5	1.13	0.94	-0.63
11,517.0	91.00	2.80	7,301.5	4,549.2	-326.9	4,560.3	1.74	1.61	0.65
11,549.0	91.50	2.90	7,300.8	4,581.1	-325.4	4,592.1	1.59	1.56	0.31
11,580.0	90.30	2.60	7,300.3	4,612.1	-323.9	4,623.0	3.99	-3.87	-0.97
11,612.0	89.80	2.60	7,300.3	4,644.1	-322.4	4,654.8	1.56	-1.56	0.00
11,643.0	90.00	2.60	7,300.3	4,675.0	-321.0	4,685.6	0.65	0.65	0.00
11,675.0	90.50	2.50	7,300.2	4,707.0	-319.6	4,717.5	1.59	1.56	-0.31
11,707.0	90.00	1.60	7,300.0	4,739.0	-318.4	4,749.4	3.22	-1.56	-2.81
11,739.0	90.00	1.10	7,300.0	4,771.0	-317.7	4,781.3	1.56	0.00	-1.56
11,771.0	90.70	1.00	7,299.8	4,803.0	-317.1	4,813.2	2.21	2.19	-0.31
11,802.0	90.90	0.20	7,299.4	4,834.0	-316.8	4,844.1	2.66	0.65	-2.58
11,834.0	91.00	359.80	7,298.9	4,865.9	-316.8	4,876.0	1.29	0.31	-1.25
11,866.0	91.00	0.30	7,298.3	4,897.9	-316.7	4,908.0	1.56	0.00	1.56
11,898.0	90.60	0.20	7,297.9	4,929.9	-316.6	4,939.9	1.29	-1.25	-0.31
11,954.0	90.60	0.20	7,297.3	4,985.9	-316.4	4,995.8	0.00	0.00	0.00

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
HARDLINE BHL 460'F	0.00	0.00	1.0	5,020.3	-400.0	1,433,727.71	3,181,955.30	40.522140	-104.845499
- survey misses target center by 5036.2ft at 23.5ft MD (23.5 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1			1.0	0.0	0.0	1,433,727.71	3,181,955.30		
Point 2			1.0	0.0	500.0	1,433,731.41	3,182,455.27		
SECTIONLINE 210'N	0.00	0.00	1.0	210.0	-400.0	1,428,917.71	3,181,990.88	40.508936	-104.845498
- survey misses target center by 451.8ft at 3.7ft MD (3.7 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1			1.0	0.0	0.0	1,428,917.71	3,181,990.88		
Point 2			1.0	0.0	500.0	1,428,921.41	3,182,490.85		
BHL 500'FNL & 1700'	0.00	0.00	7,315.0	4,980.3	-278.0	1,433,688.57	3,182,077.57	40.522030	-104.845060
- survey misses target center by 42.3ft at 11948.3ft MD (7297.3 TVD, 4980.2 N, -316.4 E)									
- Point									

Checked By: _____	Approved By: _____	Date: _____
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