

Well Name: **Walters 23-21DU**

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

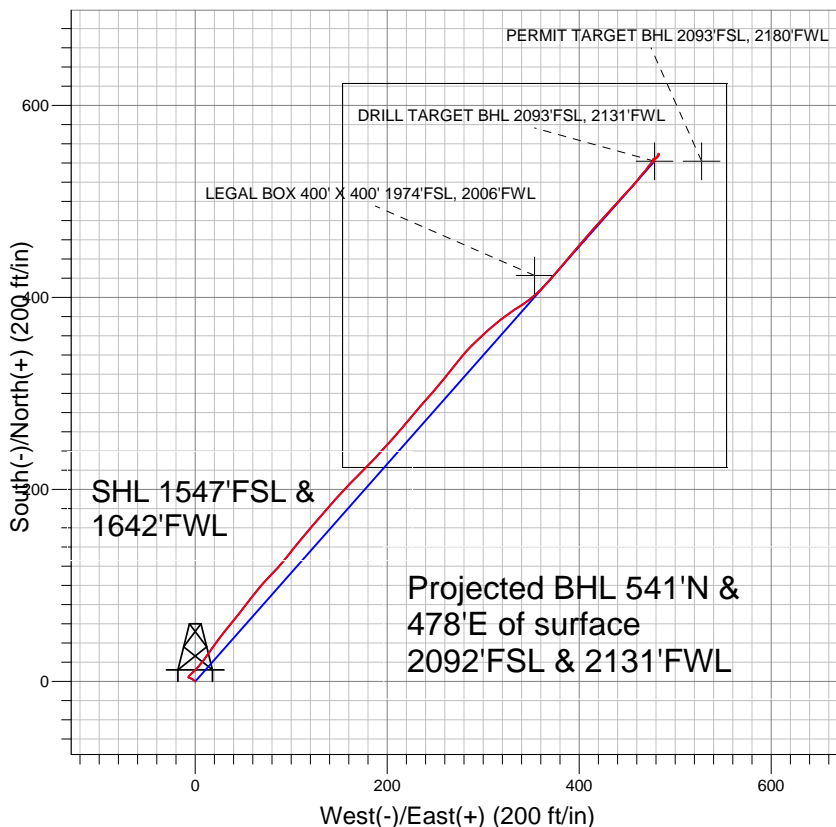
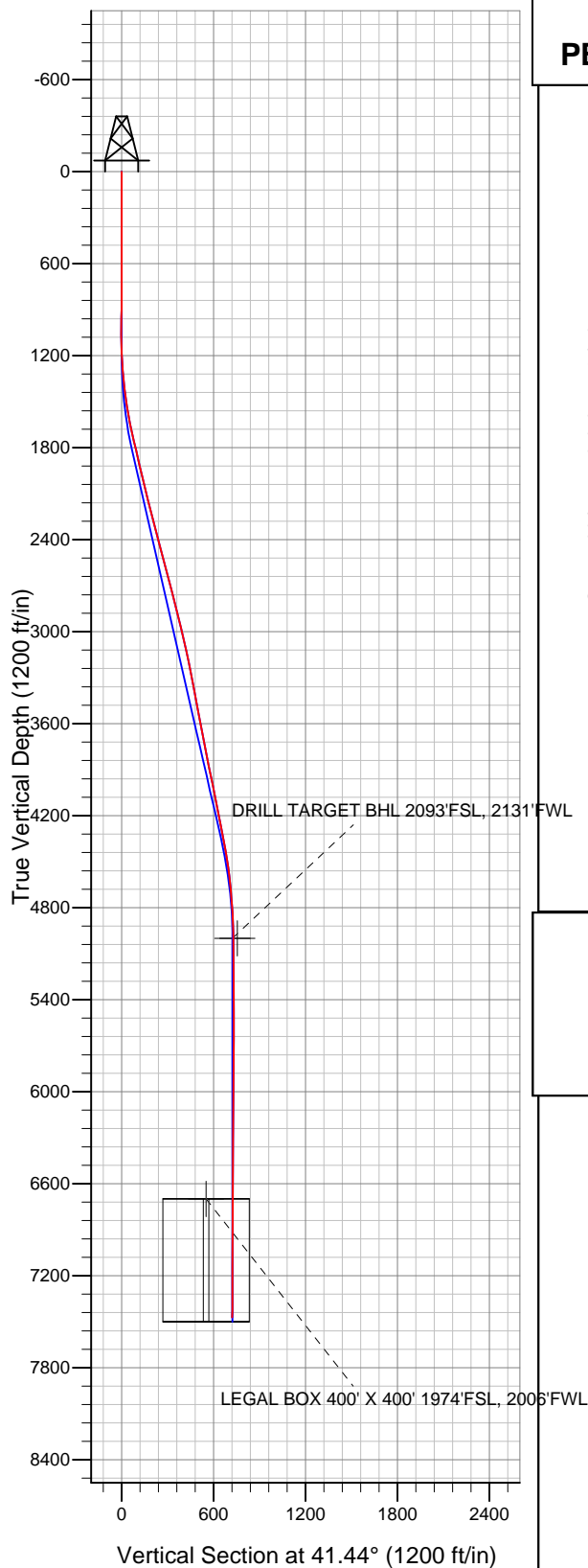
Ground Elevation: 4940.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1351015.07	3167479.97	40.295380	-104.899580

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

Slot

PETROLEUM DEVELOPMENT CORP Weld County CO



LEGEND

- ◆ Walters 23-21DU, Wellbore #1, Plan #1 (6-4-10) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
7549'MD & 7472'TVD @ 722'VS
0.6 deg Inc 144.1 deg AZ

Project: SEC.21-T4N-R67W
Site: Walters/Wedco/Ryland Pad Sec.21-T4N-R67W
Well: Walters 23-21DU
Plan: Wellbore #1



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.21-T4N-R67W

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

Walters 23-21DU

Wellbore #1

Survey: Survey #1

Standard Survey Report

09 May, 2011

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Walters 23-21DU
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:	Walters 23-21DU	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	Walters 23-21DU					
Well Position	+N-S	0.0 ft	Northing:	1,351,015.07 ft	Latitude:	40.295380
	+E-W	0.0 ft	Easting:	3,167,479.97 ft	Longitude:	-104.899580
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	41.44	

Survey Program	Date 5/9/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
704.0	7,549.0	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
704.0	0.50	304.80	704.0	1.8	-2.5	-0.4	0.07	0.07	0.00
797.0	0.70	309.20	797.0	2.3	-3.3	-0.4	0.22	0.22	4.73
890.0	0.70	303.80	890.0	3.0	-4.2	-0.5	0.07	0.00	-5.81
983.0	0.90	292.40	983.0	3.6	-5.4	-0.8	0.27	0.22	-12.26
1,076.0	0.90	273.10	1,076.0	3.9	-6.8	-1.5	0.32	0.00	-20.75
1,170.0	1.40	32.30	1,169.9	4.9	-6.9	-0.9	2.13	0.53	126.81
1,263.0	4.10	44.90	1,262.8	8.3	-3.9	3.6	2.96	2.90	13.55
1,356.0	5.90	45.70	1,355.5	14.0	1.8	11.7	1.94	1.94	0.86
1,450.0	7.30	35.10	1,448.9	22.2	8.7	22.4	1.97	1.49	-11.28
1,543.0	9.70	35.90	1,540.8	33.4	16.7	36.1	2.58	2.58	0.86
1,636.0	11.30	36.40	1,632.3	47.1	26.7	53.0	1.72	1.72	0.54

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Site:	Walters/Wedco/Ryland Pad Sec.21-T4N-R67W	MD Reference:	WELL @ 4953.0ft (Original Well Elev)
Well:	Walters 23-21DU	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)
1,729.0	12.10	40.60	1,723.3	61.8	38.5	71.8	1.26	0.86	4.52
1,823.0	13.80	36.60	1,814.9	78.3	51.6	92.8	2.04	1.81	-4.26
1,916.0	12.90	39.60	1,905.4	95.2	64.8	114.3	1.22	-0.97	3.23
2,009.0	13.40	44.50	1,996.0	110.9	79.0	135.4	1.31	0.54	5.27
2,103.0	14.40	38.40	2,087.2	127.8	93.9	157.9	1.89	1.06	-6.49
2,195.0	14.00	39.40	2,176.4	145.4	108.0	180.5	0.51	-0.43	1.09
2,289.0	14.00	40.60	2,267.6	162.8	122.7	203.2	0.31	0.00	1.28
2,382.0	14.40	41.40	2,357.8	180.0	137.6	226.0	0.48	0.43	0.86
2,475.0	14.30	41.90	2,447.9	197.2	152.9	249.1	0.17	-0.11	0.54
2,568.0	15.70	45.30	2,537.7	214.6	169.6	273.1	1.78	1.51	3.66
2,661.0	15.70	43.50	2,627.3	232.6	187.2	298.3	0.52	0.00	-1.94
2,754.0	14.60	41.30	2,717.0	250.5	203.6	322.5	1.33	-1.18	-2.37
2,847.0	13.40	40.00	2,807.3	267.6	218.2	345.0	1.33	-1.29	-1.40
2,940.0	14.30	41.20	2,897.6	284.5	232.7	367.3	1.02	0.97	1.29
3,034.0	13.60	41.10	2,988.8	301.6	247.6	390.0	0.75	-0.74	-0.11
3,127.0	12.30	39.10	3,079.4	317.5	261.1	410.8	1.48	-1.40	-2.15
3,220.0	12.80	37.70	3,170.2	333.3	273.6	431.0	0.63	0.54	-1.51
3,313.0	11.10	44.50	3,261.2	347.9	286.2	450.2	2.37	-1.83	7.31
3,406.0	10.50	47.70	3,352.5	360.0	298.7	467.6	0.91	-0.65	3.44
3,499.0	10.50	48.60	3,444.0	371.3	311.4	484.4	0.18	0.00	0.97
3,592.0	11.50	56.20	3,535.3	382.0	325.4	501.8	1.89	1.08	8.17
3,685.0	11.00	55.80	3,626.5	392.2	340.5	519.3	0.54	-0.54	-0.43
3,778.0	10.50	48.60	3,717.9	402.8	354.2	536.3	1.54	-0.54	-7.74
3,872.0	11.20	42.10	3,810.2	415.2	366.7	554.0	1.50	0.74	-6.91
3,965.0	12.50	40.10	3,901.2	429.6	379.2	573.0	1.47	1.40	-2.15
4,058.0	11.50	39.80	3,992.2	444.4	391.7	592.4	1.08	-1.08	-0.32
4,151.0	10.90	41.50	4,083.4	458.1	403.4	610.4	0.74	-0.65	1.83
4,244.0	11.10	40.30	4,174.7	471.6	415.0	628.2	0.33	0.22	-1.29
4,337.0	11.60	43.30	4,265.9	485.2	427.2	646.5	0.83	0.54	3.23
4,430.0	10.90	41.70	4,357.1	498.6	439.5	664.6	0.82	-0.75	-1.72
4,523.0	10.00	43.30	4,448.5	511.0	450.9	681.5	1.02	-0.97	1.72
4,617.0	7.30	38.20	4,541.5	521.6	460.2	695.6	2.98	-2.87	-5.43
4,710.0	6.20	40.50	4,633.8	530.1	467.1	706.5	1.22	-1.18	2.47
4,803.0	4.70	37.00	4,726.4	537.0	472.6	715.3	1.65	-1.61	-3.76
4,896.0	3.60	43.40	4,819.1	542.1	476.9	722.1	1.28	-1.18	6.88
4,989.0	1.90	49.20	4,912.0	545.2	480.1	726.5	1.85	-1.83	6.24
5,076.9	0.86	42.00	4,999.9	546.7	481.7	728.6	1.20	-1.18	-8.20
DRILL TARGET BHL 2093'FSL, 2131'FWL									
5,077.7	0.85	41.85	5,000.7	546.7	481.7	728.6	1.20	-1.17	-18.27
PERMIT TARGET BHL 2093'FSL, 2180'FWL									
5,082.0	0.80	41.00	5,005.0	546.7	481.7	728.7	1.20	-1.16	-19.64
5,175.0	0.50	36.60	5,098.0	547.6	482.4	729.7	0.33	-0.32	-4.73
5,361.0	0.30	11.60	5,284.0	548.7	483.0	731.0	0.14	-0.11	-13.44
5,548.0	0.30	331.30	5,471.0	549.6	482.8	731.6	0.11	0.00	-21.55
5,734.0	0.30	209.20	5,657.0	549.6	482.4	731.2	0.28	0.00	-65.65
5,920.0	0.50	196.60	5,843.0	548.4	481.9	730.0	0.12	0.11	-6.77
6,106.0	0.40	191.30	6,029.0	547.0	481.5	728.7	0.06	-0.05	-2.85
6,295.0	0.40	237.30	6,218.0	546.0	480.8	727.5	0.17	0.00	24.34
6,481.0	0.20	266.80	6,404.0	545.6	480.0	726.7	0.13	-0.11	15.86
6,667.0	0.40	242.20	6,590.0	545.3	479.1	725.8	0.13	0.11	-13.23
6,778.4	0.46	234.87	6,701.3	544.9	478.4	725.0	0.07	0.05	-6.58
LEGAL BOX 400' X 400' 1974'FSL, 2006'FWL									
6,852.0	0.50	231.00	6,775.0	544.5	477.9	724.4	0.07	0.06	-5.26

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7,037.0	0.40	224.90	6,960.0	543.5	476.8	723.0	0.06	-0.05	-3.30
7,223.0	0.30	168.90	7,146.0	542.6	476.4	722.1	0.18	-0.05	-30.11
7,409.0	0.40	129.90	7,332.0	541.7	477.0	721.8	0.14	0.05	-20.97
7,502.0	0.60	144.10	7,425.0	541.1	477.6	721.7	0.25	0.22	15.27
7,549.0	0.60	144.10	7,471.9	540.7	477.8	721.6	0.00	0.00	0.00

Checked By: _____	Approved By: _____	Date: _____
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