

Bill Barrett Corp

Weld County, CO (NAD 1983)

Sec. 20-T6N-R61W

Greasewood 10-20H

Plan A

Design: Sperry Final Surveys

Sperry Drilling Services

Standard Report

02 April, 2013

Well Coordinates: 1,419,976.97 N, 3,350,208.11 E (40° 28' 45.89" N, 104° 14' 27.78" W)

Ground Level: 4,663.00 ft

Local Coordinate Origin:

Centered on Well Greasewood 10-20H

Viewing Datum:

RKB 16' @ 4679.00ft (Xtreme 15)

TVDs to System:

N

North Reference:

Grid

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

HALLIBURTON

Design Report for Greasewood 10-20H - Sperry Final Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
830.00	0.00	0.000	830.00	0.00	0.00	0.00	0.00
Tie-On Surface Casing Assumed Vertical @ 830.00' MD							
856.00	5.63	126.080	855.96	-0.75	1.03	1.04	21.65
First Sperry MWD Survey @ 856.00' MD							
949.00	3.85	126.040	948.64	-5.28	7.24	7.31	1.91
1,066.00	0.46	153.320	1,065.54	-8.01	10.63	10.73	2.95
1,151.00	1.27	112.450	1,150.53	-8.67	11.66	11.76	1.14
1,237.00	1.98	258.760	1,236.51	-9.33	11.08	11.19	3.62
1,322.00	2.70	258.550	1,321.44	-10.01	7.68	7.80	0.85
1,450.00	2.76	258.130	1,449.30	-11.24	1.71	1.84	0.05
1,535.00	2.72	254.860	1,534.20	-12.19	-2.24	-2.09	0.19
1,621.00	2.43	256.350	1,620.11	-13.15	-5.99	-5.82	0.35
1,706.00	2.21	246.560	1,705.04	-14.23	-9.24	-9.06	0.53
1,791.00	1.95	246.730	1,789.99	-15.45	-12.07	-11.88	0.31
1,876.00	3.04	266.610	1,874.91	-16.16	-15.65	-15.45	1.62
1,962.00	2.38	262.660	1,960.81	-16.52	-19.70	-19.49	0.80
2,047.00	2.16	266.060	2,045.74	-16.86	-23.05	-22.84	0.30
2,132.00	4.57	261.170	2,130.59	-17.49	-27.99	-27.78	2.85
2,217.00	6.98	259.800	2,215.15	-18.92	-36.42	-36.19	2.84
2,303.00	8.71	253.020	2,300.35	-21.75	-47.79	-47.52	2.28
2,388.00	11.98	252.750	2,383.95	-26.24	-62.38	-62.05	3.85
2,473.00	11.76	250.240	2,467.14	-31.79	-78.96	-78.56	0.66
2,558.00	9.74	251.670	2,550.64	-36.98	-93.93	-93.47	2.40
2,644.00	10.97	253.750	2,635.24	-41.56	-108.70	-108.18	1.49
2,729.00	10.21	250.420	2,718.79	-46.34	-123.56	-122.98	1.15
2,814.00	11.05	255.850	2,802.33	-50.86	-138.56	-137.92	1.54
2,900.00	10.14	252.910	2,886.87	-55.10	-153.78	-153.10	1.23
2,985.00	10.70	258.550	2,970.47	-58.87	-168.67	-167.94	1.37
3,070.00	11.18	255.900	3,053.92	-62.44	-184.40	-183.62	0.82
3,156.00	10.14	252.810	3,138.44	-66.71	-199.71	-198.88	1.38
3,241.00	10.84	253.230	3,222.02	-71.23	-214.52	-213.63	0.83
3,326.00	10.53	251.390	3,305.54	-76.01	-229.53	-228.58	0.54
3,412.00	10.77	251.810	3,390.06	-81.03	-244.61	-243.60	0.29
3,497.00	11.38	252.920	3,473.48	-85.97	-260.17	-259.10	0.76
3,583.00	11.79	252.970	3,557.73	-91.03	-276.68	-275.55	0.48
3,668.00	10.63	248.590	3,641.10	-96.44	-292.29	-291.08	1.69
3,753.00	9.94	248.080	3,724.74	-102.04	-306.39	-305.12	0.82
3,838.00	10.18	250.510	3,808.43	-107.29	-320.28	-318.94	0.57
3,924.00	9.98	251.460	3,893.10	-112.19	-334.51	-333.11	0.30
4,009.00	9.35	244.990	3,976.90	-117.45	-347.75	-346.28	1.48
4,095.00	8.90	245.440	4,061.81	-123.17	-360.13	-358.60	0.53
4,179.00	9.98	253.040	4,144.68	-127.99	-373.00	-371.41	1.96
4,265.00	10.16	251.570	4,229.35	-132.57	-387.33	-385.68	0.36
4,350.00	8.06	248.010	4,313.28	-137.17	-399.97	-398.26	2.56
4,435.00	6.35	252.610	4,397.60	-140.81	-409.98	-408.22	2.12
4,520.00	5.78	250.530	4,482.13	-143.64	-418.50	-416.71	0.72
4,605.00	4.37	263.710	4,566.79	-145.42	-425.75	-423.94	2.14
4,691.00	4.34	266.190	4,652.54	-145.99	-432.26	-430.44	0.22
4,776.00	2.72	260.970	4,737.38	-146.52	-437.46	-435.63	1.94
4,861.00	1.10	228.390	4,822.33	-147.38	-440.06	-438.22	2.22

Design Report for Greasewood 10-20H - Sperry Final Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
4,946.00	0.79	229.960	4,907.32	-148.30	-441.12	-439.27	0.37
5,032.00	0.65	233.080	4,993.31	-148.98	-441.96	-440.11	0.17
5,117.00	0.80	244.030	5,078.31	-149.52	-442.88	-441.02	0.24
5,202.00	1.03	250.870	5,163.30	-150.03	-444.14	-442.27	0.30
5,288.00	0.38	273.470	5,249.29	-150.27	-445.15	-443.28	0.81
5,373.00	0.44	252.840	5,334.29	-150.35	-445.75	-443.87	0.19
5,458.00	0.28	232.570	5,419.29	-150.57	-446.22	-444.35	0.24
5,543.00	0.31	275.580	5,504.29	-150.68	-446.62	-444.74	0.26
5,586.00	0.15	91.050	5,547.28	-150.67	-446.68	-444.80	1.07
5,628.00	4.59	81.490	5,589.24	-150.42	-444.96	-443.08	10.58
5,671.00	9.09	85.570	5,631.92	-149.90	-439.87	-438.00	10.52
5,714.00	13.55	89.710	5,674.08	-149.61	-431.44	-429.58	10.54
5,756.00	17.42	92.090	5,714.54	-149.82	-420.23	-418.37	9.34
5,801.00	20.54	94.930	5,757.09	-150.74	-405.63	-403.76	7.23
5,843.00	24.11	92.820	5,795.94	-151.80	-389.72	-387.83	8.71
5,886.00	27.71	89.260	5,834.61	-152.10	-370.94	-369.05	9.12
5,931.00	30.62	89.280	5,873.90	-151.82	-349.02	-347.13	6.47
5,973.00	32.95	90.810	5,909.60	-151.85	-326.90	-325.01	5.87
6,016.00	34.17	91.050	5,945.43	-152.24	-303.13	-301.24	2.85
6,058.00	33.40	93.750	5,980.34	-153.21	-279.80	-277.90	4.02
6,114.00	37.75	93.910	6,025.88	-155.39	-247.30	-245.38	7.77
6,157.00	41.59	93.600	6,058.97	-157.18	-219.92	-217.97	8.94
6,200.00	45.42	94.310	6,090.16	-159.23	-190.39	-188.43	8.98
6,242.00	49.12	96.030	6,118.65	-162.02	-159.67	-157.68	9.31
6,285.00	53.24	96.310	6,145.60	-165.62	-126.37	-124.34	9.59
6,328.00	56.63	97.010	6,170.30	-169.71	-91.42	-89.34	8.00
6,370.00	60.80	97.120	6,192.11	-174.12	-55.81	-53.67	9.93
6,397.00	63.90	97.800	6,204.63	-177.23	-32.10	-29.93	11.70
6,440.00	71.00	97.070	6,221.11	-182.36	7.26	9.49	16.59
6,482.00	82.90	94.130	6,230.58	-186.32	47.90	50.18	29.14
6,525.00	89.32	93.430	6,233.50	-189.14	90.69	92.99	15.02
6,568.00	89.45	93.510	6,233.96	-191.75	133.60	135.94	0.35
6,610.00	89.69	93.440	6,234.28	-194.29	175.53	177.89	0.60
6,695.00	90.00	92.810	6,234.51	-198.93	260.40	262.81	0.83
6,781.00	88.86	92.290	6,235.36	-202.75	346.31	348.76	1.46
6,866.00	89.14	92.270	6,236.84	-206.13	431.23	433.72	0.33
6,951.00	89.38	91.870	6,237.94	-209.20	516.16	518.69	0.55
7,036.00	89.78	91.990	6,238.57	-212.07	601.11	603.67	0.49
7,121.00	89.57	91.540	6,239.05	-214.68	686.07	688.65	0.58
7,207.00	89.60	91.450	6,239.67	-216.93	772.04	774.64	0.11
7,292.00	89.51	91.150	6,240.33	-218.86	857.02	859.63	0.37
7,335.00	89.29	90.910	6,240.78	-219.63	900.01	902.63	0.76
7,420.00	89.35	89.930	6,241.79	-220.25	985.00	987.62	1.16
7,505.00	89.48	90.150	6,242.66	-220.31	1,069.99	1,072.61	0.30
7,548.00	90.34	90.080	6,242.73	-220.40	1,112.99	1,115.61	2.01
7,633.00	90.34	89.390	6,242.22	-220.00	1,197.99	1,200.59	0.81
7,719.00	91.05	89.340	6,241.18	-219.05	1,283.98	1,286.56	0.83
7,804.00	91.42	89.110	6,239.35	-217.90	1,368.95	1,371.51	0.51
7,889.00	90.18	88.890	6,238.16	-216.42	1,453.93	1,456.47	1.48
7,975.00	90.52	88.720	6,237.63	-214.63	1,539.91	1,542.42	0.44
8,017.00	89.82	88.080	6,237.51	-213.45	1,581.89	1,584.38	2.26

Design Report for Greasewood 10-20H - Sperry Final Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8,060.00	89.94	87.840	6,237.60	-211.92	1,624.86	1,627.33	0.62
8,145.00	90.15	87.520	6,237.53	-208.48	1,709.79	1,712.22	0.45
8,231.00	90.25	87.520	6,237.23	-204.76	1,795.71	1,798.08	0.12
8,316.00	90.43	87.280	6,236.73	-200.90	1,880.62	1,882.94	0.35
8,401.00	91.02	87.090	6,235.65	-196.73	1,965.51	1,967.77	0.73
8,486.00	89.23	87.610	6,235.47	-192.80	2,050.42	2,052.62	2.19
8,571.00	89.94	87.150	6,236.08	-188.91	2,135.32	2,137.48	1.00
8,614.00	90.49	87.230	6,235.92	-186.81	2,178.27	2,180.40	1.29
8,699.00	90.55	87.000	6,235.15	-182.53	2,263.16	2,265.23	0.28
8,785.00	90.77	86.830	6,234.16	-177.90	2,349.03	2,351.03	0.32
8,870.00	91.39	86.490	6,232.56	-172.95	2,433.87	2,435.81	0.83
8,955.00	90.52	87.500	6,231.14	-168.49	2,518.74	2,520.61	1.57
9,040.00	91.05	87.600	6,229.98	-164.86	2,603.65	2,605.48	0.63
9,125.00	91.45	88.190	6,228.12	-161.74	2,688.58	2,690.36	0.84
9,211.00	89.91	87.540	6,227.10	-158.54	2,774.51	2,776.24	1.94
9,296.00	89.85	87.150	6,227.28	-154.60	2,859.42	2,861.09	0.46
9,381.00	90.28	87.290	6,227.18	-150.48	2,944.32	2,945.94	0.53
9,466.00	90.68	87.070	6,226.47	-146.29	3,029.21	3,030.77	0.54
9,552.00	90.65	86.890	6,225.47	-141.76	3,115.08	3,116.59	0.21
9,637.00	90.89	86.400	6,224.33	-136.79	3,199.93	3,201.37	0.64
9,722.00	91.79	86.660	6,222.34	-131.65	3,284.75	3,286.12	1.10
9,808.00	90.59	87.090	6,220.56	-126.96	3,370.60	3,371.90	1.48
9,893.00	90.99	87.720	6,219.38	-123.11	3,455.51	3,456.75	0.88
9,978.00	90.03	88.910	6,218.63	-120.61	3,540.46	3,541.68	1.80
10,021.00	90.28	88.830	6,218.51	-119.76	3,583.46	3,584.65	0.61
10,106.00	90.09	88.210	6,218.24	-117.57	3,668.43	3,669.59	0.76
10,192.00	90.12	88.650	6,218.08	-115.21	3,754.39	3,755.52	0.51
10,234.00	90.37	89.760	6,217.90	-114.63	3,796.39	3,797.51	2.71
10,320.00	91.48	89.880	6,216.51	-114.36	3,882.38	3,883.48	1.30
10,405.00	92.19	89.720	6,213.79	-114.06	3,967.33	3,968.43	0.86
10,490.00	91.70	89.900	6,210.90	-113.78	4,052.28	4,053.37	0.61
10,533.00	92.06	89.960	6,209.49	-113.73	4,095.26	4,096.34	0.85
10,576.00	92.25	89.510	6,207.88	-113.53	4,138.23	4,139.31	1.14
Last Sperry MWD Survey @ 10576.00' MD							
10,670.00	92.25	89.510	6,204.19	-112.73	4,232.15	4,233.21	0.00
Straight Line Projection to TD @ 10670.00' MD							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
830.00	830.00	0.00	0.00	Tie-On Surface Casing Assumed Vertical @ 830.00' MD
856.00	855.96	-0.75	1.03	First Sperry MWD Survey @ 856.00' MD
10,576.00	6,207.88	-113.53	4,138.23	Last Sperry MWD Survey @ 10576.00' MD
10,670.00	6,204.19	-112.73	4,232.15	Straight Line Projection to TD @ 10670.00' MD

Design Report for Greasewood 10-20H - Sperry Final Surveys

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	Origin +E/-W (ft)	Start TVD (ft)
Target	Greasewood 10-20H_BHL TGT	90.702	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
830.00	10,670.00	Sperry MWD Surveys	MWD

Targets

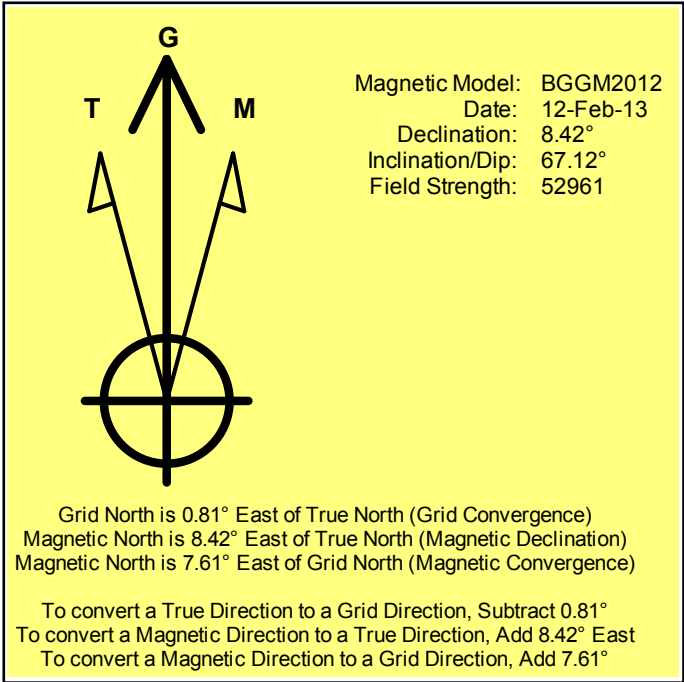
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Greasewood 10-20H_£	0.00	359.18	6,219.00	-51.59	4,213.16	1,419,925.38	3,354,421.12	40° 28' 44.786 N	104° 13' 33.274 W
- actual wellpath misses target center by 62.89ft at 10650.96ft MD (6204.93 TVD, -112.89 N, 4213.13 E)									
- Point									
Greasewood 10-20H_§	0.00	359.19	0.00	0.00	0.00	1,419,976.97	3,350,208.11	40° 28' 45.890 N	104° 14' 27.780 W
- actual wellpath misses target center by 830.00ft at 830.00ft MD (830.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1			4,233.04	-11.31	1,419,965.67	3,354,441.00			
Point 2			100.43	-96.93	1,419,880.04	3,350,308.53			
Point 3			126.46	-2,137.08	1,417,839.97	3,350,334.57			
Point 4			155.91	-4,163.98	1,415,813.14	3,350,364.02			
Point 5			4,297.96	-4,049.40	1,415,927.72	3,354,505.92			
Point 6			4,233.04	-11.31	1,419,965.67	3,354,441.00			
Greasewood 10-20H_£	0.00	359.18	6,219.00	-11.30	4,233.04	1,419,965.67	3,354,441.00	40° 28' 45.181 N	104° 13' 33.010 W
- actual wellpath misses target center by 102.51ft at 10670.00ft MD (6204.19 TVD, -112.73 N, 4232.15 E)									
- Point									
Greasewood 10-20H_§	0.00	359.19	0.00	0.00	0.00	1,419,976.97	3,350,208.11	40° 28' 45.890 N	104° 14' 27.780 W
- actual wellpath misses target center by 830.00ft at 830.00ft MD (830.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1			4,824.65	600.22	1,420,577.17	3,355,032.59			
Point 2			-507.76	490.88	1,420,467.84	3,349,700.37			
Point 3			-473.56	-2,137.08	1,417,839.97	3,349,734.57			
Point 4			-444.11	-4,764.01	1,415,213.14	3,349,764.02			
Point 5			4,897.98	-4,649.43	1,415,327.70	3,355,105.92			
Point 6			4,824.65	600.22	1,420,577.17	3,355,032.59			
Greasewood 10-20H_§	0.00	359.19	0.00	0.00	0.00	1,419,976.97	3,350,208.11	40° 28' 45.890 N	104° 14' 27.780 W
- actual wellpath misses target center by 830.00ft at 830.00ft MD (830.00 TVD, 0.00 N, 0.00 E)									
- Point									

North Reference Sheet for Sec. 20-T6N-R61W - Greasewood 10-20H - Plan A

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' @ 4679.00ft (Xtreme 15). Northing and Easting are relative to Greasewood 10-20H
 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: 0.99996479

Grid Coordinates of Well: 1,419,976.97 ft N, 3,350,208.11 ft E
 Geographical Coordinates of Well: 40° 28' 45.89" N, 104° 14' 27.78" W
 Grid Convergence at Surface is: 0.81°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,670.00ft
 the Bottom Hole Displacement is 4,233.65ft in the Direction of 91.53° (Grid).
 Magnetic Convergence at surface is: -7.61° (12 February 2013, , BGGM2012)



Project: Weld County, CO (NAD 1983)
Site: Sec. 20-T6N-R61W
Well: Greasewood 10-20H

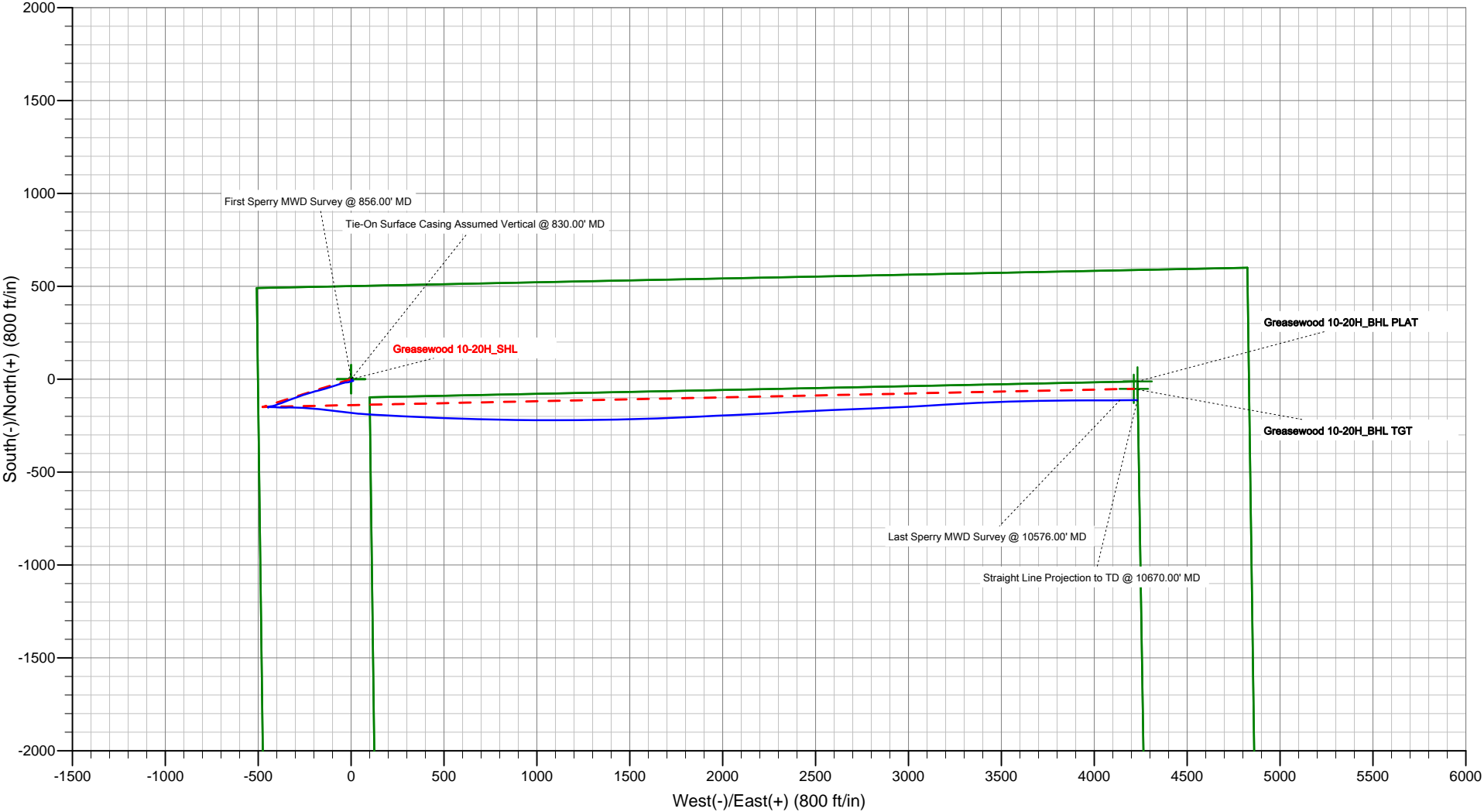
Bill Barrett Corp



LEGEND

Greasewood 10-20H, Plan A, Plan A Rev 1 Proposal V0

Sperry Final Surveys



Project: Weld County, CO (NAD 1983)
Site: Sec. 20-T6N-R61W
Well: Greasewood 10-20H

Bill Barrett Corp



LEGEND

- Greasewood 10-20H, Plan A, Plan A Rev 1 Proposal V0
- Sperry Final Surveys

