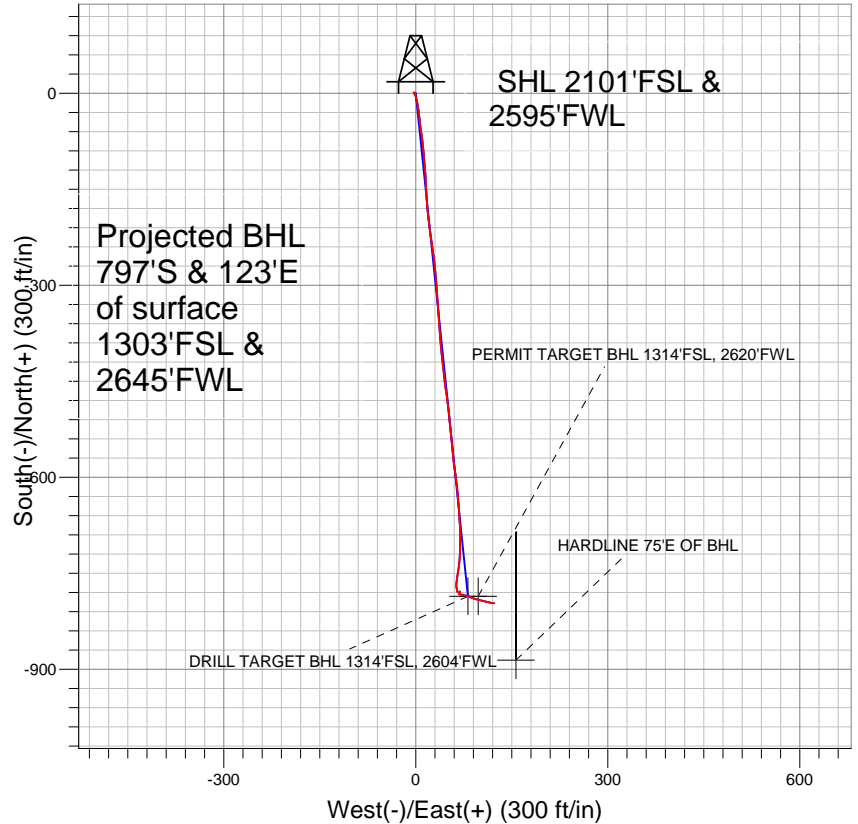
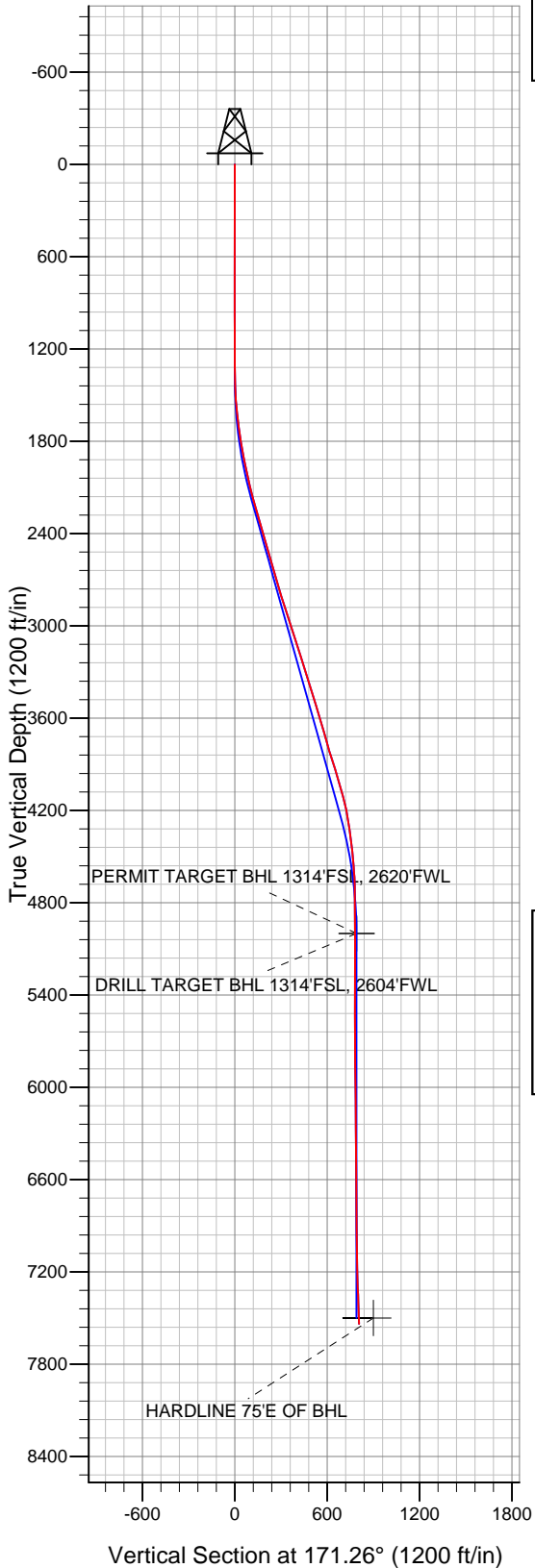


PETROLEUM DEVELOPMENT CORP Weld County CO



LEGEND

- △ Carlson 2PD, Wellbore #1, Plan #2 (8-21-10) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
 7644'MD & 7538'TVD @ 805' VS
 5.6 deg Inc 98.3 deg AZ

Project: SEC.2-T6N-R66W
 Site: Carlson 2OD Pad Sec.2-T6N-R66W
 Well: Carlson 2PD
 Plan: Wellbore #1



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.2-T6N-R66W

Carlson 2OD Pad Sec.2-T6N-R66W

Carlson 2PD

Wellbore #1

Survey: Survey #1

Standard Survey Report

22 November, 2010

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Carlson 2PD
Project:	SEC.2-T6N-R66W	TVD Reference:	WELL @ 4873.0ft (Original Well Elev)
Site:	Carlson 2OD Pad Sec.2-T6N-R66W	MD Reference:	WELL @ 4873.0ft (Original Well Elev)
Well:	Carlson 2PD	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.2-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	Carlson 2OD Pad Sec.2-T6N-R66W				
Site Position:		Northing:	1,431,780.54ft	Latitude:	40° 30' 58.284 N
From:	Lat/Long	Easting:	3,209,712.21ft	Longitude:	104° 44' 44.592 W
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.49 °

Well	Carlson 2PD					
Well Position	+N-S	0.0 ft	Northing:	1,431,679.24 ft	Latitude:	40° 30' 57.276 N
	+E-W	0.0 ft	Easting:	3,209,796.49 ft	Longitude:	104° 44' 43.512 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,860.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/15/2010	8.94	67.17	53,255

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	171.26	

Survey Program	Date	11/22/2010			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
699.0	7,644.0	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	
699.0	0.40	288.00	699.0	0.8	-2.3	-1.1	0.06	0.06	0.00	
792.0	0.40	261.90	792.0	0.8	-3.0	-1.2	0.19	0.00	-28.06	
886.0	0.20	121.70	886.0	0.7	-3.1	-1.1	0.60	-0.21	-149.15	
979.0	0.10	100.80	979.0	0.6	-2.9	-1.0	0.12	-0.11	-22.47	
1,072.0	0.10	159.60	1,072.0	0.5	-2.8	-0.9	0.11	0.00	63.23	
1,165.0	0.20	104.40	1,165.0	0.4	-2.6	-0.8	0.18	0.11	-59.35	
1,258.0	0.30	151.80	1,258.0	0.1	-2.4	-0.5	0.24	0.11	50.97	
1,352.0	0.20	169.80	1,352.0	-0.3	-2.2	-0.1	0.13	-0.11	19.15	
1,445.0	1.90	152.70	1,445.0	-1.8	-1.5	1.6	1.84	1.83	-18.39	
1,538.0	4.40	162.00	1,537.8	-6.6	0.3	6.5	2.73	2.69	10.00	
1,631.0	6.50	170.80	1,630.4	-15.1	2.3	15.3	2.42	2.26	9.46	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Carlson 2PD
Project:	SEC.2-T6N-R66W	TVD Reference:	WELL @ 4873.0ft (Original Well Elev)
Site:	Carlson 2OD Pad Sec.2-T6N-R66W	MD Reference:	WELL @ 4873.0ft (Original Well Elev)
Well:	Carlson 2PD	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)
1,725.0	7.90	169.90	1,723.7	-26.8	4.3	27.1	1.49	1.49	-0.96
1,818.0	9.30	175.60	1,815.6	-40.5	6.0	41.0	1.76	1.51	6.13
1,911.0	11.10	170.90	1,907.1	-56.9	8.0	57.4	2.13	1.94	-5.05
2,004.0	12.70	173.80	1,998.1	-75.9	10.5	76.6	1.84	1.72	3.12
2,097.0	13.10	174.90	2,088.8	-96.5	12.5	97.3	0.50	0.43	1.18
2,190.0	14.70	175.20	2,179.1	-118.8	14.4	119.6	1.72	1.72	0.32
2,283.0	16.60	177.90	2,268.6	-143.8	15.9	144.6	2.19	2.04	2.90
2,376.0	16.50	175.60	2,357.8	-170.3	17.4	171.0	0.71	-0.11	-2.47
2,469.0	15.70	173.00	2,447.1	-195.9	20.0	196.7	1.16	-0.86	-2.80
2,562.0	16.20	172.10	2,536.5	-221.3	23.3	222.2	0.60	0.54	-0.97
2,655.0	16.70	172.90	2,625.7	-247.4	26.7	248.6	0.59	0.54	0.86
2,749.0	15.70	173.10	2,716.0	-273.4	29.9	274.8	1.07	-1.06	0.21
2,842.0	17.30	176.20	2,805.2	-299.7	32.3	301.1	1.96	1.72	3.33
2,935.0	17.90	176.60	2,893.8	-327.8	34.1	329.2	0.66	0.65	0.43
3,028.0	17.70	175.00	2,982.4	-356.1	36.2	357.5	0.57	-0.22	-1.72
3,121.0	17.50	176.10	3,071.0	-384.2	38.4	385.5	0.42	-0.22	1.18
3,215.0	18.20	172.70	3,160.5	-412.8	41.2	414.3	1.34	0.74	-3.62
3,308.0	18.30	174.90	3,248.8	-441.8	44.3	443.4	0.75	0.11	2.37
3,401.0	16.70	170.60	3,337.5	-469.5	47.8	471.3	2.21	-1.72	-4.62
3,494.0	17.00	174.70	3,426.5	-496.2	51.3	498.2	1.32	0.32	4.41
3,588.0	17.50	174.20	3,516.3	-524.0	54.0	526.1	0.55	0.53	-0.53
3,681.0	16.30	174.10	3,605.3	-550.9	56.7	553.1	1.29	-1.29	-0.11
3,774.0	15.90	174.00	3,694.6	-576.5	59.4	578.8	0.43	-0.43	-0.11
3,867.0	15.90	171.30	3,784.1	-601.8	62.6	604.3	0.80	0.00	-2.90
3,961.0	18.10	175.50	3,873.9	-629.1	65.7	631.7	2.68	2.34	4.47
4,054.0	17.30	175.80	3,962.5	-657.3	67.9	659.9	0.87	-0.86	0.32
4,147.0	15.30	178.70	4,051.8	-683.3	69.2	685.9	2.32	-2.15	3.12
4,240.0	14.90	180.80	4,141.6	-707.5	69.3	709.8	0.73	-0.43	2.26
4,334.0	10.20	184.20	4,233.3	-727.9	68.5	729.9	5.06	-5.00	3.62
4,427.0	8.80	188.80	4,325.0	-743.2	66.8	744.7	1.71	-1.51	4.95
4,520.0	7.30	189.30	4,417.1	-756.0	64.8	757.1	1.61	-1.61	0.54
4,613.0	5.00	184.30	4,509.6	-765.9	63.5	766.7	2.54	-2.47	-5.38
4,706.0	3.90	169.10	4,602.3	-773.1	63.8	773.8	1.72	-1.18	-16.34
4,799.0	1.30	181.50	4,695.2	-777.2	64.4	778.0	2.84	-2.80	13.33
4,893.0	0.10	160.30	4,789.2	-778.4	64.4	779.1	1.28	-1.28	-22.55
5,079.0	1.30	119.60	4,975.2	-779.6	66.3	780.6	0.66	0.65	-21.88
5,104.0	1.14	116.29	5,000.2	-779.8	66.7	780.9	0.70	-0.64	-13.22
DRILL TARGET BHL 1314'FSL, 2604'FWL									
5,104.2	1.14	116.29	5,000.4	-779.8	66.7	780.9	0.00	0.00	0.00
PERMIT TARGET BHL 1314'FSL, 2620'FWL									
5,266.0	0.50	40.20	5,162.2	-780.0	68.6	781.4	0.70	-0.40	-47.03
5,452.0	0.40	340.30	5,348.2	-778.8	68.9	780.2	0.25	-0.05	-32.20
5,639.0	0.20	165.60	5,535.2	-778.5	68.8	779.9	0.32	-0.11	-93.42
5,825.0	0.80	224.50	5,721.1	-779.7	68.0	781.0	0.39	0.32	31.67
6,011.0	0.60	171.50	5,907.1	-781.6	67.2	782.7	0.35	-0.11	-28.49
6,104.0	0.60	144.20	6,000.1	-782.5	67.6	783.6	0.30	0.00	-29.35
6,197.0	0.90	110.90	6,093.1	-783.1	68.5	784.4	0.56	0.32	-35.81
6,384.0	1.20	95.60	6,280.1	-783.8	71.9	785.6	0.22	0.16	-8.18
6,571.0	1.20	104.40	6,467.1	-784.5	75.7	786.9	0.10	0.00	4.71
6,757.0	1.70	99.50	6,653.0	-785.5	80.3	788.5	0.28	0.27	-2.63
6,943.0	0.70	132.20	6,838.9	-786.7	83.9	790.3	0.63	-0.54	17.58
7,129.0	1.30	110.80	7,024.9	-788.2	86.7	792.2	0.37	0.32	-11.51
7,313.0	3.10	105.60	7,208.8	-790.3	93.4	795.3	0.98	0.98	-2.83

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Survey									
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7,500.0	6.30	105.10	7,395.1	-794.3	108.2	801.5	1.71	1.71	-0.27
7,594.0	5.60	98.30	7,488.6	-796.3	117.7	804.9	1.06	-0.74	-7.23
HARDLINE 75'E OF BHL									
7,644.0	5.60	98.30	7,538.4	-797.0	122.6	806.4	0.00	0.00	0.00

Checked By: _____	Approved By: _____	Date: _____
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