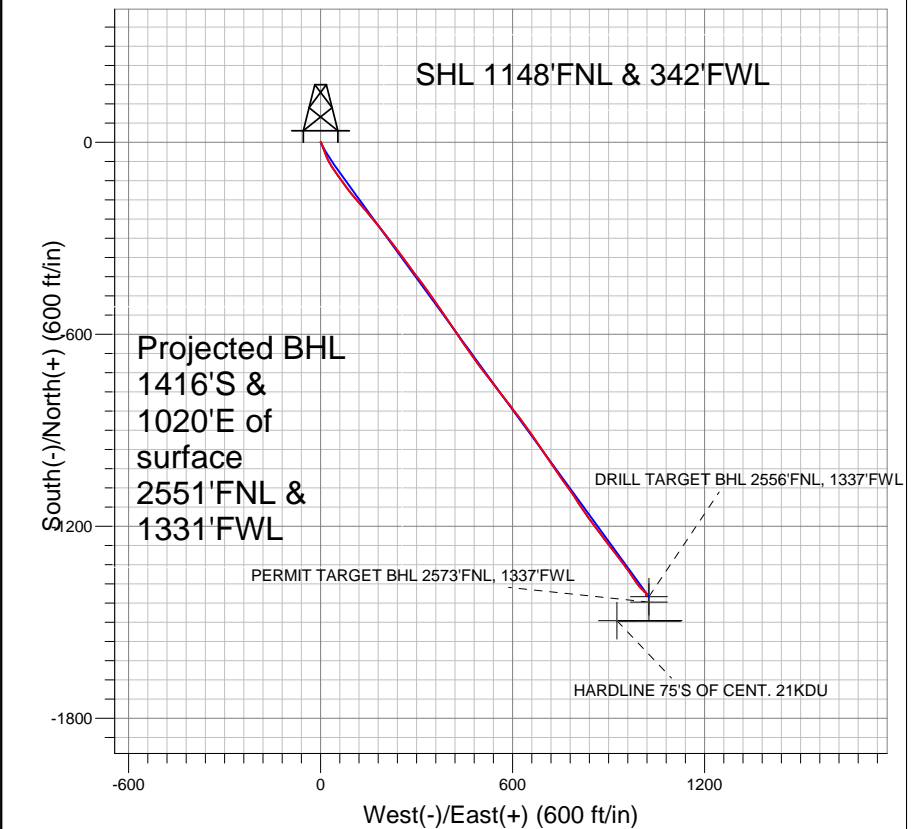


PETROLEUM DEVELOPMENT CORP Weld County CO



LEGEND

- Centennial 21KDU, Wellbore #1, Plan #1 (3-8-10) VO
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
 7766'MD & 7466'TVD @ 1745' VS
 0.7 deg Inc 92.0 deg AZ

Project: SEC.21-T4N-R67W
 Site: EEE/Ryland 20SD Pad Sec.21-T4N-R67W
 Well: Centennial 21KDU
 Plan: Wellbore #1



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.21-T4N-R67W

EEE/Ryland 20SD Pad Sec.21-T4N-R67W

Centennial 21KDU

Wellbore #1

Survey: Survey #1

Standard Survey Report

21 October, 2010





Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Centennial 21KDU
Project:	SEC.21-T4N-R67W	TVD Reference:	WELL @ 4935.0ft (Original Well Elev)
Site:	EEE/Ryland 20SD Pad Sec.21-T4N-R67W	MD Reference:	WELL @ 4935.0ft (Original Well Elev)
Well:	Centennial 21KDU	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.21-T4N-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	EEE/Ryland 20SD Pad Sec.21-T4N-R67W		
Site Position:		Northing:	1,353,584.71 ft
From:	Lat/Long	Easting:	3,166,056.83 ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	40° 18' 8.856 N
		Longitude:	104° 54' 16.632 W
		Grid Convergence:	0.38 °

Well	Centennial 21KDU		
Well Position	+N/-S	0.0 ft	Northing: 1,353,596.00 ft
	+E/-W	0.0 ft	Easting: 3,166,112.53 ft
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft
		Latitude:	40° 18' 8.964 N
		Longitude:	104° 54' 15.912 W
		Ground Level:	4,922.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/31/2009	9.09	67.01	53,237

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	144.23

Survey Program	Date	10/21/2010		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
155.0	7,766.0	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
155.0	0.40	91.00	155.0	0.0	0.5	0.3	0.26	0.26	0.00
243.0	0.50	139.10	243.0	-0.3	1.1	0.9	0.43	0.11	54.66
333.0	2.30	166.50	333.0	-2.4	1.8	3.0	2.08	2.00	30.44
425.0	4.60	157.90	424.8	-7.6	3.6	8.2	2.56	2.50	-9.35
516.0	6.70	158.10	515.3	-15.9	7.0	16.9	2.31	2.31	0.22
610.0	7.90	157.10	608.6	-26.9	11.5	28.6	1.28	1.28	-1.06
658.0	8.30	159.80	656.1	-33.2	14.0	35.1	1.15	0.83	5.63
735.0	9.10	159.80	732.2	-44.1	18.0	46.3	1.04	1.04	0.00
828.0	10.20	152.20	823.9	-58.3	24.4	61.6	1.81	1.18	-8.17
922.0	12.40	147.70	916.1	-74.2	33.7	79.9	2.52	2.34	-4.79
1,016.0	14.50	146.00	1,007.5	-92.5	45.6	101.7	2.27	2.23	-1.81



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Centennial 21KDU
Project:	SEC.21-T4N-R67W	TVD Reference:	WELL @ 4935.0ft (Original Well Elev)
Site:	EEE/Ryland 20SD Pad Sec.21-T4N-R67W	MD Reference:	WELL @ 4935.0ft (Original Well Elev)
Well:	Centennial 21KDU	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)
1,108.0	16.80	143.30	1,096.1	-112.7	60.0	126.5	2.62	2.50	-2.93
1,202.0	18.80	144.70	1,185.6	-136.0	76.9	155.3	2.18	2.13	1.49
1,296.0	20.10	139.60	1,274.2	-160.6	96.1	186.5	2.27	1.38	-5.43
1,389.0	21.70	139.60	1,361.1	-185.9	117.6	219.6	1.72	1.72	0.00
1,483.0	22.30	140.00	1,448.2	-212.8	140.4	254.7	0.66	0.64	0.43
1,576.0	23.30	141.10	1,534.0	-240.6	163.2	290.7	1.17	1.08	1.18
1,670.0	22.30	140.50	1,620.6	-268.9	186.3	327.0	1.09	-1.06	-0.64
1,763.0	22.70	142.50	1,706.6	-296.7	208.4	362.6	0.93	0.43	2.15
1,857.0	22.40	143.20	1,793.4	-325.4	230.2	398.6	0.43	-0.32	0.74
1,951.0	21.80	143.20	1,880.5	-353.8	251.4	434.0	0.64	-0.64	0.00
2,044.0	22.20	144.20	1,966.7	-381.8	272.0	468.8	0.59	0.43	1.08
2,138.0	21.90	143.20	2,053.8	-410.3	292.9	504.1	0.51	-0.32	-1.06
2,231.0	21.20	142.40	2,140.3	-437.5	313.5	538.2	0.82	-0.75	-0.86
2,325.0	21.70	144.60	2,227.8	-465.1	334.0	572.6	1.01	0.53	2.34
2,418.0	21.00	145.50	2,314.4	-492.9	353.4	606.5	0.83	-0.75	0.97
2,512.0	20.50	144.80	2,402.3	-520.2	372.4	639.8	0.59	-0.53	-0.74
2,605.0	22.00	145.40	2,489.0	-547.9	391.7	673.5	1.63	1.61	0.65
2,699.0	22.20	146.50	2,576.1	-577.2	411.5	708.8	0.49	0.21	1.17
2,792.0	23.60	146.20	2,661.8	-607.3	431.5	745.0	1.51	1.51	-0.32
2,886.0	22.20	145.30	2,748.4	-637.5	452.1	781.5	1.54	-1.49	-0.96
2,980.0	22.80	144.10	2,835.2	-666.9	472.9	817.5	0.80	0.64	-1.28
3,074.0	23.50	143.70	2,921.6	-696.7	494.7	854.5	0.76	0.74	-0.43
3,167.0	22.50	141.50	3,007.2	-725.6	516.7	890.8	1.42	-1.08	-2.37
3,261.0	21.70	143.20	3,094.3	-753.6	538.3	926.1	1.09	-0.85	1.81
3,354.0	21.80	142.90	3,180.7	-781.1	559.0	960.6	0.16	0.11	-0.32
3,448.0	21.20	140.80	3,268.2	-808.2	580.3	995.0	1.04	-0.64	-2.23
3,541.0	20.90	143.60	3,355.0	-834.6	600.8	1,028.4	1.13	-0.32	3.01
3,635.0	20.90	142.70	3,442.8	-861.4	620.9	1,061.9	0.34	0.00	-0.96
3,728.0	20.20	144.40	3,529.9	-887.7	640.3	1,094.5	0.99	-0.75	1.83
3,822.0	19.60	144.70	3,618.2	-913.8	658.9	1,126.5	0.65	-0.64	0.32
3,915.0	21.70	144.70	3,705.3	-940.5	677.8	1,159.3	2.26	2.26	0.00
4,009.0	22.00	146.10	3,792.5	-969.3	697.7	1,194.3	0.64	0.32	1.49
4,102.0	22.20	146.90	3,878.7	-998.5	717.0	1,229.2	0.39	0.22	0.86
4,196.0	21.10	147.20	3,966.1	-1,027.6	735.8	1,263.9	1.18	-1.17	0.32
4,290.0	20.60	142.30	4,053.9	-1,054.9	755.1	1,297.3	1.93	-0.53	-5.21
4,383.0	20.00	144.00	4,141.1	-1,080.7	774.5	1,329.6	0.90	-0.65	1.83
4,476.0	20.00	146.10	4,228.5	-1,106.8	792.7	1,361.4	0.77	0.00	2.26
4,570.0	19.60	148.90	4,317.0	-1,133.6	809.8	1,393.2	1.09	-0.43	2.98
4,663.0	20.70	145.20	4,404.3	-1,160.5	827.2	1,425.1	1.81	1.18	-3.98
4,757.0	20.50	142.50	4,492.3	-1,187.2	846.8	1,458.2	1.03	-0.21	-2.87
4,850.0	20.30	143.70	4,579.4	-1,213.1	866.2	1,490.6	0.50	-0.22	1.29
4,944.0	18.50	141.80	4,668.1	-1,238.0	885.1	1,521.8	2.03	-1.91	-2.02
5,037.0	19.10	142.80	4,756.1	-1,261.7	903.4	1,551.8	0.73	0.65	1.08
5,131.0	17.70	143.20	4,845.3	-1,285.4	921.3	1,581.4	1.50	-1.49	0.43
5,225.0	15.90	142.30	4,935.3	-1,307.0	937.7	1,608.6	1.93	-1.91	-0.96
5,318.0	13.20	144.00	5,025.3	-1,325.7	951.7	1,631.9	2.94	-2.90	1.83
5,412.0	11.30	144.80	5,117.2	-1,341.9	963.4	1,651.9	2.03	-2.02	0.85
5,506.0	9.70	144.90	5,209.6	-1,355.9	973.2	1,669.0	1.70	-1.70	0.11
5,600.0	7.80	146.20	5,302.5	-1,367.7	981.3	1,683.3	2.03	-2.02	1.38
5,693.0	6.40	147.00	5,394.8	-1,377.3	987.7	1,694.8	1.51	-1.51	0.86
5,787.0	5.30	144.50	5,488.3	-1,385.2	993.0	1,704.4	1.20	-1.17	-2.66
5,881.0	4.10	133.60	5,582.0	-1,391.0	998.0	1,712.0	1.59	-1.28	-11.60
5,975.0	3.50	134.10	5,675.8	-1,395.4	1,002.5	1,718.1	0.64	-0.64	0.53



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Centennial 21KDU
Project:	SEC.21-T4N-R67W	TVD Reference:	WELL @ 4935.0ft (Original Well Elev)
Site:	EEE/Ryland 20SD Pad Sec.21-T4N-R67W	MD Reference:	WELL @ 4935.0ft (Original Well Elev)
Well:	Centennial 21KDU	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)
6,068.0	3.30	134.50	5,768.6	-1,399.2	1,006.4	1,723.6	0.22	-0.22	0.43
6,162.0	2.70	140.80	5,862.5	-1,402.8	1,009.8	1,728.5	0.73	-0.64	6.70
6,256.0	1.50	116.80	5,956.4	-1,405.1	1,012.3	1,731.8	1.56	-1.28	-25.53
6,349.0	1.00	132.60	6,049.4	-1,406.2	1,013.9	1,733.6	0.65	-0.54	16.99
6,442.0	1.10	141.90	6,142.4	-1,407.4	1,015.1	1,735.3	0.21	0.11	10.00
6,536.0	1.20	143.20	6,236.4	-1,408.9	1,016.2	1,737.2	0.11	0.11	1.38
6,629.0	1.30	154.90	6,329.3	-1,410.7	1,017.3	1,739.2	0.29	0.11	12.58
6,723.0	1.10	157.80	6,423.3	-1,412.5	1,018.1	1,741.1	0.22	-0.21	3.09
6,816.0	0.70	160.40	6,516.3	-1,413.8	1,018.6	1,742.5	0.43	-0.43	2.80
6,910.0	0.70	183.90	6,610.3	-1,415.0	1,018.7	1,743.5	0.30	0.00	25.00
7,003.0	0.50	232.90	6,703.3	-1,415.8	1,018.4	1,744.0	0.57	-0.22	52.69
7,097.0	0.60	247.90	6,797.3	-1,416.2	1,017.6	1,743.9	0.19	0.11	15.96
7,190.0	0.40	244.50	6,890.3	-1,416.5	1,016.9	1,743.7	0.22	-0.22	-3.66
7,284.0	0.40	286.50	6,984.3	-1,416.6	1,016.2	1,743.4	0.30	0.00	44.68
7,378.0	0.30	34.00	7,078.3	-1,416.3	1,016.1	1,743.0	0.60	-0.11	114.36
7,471.0	0.40	61.30	7,171.3	-1,415.9	1,016.5	1,743.0	0.21	0.11	29.35
7,565.0	0.80	89.20	7,265.3	-1,415.7	1,017.4	1,743.4	0.52	0.43	29.68
7,719.0	0.70	92.00	7,419.3	-1,415.8	1,019.4	1,744.6	0.07	-0.06	1.82
7,766.0	0.70	92.00	7,466.3	-1,415.8	1,020.0	1,745.0	0.00	0.00	0.00

Checked By: _____	Approved By: _____	Date: _____
-------------------	--------------------	-------------