

Noble Energy

Garfield County, CO (NAD 83)
Sec. 8-T8S-R95W (SGV 8D PAD)
SGV Federal 8-12A - B 5

Plan #2

Design: Gyro and Sperry MWD Survey

Sperry Drilling Services

Final Survey Report

03 February, 2011

Well Coordinates: 1,573,833.28 N, 2,286,021.09 E (39° 22' 54.03" N, 108° 01' 34.55" W)
Ground Level: 6,341.70 ft

| | |
|--------------------------|---|
| Local Coordinate Origin: | Centered on Well SGV Federal 8-12A - Slot B 5 |
| Viewing Datum: | RKB 24' @ 6365.70ft (H&P 322) |
| TVDs to System: | N |
| North Reference: | Grid |
| Unit System: | API - US Survey Feet - Custom |

Geodetic Scale Factor Applied
Version: 2003.16 Build: 43I

HALLIBURTON

Design Report for SGV Federal 8-12A - Gyro and Sperry 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 |
| 120.00 | 0.65 | 155.98 | 120.00 | -0.62 | 0.28 | 0.57 | 0.54 |
| Surveys from 120.00ft to 367.00ft are Gyro Surveys | | | | | | | |
| 182.00 | 0.95 | 137.68 | 181.99 | -1.32 | 0.77 | 1.36 | 0.63 |
| 243.00 | 0.51 | 33.65 | 242.99 | -1.47 | 1.26 | 1.85 | 1.94 |
| 306.00 | 0.97 | 66.08 | 305.98 | -1.02 | 1.90 | 2.15 | 0.96 |
| 367.00 | 0.08 | 38.21 | 366.98 | -0.78 | 2.40 | 2.44 | 1.48 |
| Tie-On to Gyro Survey | | | | | | | |
| 442.00 | 0.68 | 100.95 | 441.98 | -0.82 | 2.87 | 2.85 | 0.86 |
| First Sperry MWD Survey | | | | | | | |
| 524.00 | 0.67 | 120.25 | 523.97 | -1.16 | 3.76 | 3.79 | 0.28 |
| 615.00 | 1.26 | 104.43 | 614.96 | -1.67 | 5.19 | 5.27 | 0.71 |
| 707.00 | 2.43 | 100.71 | 706.91 | -2.29 | 8.08 | 8.03 | 1.28 |
| 799.00 | 2.69 | 97.43 | 798.82 | -2.93 | 12.14 | 11.79 | 0.32 |
| 893.00 | 2.81 | 105.33 | 892.71 | -3.82 | 16.55 | 15.98 | 0.42 |
| 987.00 | 3.03 | 96.26 | 986.59 | -4.70 | 21.24 | 20.40 | 0.54 |
| 1,082.00 | 3.18 | 76.01 | 1,081.45 | -4.34 | 26.30 | 24.44 | 1.16 |
| 1,176.00 | 4.31 | 85.61 | 1,175.25 | -3.44 | 32.35 | 29.04 | 1.37 |
| 1,271.00 | 6.89 | 99.44 | 1,269.79 | -4.10 | 41.53 | 37.11 | 3.05 |
| 1,365.00 | 6.57 | 115.22 | 1,363.15 | -7.32 | 51.96 | 47.62 | 1.99 |
| 1,459.00 | 7.76 | 123.85 | 1,456.42 | -13.14 | 62.09 | 59.29 | 1.70 |
| 1,503.00 | 7.27 | 122.64 | 1,500.04 | -16.30 | 66.90 | 65.05 | 1.17 |
| 1,556.00 | 7.73 | 122.97 | 1,552.59 | -20.05 | 72.72 | 71.97 | 0.87 |
| 1,650.00 | 7.31 | 123.31 | 1,645.78 | -26.77 | 83.02 | 84.27 | 0.45 |
| 1,744.00 | 7.59 | 121.23 | 1,738.99 | -33.28 | 93.33 | 96.45 | 0.41 |
| 1,839.00 | 8.41 | 115.64 | 1,833.06 | -39.54 | 104.95 | 109.62 | 1.19 |
| 1,933.00 | 7.68 | 108.93 | 1,926.14 | -44.55 | 117.09 | 122.53 | 1.26 |
| 2,028.00 | 8.31 | 114.81 | 2,020.22 | -49.49 | 129.33 | 135.49 | 1.09 |
| 2,122.00 | 7.39 | 112.28 | 2,113.34 | -54.63 | 141.09 | 148.16 | 1.05 |
| 2,216.00 | 8.17 | 117.24 | 2,206.47 | -59.98 | 152.62 | 160.75 | 1.09 |
| 2,311.00 | 7.90 | 118.74 | 2,300.54 | -66.21 | 164.35 | 173.98 | 0.36 |
| 2,405.00 | 7.38 | 114.57 | 2,393.70 | -71.83 | 175.50 | 186.40 | 0.81 |
| 2,499.00 | 7.69 | 120.93 | 2,486.89 | -77.57 | 186.39 | 198.66 | 0.95 |
| 2,594.00 | 6.37 | 119.76 | 2,581.18 | -83.45 | 196.42 | 210.28 | 1.40 |
| 2,688.00 | 7.52 | 119.32 | 2,674.49 | -89.05 | 206.31 | 221.62 | 1.22 |
| 2,782.00 | 7.32 | 118.14 | 2,767.70 | -94.89 | 216.95 | 233.73 | 0.27 |
| 2,877.00 | 7.68 | 117.34 | 2,861.89 | -100.66 | 227.93 | 246.08 | 0.39 |
| 2,971.00 | 8.78 | 120.96 | 2,954.92 | -107.23 | 239.66 | 259.50 | 1.29 |
| 3,065.00 | 9.00 | 119.02 | 3,047.79 | -114.49 | 252.24 | 274.01 | 0.40 |
| 3,159.00 | 8.37 | 123.46 | 3,140.71 | -121.83 | 264.38 | 288.19 | 0.98 |
| 3,254.00 | 8.35 | 124.08 | 3,234.70 | -129.51 | 275.86 | 302.00 | 0.10 |
| 3,348.00 | 8.42 | 118.83 | 3,327.70 | -136.65 | 287.54 | 315.69 | 0.82 |
| 3,442.00 | 8.01 | 117.87 | 3,420.73 | -143.03 | 299.36 | 329.08 | 0.46 |
| 3,537.00 | 7.75 | 120.99 | 3,514.84 | -149.42 | 310.70 | 342.07 | 0.53 |
| 3,631.00 | 7.53 | 116.91 | 3,608.00 | -155.47 | 321.63 | 354.53 | 0.62 |
| 3,725.00 | 7.60 | 110.43 | 3,701.19 | -160.43 | 332.95 | 366.73 | 0.91 |
| 3,820.00 | 8.27 | 120.61 | 3,795.28 | -166.10 | 344.71 | 379.69 | 1.64 |
| 3,914.00 | 7.63 | 122.02 | 3,888.38 | -172.86 | 355.82 | 392.69 | 0.71 |
| 4,008.00 | 7.96 | 119.36 | 3,981.51 | -179.36 | 366.79 | 405.42 | 0.52 |
| 4,102.00 | 7.70 | 120.69 | 4,074.63 | -185.76 | 377.87 | 418.21 | 0.34 |

Design Report for SGV Federal 8-12A - Gyro and Sperry MWD Survey

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) |
|---|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|
| 4,197.00 | 7.46 | 120.02 | 4,168.80 | -192.09 | 388.69 | 430.73 | 0.27 |
| 4,291.00 | 6.83 | 119.77 | 4,262.07 | -197.92 | 398.82 | 442.41 | 0.67 |
| 4,385.00 | 6.35 | 118.48 | 4,355.45 | -203.18 | 408.24 | 453.17 | 0.53 |
| 4,480.00 | 6.37 | 125.56 | 4,449.87 | -208.75 | 417.15 | 463.68 | 0.83 |
| 4,574.00 | 5.09 | 127.38 | 4,543.40 | -214.31 | 424.71 | 473.04 | 1.38 |
| 4,668.00 | 3.86 | 124.54 | 4,637.11 | -218.64 | 430.63 | 480.36 | 1.33 |
| 4,762.00 | 1.71 | 106.39 | 4,730.99 | -220.83 | 434.58 | 484.87 | 2.44 |
| 4,856.00 | 1.31 | 130.60 | 4,824.96 | -221.92 | 436.74 | 487.28 | 0.79 |
| 4,951.00 | 1.04 | 122.59 | 4,919.94 | -223.09 | 438.29 | 489.22 | 0.33 |
| 5,045.00 | 1.16 | 113.32 | 5,013.92 | -223.93 | 439.88 | 491.01 | 0.23 |
| 5,139.00 | 1.13 | 134.68 | 5,107.91 | -224.96 | 441.42 | 492.85 | 0.45 |
| 5,234.00 | 1.52 | 166.07 | 5,202.88 | -226.84 | 442.38 | 494.69 | 0.85 |
| 5,328.00 | 2.11 | 188.01 | 5,296.83 | -229.76 | 442.44 | 496.33 | 0.96 |
| 5,422.00 | 1.84 | 179.60 | 5,390.78 | -232.99 | 442.21 | 497.88 | 0.42 |
| 5,516.00 | 1.71 | 196.10 | 5,484.73 | -235.84 | 441.83 | 499.11 | 0.56 |
| 5,611.00 | 1.78 | 202.18 | 5,579.69 | -238.57 | 440.88 | 499.79 | 0.21 |
| 5,705.00 | 1.63 | 231.38 | 5,673.65 | -240.76 | 439.29 | 499.64 | 0.93 |
| 5,800.00 | 2.27 | 213.76 | 5,768.60 | -243.16 | 437.19 | 499.18 | 0.92 |
| 5,894.00 | 2.53 | 223.48 | 5,862.51 | -246.22 | 434.73 | 498.77 | 0.51 |
| 5,988.00 | 2.39 | 215.09 | 5,956.43 | -249.33 | 432.17 | 498.31 | 0.41 |
| 6,083.00 | 1.77 | 209.86 | 6,051.36 | -252.22 | 430.30 | 498.31 | 0.68 |
| 6,177.00 | 1.91 | 224.22 | 6,145.32 | -254.60 | 428.49 | 498.07 | 0.51 |
| 6,271.00 | 1.49 | 233.86 | 6,239.27 | -256.44 | 426.41 | 497.33 | 0.54 |
| 6,365.00 | 1.72 | 240.90 | 6,333.24 | -257.85 | 424.19 | 496.23 | 0.32 |
| 6,459.00 | 2.39 | 230.19 | 6,427.18 | -259.79 | 421.45 | 494.98 | 0.82 |
| 6,553.00 | 2.48 | 237.05 | 6,521.09 | -262.15 | 418.24 | 493.56 | 0.32 |
| 6,647.00 | 2.21 | 240.35 | 6,615.01 | -264.16 | 414.96 | 491.89 | 0.32 |
| 6,688.00 | 1.97 | 243.43 | 6,655.99 | -264.86 | 413.64 | 491.17 | 0.65 |
| Final Sperry MWD Survey | | | | | | | |
| 6,748.00 | 1.97 | 243.43 | 6,715.95 | -265.78 | 411.79 | 490.12 | 0.00 |
| Survey Projection to TD - Estimated BHL: 1498' FNL, 736' FWL | | | | | | | |

Design Annotations

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates | | Comment |
|---------------------|---------------------|-------------------|------------|--|
| | | +N/-S (ft) | +E/-W (ft) | |
| 120.00 | 120.00 | -0.62 | 0.28 | Surveys from 120.00ft to 367.00ft are Gyro Surveys |
| 367.00 | 366.98 | -0.78 | 2.40 | Tie-On to Gyro Survey |
| 442.00 | 441.98 | -0.82 | 2.87 | First Sperry MWD Survey |
| 6,688.00 | 6,655.99 | -264.86 | 413.64 | Final Sperry MWD Survey |
| 6,748.00 | 6,715.95 | -265.78 | 411.79 | Survey Projection to TD |
| 6,748.00 | 6,715.95 | -265.78 | 411.79 | Estimated BHL: 1498' FNL, 736' FWL |

Vertical Section Information

| Angle Type | Target | Azimuth (°) | Origin Type | Origin | | Start TVD (ft) |
|------------|-------------------------------------|-------------|-------------|------------|------------|----------------|
| | | | | +N/-S (ft) | +E/-W (ft) | |
| Target | SGV Federal 8-12A Plan #2 BH Tgt | 122.85 | Slot | 0.00 | 0.00 | 0.00 |

Design Report for SGV Federal 8-12A - Gyro and Sperry MWD Survey

Survey tool program

| From (ft) | To (ft) | Survey/Plan | Survey Tool |
|--------------|------------|--------------------|-------------|
| 120.00 | 367.00 | Gyro Surveys | NS-GYRO-MS |
| 442.00 | 6,748.00 | 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 |
|--|---------------------|--------------------|-------------|---------------|---------------|------------------|-----------------|------------------|------------------|
| SGV Federal 8-12A - actual wellpath misses target center by 7.07ft at 4917.92ft MD (4886.87 TVD, -222.74 N, 437.77 E) - Rectangle (sides W25.00 H25.00 D0.00) | 0.00 | 360.00 | 4,887.00 | -220.98 | 430.93 | 1,573,612.31 | 2,286,452.00 | 39° 22' 51.961 N | 108° 1' 28.987 W |
| SGV Federal 8-12A - actual wellpath hits target center - Polygon Point 1 Point 2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1,573,833.28 | 2,286,021.09 | 39° 22' 54.026 N | 108° 1' 34.551 W |
| | | | | 180.00 | -178.98 | 1,573,654.31 | 2,286,201.08 | | |
| | | | | 580.00 | -178.98 | 1,573,654.31 | 2,286,601.06 | | |
| SGV Federal 8-12A - actual wellpath misses target center by 61.40ft at 4917.41ft MD (4886.36 TVD, -222.73 N, 437.76 E) - Rectangle (sides W100.00 H200.00 D2,600.00) | 0.00 | 0.00 | 4,887.00 | -245.98 | 380.93 | 1,573,587.31 | 2,286,402.00 | 39° 22' 51.701 N | 108° 1' 29.615 W |
| SGV Federal 8-12A - actual wellpath misses target center by 771.92ft at 6748.00ft MD (6715.95 TVD, -265.78 N, 411.79 E) - Point | 0.00 | 0.00 | 7,487.00 | -245.98 | 380.93 | 1,573,587.31 | 2,286,402.00 | 39° 22' 51.701 N | 108° 1' 29.615 W |

North Reference Sheet for Sec. 8-T8S-R95W (SGV 8D PAD) - SGV Federal 8-12A - Plan #2

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

Vertical Depths are relative to RKB 24' @ 6365.70ft (H&P 322). Northing and Easting are relative to SGV Federal 8-12A - Slot B 5

Coordinate System is US State Plane 1983, Colorado Central 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:39° 45' 0.000 N°

False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99994787

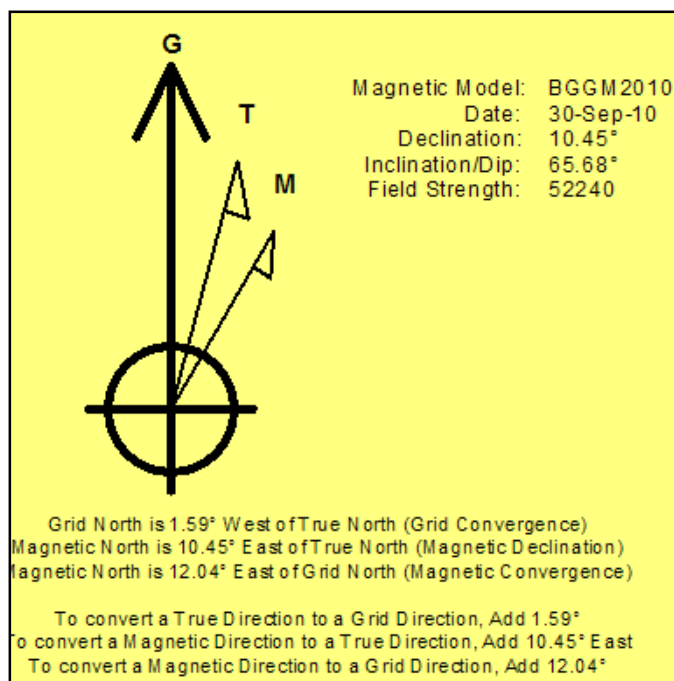
Grid Coordinates of Well: 1,573,833.28 ft N, 2,286,021.09 ft E

Geographical Coordinates of Well: 39° 22' 54.03" N, 108° 01' 34.55" W

Grid Convergence at Surface is: -1.59°

Based upon Minimum Curvature type calculations, at a Measured Depth of 6,748.00ft
the Bottom Hole Displacement is 490.12ft in the Direction of 122.84° (Grid).

Magnetic Convergence at surface is: -12.04° (30 September 2010, , BGGM2010)



Project: Garfield County, CO (NAD 83)
 Site: Sec. 8-T8S-R95W (SGV 8D PAD)
 Well: SGV Federal 8-12A

Noble Energy

HALLIBURTON

Sperry Drilling



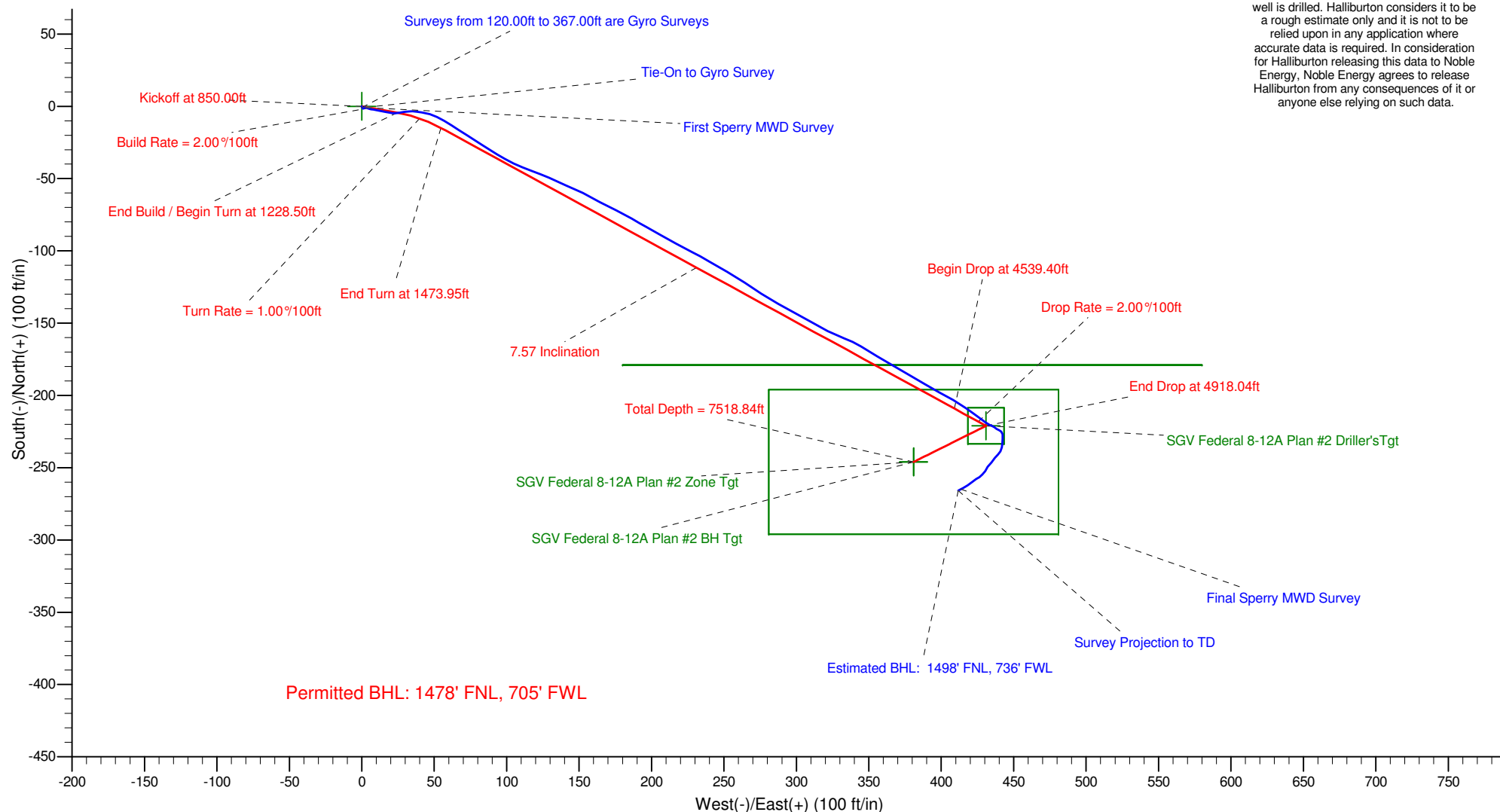
Azimuths to Grid North
 True North: 1.59°
 Magnetic North: 12.04°

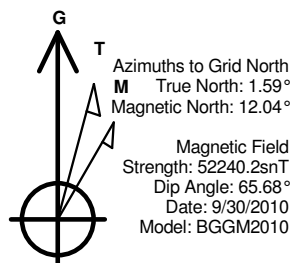
Magnetic Field
 Strength: 52240.2snT
 Dip Angle: 65.68°
 Date: 9/30/2010
 Model: BGGM2010

LEGEND

- SGV Federal 8-12A, Plan #2, Plan #2 Proposal V0
- Gyro and Sperry MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the SGV Federal 8-12A well located at Garfield County, CO. At the conclusion of the job Halliburton performed a final survey on the well. Noble Energy has requested that Halliburton provide them the distances from BHL to section lines from that final survey to allow Noble Energy to meet its requirements under Colorado law. These distances are generated by a mathematical algorithm based on rough data collected after the well is drilled. Halliburton considers it to be a rough estimate only and it is not to be relied upon in any application where accurate data is required. In consideration for Halliburton releasing this data to Noble Energy, Noble Energy agrees to release Halliburton from any consequences of it or anyone else relying on such data.





LEGEND

- SGV Federal 8-12A, Plan #2, Plan #2 Proposal V0
- Gyro and Sperry MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the SGV Federal 8-12A well located at Garfield County, CO. At the conclusion of the job Halliburton performed a final survey on the well. Noble Energy has requested that Halliburton provide them the distances from BHL to section lines from that final survey to allow Noble Energy to meet its requirements under Colorado law. These distances are generated by a mathematical algorithm based on rough data collected after the well is drilled. Halliburton considers it to be a rough estimate only and it is not to be relied upon in any application where accurate data is required. In consideration for Halliburton releasing this data to Noble Energy, Noble Energy agrees to release Halliburton from any consequences of it or anyone else relying on such data.

