

Bill Barrett Corp

Weld County, CO (NAD 1983)

Sec. 35-T6N-R62W

Dutch Lake 23-35H

Plan B

Survey: Sperry MWD Surveys (Orig Hole)

Sperry Drilling Services

Standard Report

20 February, 2013

Well Coordinates: 1,408,994.82 N, 3,334,566.39 E (40° 26' 59.52" N, 104° 17' 52.11" W)

Ground Level: 4,673.00 ft

Local Coordinate Origin:

Centered on Well Dutch Lake 23-35H

Viewing Datum:

RKB 16' @ 4689.00ft (Xtreme 15)

TVDs to System:

N

North Reference:

Grid

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

HALLIBURTON

Survey Report for Dutch Lake 23-35H - Sperry MWD Surveys (Orig Hole)

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
829.00	0.00	0.000	829.00	0.00	0.00	0.00	0.00
Tie-On (Assumed Vertical) @ 829.00' MD							
935.00	0.25	63.670	935.00	0.10	0.21	0.21	0.24
First Sperry MWD Survey (Orig Hole) @ 935.00' MD							
1,029.00	0.49	53.010	1,029.00	0.44	0.71	0.71	0.26
1,122.00	0.53	47.280	1,122.00	0.97	1.35	1.33	0.07
1,216.00	0.63	38.320	1,215.99	1.67	1.99	1.97	0.14
1,310.00	0.96	50.590	1,309.98	2.57	2.91	2.88	0.39
1,403.00	1.18	53.660	1,402.97	3.63	4.29	4.24	0.24
1,497.00	1.40	300.210	1,496.95	4.79	4.07	4.02	2.30
1,587.00	2.54	268.530	1,586.90	5.29	1.13	1.07	1.71
1,690.00	3.12	260.970	1,689.78	4.79	-3.92	-3.98	0.67
1,775.00	3.11	276.010	1,774.65	4.67	-8.50	-8.55	0.96
1,861.00	4.79	258.680	1,860.45	4.21	-14.34	-14.39	2.38
1,946.00	6.64	254.770	1,945.02	2.22	-22.56	-22.59	2.22
2,032.00	7.65	245.360	2,030.36	-1.47	-32.56	-32.54	1.79
2,117.00	8.62	245.180	2,114.50	-6.51	-43.49	-43.40	1.14
2,203.00	8.92	247.530	2,199.49	-11.76	-55.50	-55.35	0.54
2,288.00	9.47	250.600	2,283.40	-16.60	-68.18	-67.98	0.87
2,374.00	8.60	250.380	2,368.34	-21.11	-80.91	-80.65	1.01
2,459.00	10.40	251.810	2,452.17	-25.64	-94.19	-93.87	2.14
2,544.00	11.86	252.370	2,535.57	-30.68	-109.80	-109.42	1.72
2,630.00	11.11	253.920	2,619.84	-35.65	-126.19	-125.75	0.94
2,715.00	10.67	254.910	2,703.31	-39.97	-141.65	-141.16	0.56
2,801.00	10.28	252.910	2,787.88	-44.30	-156.67	-156.13	0.62
2,886.00	9.70	252.530	2,871.59	-48.68	-170.76	-170.15	0.69
2,972.00	9.57	246.190	2,956.38	-53.74	-184.21	-183.54	1.24
3,057.00	10.38	250.080	3,040.09	-59.20	-197.87	-197.14	1.24
3,143.00	9.31	248.370	3,124.83	-64.40	-211.62	-210.83	1.29
3,228.00	9.86	244.790	3,208.64	-70.04	-224.60	-223.74	0.95
3,314.00	9.47	252.340	3,293.42	-75.32	-238.00	-237.07	1.54
3,400.00	9.95	251.950	3,378.19	-79.77	-251.81	-250.83	0.56
3,485.00	12.00	257.470	3,461.63	-83.96	-267.42	-266.38	2.71
3,570.00	12.48	259.990	3,544.70	-87.47	-285.09	-284.01	0.84
3,656.00	11.02	254.900	3,628.90	-91.23	-302.18	-301.05	2.08
3,742.00	10.98	254.620	3,713.32	-95.54	-318.01	-316.83	0.08
3,828.00	10.34	251.900	3,797.84	-100.11	-333.24	-332.01	0.95
3,913.00	9.73	247.380	3,881.54	-105.25	-347.12	-345.83	1.17
3,999.00	10.43	248.970	3,966.21	-110.84	-361.10	-359.73	0.88
4,085.00	9.17	248.330	4,050.95	-116.16	-374.73	-373.30	1.47
4,170.00	10.10	257.740	4,134.76	-120.24	-388.31	-386.83	2.15
4,256.00	9.62	255.400	4,219.49	-123.66	-402.63	-401.11	0.73
4,342.00	8.90	250.950	4,304.37	-127.64	-415.88	-414.30	1.18
4,427.00	8.08	244.730	4,388.44	-132.34	-427.49	-425.86	1.45
4,513.00	7.59	239.970	4,473.63	-137.76	-437.88	-436.18	0.95
4,599.00	9.01	244.900	4,558.73	-143.46	-448.89	-447.13	1.85
4,684.00	8.06	243.360	4,642.79	-148.95	-460.25	-458.41	1.15
4,770.00	5.79	244.700	4,728.16	-153.51	-469.56	-467.67	2.65
4,855.00	3.79	248.060	4,812.86	-156.39	-476.04	-474.12	2.37
4,940.00	0.53	258.510	4,897.78	-157.52	-479.03	-477.09	3.85

Survey Report for Dutch Lake 23-35H - Sperry MWD Surveys (Orig Hole)

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,026.00	0.11	245.280	4,983.78	-157.63	-479.50	-477.56	0.49
5,111.00	0.22	51.810	5,068.78	-157.57	-479.44	-477.50	0.39
5,196.00	0.09	131.730	5,153.78	-157.51	-479.27	-477.33	0.26
5,281.00	0.17	198.300	5,238.78	-157.68	-479.26	-477.32	0.19
5,367.00	0.47	217.750	5,324.78	-158.08	-479.51	-477.57	0.37
5,452.00	0.86	197.490	5,409.78	-158.96	-479.92	-477.96	0.53
5,537.00	1.02	189.950	5,494.76	-160.31	-480.24	-478.27	0.24
5,580.00	0.83	206.660	5,537.76	-160.97	-480.44	-478.46	0.76
5,622.00	0.66	195.090	5,579.76	-161.47	-480.64	-478.66	0.54
5,665.00	2.87	106.620	5,622.74	-162.02	-479.68	-477.68	6.81
5,707.00	7.14	102.700	5,664.57	-162.90	-476.12	-474.12	10.19
5,750.00	9.07	104.080	5,707.13	-164.31	-470.23	-468.21	4.51
5,793.00	9.81	104.160	5,749.55	-166.03	-463.39	-461.35	1.72
5,835.00	10.11	99.190	5,790.92	-167.49	-456.28	-454.22	2.17
5,878.00	12.82	94.300	5,833.06	-168.45	-447.79	-445.73	6.69
5,920.00	17.62	90.730	5,873.57	-168.88	-436.78	-434.71	11.64
5,963.00	22.68	91.000	5,913.93	-169.11	-421.98	-419.90	11.77
6,006.00	27.94	90.440	5,952.79	-169.33	-403.60	-401.53	12.25
6,048.00	33.44	87.850	5,988.89	-168.98	-382.18	-380.11	13.47
6,091.00	38.65	85.970	6,023.65	-167.59	-356.93	-354.88	12.39
6,134.00	42.46	87.170	6,056.32	-165.93	-329.03	-327.00	9.04
6,176.00	46.15	89.770	6,086.37	-165.16	-299.71	-297.69	9.79
6,219.00	49.04	91.550	6,115.37	-165.54	-267.97	-265.95	7.38
6,261.00	52.73	91.530	6,141.86	-166.42	-235.40	-233.37	8.79
6,304.00	55.81	91.700	6,166.97	-167.40	-200.51	-198.47	7.17
6,358.00	59.34	92.730	6,195.92	-169.17	-154.97	-152.92	6.73
6,401.00	64.80	91.790	6,216.05	-170.66	-117.03	-114.95	12.84
6,443.00	69.79	90.550	6,232.26	-171.44	-78.30	-76.22	12.19
6,486.00	71.03	89.160	6,246.67	-171.34	-37.79	-35.72	4.19
6,529.00	73.15	89.050	6,259.90	-170.70	3.12	5.18	4.94
6,571.00	75.42	90.820	6,271.27	-170.66	43.54	45.60	6.76
6,614.00	79.34	93.690	6,280.67	-172.32	85.46	87.53	11.20
6,657.00	83.71	95.410	6,287.00	-175.69	127.84	129.96	10.91
6,705.00	90.28	97.620	6,289.52	-181.13	175.44	177.61	14.44
6,734.00	93.20	97.340	6,288.64	-184.90	204.17	206.39	10.12
6,819.00	93.20	96.720	6,283.89	-195.29	288.40	290.74	0.73
6,904.00	93.95	94.590	6,278.59	-203.65	372.82	375.25	2.65
6,989.00	92.59	92.950	6,273.74	-209.23	457.49	459.99	2.50
7,074.00	92.56	90.510	6,269.93	-211.79	542.36	544.88	2.87
7,159.00	92.22	89.910	6,266.38	-212.10	627.29	629.80	0.81
7,245.00	91.57	89.070	6,263.54	-211.34	713.23	715.74	1.23
7,330.00	90.77	88.440	6,261.80	-209.49	798.20	800.67	1.20
7,415.00	92.13	88.500	6,259.65	-207.22	883.14	885.58	1.60
7,500.00	90.92	87.750	6,257.39	-204.44	968.06	970.46	1.67
7,586.00	89.17	85.950	6,257.32	-199.72	1,053.92	1,056.26	2.92
7,671.00	91.17	86.420	6,257.07	-194.06	1,138.73	1,140.99	2.42
7,756.00	91.60	85.980	6,255.01	-188.43	1,223.52	1,225.70	0.72
7,842.00	91.14	86.030	6,252.96	-182.44	1,309.28	1,311.39	0.54
7,927.00	90.62	85.380	6,251.65	-176.08	1,394.03	1,396.06	0.98
8,012.00	91.14	85.660	6,250.35	-169.44	1,478.76	1,480.70	0.69
8,097.00	89.69	86.020	6,249.73	-163.27	1,563.53	1,565.39	1.76

Survey Report for Dutch Lake 23-35H - Sperry MWD Surveys (Orig Hole)

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8,182.00	89.41	85.370	6,250.40	-156.89	1,648.29	1,650.07	0.83
8,267.00	89.54	84.870	6,251.18	-149.66	1,732.98	1,734.66	0.61
8,352.00	89.85	86.210	6,251.63	-143.05	1,817.72	1,819.31	1.62
8,438.00	91.30	86.580	6,250.77	-137.64	1,903.54	1,905.07	1.74
8,523.00	92.13	89.050	6,248.22	-134.40	1,988.43	1,989.91	3.06
8,608.00	92.50	89.630	6,244.79	-133.43	2,073.36	2,074.82	0.81
8,693.00	93.42	89.080	6,240.40	-132.47	2,158.24	2,159.68	1.26
8,778.00	93.05	89.030	6,235.60	-131.07	2,243.09	2,244.51	0.44
8,863.00	92.28	88.970	6,231.65	-129.59	2,327.99	2,329.38	0.91
8,948.00	92.80	89.130	6,227.88	-128.18	2,412.89	2,414.26	0.64
9,033.00	92.25	89.200	6,224.14	-126.94	2,497.80	2,499.15	0.65
9,118.00	91.82	90.420	6,221.12	-126.66	2,582.74	2,584.08	1.52
9,204.00	91.79	89.480	6,218.41	-126.59	2,668.70	2,670.03	1.09
9,289.00	91.57	88.570	6,215.92	-125.14	2,753.65	2,754.96	1.10
9,374.00	92.37	88.480	6,213.00	-122.96	2,838.57	2,839.85	0.95
9,460.00	93.27	87.750	6,208.77	-120.13	2,924.42	2,925.66	1.35
9,545.00	92.55	88.760	6,204.45	-117.55	3,009.27	3,010.47	1.46
9,630.00	91.29	90.100	6,201.60	-116.70	3,094.21	3,095.40	2.16
9,673.00	90.58	90.280	6,200.90	-116.84	3,137.21	3,138.39	1.70
9,715.00	89.48	90.390	6,200.88	-117.09	3,179.20	3,180.39	2.63
9,800.00	89.35	89.490	6,201.75	-117.00	3,264.20	3,265.37	1.07
9,886.00	89.04	88.800	6,202.96	-115.72	3,350.18	3,351.33	0.88
9,971.00	89.23	88.440	6,204.24	-113.67	3,435.15	3,436.27	0.48
10,056.00	89.63	87.350	6,205.09	-110.55	3,520.08	3,521.16	1.37
10,142.00	90.59	87.080	6,204.92	-106.37	3,605.98	3,607.00	1.16
10,227.00	90.71	86.660	6,203.96	-101.73	3,690.85	3,691.81	0.51
10,312.00	90.95	86.920	6,202.72	-96.97	3,775.71	3,776.60	0.42
10,355.00	91.20	87.130	6,201.92	-94.74	3,818.64	3,819.51	0.76
10,440.00	92.74	87.380	6,199.00	-90.67	3,903.49	3,904.30	1.84
10,483.00	92.71	87.030	6,196.95	-88.58	3,946.39	3,947.17	0.82
10,542.00	92.44	86.860	6,194.30	-85.43	4,005.25	4,005.99	0.54
Last Sperry MWD Survey (Orig Hole) @ 10542.00' MD							
10,604.00	92.44	86.860	6,191.66	-82.04	4,067.10	4,067.79	0.00
Straight Line Projection to TD (Orig Hole) @ 10604.00' MD							

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
829.00	829.00	0.00	0.00	Tie-On (Assumed Vertical) @ 829.00' MD
935.00	935.00	0.10	0.21	First Sperry MWD Survey (Orig Hole) @ 935.00' MD
10,542.00	6,194.30	-85.43	4,005.25	Last Sperry MWD Survey (Orig Hole) @ 10542.00' MD
10,604.00	6,191.66	-82.04	4,067.10	Straight Line Projection to TD (Orig Hole) @ 10604.00' MD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Dutch Lake 23-35H_BHL Tgt	90.692	Slot	0.00	0.00	0.00

Survey Report for Dutch Lake 23-35H - Sperry MWD Surveys (Orig Hole)

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
829.00	7,586.00	Sperry MWD Surveys (Orig Hole)	MWD
7,586.00	10,600.00	Sperry MWD Surveys ST1	MWD

Targets

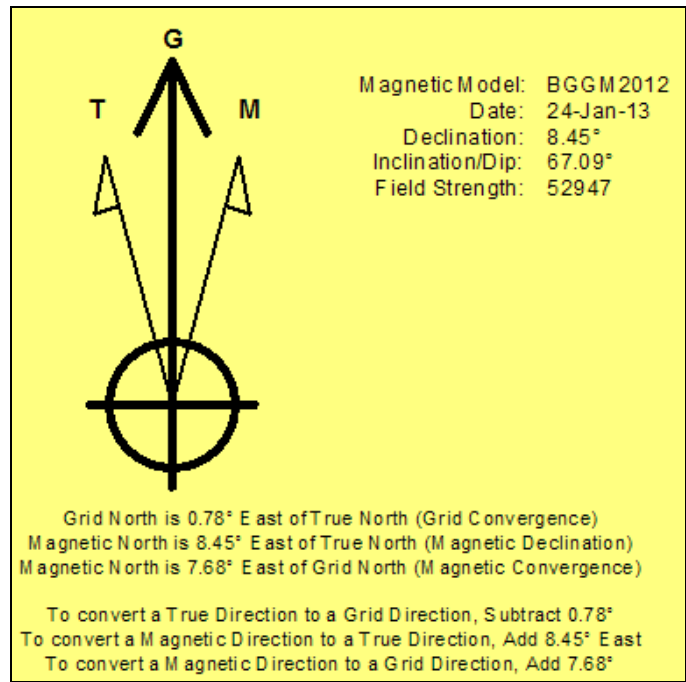
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Dutch Lake 23-35H_ - survey misses target center by 70.39ft at 10586.65ft MD (6192.40 TVD, -82.99 N, 4049.79 E) - Point	0.00	359.21	6,254.00	-48.95	4,050.55	1,408,945.88	3,338,616.78	40° 26' 58.492 N	104° 16' 59.729 W
Dutch Lake 23-35H_ - survey misses target center by 829.00ft at 829.00ft MD (829.00 TVD, 0.00 N, 0.00 E) - Polygon	0.00	359.22	0.00	0.00	0.00	1,408,994.82	3,334,566.38	40° 26' 59.521 N	104° 17' 52.109 W
Dutch Lake 23-35H_ - survey misses target center by 829.00ft at 829.00ft MD (829.00 TVD, 0.00 N, 0.00 E) - Point	0.00	359.22	0.00	0.00	0.00	1,408,994.82	3,334,566.38	40° 26' 59.521 N	104° 17' 52.109 W
Dutch Lake 23-35H_ - survey misses target center by 829.00ft at 829.00ft MD (829.00 TVD, 0.00 N, 0.00 E) - Polygon	0.00	359.22	0.00	0.00	0.00	1,408,994.82	3,334,566.38	40° 26' 59.521 N	104° 17' 52.109 W
Dutch Lake 23-35H : - survey misses target center by 92.89ft at 10580.96ft MD (6192.64 TVD, -83.30 N, 4044.11 E) - Point	0.00	0.00	6,252.00	-154.46	4,050.55	1,408,840.37	3,338,616.78	40° 26' 57.449 N	104° 16' 59.747 W

North Reference Sheet for Sec. 35-T6N-R62W - Dutch Lake 23-35H - Plan B

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.
 Vertical Depths are relative to RKB 16' @ 4689.00ft (Xtreme 15). Northing and Easting are relative to Dutch Lake 23-35H
 Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980
 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: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99996287

Grid Coordinates of Well: 1,408,994.82 ft N, 3,334,566.39 ft E
 Geographical Coordinates of Well: 40° 26' 59.52" N, 104° 17' 52.11" W
 Grid Convergence at Surface is: 0.78°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,604.00ft
 the Bottom Hole Displacement is 4,067.92ft in the Direction of 91.16° (Grid).
 Magnetic Convergence at surface is: -7.68° (24 January 2013, , BGGM2012)



Project: Weld County, CO (NAD 1983)
Site: Sec. 35-T6N-R62W
Well: Dutch Lake 23-35H

Bill Barrett Corp

