

# EOG Resources, Inc.

Weld County, CO  
Sec. 12-T11N-R63W  
Critter Creek 06-12H

Plan #2

Design: MWD Survey

## Sperry Drilling Services Standard Report

02 September, 2010

Well Coordinates: 587,853.33 N, 2,307,444.84 E (40° 56' 30.32" N, 104° 23' 13.98" W)  
Ground Level: 5,270.00 ft

Local Coordinate Origin:	Centered on Well Critter Creek 06-12H
Viewing Datum:	RKB 21' @ 5291.00ft (SST 56)
TVDs to System:	N
North Reference:	True
Unit System:	API - US Survey Feet - Custom
Geodetic Scale Factor Applied	
Version: 2003.16 Build: 43I	

**HALLIBURTON**

**Design Report for Critter Creek 06-12H - MWD Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,419.00	0.00	0.00	1,419.00	0.00	0.00	0.00	0.00
<b>Surface Casing Assumed Vertical at 1419.00ft</b>							
1,465.00	0.31	100.51	1,465.00	-0.02	0.12	0.10	0.67
<b>First MWD Survey</b>							
1,591.00	0.31	130.70	1,591.00	-0.31	0.72	0.73	0.13
1,718.00	0.44	141.27	1,718.00	-0.91	1.28	1.55	0.12
1,844.00	0.15	138.63	1,843.99	-1.41	1.69	2.20	0.23
1,970.00	0.28	160.99	1,969.99	-1.83	1.90	2.64	0.12
2,097.00	0.17	125.79	2,096.99	-2.23	2.16	3.10	0.14
2,224.00	0.04	99.50	2,223.99	-2.35	2.35	3.32	0.11
2,351.00	0.28	112.31	2,350.99	-2.47	2.68	3.65	0.19
2,477.00	0.34	117.71	2,476.99	-2.76	3.30	4.29	0.05
2,604.00	0.71	139.44	2,603.98	-3.54	4.14	5.44	0.33
2,889.00	0.70	116.36	2,888.96	-5.65	6.85	8.85	0.10
3,175.00	0.52	120.84	3,174.95	-7.09	9.53	11.77	0.07
3,460.00	0.26	114.79	3,459.94	-8.03	11.23	13.64	0.09
3,745.00	0.03	111.93	3,744.94	-8.33	11.89	14.32	0.08
4,031.00	0.09	156.21	4,030.94	-8.56	12.05	14.60	0.03
4,316.00	0.52	155.19	4,315.93	-9.94	12.68	16.01	0.15
4,601.00	0.49	112.23	4,600.92	-11.57	14.35	18.35	0.13
4,887.00	0.54	41.91	4,886.91	-11.03	16.38	19.42	0.21
5,172.00	0.90	43.26	5,171.89	-8.40	18.81	19.32	0.13
5,457.00	1.08	20.08	5,456.85	-4.25	21.27	18.17	0.15
5,742.00	1.43	39.21	5,741.78	1.03	24.44	16.74	0.19
6,027.00	1.58	54.41	6,026.68	6.07	29.88	17.10	0.15
6,312.00	1.51	55.34	6,311.58	10.49	36.17	18.50	0.03
6,407.00	1.60	49.86	6,406.55	12.06	38.21	18.86	0.18
6,502.00	0.57	83.70	6,501.53	12.97	39.69	19.29	1.23
6,755.00	0.54	62.23	6,754.52	13.66	42.00	20.45	0.08
6,786.00	0.47	56.83	6,785.52	13.80	42.24	20.52	0.27
6,817.00	2.40	149.01	6,816.51	13.31	42.68	21.18	7.95
6,849.00	6.46	156.00	6,848.40	11.09	43.75	23.50	12.78
6,881.00	9.71	157.10	6,880.08	6.96	45.54	27.66	10.17
6,912.00	12.64	156.52	6,910.49	1.44	47.91	33.22	9.46
6,944.00	15.93	156.56	6,941.50	-5.80	51.05	40.53	10.28
6,976.00	19.84	154.92	6,971.95	-14.76	55.10	49.69	12.32
7,007.00	22.76	153.57	7,000.82	-24.89	60.00	60.28	9.55
7,039.00	26.85	152.17	7,029.87	-36.83	66.13	73.02	12.91
7,071.00	31.79	152.18	7,057.76	-50.68	73.44	87.93	15.44
7,103.00	37.03	151.32	7,084.15	-66.60	82.01	105.19	16.44
7,134.00	42.23	153.95	7,108.02	-84.17	91.07	123.95	17.62
7,166.00	46.85	156.23	7,130.82	-104.52	100.50	144.94	15.28
7,198.00	50.68	157.43	7,151.91	-126.64	109.96	167.17	12.30
7,230.00	53.35	157.93	7,171.61	-149.97	119.54	190.34	8.43
7,261.00	56.76	157.63	7,189.36	-173.49	129.15	213.66	11.03
7,293.00	60.98	156.00	7,205.90	-198.66	139.94	238.98	13.89
7,325.00	64.53	155.57	7,220.55	-224.61	151.60	265.47	11.16
7,356.00	66.88	155.78	7,233.30	-250.35	163.24	291.80	7.61
7,388.00	69.76	155.88	7,245.12	-277.48	175.41	319.47	9.00

**Design Report for Critter Creek 06-12H - MWD Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
7,420.00	72.62	156.13	7,255.44	-305.15	187.73	347.64	8.97
7,451.00	75.62	156.55	7,263.92	-332.45	199.69	375.29	9.76
7,483.00	79.62	154.77	7,270.78	-360.92	212.58	404.41	13.63
7,505.00	83.05	153.22	7,274.09	-380.47	222.11	424.90	17.08
7,588.00	87.31	152.54	7,281.07	-454.06	259.81	503.33	5.20
7,619.00	88.08	151.73	7,282.31	-481.44	274.28	532.83	3.60
7,651.00	88.86	150.26	7,283.17	-509.42	289.79	563.48	5.20
7,683.00	89.82	149.34	7,283.54	-537.07	305.89	594.33	4.16
7,715.00	90.86	148.79	7,283.35	-564.52	322.34	625.29	3.68
7,747.00	90.31	148.23	7,283.02	-591.81	339.05	656.32	2.45
7,779.00	89.75	146.78	7,283.00	-618.80	356.24	687.49	4.86
7,810.00	89.05	145.59	7,283.33	-644.55	373.49	717.83	4.45
7,842.00	88.92	145.50	7,283.89	-670.93	391.60	749.23	0.49
7,905.00	91.02	145.03	7,283.93	-722.70	427.49	811.09	3.42
7,969.00	90.40	144.11	7,283.13	-774.85	464.59	874.08	1.73
8,031.00	89.75	143.22	7,283.05	-824.79	501.32	935.27	1.78
8,095.00	89.04	144.62	7,283.73	-876.51	539.01	998.39	2.45
8,158.00	87.84	143.79	7,285.44	-927.59	575.84	1,060.44	2.32
8,221.00	87.35	145.20	7,288.09	-978.83	612.40	1,122.41	2.37
8,284.00	87.49	146.86	7,290.92	-1,031.02	647.56	1,184.06	2.64
8,347.00	87.48	146.96	7,293.69	-1,083.75	681.93	1,245.50	0.16
8,411.00	89.23	147.14	7,295.52	-1,137.44	716.72	1,307.92	2.75
8,473.00	91.73	148.16	7,295.01	-1,189.81	749.89	1,368.26	4.35
8,505.00	92.12	146.96	7,293.93	-1,216.80	767.05	1,399.41	3.94
8,568.00	91.66	147.29	7,291.85	-1,269.68	801.22	1,460.83	0.90
8,631.00	89.97	147.04	7,290.96	-1,322.61	835.38	1,522.26	2.71
8,663.00	89.72	147.59	7,291.04	-1,349.54	852.66	1,553.45	1.89
8,695.00	90.77	147.70	7,290.91	-1,376.57	869.79	1,584.60	3.30
8,727.00	91.29	147.72	7,290.33	-1,403.62	886.88	1,615.74	1.63
8,758.00	91.48	147.45	7,289.58	-1,429.78	903.49	1,645.91	1.06
8,789.00	90.25	147.55	7,289.11	-1,455.92	920.14	1,676.10	3.98
8,821.00	90.43	147.62	7,288.92	-1,482.94	937.30	1,707.26	0.60
8,853.00	90.99	147.52	7,288.53	-1,509.94	954.46	1,738.41	1.78
8,885.00	91.60	147.31	7,287.80	-1,536.90	971.69	1,769.58	2.02
8,917.00	92.22	147.40	7,286.74	-1,563.83	988.94	1,800.75	1.96
8,949.00	90.80	147.31	7,285.89	-1,590.76	1,006.19	1,831.93	4.45
8,981.00	90.62	145.98	7,285.50	-1,617.49	1,023.79	1,863.20	4.19
9,012.00	89.23	146.69	7,285.54	-1,643.29	1,040.97	1,893.53	5.03
9,044.00	89.05	146.18	7,286.02	-1,669.95	1,058.66	1,924.82	1.69
9,076.00	89.54	146.61	7,286.41	-1,696.60	1,076.37	1,956.12	2.04
9,108.00	89.44	147.35	7,286.70	-1,723.43	1,093.81	1,987.35	2.33
9,139.00	89.45	147.13	7,287.00	-1,749.50	1,110.58	2,017.57	0.71
9,171.00	89.72	146.98	7,287.23	-1,776.35	1,127.98	2,048.79	0.97
9,203.00	90.06	148.15	7,287.29	-1,803.36	1,145.14	2,079.95	3.81
9,235.00	89.97	148.44	7,287.28	-1,830.58	1,161.96	2,111.02	0.95
9,267.00	90.40	148.31	7,287.18	-1,857.83	1,178.74	2,142.07	1.40
9,298.00	90.91	147.78	7,286.82	-1,884.13	1,195.15	2,172.19	2.37
9,330.00	91.64	147.99	7,286.11	-1,911.23	1,212.15	2,203.30	2.37
9,361.00	91.97	147.96	7,285.14	-1,937.50	1,228.59	2,233.42	1.07
9,393.00	92.22	147.53	7,283.97	-1,964.54	1,245.65	2,264.54	1.55
9,424.00	91.05	147.84	7,283.08	-1,990.73	1,262.22	2,294.70	3.90

**Design Report for Critter Creek 06-12H - MWD Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
9,456.00	89.97	146.60	7,282.80	-2,017.63	1,279.54	2,325.90	5.14
9,488.00	89.54	145.79	7,282.93	-2,044.22	1,297.34	2,357.22	2.87
9,520.00	89.76	145.58	7,283.13	-2,070.65	1,315.38	2,388.60	0.95
9,552.00	90.09	145.92	7,283.17	-2,097.10	1,333.39	2,419.98	1.48
9,583.00	90.59	145.61	7,282.99	-2,122.73	1,350.83	2,450.37	1.90
9,647.00	91.31	144.01	7,281.93	-2,175.02	1,387.71	2,513.31	2.74
9,710.00	91.19	143.71	7,280.55	-2,225.89	1,424.86	2,575.44	0.51
9,774.00	90.98	143.81	7,279.34	-2,277.50	1,462.68	2,638.57	0.36
9,838.00	90.71	141.90	7,278.40	-2,328.51	1,501.32	2,701.87	3.01
9,900.00	91.23	141.38	7,277.35	-2,377.12	1,539.79	2,763.37	1.19
9,963.00	90.40	141.02	7,276.45	-2,426.21	1,579.27	2,825.92	1.44
10,026.00	90.18	138.01	7,276.13	-2,474.12	1,620.16	2,888.66	4.79
10,089.00	90.56	137.38	7,275.72	-2,520.71	1,662.57	2,951.55	1.17
10,153.00	90.12	135.78	7,275.34	-2,567.19	1,706.55	3,015.50	2.59
10,216.00	90.71	133.80	7,274.89	-2,611.57	1,751.26	3,078.50	3.28
10,279.00	89.72	131.68	7,274.65	-2,654.33	1,797.53	3,141.46	3.71
10,342.00	89.44	131.79	7,275.11	-2,696.26	1,844.54	3,204.39	0.48
10,405.00	89.69	129.83	7,275.59	-2,737.43	1,892.22	3,267.26	3.14
10,468.00	87.43	129.72	7,277.17	-2,777.72	1,940.62	3,330.04	3.59
10,500.00	86.46	129.18	7,278.88	-2,798.03	1,965.29	3,361.87	3.47
10,563.00	86.73	129.07	7,282.62	-2,837.71	2,014.08	3,424.49	0.46
10,625.00	88.43	129.12	7,285.24	-2,876.77	2,062.15	3,486.17	2.74
10,688.00	88.83	130.00	7,286.75	-2,916.89	2,110.71	3,548.93	1.53
10,751.00	90.86	130.07	7,286.92	-2,957.41	2,158.94	3,611.74	3.22
10,815.00	92.10	130.57	7,285.26	-2,998.80	2,207.72	3,675.55	2.09
10,878.00	92.71	129.25	7,282.62	-3,039.19	2,256.00	3,738.30	2.31
10,942.00	91.07	128.17	7,280.51	-3,079.19	2,305.91	3,801.95	3.07
11,006.00	90.61	126.11	7,279.57	-3,117.82	2,356.92	3,865.42	3.30
11,069.00	91.88	124.03	7,278.20	-3,154.01	2,408.47	3,927.57	3.87
11,132.00	91.36	122.79	7,276.42	-3,188.68	2,461.04	3,989.39	2.13
11,196.00	91.38	120.50	7,274.89	-3,222.25	2,515.50	4,051.79	3.58
11,258.00	90.96	118.75	7,273.62	-3,252.89	2,569.38	4,111.72	2.90
11,290.00	89.41	117.82	7,273.52	-3,268.05	2,597.56	4,142.46	5.65
11,322.00	90.89	118.23	7,273.44	-3,283.09	2,625.81	4,173.16	4.80
11,385.00	90.25	117.06	7,272.81	-3,312.32	2,681.61	4,233.48	2.12
11,417.00	89.60	116.27	7,272.85	-3,326.68	2,710.21	4,263.96	3.20
11,481.00	88.98	115.96	7,273.65	-3,354.85	2,767.67	4,324.72	1.08
11,544.00	89.94	115.13	7,274.24	-3,382.01	2,824.51	4,384.34	2.01
11,607.00	90.65	114.62	7,273.91	-3,408.51	2,881.66	4,443.71	1.39
11,670.00	92.68	113.71	7,272.08	-3,434.29	2,939.11	4,502.79	3.53
11,734.00	93.27	111.95	7,268.76	-3,459.09	2,998.02	4,562.23	2.90
11,765.00	92.34	110.42	7,267.25	-3,470.28	3,026.89	4,590.68	5.77
11,797.00	90.84	109.03	7,266.36	-3,481.07	3,057.00	4,619.74	6.39
11,828.00	89.26	107.20	7,266.33	-3,490.71	3,086.46	4,647.53	7.80
11,892.00	88.21	106.74	7,267.74	-3,509.38	3,147.65	4,704.32	1.79
11,955.00	89.01	107.63	7,269.27	-3,527.99	3,207.82	4,760.33	1.90
11,987.00	89.82	108.82	7,269.60	-3,538.00	3,238.22	4,789.04	4.50
12,018.00	90.65	109.31	7,269.47	-3,548.13	3,267.51	4,817.06	3.11
12,050.00	90.46	110.48	7,269.16	-3,559.01	3,297.60	4,846.18	3.70
12,081.00	91.23	112.03	7,268.70	-3,570.25	3,326.49	4,874.68	5.58
12,145.00	90.43	110.87	7,267.78	-3,593.65	3,386.05	4,933.60	2.20

**Design Report for Critter Creek 06-12H - MWD Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
12,208.00	90.68	110.38	7,267.17	-3,615.84	3,445.01	4,991.25	0.87
12,272.00	90.34	112.02	7,266.60	-3,638.98	3,504.67	5,050.07	2.62
12,335.00	90.46	112.76	7,266.16	-3,662.98	3,562.92	5,108.47	1.19
12,366.00	90.65	112.94	7,265.86	-3,675.02	3,591.49	5,137.30	0.84
12,430.00	90.80	112.68	7,265.05	-3,699.83	3,650.48	5,196.81	0.47
12,462.00	91.23	112.20	7,264.48	-3,712.04	3,680.05	5,226.48	2.01
<b>Final MWD Survey</b>							
12,518.00	91.23	112.20	7,263.28	-3,733.20	3,731.89	5,278.31	0.00
<b>Survey Projection to TD</b>							

**Design Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,419.00	1,419.00	0.00	0.00	Surface Casing Assumed Vertical at 1419.00ft
1,465.00	1,465.00	-0.02	0.12	First MWD Survey
12,462.00	7,264.48	-3,712.04	3,680.05	Final MWD Survey
12,518.00	7,263.28	-3,733.20	3,731.89	Survey Projection to TD

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
Target	Critter Creek 06-12H Plan #2 BH Tgt	134.40	Slot	0.00	0.00	0.00

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
1,419.00	12,518.00	Sperry MWD Surveys	MWD

**Design Report for Critter Creek 06-12H - MWD Survey****Targets**

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Critter Creek 06-12H - actual wellpath misses target center by 131.69ft at 12518.00ft MD (7263.28 TVD, -3733.20 N, 3731.89 E) - Point	0.00	0.00	7,202.00	-3,764.91	3,844.06	584,136.85	2,311,335.96	40° 55' 53.112 N	104° 22' 23.902 W
Critter Creek 06-12H - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	587,853.33	2,307,444.84	40° 56' 30.316 N	104° 23' 13.982 W
Point 1				-812.00	-4,365.00	583,478.36	2,306,687.66		
Point 2				4,444.00	-4,365.00	583,544.32	2,311,943.40		
Critter Creek 06-12H - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	587,853.33	2,307,444.84	40° 56' 30.316 N	104° 23' 13.982 W
Point 1				4,444.00	875.00	588,784.06	2,311,877.64		
Point 2				4,444.00	-4,365.00	583,544.32	2,311,943.40		
Critter Creek 06-12H - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	587,853.33	2,307,444.84	40° 56' 30.316 N	104° 23' 13.982 W
Point 1				-212.00	275.00	588,125.66	2,307,229.40		
Point 2				-212.00	-3,765.00	584,085.86	2,307,280.10		
Critter Creek 06-12H - actual wellpath misses target center by 89.10ft at 9163.28ft MD (7287.19 TVD, -1769.88 N, 1123.78 E) - Point	0.00	0.00	7,202.00	-1,784.60	1,102.20	586,082.65	2,308,569.38	40° 56' 12.682 N	104° 22' 59.622 W
Critter Creek 06-12H - actual wellpath misses target center by 70.08ft at 11985.26ft MD (7269.59 TVD, -3537.44 N, 3236.56 E) - Point	0.00	0.00	7,202.00	-3,520.10	3,243.00	584,374.10	2,310,731.86	40° 55' 55.532 N	104° 22' 31.732 W
Critter Creek 06-12H - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	587,853.33	2,307,444.84	40° 56' 30.316 N	104° 23' 13.982 W
Point 1				3,844.00	275.00	588,176.56	2,311,285.20		
Point 2				3,844.00	-3,765.00	584,136.76	2,311,335.90		
Critter Creek 06-12H - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	587,853.33	2,307,444.84	40° 56' 30.316 N	104° 23' 13.982 W
Point 1				-812.00	875.00	588,718.10	2,306,621.90		
Point 2				-812.00	-4,365.00	583,478.36	2,306,687.66		
Critter Creek 06-12H - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	587,853.33	2,307,444.84	40° 56' 30.316 N	104° 23' 13.982 W
Point 1				-212.00	-3,765.00	584,085.86	2,307,280.10		
Point 2				3,844.00	-3,765.00	584,136.76	2,311,335.90		
Critter Creek 06-12H - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	587,853.33	2,307,444.84	40° 56' 30.316 N	104° 23' 13.982 W
Point 1				-212.00	275.00	588,125.66	2,307,229.40		
Point 2				3,844.00	275.00	588,176.56	2,311,285.20		
Critter Creek 06-12H - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	587,853.33	2,307,444.84	40° 56' 30.316 N	104° 23' 13.982 W
Point 1				-812.00	875.00	588,718.10	2,306,621.90		
Point 2				4,444.00	875.00	588,784.06	2,311,877.64		

**North Reference Sheet for Sec. 12-T11N-R63W - Critter Creek 06-12H - Plan #2**

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to RKB 21' @ 5291.00ft (SST 56). Northing and Easting are relative to Critter Creek 06-12H

Coordinate System is US State Plane 1927 (Exact solution), Colorado North 501 using datum NAD 1927 (NADCON CONUS), ellipsoid Clarke 1866

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 105° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°

False Easting: 2,000,000.00ft, False Northing: 0.00ft, Scale Reduction: 1.00002955

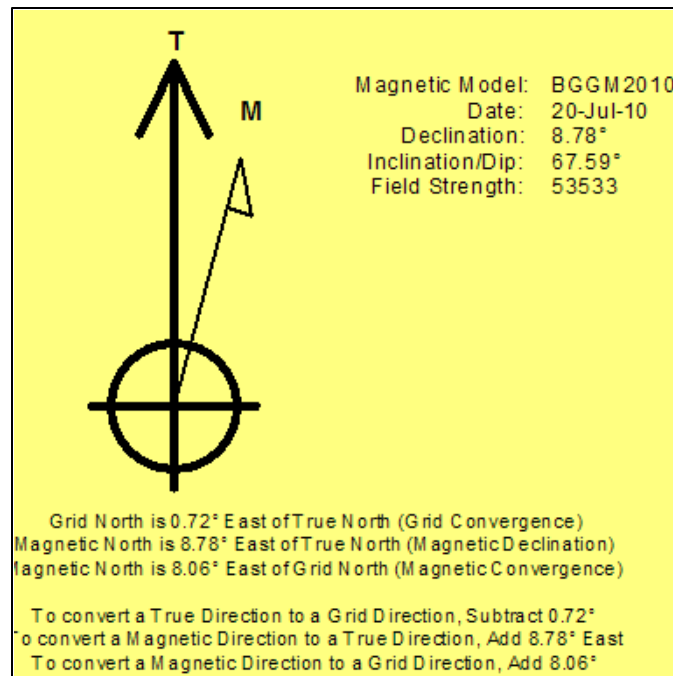
Grid Coordinates of Well: 587,853.33 ft N, 2,307,444.84 ft E

Geographical Coordinates of Well: 40° 56' 30.32" N, 104° 23' 13.98" W

Grid Convergence at Surface is: 0.72°

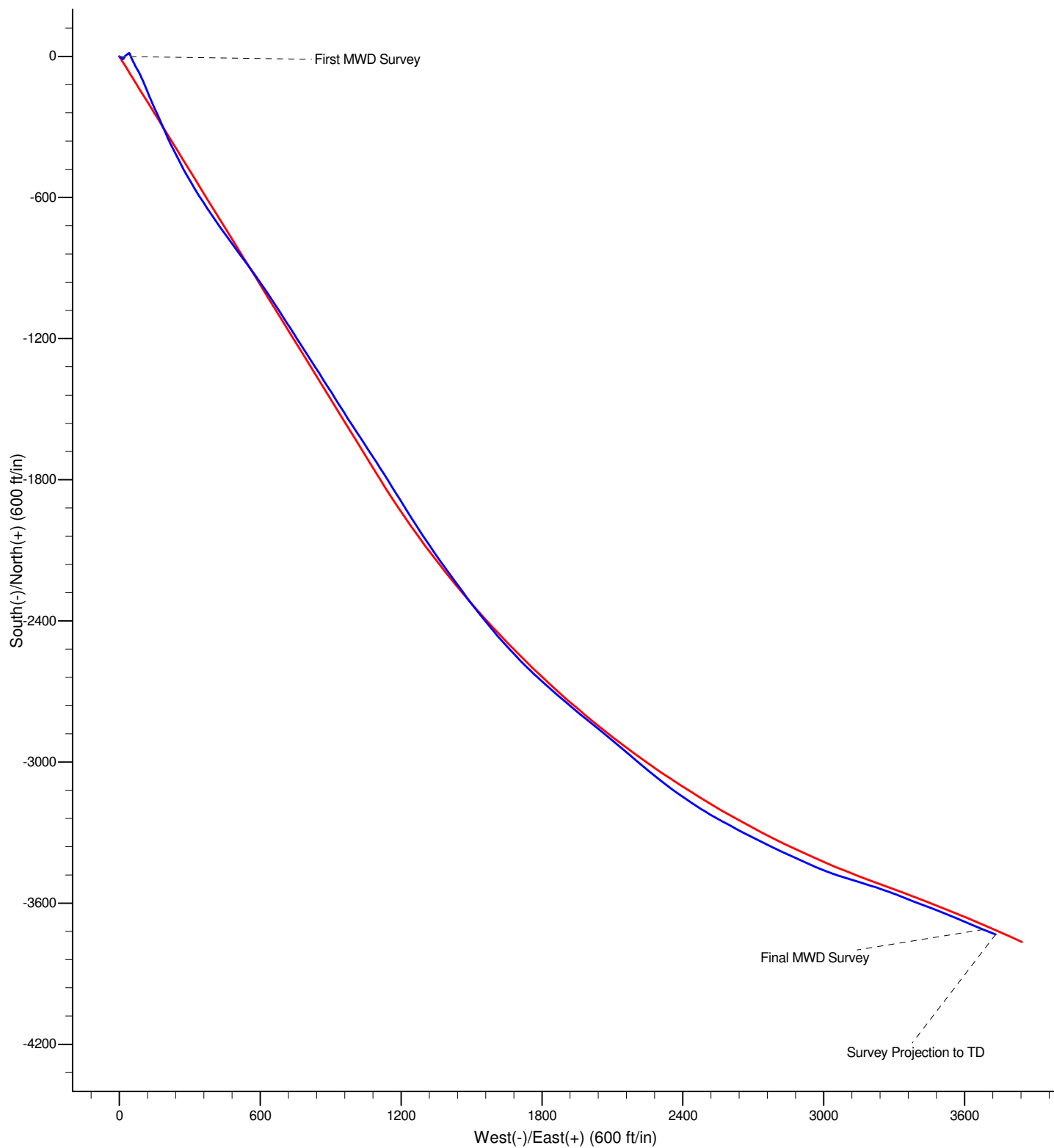
Based upon Minimum Curvature type calculations, at a Measured Depth of 12,518.00ft  
the Bottom Hole Displacement is 5,278.61ft in the Direction of 135.01° (True).

Magnetic Convergence at surface is: -8.06° (20 July 2010, , BGGM2010)



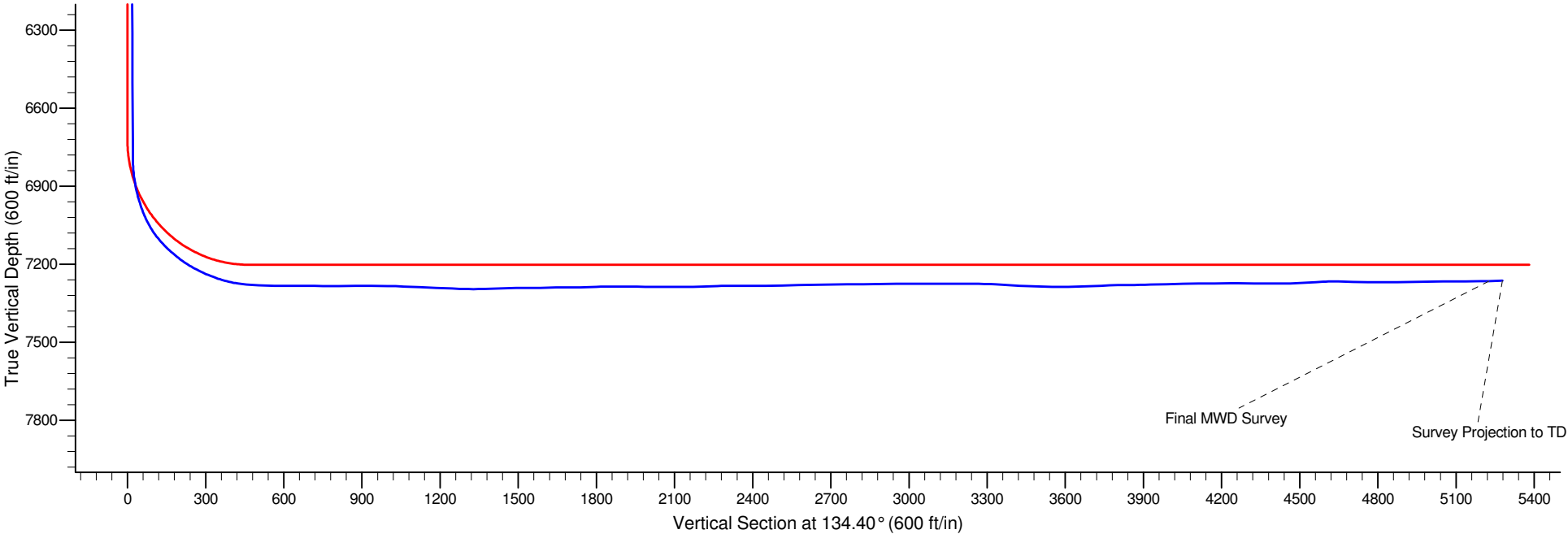
LEGEND

- Critter Creek 06-12H, Plan #2, Plan #2 Proposal V0
- MWD Survey



Project: Weld County, CO  
Site: Sec. 12-T11N-R63W  
Well: Critter Creek 06-12H

EOG Resources, Inc.



LEGEND

- Critter Creek 06-12H, Plan #2, Plan #2 Proposal V0
- MWD Survey