

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Simonsen 11-421**

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

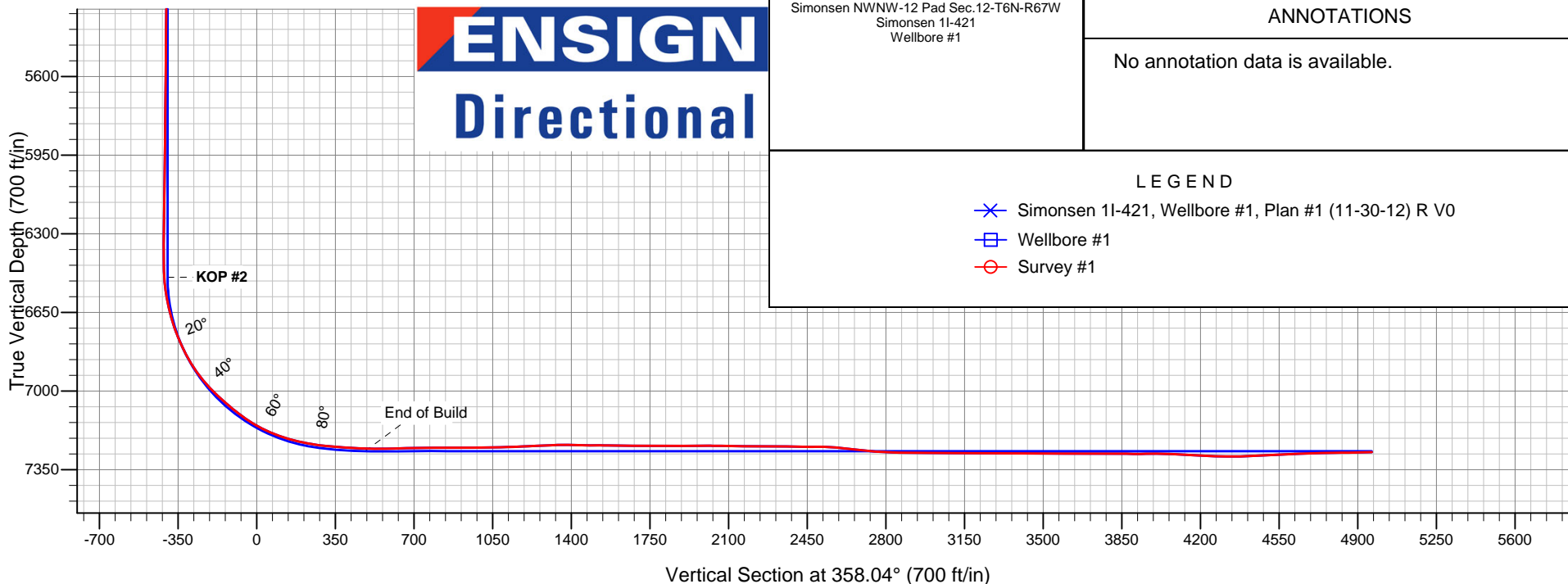
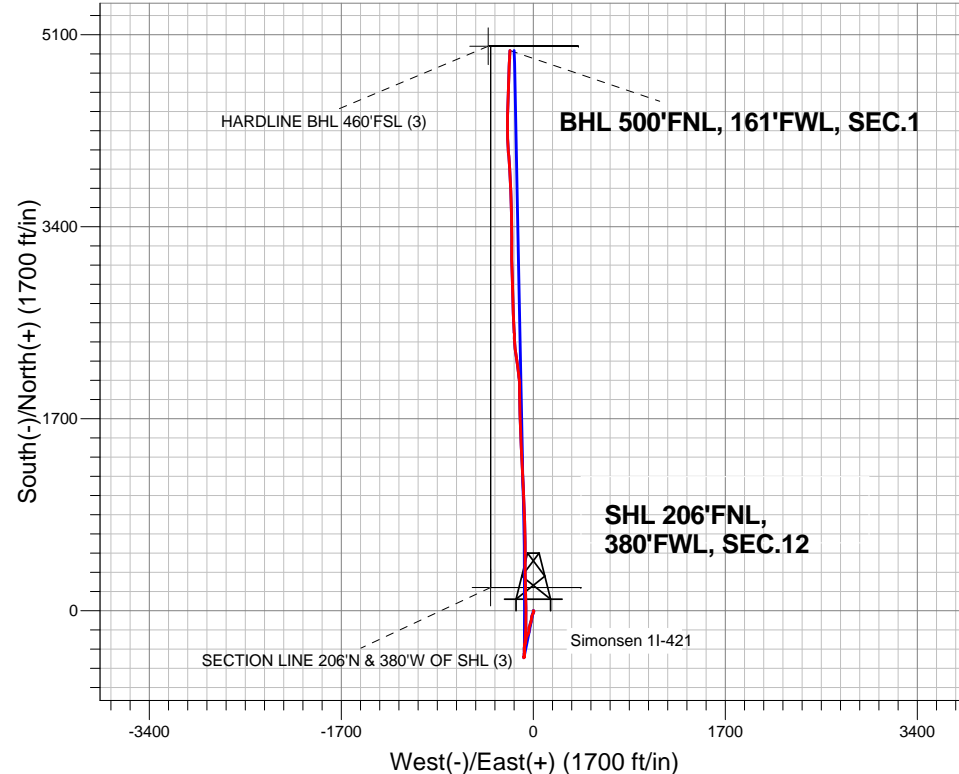
Ground Elevation: 4848.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1428709.77	3180785.16	40.508390	-104.849840	

RKB - Ensign 32 - 15' WELL @ 4863.0ft (RKB - Ensign 32 - 15')

FINAL SURVEY

Projected Bottom Hole Location
12310' MD 7272' TVD 4958' N & 208' W of
SHL
91.0 degree Incl @ 2.5 degree AZM



Simonsen NWNW-12 Pad Sec.12-T6N-R67W
Simonsen 11-421
Wellbore #1

ANNOTATIONS

No annotation data is available.

LEGEND

- Simonsen 11-421, Wellbore #1, Plan #1 (11-30-12) R V0
- Wellbore #1
- Survey #1



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.12-T6N-R67W

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

Simonsen 1I-421

Wellbore #1

Survey: Survey #1

Standard Survey Report

19 December, 2012

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Simonsen 11-421
Project:	SEC.12-T6N-R67W	TVD Reference:	WELL @ 4863.0ft (RKB - Ensign 32 - 15')
Site:	Simonsen NWNW-12 Pad Sec.12-T6N-R67W	MD Reference:	WELL @ 4863.0ft (RKB - Ensign 32 - 15')
Well:	Simonsen 11-421	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.12-T6N-R67W, 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		Simonsen NWNW-12 Pad Sec.12-T6N-R67W			
Site Position:		Northing:	1,428,710.21 ft	Latitude:	40.508390
From:	Lat/Long	Easting:	3,180,843.55 ft	Longitude:	-104.849630
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.42 °

Well	Simonsen 11-421					
Well Position	+N-S	0.0 ft	Northing:	1,428,709.77 ft	Latitude:	40.508390
	+E-W	0.0 ft	Easting:	3,180,785.16 ft	Longitude:	-104.849840
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,848.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/30/2012	8.72	67.07	53,025

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	358.04	

Survey Program	Date	12/19/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
144.0	12,310.0	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	
SECTION LINE 206°N & 380°W OF SHL (3) - HARDLINE BHL 460°FSL (3)										
144.0	0.70	111.40	144.0	-0.3	0.8	-0.3	0.49	0.49	0.00	
236.0	1.20	148.40	236.0	-1.3	1.8	-1.4	0.83	0.54	40.22	
328.0	2.10	168.00	327.9	-3.8	2.7	-3.9	1.14	0.98	21.30	
419.0	3.20	188.30	418.8	-8.0	2.7	-8.0	1.57	1.21	22.31	
511.0	4.00	196.80	510.7	-13.6	1.4	-13.6	1.04	0.87	9.24	
603.0	4.80	202.60	602.4	-20.2	-1.0	-20.2	0.99	0.87	6.30	
695.0	5.50	205.00	694.0	-27.7	-4.4	-27.6	0.80	0.76	2.61	
787.0	5.50	206.20	785.6	-35.7	-8.2	-35.4	0.13	0.00	1.30	
879.0	5.40	203.70	877.2	-43.6	-11.9	-43.2	0.28	-0.11	-2.72	
951.0	5.70	196.90	948.8	-50.1	-14.3	-49.6	1.00	0.42	-9.44	

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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)
1,042.0	6.90	182.90	1,039.3	-59.9	-15.9	-59.4	2.13	1.32	-15.38
1,134.0	5.40	186.00	1,130.8	-69.8	-16.6	-69.1	1.67	-1.63	3.37
1,226.0	5.50	187.90	1,222.4	-78.4	-17.6	-77.8	0.22	0.11	2.07
1,322.0	5.50	192.40	1,317.9	-87.5	-19.3	-86.8	0.45	0.00	4.69
1,417.0	6.30	195.30	1,412.4	-96.9	-21.6	-96.2	0.90	0.84	3.05
1,512.0	6.10	195.10	1,506.9	-106.9	-24.3	-106.0	0.21	-0.21	-0.21
1,608.0	6.30	197.80	1,602.3	-116.8	-27.2	-115.8	0.37	0.21	2.81
1,703.0	5.80	197.70	1,696.8	-126.3	-30.3	-125.2	0.53	-0.53	-0.11
1,798.0	5.60	199.80	1,791.3	-135.3	-33.3	-134.0	0.30	-0.21	2.21
1,893.0	5.40	197.30	1,885.9	-143.9	-36.2	-142.6	0.33	-0.21	-2.63
1,988.0	5.60	184.40	1,980.4	-152.8	-37.9	-151.4	1.32	0.21	-13.58
2,083.0	5.60	184.60	2,075.0	-162.0	-38.6	-160.6	0.02	0.00	0.21
2,178.0	5.00	183.50	2,169.6	-170.8	-39.3	-169.3	0.64	-0.63	-1.16
2,274.0	4.40	183.40	2,265.2	-178.6	-39.7	-177.2	0.63	-0.63	-0.10
2,368.0	4.00	183.50	2,359.0	-185.5	-40.2	-184.0	0.43	-0.43	0.11
2,462.0	4.30	201.50	2,452.7	-192.0	-41.6	-190.5	1.42	0.32	19.15
2,557.0	4.00	198.40	2,547.5	-198.5	-44.0	-196.9	0.39	-0.32	-3.26
2,652.0	5.60	202.50	2,642.2	-205.9	-46.8	-204.2	1.72	1.68	4.32
2,747.0	5.90	209.30	2,736.7	-214.5	-51.0	-212.6	0.78	0.32	7.16
2,842.0	5.80	204.30	2,831.2	-223.1	-55.3	-221.1	0.55	-0.11	-5.26
2,937.0	5.60	202.10	2,925.7	-231.8	-59.1	-229.6	0.31	-0.21	-2.32
3,032.0	6.80	194.90	3,020.2	-241.5	-62.3	-239.2	1.50	1.26	-7.58
3,127.0	6.00	191.00	3,114.6	-251.8	-64.6	-249.5	0.96	-0.84	-4.11
3,222.0	5.60	192.40	3,209.1	-261.2	-66.6	-258.8	0.45	-0.42	1.47
3,317.0	5.70	192.30	3,303.6	-270.4	-68.6	-267.9	0.11	0.11	-0.11
3,412.0	5.20	189.90	3,398.2	-279.2	-70.3	-276.6	0.58	-0.53	-2.53
3,508.0	4.40	187.10	3,493.9	-287.1	-71.5	-284.5	0.87	-0.83	-2.92
3,604.0	4.30	192.70	3,589.6	-294.3	-72.8	-291.6	0.45	-0.10	5.83
3,699.0	4.70	195.00	3,684.3	-301.5	-74.6	-298.8	0.46	0.42	2.42
3,794.0	5.80	194.00	3,778.9	-310.0	-76.7	-307.2	1.16	1.16	-1.05
3,889.0	6.30	185.70	3,873.4	-319.8	-78.4	-316.9	1.06	0.53	-8.74
3,984.0	5.80	189.40	3,967.8	-329.7	-79.7	-326.8	0.67	-0.53	3.89
4,079.0	4.50	174.30	4,062.4	-338.2	-80.1	-335.2	1.97	-1.37	-15.89
4,175.0	5.00	178.60	4,158.1	-346.1	-79.7	-343.2	0.64	0.52	4.48
4,270.0	4.70	178.70	4,252.8	-354.1	-79.5	-351.2	0.32	-0.32	0.11
4,365.0	4.50	179.60	4,347.5	-361.7	-79.4	-358.8	0.22	-0.21	0.95
4,461.0	4.70	178.80	4,443.2	-369.4	-79.2	-366.5	0.22	0.21	-0.83
4,556.0	4.40	181.50	4,537.9	-377.0	-79.3	-374.1	0.39	-0.32	2.84
4,651.0	4.30	185.20	4,632.6	-384.2	-79.7	-381.2	0.31	-0.11	3.89
4,746.0	3.90	183.10	4,727.3	-390.9	-80.2	-388.0	0.45	-0.42	-2.21
4,841.0	3.10	171.60	4,822.2	-396.7	-80.0	-393.7	1.12	-0.84	-12.11
4,937.0	1.70	164.10	4,918.1	-400.6	-79.2	-397.7	1.49	-1.46	-7.81
5,032.0	0.70	215.70	5,013.1	-402.5	-79.2	-399.5	1.45	-1.05	54.32
5,127.0	0.70	225.60	5,108.1	-403.4	-79.9	-400.4	0.13	0.00	10.42
5,222.0	0.90	218.40	5,203.0	-404.3	-80.8	-401.3	0.24	0.21	-7.58
5,318.0	1.30	214.50	5,299.0	-405.8	-81.9	-402.8	0.42	0.42	-4.06
5,413.0	0.50	162.30	5,394.0	-407.1	-82.4	-404.1	1.13	-0.84	-54.95
5,508.0	0.50	187.50	5,489.0	-407.9	-82.3	-404.9	0.23	0.00	26.53
5,603.0	0.50	237.50	5,584.0	-408.6	-82.7	-405.5	0.44	0.00	52.63
5,699.0	0.70	192.20	5,680.0	-409.4	-83.2	-406.3	0.52	0.21	-47.19
5,794.0	0.70	192.50	5,775.0	-410.5	-83.4	-407.4	0.00	0.00	0.32
5,889.0	0.60	192.70	5,870.0	-411.5	-83.7	-408.4	0.11	-0.11	0.21
5,984.0	0.70	188.20	5,965.0	-412.6	-83.8	-409.5	0.12	0.11	-4.74
6,079.0	0.80	183.00	6,060.0	-413.8	-84.0	-410.7	0.13	0.11	-5.47

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Well:	Simonsen 11-421	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)
6,174.0	0.90	197.60	6,155.0	-415.2	-84.2	-412.1	0.25	0.11	15.37
6,269.0	0.70	196.40	6,250.0	-416.5	-84.6	-413.3	0.21	-0.21	-1.26
6,364.0	0.70	198.40	6,345.0	-417.6	-85.0	-414.4	0.03	0.00	2.11
6,455.0	1.10	9.80	6,435.9	-417.2	-85.0	-414.1	1.97	0.44	188.35
6,486.0	2.00	17.50	6,466.9	-416.4	-84.8	-413.3	2.97	2.90	24.84
6,518.0	3.80	13.20	6,498.9	-414.9	-84.4	-411.7	5.66	5.63	-13.44
6,550.0	6.40	7.20	6,530.8	-412.1	-83.9	-409.0	8.28	8.13	-18.75
6,581.0	8.80	6.00	6,561.5	-408.0	-83.4	-404.9	7.76	7.74	-3.87
6,611.0	10.90	7.00	6,591.0	-402.9	-82.8	-399.8	7.02	7.00	3.33
6,641.0	12.40	6.20	6,620.4	-396.9	-82.2	-393.8	5.03	5.00	-2.67
6,671.0	14.30	3.40	6,649.6	-390.0	-81.6	-387.0	6.69	6.33	-9.33
6,702.0	16.00	2.80	6,679.5	-381.9	-81.2	-378.9	5.51	5.48	-1.94
6,733.0	18.50	1.30	6,709.1	-372.7	-80.8	-369.7	8.19	8.06	-4.84
6,763.0	20.40	0.80	6,737.4	-362.7	-80.7	-359.8	6.36	6.33	-1.67
6,794.0	22.40	0.20	6,766.3	-351.4	-80.6	-348.5	6.49	6.45	-1.94
6,824.0	24.60	1.80	6,793.8	-339.5	-80.3	-336.5	7.63	7.33	5.33
6,855.0	26.80	3.40	6,821.7	-326.0	-79.7	-323.1	7.44	7.10	5.16
6,885.0	28.70	4.70	6,848.3	-312.1	-78.7	-309.2	6.65	6.33	4.33
6,915.0	31.00	5.40	6,874.3	-297.2	-77.4	-294.4	7.75	7.67	2.33
6,946.0	33.90	5.40	6,900.5	-280.7	-75.8	-277.9	9.35	9.35	0.00
6,977.0	36.80	4.90	6,925.7	-262.8	-74.2	-260.1	9.40	9.35	-1.61
7,007.0	39.60	4.70	6,949.3	-244.3	-72.7	-241.7	9.34	9.33	-0.67
7,039.0	42.50	3.60	6,973.4	-223.4	-71.2	-220.8	9.34	9.06	-3.44
7,071.0	44.80	3.20	6,996.6	-201.3	-69.9	-198.8	7.24	7.19	-1.25
7,101.0	46.40	2.60	7,017.6	-179.9	-68.8	-177.4	5.52	5.33	-2.00
7,133.0	47.70	2.20	7,039.4	-156.5	-67.8	-154.1	4.16	4.06	-1.25
7,164.0	49.30	1.50	7,059.9	-133.3	-67.1	-130.9	5.43	5.16	-2.26
7,196.0	51.00	1.00	7,080.4	-108.7	-66.5	-106.4	5.45	5.31	-1.56
7,228.0	52.90	0.60	7,100.2	-83.5	-66.2	-81.2	6.02	5.94	-1.25
7,259.0	54.70	0.00	7,118.5	-58.5	-66.0	-56.2	6.01	5.81	-1.94
7,291.0	57.00	359.70	7,136.4	-32.0	-66.1	-29.8	7.23	7.19	-0.94
7,323.0	59.90	359.40	7,153.2	-4.8	-66.3	-2.5	9.10	9.06	-0.94
7,355.0	63.40	358.90	7,168.4	23.4	-66.7	25.6	11.02	10.94	-1.56
7,386.0	66.50	358.70	7,181.5	51.4	-67.3	53.7	10.02	10.00	-0.65
7,418.0	69.20	358.40	7,193.5	81.1	-68.1	83.4	8.48	8.44	-0.94
7,450.0	71.50	358.30	7,204.3	111.2	-69.0	113.5	7.19	7.19	-0.31
7,482.0	73.90	358.50	7,213.8	141.7	-69.8	144.0	7.52	7.50	0.63
7,513.0	76.20	358.80	7,221.8	171.7	-70.5	174.0	7.48	7.42	0.97
7,545.0	78.10	359.20	7,228.9	202.9	-71.1	205.2	6.06	5.94	1.25
7,577.0	80.10	359.70	7,235.0	234.3	-71.4	236.6	6.44	6.25	1.56
7,608.0	82.20	359.80	7,239.8	264.9	-71.5	267.2	6.78	6.77	0.32
7,640.0	84.40	359.30	7,243.5	296.7	-71.7	299.0	7.05	6.88	-1.56
7,663.0	84.80	359.00	7,245.7	319.6	-72.1	321.9	2.17	1.74	-1.30
7,694.0	84.90	358.90	7,248.4	350.5	-72.6	352.7	0.46	0.32	-0.32
7,726.0	85.90	359.30	7,251.0	382.4	-73.1	384.6	3.36	3.13	1.25
7,758.0	86.60	359.60	7,253.1	414.3	-73.5	416.5	2.38	2.19	0.94
7,790.0	87.60	359.80	7,254.7	446.2	-73.6	448.5	3.19	3.13	0.63
7,821.0	88.00	0.20	7,255.9	477.2	-73.6	479.5	1.82	1.29	1.29
7,853.0	89.10	359.70	7,256.7	509.2	-73.6	511.4	3.78	3.44	-1.56
7,885.0	89.70	0.00	7,257.0	541.2	-73.7	543.4	2.10	1.88	0.94
7,916.0	90.90	359.60	7,256.9	572.2	-73.8	574.4	4.08	3.87	-1.29
7,948.0	91.30	0.10	7,256.3	604.2	-73.9	606.4	2.00	1.25	1.56
7,980.0	91.80	359.70	7,255.4	636.2	-74.0	638.3	2.00	1.56	-1.25

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8,011.0	90.90	359.00	7,254.7	667.2	-74.3	669.3	3.68	-2.90	-2.26
8,043.0	90.90	359.30	7,254.2	699.2	-74.8	701.3	0.94	0.00	0.94
8,075.0	91.10	358.80	7,253.6	731.2	-75.3	733.3	1.68	0.63	-1.56
8,107.0	91.20	358.50	7,253.0	763.1	-76.1	765.3	0.99	0.31	-0.94
8,139.0	91.30	358.10	7,252.3	795.1	-77.0	797.3	1.29	0.31	-1.25
8,170.0	90.50	358.00	7,251.8	826.1	-78.1	828.3	2.60	-2.58	-0.32
8,202.0	89.70	357.80	7,251.7	858.1	-79.3	860.3	2.58	-2.50	-0.63
8,234.0	89.80	357.50	7,251.9	890.0	-80.6	892.3	0.99	0.31	-0.94
8,266.0	89.80	356.80	7,252.0	922.0	-82.2	924.3	2.19	0.00	-2.19
8,297.0	89.70	357.30	7,252.1	953.0	-83.8	955.3	1.64	-0.32	1.61
8,329.0	90.10	357.40	7,252.2	984.9	-85.2	987.3	1.29	1.25	0.31
8,362.0	90.80	357.30	7,251.9	1,017.9	-86.8	1,020.3	2.14	2.12	-0.30
8,393.0	91.40	357.00	7,251.3	1,048.9	-88.3	1,051.3	2.16	1.94	-0.97
8,425.0	91.70	356.70	7,250.5	1,080.8	-90.1	1,083.2	1.33	0.94	-0.94
8,457.0	92.20	357.10	7,249.4	1,112.7	-91.8	1,115.2	2.00	1.56	1.25
8,488.0	92.20	356.70	7,248.2	1,143.7	-93.5	1,146.2	1.29	0.00	-1.29
8,520.0	92.60	356.70	7,246.8	1,175.6	-95.3	1,178.1	1.25	1.25	0.00
8,552.0	92.30	357.00	7,245.5	1,207.5	-97.1	1,210.1	1.33	-0.94	0.94
8,585.0	92.50	357.40	7,244.1	1,240.4	-98.7	1,243.1	1.35	0.61	1.21
8,617.0	92.30	357.60	7,242.7	1,272.4	-100.1	1,275.0	0.88	-0.63	0.63
8,649.0	92.40	357.50	7,241.4	1,304.3	-101.4	1,307.0	0.44	0.31	-0.31
8,681.0	92.10	358.20	7,240.2	1,336.3	-102.6	1,339.0	2.38	-0.94	2.19
8,712.0	89.80	358.40	7,239.7	1,367.2	-103.6	1,370.0	7.45	-7.42	0.65
8,744.0	87.90	357.60	7,240.3	1,399.2	-104.7	1,402.0	6.44	-5.94	-2.50
8,776.0	88.50	357.50	7,241.3	1,431.2	-106.0	1,434.0	1.90	1.88	-0.31
8,807.0	89.80	358.30	7,241.8	1,462.1	-107.2	1,465.0	4.92	4.19	2.58
8,839.0	90.90	358.80	7,241.6	1,494.1	-108.0	1,497.0	3.78	3.44	1.56
8,871.0	88.50	357.10	7,241.7	1,526.1	-109.1	1,529.0	9.19	-7.50	-5.31
8,903.0	89.90	358.00	7,242.2	1,558.1	-110.5	1,560.9	5.20	4.38	2.81
8,934.0	89.00	356.70	7,242.5	1,589.0	-111.9	1,591.9	5.10	-2.90	-4.19
8,966.0	89.20	357.80	7,243.0	1,621.0	-113.5	1,623.9	3.49	0.63	3.44
8,998.0	89.30	356.80	7,243.4	1,653.0	-115.0	1,655.9	3.14	0.31	-3.13
9,029.0	89.00	356.80	7,243.9	1,683.9	-116.7	1,686.9	0.97	-0.97	0.00
9,061.0	89.40	356.50	7,244.3	1,715.9	-118.6	1,718.9	1.56	1.25	-0.94
9,093.0	89.60	356.70	7,244.6	1,747.8	-120.5	1,750.9	0.88	0.63	0.63
9,124.0	89.80	359.50	7,244.8	1,778.8	-121.5	1,781.9	9.06	0.65	9.03
9,156.0	90.30	0.10	7,244.7	1,810.8	-121.6	1,813.9	2.44	1.56	1.88
9,188.0	90.30	1.10	7,244.6	1,842.8	-121.3	1,845.8	3.12	0.00	3.13
9,220.0	90.50	0.90	7,244.3	1,874.8	-120.7	1,877.8	0.88	0.63	-0.63
9,251.0	90.40	0.20	7,244.1	1,905.8	-120.4	1,908.8	2.28	-0.32	-2.26
9,283.0	90.40	359.40	7,243.9	1,937.8	-120.5	1,940.8	2.50	0.00	-2.50
9,315.0	89.50	357.80	7,243.9	1,969.8	-121.3	1,972.7	5.74	-2.81	-5.00
9,346.0	90.40	358.60	7,243.9	2,000.7	-122.3	2,003.7	3.88	2.90	2.58
9,378.0	89.40	355.40	7,244.0	2,032.7	-124.0	2,035.7	10.48	-3.13	-10.00
9,410.0	89.10	353.80	7,244.4	2,064.5	-127.0	2,067.7	5.09	-0.94	-5.00
9,441.0	89.80	353.20	7,244.7	2,095.3	-130.5	2,098.6	2.97	2.26	-1.94
9,473.0	89.10	351.30	7,245.0	2,127.0	-134.8	2,130.4	6.33	-2.19	-5.94
9,504.0	89.50	353.10	7,245.4	2,157.8	-139.0	2,161.2	5.95	1.29	5.81
9,536.0	89.70	352.70	7,245.6	2,189.5	-143.0	2,193.1	1.40	0.63	-1.25
9,568.0	89.30	350.20	7,245.9	2,221.2	-147.7	2,224.9	7.91	-1.25	-7.81
9,599.0	89.10	351.90	7,246.3	2,251.8	-152.5	2,255.7	5.52	-0.65	5.48
9,631.0	89.80	353.00	7,246.6	2,283.5	-156.7	2,287.5	4.07	2.19	3.44
9,663.0	89.30	351.60	7,246.9	2,315.2	-161.0	2,319.4	4.65	-1.56	-4.38

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Simonsen 11-421
Project:	SEC.12-T6N-R67W	TVD Reference:	WELL @ 4863.0ft (RKB - Ensign 32 - 15')
Site:	Simonsen NWNW-12 Pad Sec.12-T6N-R67W	MD Reference:	WELL @ 4863.0ft (RKB - Ensign 32 - 15')
Well:	Simonsen 11-421	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)
9,695.0	89.50	353.80	7,247.2	2,346.9	-165.1	2,351.2	6.90	0.63	6.88
9,726.0	89.60	358.10	7,247.5	2,377.9	-167.3	2,382.2	13.87	0.32	13.87
9,758.0	89.90	358.90	7,247.6	2,409.8	-168.1	2,414.2	2.67	0.94	2.50
9,790.0	88.40	358.30	7,248.1	2,441.8	-168.9	2,446.2	5.05	-4.69	-1.88
9,821.0	90.30	359.60	7,248.4	2,472.8	-169.5	2,477.2	7.43	6.13	4.19
9,853.0	89.60	356.60	7,248.5	2,504.8	-170.5	2,509.2	9.63	-2.19	-9.38
9,885.0	87.90	356.40	7,249.1	2,536.7	-172.5	2,541.1	5.35	-5.31	-0.63
9,916.0	84.90	356.80	7,251.1	2,567.6	-174.3	2,572.1	9.76	-9.68	1.29
9,948.0	83.70	356.70	7,254.3	2,599.4	-176.1	2,603.9	3.76	-3.75	-0.31
9,980.0	83.80	357.20	7,257.8	2,631.2	-177.8	2,635.7	1.58	0.31	1.56
10,012.0	83.80	357.00	7,261.2	2,662.9	-179.4	2,667.5	0.62	0.00	-0.63
10,043.0	83.80	356.80	7,264.6	2,693.7	-181.1	2,698.3	0.64	0.00	-0.65
10,075.0	85.20	356.80	7,267.6	2,725.5	-182.9	2,730.2	4.38	4.38	0.00
10,107.0	86.90	358.80	7,269.8	2,757.4	-184.1	2,762.1	8.19	5.31	6.25
10,138.0	87.00	359.20	7,271.5	2,788.4	-184.6	2,793.0	1.33	0.32	1.29
10,170.0	87.50	359.00	7,273.0	2,820.3	-185.1	2,825.0	1.68	1.56	-0.63
10,202.0	88.30	359.80	7,274.2	2,852.3	-185.5	2,857.0	3.53	2.50	2.50
10,233.0	89.30	0.00	7,274.8	2,883.3	-185.5	2,887.9	3.29	3.23	0.65
10,265.0	90.20	359.50	7,275.0	2,915.3	-185.7	2,919.9	3.22	2.81	-1.56
10,297.0	90.30	358.90	7,274.8	2,947.3	-186.1	2,951.9	1.90	0.31	-1.88
10,329.0	90.10	358.00	7,274.7	2,979.3	-187.0	2,983.9	2.88	-0.63	-2.81
10,360.0	89.80	357.40	7,274.8	3,010.2	-188.2	3,014.9	2.16	-0.97	-1.94
10,392.0	89.30	357.50	7,275.0	3,042.2	-189.7	3,046.9	1.59	-1.56	0.31
10,424.0	88.90	357.40	7,275.5	3,074.2	-191.1	3,078.9	1.29	-1.25	-0.31
10,455.0	89.30	358.40	7,276.0	3,105.2	-192.2	3,109.9	3.47	1.29	3.23
10,487.0	88.90	0.10	7,276.5	3,137.1	-192.6	3,141.9	5.46	-1.25	5.31
10,519.0	89.70	0.70	7,276.9	3,169.1	-192.4	3,173.9	3.12	2.50	1.88
10,550.0	89.70	0.90	7,277.1	3,200.1	-192.0	3,204.8	0.65	0.00	0.65
10,582.0	89.80	0.40	7,277.2	3,232.1	-191.6	3,236.8	1.59	0.31	-1.56
10,614.0	89.80	0.20	7,277.3	3,264.1	-191.4	3,268.8	0.62	0.00	-0.63
10,646.0	90.00	359.40	7,277.4	3,296.1	-191.6	3,300.8	2.58	0.63	-2.50
10,677.0	89.60	359.50	7,277.5	3,327.1	-191.9	3,331.7	1.33	-1.29	0.32
10,709.0	89.30	358.80	7,277.8	3,359.1	-192.3	3,363.7	2.38	-0.94	-2.19
10,741.0	89.00	358.40	7,278.2	3,391.1	-193.1	3,395.7	1.56	-0.94	-1.25
10,772.0	89.20	358.80	7,278.7	3,422.1	-193.9	3,426.7	1.44	0.65	1.29
10,804.0	89.50	359.50	7,279.1	3,454.1	-194.3	3,458.7	2.38	0.94	2.19
10,836.0	89.80	359.60	7,279.3	3,486.1	-194.6	3,490.7	0.99	0.94	0.31
10,867.0	90.20	359.60	7,279.3	3,517.1	-194.8	3,521.7	1.29	1.29	0.00
10,899.0	90.60	359.00	7,279.1	3,549.1	-195.2	3,553.7	2.25	1.25	-1.88
10,930.0	90.90	359.10	7,278.7	3,580.1	-195.7	3,584.7	1.02	0.97	0.32
10,962.0	90.20	358.10	7,278.4	3,612.1	-196.5	3,616.7	3.81	-2.19	-3.13
10,994.0	90.50	357.70	7,278.2	3,644.0	-197.7	3,648.7	1.56	0.94	-1.25
11,025.0	90.60	357.50	7,277.9	3,675.0	-199.0	3,679.7	0.72	0.32	-0.65
11,057.0	89.60	357.80	7,277.8	3,707.0	-200.3	3,711.7	3.26	-3.13	0.94
11,089.0	89.40	357.80	7,278.1	3,739.0	-201.5	3,743.7	0.63	-0.63	0.00
11,121.0	89.40	357.50	7,278.4	3,770.9	-202.8	3,775.7	0.94	0.00	-0.94
11,152.0	89.20	357.50	7,278.8	3,801.9	-204.2	3,806.7	0.65	-0.65	0.00
11,184.0	89.30	357.00	7,279.2	3,833.9	-205.7	3,838.7	1.59	0.31	-1.56
11,216.0	89.50	357.00	7,279.6	3,865.8	-207.4	3,870.6	0.63	0.63	0.00
11,247.0	89.70	356.70	7,279.8	3,896.8	-209.1	3,901.6	1.16	0.65	-0.97
11,279.0	90.00	356.30	7,279.9	3,928.7	-211.0	3,933.6	1.56	0.94	-1.25
11,311.0	90.50	355.90	7,279.7	3,960.6	-213.2	3,965.6	2.00	1.56	-1.25
11,342.0	90.80	355.60	7,279.4	3,991.5	-215.5	3,996.6	1.37	0.97	-0.97
11,374.0	89.20	355.30	7,279.4	4,023.4	-218.0	4,028.6	5.09	-5.00	-0.94

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Simonsen 11-421
Project:	SEC.12-T6N-R67W	TVD Reference:	WELL @ 4863.0ft (RKB - Ensign 32 - 15')
Site:	Simonsen NWNW-12 Pad Sec.12-T6N-R67W	MD Reference:	WELL @ 4863.0ft (RKB - Ensign 32 - 15')
Well:	Simonsen 11-421	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)
11,406.0	87.90	355.60	7,280.2	4,055.3	-220.6	4,060.5	4.17	-4.06	0.94
11,438.0	87.60	356.30	7,281.4	4,087.2	-222.8	4,092.5	2.38	-0.94	2.19
11,469.0	86.70	356.00	7,283.0	4,118.1	-224.9	4,123.4	3.06	-2.90	-0.97
11,501.0	86.80	356.90	7,284.8	4,150.0	-226.9	4,155.3	2.83	0.31	2.81
11,533.0	86.30	358.30	7,286.7	4,181.9	-228.2	4,187.3	4.64	-1.56	4.38
11,564.0	87.30	358.90	7,288.4	4,212.9	-229.0	4,218.2	3.76	3.23	1.94
11,596.0	87.70	359.20	7,289.8	4,244.8	-229.5	4,250.2	1.56	1.25	0.94
11,628.0	88.60	359.50	7,290.9	4,276.8	-229.9	4,282.2	2.96	2.81	0.94
11,659.0	90.00	0.40	7,291.2	4,307.8	-229.9	4,313.1	5.37	4.52	2.90
11,691.0	90.20	1.40	7,291.2	4,339.8	-229.4	4,345.1	3.19	0.63	3.13
11,723.0	90.90	1.20	7,290.9	4,371.8	-228.7	4,377.1	2.28	2.19	-0.63
11,755.0	92.10	1.30	7,290.0	4,403.8	-228.0	4,409.0	3.76	3.75	0.31
11,787.0	92.70	1.60	7,288.7	4,435.7	-227.2	4,440.9	2.10	1.88	0.94
11,818.0	92.90	2.00	7,287.2	4,466.7	-226.2	4,471.8	1.44	0.65	1.29
11,850.0	93.10	2.10	7,285.5	4,498.6	-225.1	4,503.7	0.70	0.63	0.31
11,882.0	93.20	1.80	7,283.8	4,530.6	-224.0	4,535.6	0.99	0.31	-0.94
11,914.0	92.90	1.30	7,282.1	4,562.5	-223.1	4,567.5	1.82	-0.94	-1.56
11,946.0	92.30	1.50	7,280.6	4,594.5	-222.3	4,599.4	1.98	-1.88	0.63
11,953.0	92.30	1.50	7,280.3	4,601.4	-222.1	4,606.3	0.00	0.00	0.00
11,985.0	92.00	1.60	7,279.1	4,633.4	-221.3	4,638.3	0.99	-0.94	0.31
12,016.0	91.70	1.90	7,278.1	4,664.4	-220.3	4,669.2	1.37	-0.97	0.97
12,048.0	91.50	2.40	7,277.2	4,696.3	-219.1	4,701.1	1.68	-0.63	1.56
12,080.0	91.10	2.20	7,276.5	4,728.3	-217.9	4,733.0	1.40	-1.25	-0.63
12,111.0	91.60	2.10	7,275.8	4,759.3	-216.7	4,763.9	1.64	1.61	-0.32
12,143.0	91.10	1.90	7,275.0	4,791.3	-215.6	4,795.8	1.68	-1.56	-0.63
12,175.0	90.80	2.60	7,274.5	4,823.2	-214.3	4,827.7	2.38	-0.94	2.19
12,207.0	90.90	2.70	7,274.0	4,855.2	-212.8	4,859.6	0.44	0.31	0.31
12,239.0	90.80	2.20	7,273.5	4,887.2	-211.5	4,891.5	1.59	-0.31	-1.56
12,259.0	91.00	2.50	7,273.2	4,907.1	-210.7	4,911.5	1.80	1.00	1.50
12,310.0	91.00	2.50	7,272.3	4,958.1	-208.4	4,962.3	0.00	0.00	0.00
BHL 500'FNL, 200'FWL, SEC.1									

Design Targets									
Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	
SECTION LINE 206'N	- Shape								
- survey misses target center by 432.2ft at 0.0ft MD (0.0 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1				1.0	0.0	0.0	1,428,912.97	3,180,403.67	
Point 2				1.0	4,790.0	0.0	1,433,702.67	3,180,368.55	
Point 3				1.0	0.0	0.0	1,428,912.97	3,180,403.67	
Point 4				1.0	0.0	800.0	1,428,918.83	3,181,203.62	
HARDLINE BHL 460'f	- Shape								
- survey misses target center by 5014.4ft at 0.0ft MD (0.0 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1				1.0	0.0	0.0	1,433,704.93	3,180,348.54	
Point 2				1.0	0.0	800.0	1,433,710.79	3,181,148.49	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Simonsen 11-421
Project:	SEC.12-T6N-R67W	TVD Reference:	WELL @ 4863.0ft (RKB - Ensign 32 - 15')
Site:	Simonsen NWNW-12 Pad Sec.12-T6N-R67W	MD Reference:	WELL @ 4863.0ft (RKB - Ensign 32 - 15')
Well:	Simonsen 11-421	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Checked By: _____	Approved By: _____	Date: _____
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