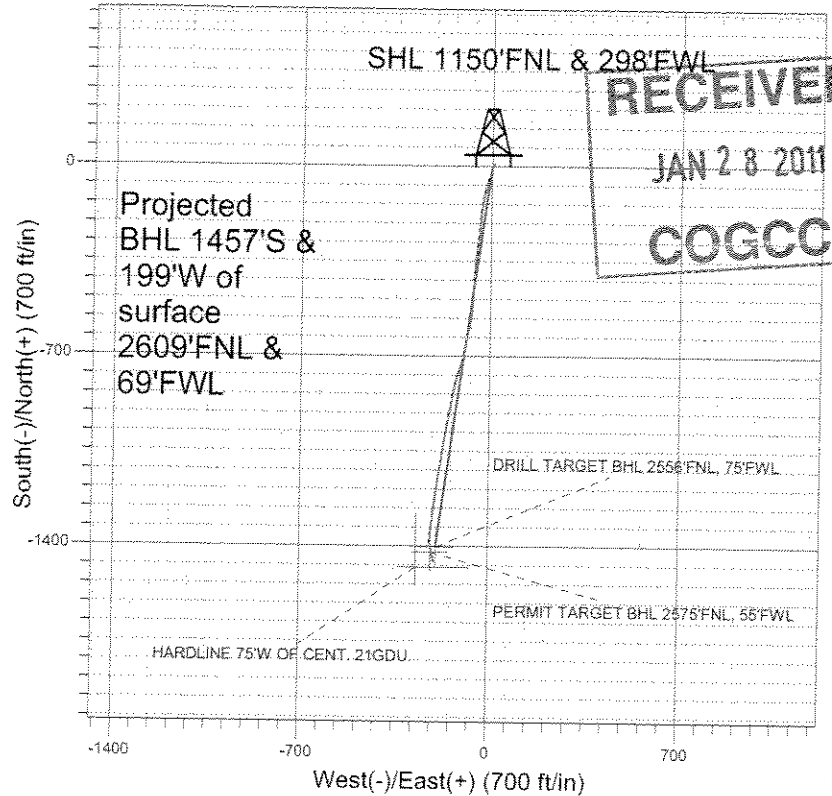




02072181

Surface Location: EEE/Ryland 20SD Pad Sec.21-T4N-R67W
North American Datum 1983 US State Plane 1983 Colorado Northern Zone
Ground Elevation: 4922.0
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1353588.47 3166076.32 40° 18' 8.892 N 104° 54' 16.380 W
Original Well Elev @ 4935.0ft (Original Well Elev)

PETROLEUM DEVELOPMENT CORP Weld County CO



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COGCC

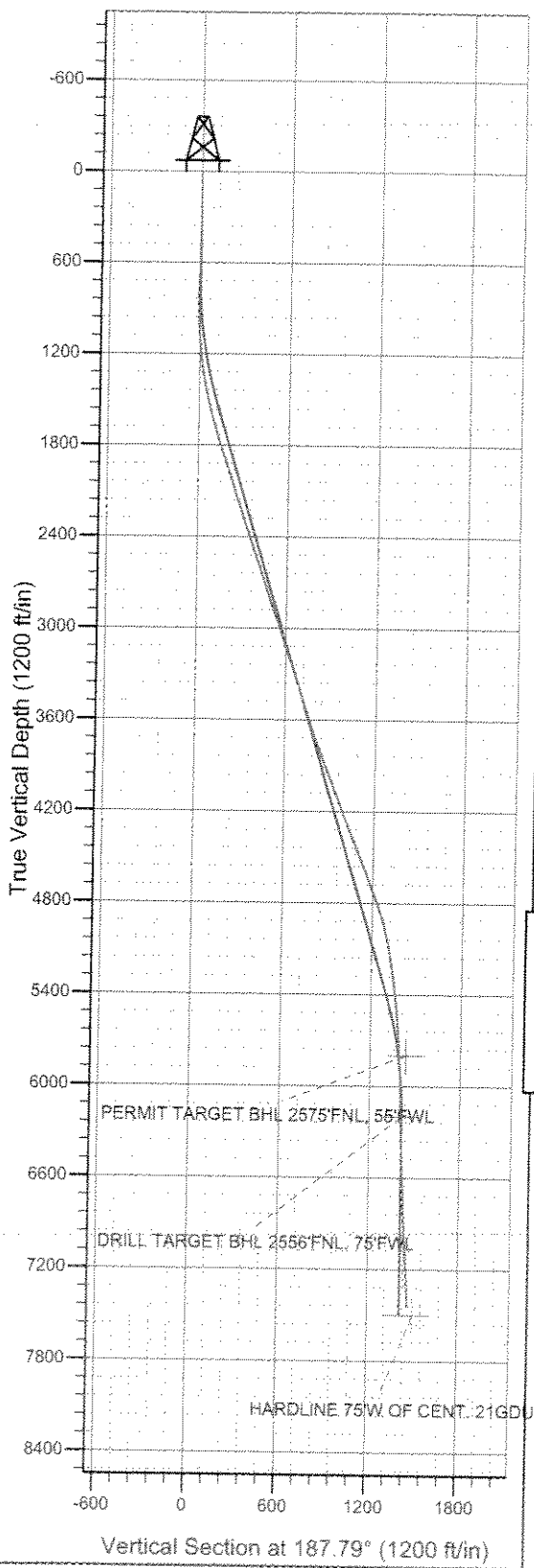
LEGEND

- Centennial 21GDU, Wellbore #1, Plan #1 (3-8-10) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
7672'MD & 7444'TVD @ 1470' VS
3.4 deg Inc 163.7 deg AZ

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



ENSIGN Directional

Ensign Directional Survey Report

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Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Centennial 21GDU
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 21GDU	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)
1,731.0	17.50	190.90	1,716.8	-119.9	-30.4	122.9	1.62	1.61	0.43
1,825.0	18.60	188.40	1,806.2	-148.6	-35.3	152.0	1.43	1.17	-2.66
1,919.0	18.40	186.80	1,895.3	-178.2	-39.2	181.9	0.58	-0.21	-1.70
2,012.0	18.80	183.60	1,983.5	-207.7	-41.9	211.5	1.18	0.43	-3.44
2,106.0	18.90	184.40	2,072.4	-238.0	-44.0	241.8	0.29	0.11	0.85
2,199.0	17.90	187.00	2,160.7	-267.2	-46.9	271.1	1.39	-1.08	2.80
2,293.0	18.20	188.20	2,250.1	-296.1	-50.8	300.2	0.51	0.32	1.28
2,386.0	18.20	185.10	2,338.4	-324.9	-54.1	329.3	1.04	0.00	-3.33
2,480.0	18.20	183.90	2,427.7	-354.2	-56.4	358.6	0.40	0.00	-1.28
2,574.0	19.10	184.10	2,516.8	-384.2	-58.5	388.6	0.96	0.96	0.21
2,667.0	19.80	183.90	2,604.5	-415.1	-60.7	419.5	0.76	0.75	-0.22
2,761.0	20.00	182.00	2,692.8	-447.0	-62.4	451.3	0.72	0.21	-2.02
2,855.0	18.90	182.40	2,781.5	-478.3	-63.5	482.5	1.18	-1.17	0.43
2,948.0	19.80	184.40	2,869.2	-509.0	-65.4	513.2	1.20	0.97	2.15
3,042.0	19.70	188.00	2,957.7	-540.6	-68.8	544.9	1.30	-0.11	3.83
3,135.0	17.70	190.30	3,045.8	-570.0	-73.5	574.8	2.29	-2.15	2.47
3,229.0	18.90	191.10	3,135.0	-599.0	-79.0	604.2	1.30	1.28	0.85
3,322.0	18.60	193.80	3,223.1	-628.2	-85.4	634.0	0.99	-0.32	2.90
3,416.0	18.40	189.90	3,312.2	-657.4	-91.6	663.8	1.33	-0.21	-4.15
3,509.0	18.80	187.10	3,400.4	-686.7	-96.0	693.4	1.05	0.43	-3.01
3,603.0	18.00	195.30	3,489.6	-715.8	-101.7	723.0	2.88	-0.85	8.72
3,697.0	18.40	199.40	3,578.9	-743.8	-110.4	751.9	1.43	0.43	4.36
3,790.0	19.90	196.10	3,666.8	-772.8	-119.7	781.9	1.99	1.61	-3.55
3,884.0	21.30	194.00	3,754.7	-804.8	-128.2	814.7	1.68	1.49	-2.23
3,978.0	22.20	191.80	3,842.0	-838.7	-136.0	849.4	1.29	0.96	-2.34
4,071.0	21.90	189.80	3,928.2	-873.0	-142.6	884.3	0.87	-0.32	-2.15
4,164.0	21.70	188.80	4,014.6	-907.1	-148.1	918.8	0.45	-0.22	-1.08
4,258.0	20.30	191.50	4,102.4	-940.3	-154.0	952.5	1.81	-1.49	2.87
4,351.0	21.60	189.80	4,189.2	-972.9	-160.2	985.7	1.54	1.40	-1.83
4,444.0	21.90	189.40	4,275.6	-1,006.9	-165.9	1,020.1	0.36	0.32	-0.43
4,538.0	22.20	188.20	4,362.7	-1,041.8	-171.3	1,055.4	0.58	0.32	-1.28
4,632.0	23.30	189.10	4,449.4	-1,077.7	-176.8	1,091.7	1.23	1.17	0.96
4,725.0	21.50	189.80	4,535.4	-1,112.7	-182.6	1,127.2	1.96	-1.94	0.75
4,819.0	21.80	187.40	4,622.7	-1,147.0	-187.8	1,161.8	0.99	0.32	-2.55
4,912.0	20.70	187.90	4,709.4	-1,180.4	-192.3	1,195.5	1.20	-1.18	0.54
5,006.0	20.90	188.70	4,797.3	-1,213.4	-197.1	1,228.9	0.37	0.21	0.85
5,099.0	17.80	187.20	4,885.0	-1,243.8	-201.4	1,259.7	3.38	-3.33	-1.61
5,193.0	14.30	187.40	4,975.4	-1,269.7	-204.7	1,285.7	3.72	-3.72	0.21
5,286.0	11.60	185.50	5,066.0	-1,290.4	-207.1	1,306.5	2.94	-2.90	-2.04
5,380.0	10.20	184.70	5,158.3	-1,308.1	-208.6	1,324.3	1.50	-1.49	-0.85
5,473.0	8.40	186.00	5,250.1	-1,323.0	-210.0	1,339.3	1.95	-1.94	1.40
5,567.0	6.90	187.70	5,343.2	-1,335.5	-211.5	1,351.8	1.61	-1.60	1.81
5,660.0	6.50	195.00	5,435.6	-1,346.1	-213.6	1,362.6	1.01	-0.43	7.85
5,754.0	5.70	188.00	5,529.0	-1,355.9	-215.6	1,372.6	1.16	-0.85	-7.45
5,848.0	4.80	184.80	5,622.7	-1,364.4	-216.6	1,381.2	1.01	-0.96	-3.40
5,941.0	4.10	183.00	5,715.4	-1,371.6	-217.1	1,388.4	0.77	-0.75	-1.94
6,028.7	3.45	183.64	5,802.9	-1,377.4	-217.4	1,394.1	0.75	-0.74	0.73
PERMIT TARGET BHL 2575'FNL, 55'FWL									
6,035.0	3.40	183.70	5,809.2	-1,377.7	-217.5	1,394.5	0.75	-0.74	0.89
6,129.0	2.90	174.10	5,903.0	-1,382.9	-217.4	1,399.6	0.77	-0.53	-10.21
6,222.0	2.40	172.50	5,995.9	-1,387.1	-216.9	1,403.7	0.54	-0.54	-1.72
6,316.0	1.50	154.80	6,089.9	-1,390.2	-216.1	1,406.7	1.14	-0.96	-18.83
6,409.0	1.50	157.30	6,182.8	-1,392.4	-215.1	1,408.7	0.07	0.00	2.69

ENSIGN

Directional

Ensign Directional Survey Report



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Centennial 21GDU
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 21GDU	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	Latitude:	40° 18' 8.856 N
From:	Lat/Long	Easting:	3,166,056.83 ft	Longitude:	104° 54' 16.632 W
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.38 °

Well	Centennial 21GDU					
Well Position	+N/-S	0.0 ft	Northing:	1,353,588.47 ft	Latitude:	40° 18' 8.892 N
	+E/-W	0.0 ft	Easting:	3,166,076.32 ft	Longitude:	104° 54' 16.380 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	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	187.79	

Survey Program	Date 10/12/2010			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
703.0	7,672.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard

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
703.0	1.40	39.40	702.9	6.6	5.5	-7.3	0.20	0.20	0.00
796.0	1.10	36.10	795.9	8.2	6.7	-9.1	0.33	-0.32	-3.55
890.0	0.70	250.70	889.9	8.8	6.7	-9.6	1.83	-0.43	-154.68
983.0	2.40	214.50	982.9	7.0	5.0	-7.6	2.02	1.83	-38.92
1,077.0	4.40	206.40	1,076.7	2.1	2.3	-2.4	2.18	2.13	-8.62
1,170.0	6.50	204.00	1,169.3	-5.9	-1.4	6.0	2.27	2.26	-2.58
1,263.0	8.40	194.10	1,261.5	-17.3	-5.2	17.8	2.46	2.04	-10.65
1,357.0	10.20	194.00	1,354.2	-32.0	-8.9	32.9	1.91	1.91	-0.11
1,451.0	11.80	197.70	1,446.5	-49.2	-13.8	50.7	1.86	1.70	3.94
1,544.0	14.50	195.80	1,537.1	-69.5	-19.9	71.6	2.94	2.90	-2.04
1,638.0	16.00	190.50	1,627.8	-93.6	-25.4	96.2	2.18	1.60	-5.64

ENSIGN

Directional

Ensign Directional Survey Report



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Centennial 21GDU
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 21GDU	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)
6,426.6	1.53	159.53	6,200.5	-1,392.9	-215.0	1,409.2	0.39	0.19	12.68
DRILL TARGET BHL 2556'FNL, 75'FWL									
6,502.0	1.70	168.00	6,275.8	-1,394.9	-214.4	1,411.1	0.39	0.22	11.23
6,596.0	1.90	169.70	6,369.8	-1,397.8	-213.8	1,413.9	0.22	0.21	1.81
6,690.0	2.20	170.40	6,463.7	-1,401.1	-213.2	1,417.1	0.32	0.32	0.74
6,784.0	2.50	172.90	6,557.6	-1,404.9	-212.7	1,420.8	0.34	0.32	2.66
6,877.0	2.50	160.40	6,650.5	-1,408.9	-211.8	1,424.6	0.59	0.00	-13.44
6,971.0	2.90	162.70	6,744.4	-1,413.1	-210.4	1,428.5	0.44	0.43	2.45
7,064.0	3.30	164.80	6,837.3	-1,417.9	-209.0	1,433.1	0.45	0.43	2.26
7,158.0	3.60	169.80	6,931.1	-1,423.4	-207.7	1,438.4	0.45	0.32	5.32
7,251.0	3.80	168.80	7,023.9	-1,429.3	-206.6	1,444.1	0.23	0.22	-1.08
7,345.0	4.00	166.50	7,117.7	-1,435.5	-205.2	1,450.1	0.27	0.21	-2.45
7,438.0	4.10	164.50	7,210.5	-1,441.9	-203.6	1,456.2	0.19	0.11	-2.15
7,532.0	3.90	162.80	7,304.3	-1,448.2	-201.7	1,462.2	0.25	-0.21	-1.81
7,625.0	3.40	163.70	7,397.1	-1,453.9	-200.0	1,467.6	0.54	-0.54	0.97
7,672.0	3.40	163.70	7,444.0	-1,456.5	-199.3	1,470.1	0.00	0.00	0.00
HARDLINE 75'W OF CENT. 21GDU									

Checked By: _____ Approved By: _____ Date: _____