

Well Name: **Ryland 20YD**

Surface Location: Walters/Wedco/Ryland Pad Sec.21-T4N-R67W
 North American Datum 1983 US State Plane 1983 Colorado Northern Zone

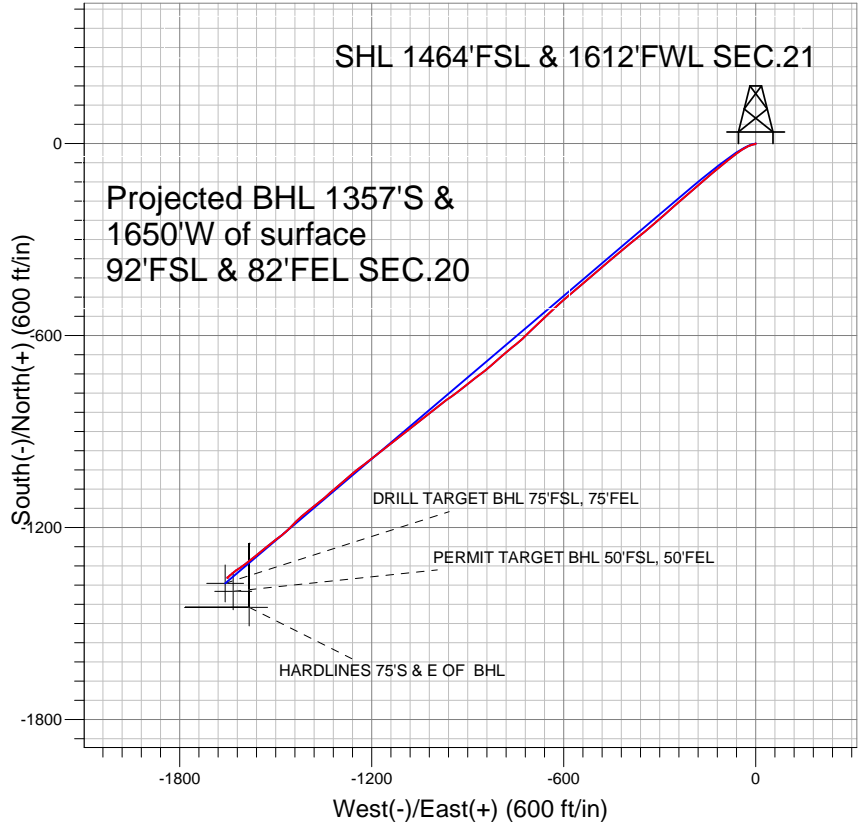
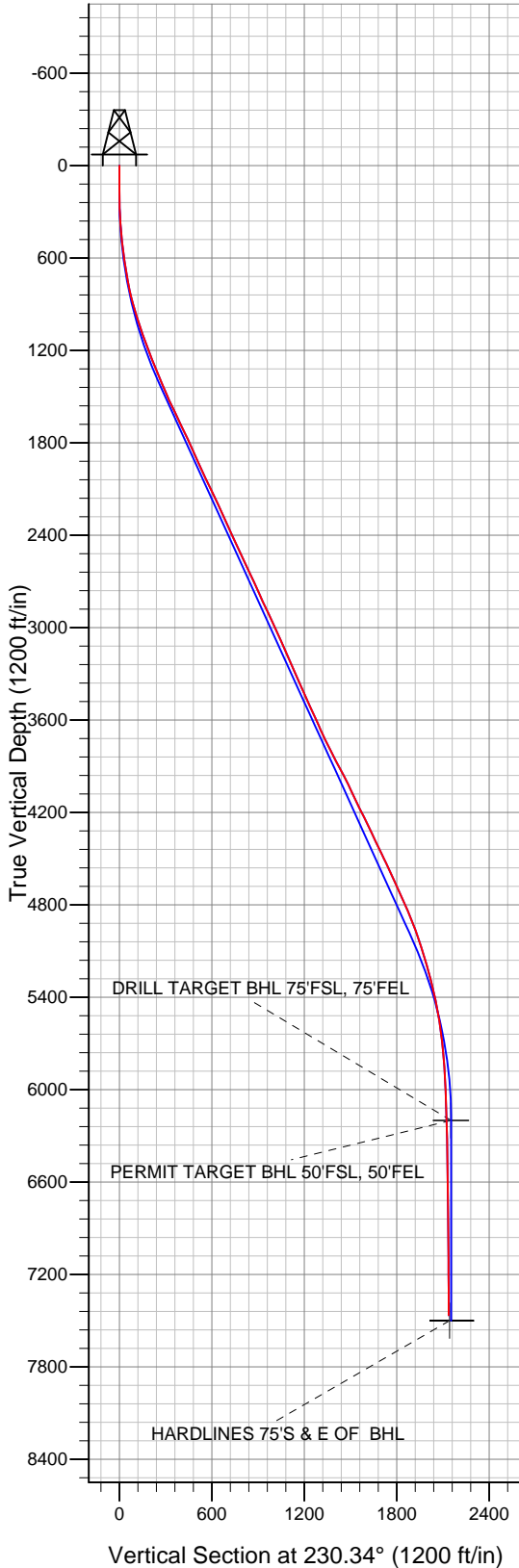
Ground Elevation: 4940.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1350934.72	3167449.83	40.295160	-104.899690

Original Well Elev WELL @ 4953.0ft (Original Well Elev)

Slot

PETROLEUM DEVELOPMENT CORP Weld County CO



LEGEND

- Ryland 20YD, Wellbore #1, Plan #1 (6-4-10) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
 7893'MD & 7465'TVD @ 2136'VS
 0.3 deg Inc 126.8 deg AZ

Project: SEC.21-T4N-R67W
 Site: Walters/Wedco/Ryland Pad Sec.21-T4N-R67W
 Well: Ryland 20YD
 Plan: Wellbore #1



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.21-T4N-R67W

Walters/Wedco/Ryland Pad Sec.21-T4N-R67W

Ryland 20YD

Wellbore #1

Survey: Survey #1

Standard Survey Report

31 May, 2011

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Ryland 20YD
Project:	SEC.21-T4N-R67W	TVD Reference:	WELL @ 4953.0ft (Original Well Elev)
Site:	Walters/Wedco/Ryland Pad Sec.21-T4N-R67W	MD Reference:	WELL @ 4953.0ft (Original Well Elev)
Well:	Ryland 20YD	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		Walters/Wedco/Ryland Pad Sec.21-T4N-R67W			
Site Position:		Northing:	1,351,058.86ft	Latitude:	40.295500
From:	Lat/Long	Easting:	3,167,490.83ft	Longitude:	-104.899540
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.39 °

Well	Ryland 20YD					
Well Position	+N-S	0.0 ft	Northing:	1,350,934.72 ft	Latitude:	40.295160
	+E-W	0.0 ft	Easting:	3,167,449.83 ft	Longitude:	-104.899690
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,940.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/31/2009	9.09	67.00	53,234

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	230.34	

Survey Program	Date 5/31/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
156.0	7,893.0	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
156.0	0.40	136.40	156.0	-0.4	0.4	0.0	0.26	0.26	0.00
245.0	1.10	241.30	245.0	-1.0	-0.2	0.8	1.42	0.79	117.87
337.0	3.40	257.00	336.9	-2.1	-3.6	4.1	2.57	2.50	17.07
429.0	5.20	257.60	428.7	-3.6	-10.3	10.2	1.96	1.96	0.65
521.0	7.30	247.20	520.1	-6.7	-19.8	19.5	2.58	2.28	-11.30
614.0	8.70	242.40	612.2	-12.3	-31.5	32.1	1.67	1.51	-5.16
643.0	9.00	239.50	640.9	-14.5	-35.4	36.4	1.85	1.03	-10.00
735.0	8.90	233.30	731.7	-22.4	-47.3	50.7	1.05	-0.11	-6.74
828.0	13.30	235.00	823.0	-32.8	-61.8	68.5	4.74	4.73	1.83
921.0	15.90	230.90	913.0	-47.0	-80.5	91.9	3.01	2.80	-4.41
1,014.0	17.70	230.00	1,002.0	-64.1	-101.2	118.8	1.96	1.94	-0.97

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Ryland 20YD
Project:	SEC.21-T4N-R67W	TVD Reference:	WELL @ 4953.0ft (Original Well Elev)
Site:	Walters/Wedco/Ryland Pad Sec.21-T4N-R67W	MD Reference:	WELL @ 4953.0ft (Original Well Elev)
Well:	Ryland 20YD	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	19.10	230.70	1,091.2	-83.0	-124.0	148.5	1.51	1.49	0.74
1,201.0	20.70	229.70	1,178.6	-103.3	-148.3	180.1	1.76	1.72	-1.08
1,294.0	21.50	228.60	1,265.4	-125.2	-173.7	213.6	0.96	0.86	-1.18
1,387.0	22.70	228.60	1,351.6	-148.3	-199.9	248.6	1.29	1.29	0.00
1,479.0	22.60	230.80	1,436.5	-171.2	-226.9	284.0	0.93	-0.11	2.39
1,573.0	25.00	227.50	1,522.5	-196.1	-255.6	321.9	2.92	2.55	-3.51
1,666.0	25.90	228.30	1,606.4	-222.9	-285.2	361.8	1.04	0.97	0.86
1,759.0	25.20	229.20	1,690.3	-249.3	-315.4	401.9	0.86	-0.75	0.97
1,853.0	25.60	230.30	1,775.3	-275.4	-346.1	442.2	0.66	0.43	1.17
1,946.0	24.00	231.60	1,859.7	-300.0	-376.4	481.2	1.82	-1.72	1.40
2,039.0	23.90	231.00	1,944.7	-323.6	-405.9	519.0	0.28	-0.11	-0.65
2,132.0	26.00	229.70	2,029.0	-348.6	-436.1	558.2	2.33	2.26	-1.40
2,225.0	25.50	229.20	2,112.8	-374.9	-466.8	598.6	0.59	-0.54	-0.54
2,318.0	24.70	227.90	2,197.0	-401.0	-496.4	638.0	1.04	-0.86	-1.40
2,411.0	24.30	231.20	2,281.6	-426.0	-525.7	676.6	1.53	-0.43	3.55
2,503.0	24.90	230.80	2,365.3	-450.1	-555.5	714.9	0.68	0.65	-0.43
2,597.0	24.40	229.30	2,450.7	-475.3	-585.5	754.1	0.85	-0.53	-1.60
2,689.0	25.10	226.20	2,534.2	-501.2	-614.0	792.5	1.60	0.76	-3.37
2,783.0	25.10	227.20	2,619.4	-528.5	-643.0	832.3	0.45	0.00	1.06
2,876.0	25.10	226.40	2,703.6	-555.5	-671.8	871.7	0.36	0.00	-0.86
2,969.0	24.60	225.50	2,788.0	-582.7	-699.9	910.7	0.67	-0.54	-0.97
3,063.0	25.60	227.20	2,873.1	-610.2	-728.7	950.5	1.31	1.06	1.81
3,156.0	25.10	232.50	2,957.2	-635.9	-759.1	990.2	2.50	-0.54	5.70
3,249.0	23.90	228.60	3,041.8	-660.3	-788.9	1,028.8	2.16	-1.29	-4.19
3,342.0	23.30	227.80	3,127.0	-685.1	-816.7	1,066.0	0.73	-0.65	-0.86
3,435.0	24.70	232.20	3,212.0	-709.4	-845.6	1,103.8	2.44	1.51	4.73
3,528.0	23.30	231.80	3,296.9	-732.7	-875.5	1,141.6	1.52	-1.51	-0.43
3,622.0	24.30	232.10	3,382.9	-756.1	-905.3	1,179.5	1.07	1.06	0.32
3,715.0	23.70	233.30	3,467.9	-779.0	-935.4	1,217.3	0.83	-0.65	1.29
3,806.0	24.90	234.40	3,550.8	-801.1	-965.6	1,254.7	1.41	1.32	1.21
3,900.0	23.70	231.40	3,636.5	-824.4	-996.5	1,293.3	1.83	-1.28	-3.19
3,993.0	25.90	232.00	3,720.9	-848.6	-1,027.1	1,332.3	2.38	2.37	0.65
4,086.0	26.60	230.30	3,804.3	-874.4	-1,059.1	1,373.4	1.10	0.75	-1.83
4,179.0	28.20	232.00	3,886.9	-901.2	-1,092.5	1,416.2	1.91	1.72	1.83
4,273.0	27.30	232.90	3,970.1	-927.9	-1,127.2	1,460.0	1.06	-0.96	0.96
4,366.0	25.50	231.60	4,053.4	-953.2	-1,159.9	1,501.3	2.03	-1.94	-1.40
4,459.0	25.30	232.20	4,137.4	-977.8	-1,191.3	1,541.1	0.35	-0.22	0.65
4,552.0	26.90	232.30	4,220.9	-1,002.8	-1,223.6	1,582.0	1.72	1.72	0.11
4,646.0	25.00	230.80	4,305.4	-1,028.4	-1,255.8	1,623.2	2.14	-2.02	-1.60
4,739.0	25.70	229.30	4,389.5	-1,054.0	-1,286.4	1,663.0	1.02	0.75	-1.61
4,832.0	26.30	228.50	4,473.1	-1,080.8	-1,317.1	1,703.7	0.75	0.65	-0.86
4,925.0	23.80	229.80	4,557.3	-1,106.5	-1,346.9	1,743.1	2.75	-2.69	1.40
5,018.0	25.20	231.70	4,641.9	-1,130.9	-1,376.7	1,781.6	1.73	1.51	2.04
5,112.0	24.80	230.80	4,727.1	-1,155.8	-1,407.7	1,821.4	0.59	-0.43	-0.96
5,205.0	23.60	224.60	4,812.0	-1,181.4	-1,435.9	1,859.4	3.02	-1.29	-6.67
5,299.0	21.70	225.90	4,898.7	-1,206.9	-1,461.6	1,895.5	2.09	-2.02	1.38
5,393.0	19.30	232.30	4,986.8	-1,228.5	-1,486.4	1,928.3	3.49	-2.55	6.81
5,486.0	17.70	232.70	5,075.0	-1,246.4	-1,509.8	1,957.8	1.73	-1.72	0.43
5,579.0	17.00	231.80	5,163.7	-1,263.4	-1,531.7	1,985.5	0.81	-0.75	-0.97
5,672.0	15.00	231.10	5,253.1	-1,279.4	-1,551.8	2,011.1	2.16	-2.15	-0.75
5,765.0	13.70	230.40	5,343.2	-1,293.9	-1,569.6	2,034.2	1.41	-1.40	-0.75
5,858.0	11.50	230.40	5,434.0	-1,306.9	-1,585.2	2,054.5	2.37	-2.37	0.00
5,952.0	9.00	234.20	5,526.5	-1,317.2	-1,598.4	2,071.2	2.75	-2.66	4.04

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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)
6,045.0	8.00	237.80	5,618.4	-1,324.9	-1,609.8	2,084.9	1.22	-1.08	3.87
6,139.0	6.00	235.50	5,711.7	-1,331.1	-1,619.4	2,096.2	2.15	-2.13	-2.45
6,232.0	4.70	230.10	5,804.3	-1,336.3	-1,626.3	2,104.9	1.50	-1.40	-5.81
6,325.0	3.30	232.90	5,897.1	-1,340.4	-1,631.4	2,111.4	1.52	-1.51	3.01
6,418.0	2.50	232.90	5,990.0	-1,343.2	-1,635.1	2,116.1	0.86	-0.86	0.00
6,511.0	1.90	229.30	6,082.9	-1,345.5	-1,637.9	2,119.6	0.66	-0.65	-3.87
6,604.0	1.70	224.90	6,175.9	-1,347.4	-1,640.1	2,122.6	0.26	-0.22	-4.73
6,628.8	1.58	228.30	6,200.7	-1,347.9	-1,640.6	2,123.3	0.61	-0.47	13.70
PERMIT TARGET BHL 50'FSL, 50'FEL									
6,628.9	1.58	228.30	6,200.7	-1,347.9	-1,640.6	2,123.3	0.00	0.00	0.00
DRILL TARGET BHL 75'FSL, 75'FEL									
6,697.0	1.30	240.60	6,268.8	-1,348.9	-1,642.0	2,125.0	0.61	-0.42	18.06
6,790.0	0.90	232.20	6,361.8	-1,349.9	-1,643.4	2,126.7	0.46	-0.43	-9.03
6,884.0	1.00	217.70	6,455.8	-1,351.0	-1,644.5	2,128.3	0.28	0.11	-15.43
6,977.0	0.90	221.20	6,548.8	-1,352.2	-1,645.5	2,129.8	0.12	-0.11	3.76
7,070.0	0.70	217.40	6,641.8	-1,353.2	-1,646.3	2,131.1	0.22	-0.22	-4.09
7,163.0	0.80	233.00	6,734.8	-1,354.0	-1,647.2	2,132.3	0.24	0.11	16.77
7,256.0	0.50	231.90	6,827.8	-1,354.7	-1,648.0	2,133.3	0.32	-0.32	-1.18
7,350.0	0.70	235.40	6,921.8	-1,355.2	-1,648.8	2,134.3	0.22	0.21	3.72
7,443.0	0.40	221.30	7,014.8	-1,355.8	-1,649.5	2,135.2	0.35	-0.32	-15.16
7,536.0	0.40	268.60	7,107.8	-1,356.1	-1,650.1	2,135.8	0.35	0.00	50.86
7,629.0	0.30	180.10	7,200.8	-1,356.3	-1,650.4	2,136.2	0.53	-0.11	-95.16
7,722.0	0.20	208.50	7,293.8	-1,356.7	-1,650.5	2,136.5	0.17	-0.11	30.54
7,815.0	0.30	126.80	7,386.8	-1,357.0	-1,650.3	2,136.6	0.36	0.11	-87.85
7,893.0	0.30	126.80	7,464.7	-1,357.2	-1,650.0	2,136.5	0.00	0.00	0.00
HARDLINES 75'S & E OF BHL									

Checked By: _____ Approved By: _____ Date: _____