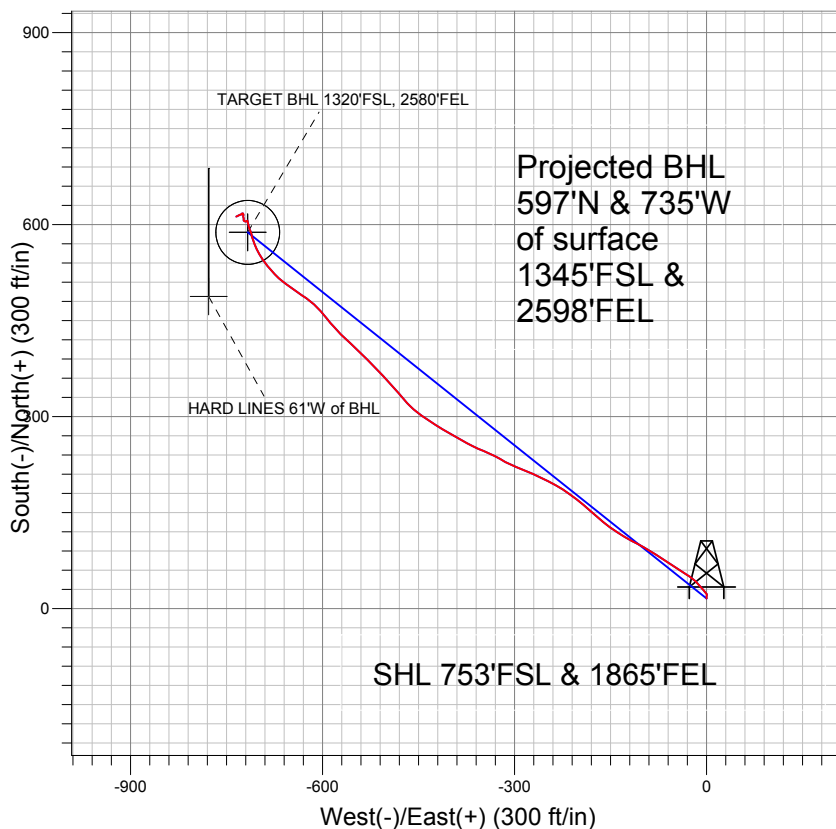


Anadarko, Weld County CO



LEGEND

- ✕ Cottonwood 23-33, Wellbore #1, Plan #1 (11-04-10) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
 7805'MD & 7683'TVD @ 947' VS
 3.2 deg Inc 243.9 deg AZ

Project: SEC.33-T2N-R66W
 Site: Cottonwood 15-33 Pad Sec.33-T2N-R66W
 Well: Cottonwood 23-33
 Plan: Wellbore #1



Anadarko, Weld County CO

SEC.33-T2N-R66W

Cottonwood 15-33 Pad Sec.33-T2N-R66W

Cottonwood 23-33

Wellbore #1

Survey: Survey #1

Standard Survey Report

15 December, 2010



Company:	Anadarko, Weld County CO	Local Co-ordinate Reference:	Site Cottonwood 15-33 Pad Sec.33-T2N-R66W
Project:	SEC.33-T2N-R66W	TVD Reference:	WELL @ 4997.0ft (Original Well Elev)
Site:	Cottonwood 15-33 Pad Sec.33-T2N-R66W	MD Reference:	WELL @ 4997.0ft (Original Well Elev)
Well:	Cottonwood 23-33	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.33-T2N-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	Cottonwood 15-33 Pad Sec.33-T2N-R66W		
Site Position:		Northing:	1,276,226.88 ft
From:	Lat/Long	Easting:	3,201,622.77 ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	40° 5' 21.786 N
		Longitude:	104° 46' 45.700 W
		Grid Convergence:	0.47 °

Well	Cottonwood 23-33		
Well Position	+N-S	16.0 ft	Northing:
	+E-W	0.0 ft	Easting:
Position Uncertainty		0.0 ft	Wellhead Elevation:
			Latitude:
			Longitude:
			Ground Level:

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/6/2010	8.91	66.81	53,020

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	16.0	0.0	309.09	

Survey Program	Date	12/15/2010			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
174.0	7,805.0	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	16.0	0.0	0.0	0.00	0.00	0.00	
174.0	0.80	0.60	174.0	17.2	0.0	0.8	0.46	0.46	0.00	
263.0	1.20	359.50	263.0	18.8	0.0	1.7	0.45	0.45	-1.24	
355.0	1.00	18.40	355.0	20.5	0.3	2.6	0.45	-0.22	20.54	
446.0	0.60	15.00	446.0	21.7	0.6	3.1	0.44	-0.44	-3.74	
539.0	1.10	326.80	538.9	22.9	0.3	4.2	0.89	0.54	-51.83	
631.0	2.20	318.70	630.9	25.0	-1.4	6.7	1.22	1.20	-8.80	
723.0	4.00	320.10	722.8	28.8	-4.6	11.6	1.96	1.96	1.52	
818.0	5.60	320.10	817.4	34.9	-9.7	19.4	1.68	1.68	0.00	
913.0	7.20	314.10	911.8	42.6	-17.0	29.9	1.82	1.68	-6.32	
953.0	7.60	309.00	951.5	46.0	-20.8	35.1	1.92	1.00	-12.75	
1,056.0	6.80	301.60	1,053.7	53.5	-31.3	47.9	1.19	-0.78	-7.18	
1,151.0	9.50	303.40	1,147.7	60.7	-42.6	61.3	2.85	2.84	1.89	

Company:	Anadarko, Weld County CO	Local Co-ordinate Reference:	Site Cottonwood 15-33 Pad Sec.33-T2N-R66W
Project:	SEC.33-T2N-R66W	TVD Reference:	WELL @ 4997.0ft (Original Well Elev)
Site:	Cottonwood 15-33 Pad Sec.33-T2N-R66W	MD Reference:	WELL @ 4997.0ft (Original Well Elev)
Well:	Cottonwood 23-33	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)
1,246.0	11.80	303.40	1,241.1	70.4	-57.3	78.8	2.42	2.42	0.00
1,341.0	13.40	303.00	1,333.8	81.8	-74.6	99.4	1.69	1.68	-0.42
1,437.0	14.30	300.10	1,427.0	93.8	-94.2	122.1	1.18	0.94	-3.02
1,532.0	16.30	297.30	1,518.6	105.8	-116.2	146.8	2.24	2.11	-2.95
1,627.0	16.80	303.40	1,609.7	119.4	-139.5	173.5	1.90	0.53	6.42
1,722.0	16.30	309.20	1,700.8	135.4	-161.3	200.5	1.82	-0.53	6.11
1,817.0	16.90	311.90	1,791.8	153.1	-181.9	227.6	1.03	0.63	2.84
1,912.0	16.60	308.40	1,882.8	170.7	-202.8	255.0	1.11	-0.32	-3.68
2,009.0	15.50	302.70	1,976.0	186.3	-224.6	281.7	1.98	-1.13	-5.88
2,105.0	16.20	296.80	2,068.4	199.3	-247.4	307.6	1.83	0.73	-6.15
2,200.0	16.40	293.60	2,159.5	210.6	-271.5	333.4	0.97	0.21	-3.37
2,295.0	17.30	292.20	2,250.5	221.3	-296.9	359.9	1.04	0.95	-1.47
2,391.0	17.70	299.80	2,342.0	234.0	-322.7	387.9	2.42	0.42	7.92
2,486.0	17.10	291.60	2,432.7	246.3	-348.3	415.5	2.66	-0.63	-8.63
2,581.0	18.50	299.30	2,523.2	258.8	-374.4	443.7	2.88	1.47	8.11
2,676.0	17.50	299.60	2,613.5	273.3	-400.0	472.6	1.06	-1.05	0.32
2,772.0	15.80	301.90	2,705.5	287.3	-423.6	499.8	1.90	-1.77	2.40
2,867.0	15.70	305.50	2,796.9	301.6	-445.0	525.5	1.03	-0.11	3.79
2,962.0	14.10	315.00	2,888.7	317.3	-463.7	549.8	3.07	-1.68	10.00
3,057.0	16.90	320.10	2,980.3	336.0	-480.7	574.9	3.28	2.95	5.37
3,152.0	16.90	318.40	3,071.2	357.0	-498.8	602.1	0.52	0.00	-1.79
3,247.0	18.20	315.50	3,161.8	377.9	-518.3	630.5	1.65	1.37	-3.05
3,343.0	18.40	312.90	3,252.9	398.9	-539.9	660.5	0.88	0.21	-2.71
3,438.0	17.60	313.00	3,343.3	418.9	-561.4	689.8	0.84	-0.84	0.11
3,532.0	17.60	319.30	3,432.9	439.3	-581.1	717.9	2.03	0.00	6.70
3,564.0	17.80	317.90	3,463.3	446.6	-587.5	727.5	1.47	0.63	-4.38
3,628.0	17.50	321.60	3,524.3	461.4	-600.1	746.6	1.81	-0.47	5.78
3,723.0	15.70	307.00	3,615.4	480.4	-619.2	773.4	4.77	-1.89	-15.37
3,818.0	13.80	303.60	3,707.3	494.4	-638.9	797.5	2.20	-2.00	-3.58
3,913.0	13.70	307.10	3,799.6	507.4	-657.3	820.1	0.88	-0.11	3.68
4,008.0	11.40	315.20	3,892.3	520.9	-672.9	840.6	3.04	-2.42	8.53
4,103.0	10.70	322.70	3,985.5	534.6	-684.9	858.5	1.68	-0.74	7.89
4,199.0	9.00	323.60	4,080.1	547.7	-694.7	874.5	1.78	-1.77	0.94
4,294.0	6.90	336.50	4,174.2	558.9	-701.4	886.7	2.89	-2.21	13.58
4,389.0	6.70	338.20	4,268.5	569.3	-705.8	896.6	0.30	-0.21	1.79
4,484.0	4.80	340.40	4,363.1	578.2	-709.1	904.9	2.01	-2.00	2.32
4,579.0	3.20	349.30	4,457.8	584.5	-711.0	910.3	1.80	-1.68	9.37
4,674.0	1.30	341.10	4,552.7	588.2	-711.8	913.2	2.02	-2.00	-8.63
4,770.0	1.20	338.00	4,648.7	590.1	-712.5	915.0	0.13	-0.10	-3.23
4,865.0	0.80	329.60	4,743.7	591.6	-713.3	916.5	0.45	-0.42	-8.84
4,959.0	0.80	327.30	4,837.7	592.7	-713.9	917.8	0.03	0.00	-2.45
5,054.0	1.20	341.80	4,932.7	594.2	-714.6	919.2	0.50	0.42	15.26
5,150.0	1.10	354.80	5,028.7	596.1	-715.0	920.7	0.29	-0.10	13.54
5,245.0	1.30	349.40	5,123.6	598.1	-715.3	922.2	0.24	0.21	-5.68
5,321.1	1.14	342.59	5,199.8	599.7	-715.7	923.5	0.29	-0.21	-8.95
TARGET BHL 1320'FSL, 2580'FEL									
5,340.0	1.10	340.60	5,218.6	600.0	-715.8	923.8	0.29	-0.20	-10.55
5,435.0	1.10	348.40	5,313.6	601.8	-716.3	925.3	0.16	0.00	8.21
5,530.0	1.30	346.40	5,408.6	603.7	-716.7	926.8	0.22	0.21	-2.11
5,625.0	1.20	351.30	5,503.6	605.7	-717.1	928.4	0.15	-0.11	5.16
5,721.0	0.70	216.30	5,599.6	606.2	-717.6	929.1	1.84	-0.52	-140.63
5,816.0	0.60	244.10	5,694.5	605.6	-718.4	929.3	0.34	-0.11	29.26
5,911.0	0.50	234.20	5,789.5	605.1	-719.2	929.6	0.14	-0.11	-10.42
6,006.0	0.70	282.30	5,884.5	605.0	-720.1	930.3	0.55	0.21	50.63

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6,101.0	0.60	283.80	5,979.5	605.2	-721.1	931.2	0.11	-0.11	1.58
6,196.0	0.70	310.20	6,074.5	605.7	-722.1	932.3	0.33	0.11	27.79
6,292.0	0.50	279.50	6,170.5	606.2	-722.9	933.2	0.39	-0.21	-31.98
6,387.0	0.30	3.40	6,265.5	606.5	-723.3	933.7	0.58	-0.21	88.32
6,482.0	0.80	355.60	6,360.5	607.4	-723.4	934.3	0.53	0.53	-8.21
6,577.0	0.70	11.60	6,455.5	608.6	-723.3	935.0	0.24	-0.11	16.84
6,672.0	0.80	350.90	6,550.5	609.8	-723.3	935.8	0.30	0.11	-21.79
6,767.0	0.70	346.30	6,645.5	611.1	-723.5	936.8	0.12	-0.11	-4.84
6,862.0	0.80	354.40	6,740.5	612.3	-723.7	937.7	0.15	0.11	8.53
6,958.0	0.80	2.40	6,836.5	613.6	-723.8	938.6	0.12	0.00	8.33
7,050.0	1.10	8.70	6,928.5	615.1	-723.6	939.4	0.34	0.33	6.85
7,148.0	1.00	342.50	7,026.4	616.9	-723.7	940.6	0.50	-0.10	-26.73
7,243.0	0.80	272.00	7,121.4	617.7	-724.6	941.8	1.11	-0.21	-74.21
7,290.5	0.69	263.23	7,168.9	617.7	-725.2	942.3	0.33	-0.23	-18.46
TARGET CIRCLE 1320'FSL & 2580'FEL									
7,338.0	0.60	251.50	7,216.4	617.6	-725.8	942.6	0.33	-0.19	-24.70
7,433.0	0.40	184.30	7,311.4	617.1	-726.3	942.7	0.61	-0.21	-70.74
7,529.0	0.40	127.80	7,407.4	616.5	-726.0	942.2	0.39	0.00	-58.85
7,624.0	1.70	258.20	7,502.4	616.0	-727.1	942.7	2.09	1.37	137.26
7,687.0	2.30	247.80	7,565.4	615.4	-729.2	943.9	1.11	0.95	-16.51
7,755.0	3.20	243.90	7,633.3	614.0	-732.2	945.4	1.35	1.32	-5.74
7,805.0	3.20	243.90	7,683.2	612.8	-734.7	946.5	0.00	0.00	0.00
HARD LINES 61'W of BHL									

Checked By: _____	Approved By: _____	Date: _____
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