



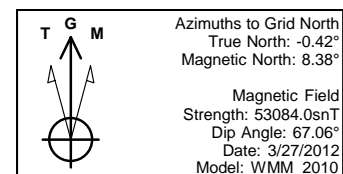
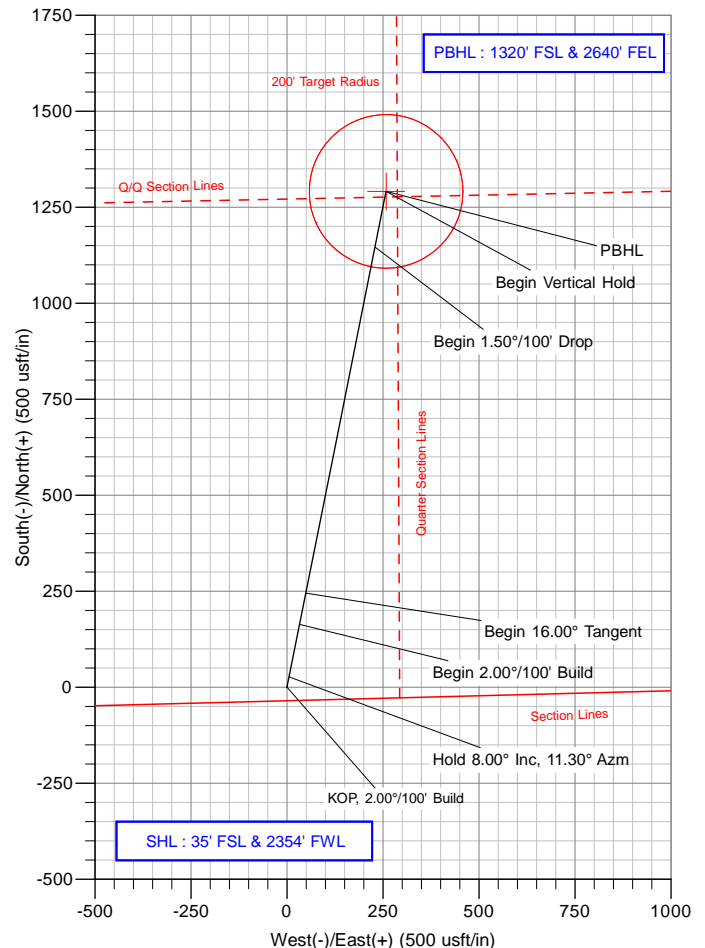
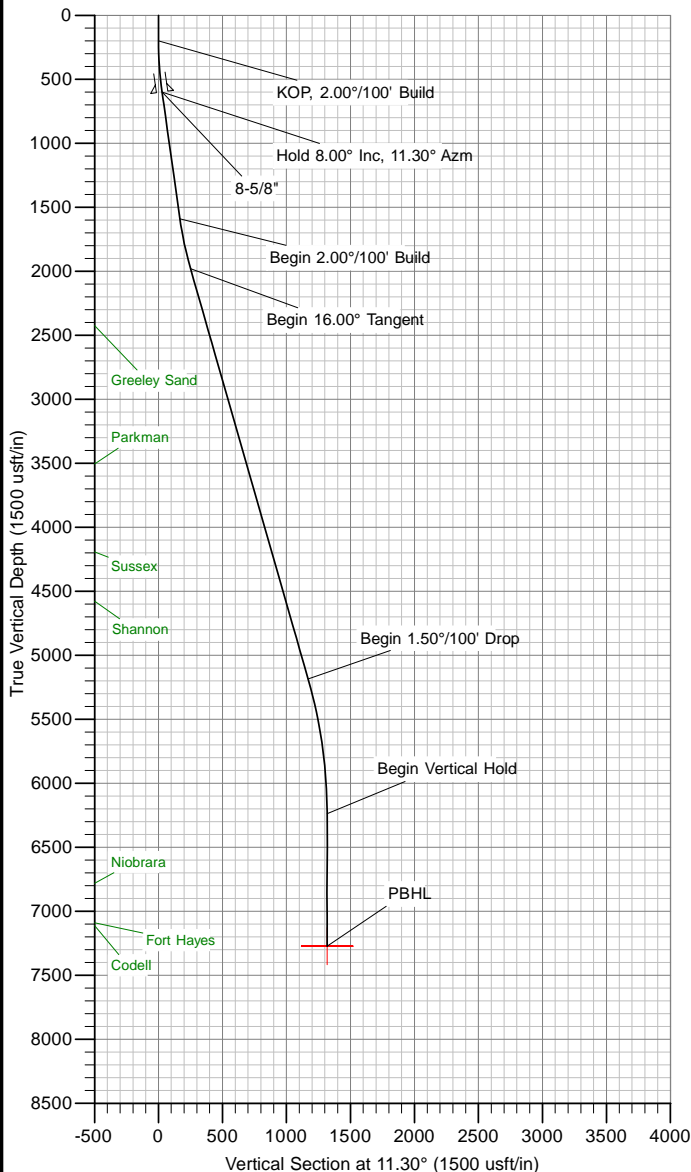
Company: Great Western  
Site: HCW FD  
Well: 24-20D  
Project: Weld County, Colorado (NAD 83)  
Rig Name: Cade 22



Planning: 936.442.2510 Fax: 936.442.2515  
Operations: 936.442.2500 Fax: 936.442.2599

#### ANNOTATIONS

| MD      | Inc   | Azi   | TVD     | +N/-S   | +E/-W  | Vsect   | Departure | Annotation                 |
|---------|-------|-------|---------|---------|--------|---------|-----------|----------------------------|
| 200.00  | 0.00  | 0.00  | 200.00  | 0.00    | 0.00   | 0.00    | 0.00      | KOP, 2.00°/100' Build      |
| 600.00  | 8.00  | 11.30 | 598.70  | 27.34   | 5.46   | 27.88   | 27.88     | Hold 8.00° Inc, 11.30° Azm |
| 1600.00 | 8.00  | 11.30 | 1588.97 | 163.81  | 32.74  | 167.05  | 167.05    | Begin 2.00°/100' Build     |
| 1999.78 | 16.00 | 11.30 | 1979.70 | 245.24  | 49.01  | 250.09  | 250.09    | Begin 16.00° Tangent       |
| 5334.62 | 16.00 | 11.30 | 5185.43 | 1146.38 | 229.09 | 1169.05 | 1169.05   | Begin 1.50°/100' Drop      |
| 6400.99 | 0.00  | 0.00  | 6238.00 | 1291.40 | 258.07 | 1316.94 | 1316.94   | Begin Vertical Hold        |
| 7434.99 | 0.00  | 0.00  | 7272.00 | 1291.40 | 258.07 | 1316.94 | 1316.94   | PBHL                       |



US State Plane 1983  
Colorado Northern Zone

Created By: Allen Slack  
Date: 11:15, March 28 2012  
Plan: Design #1

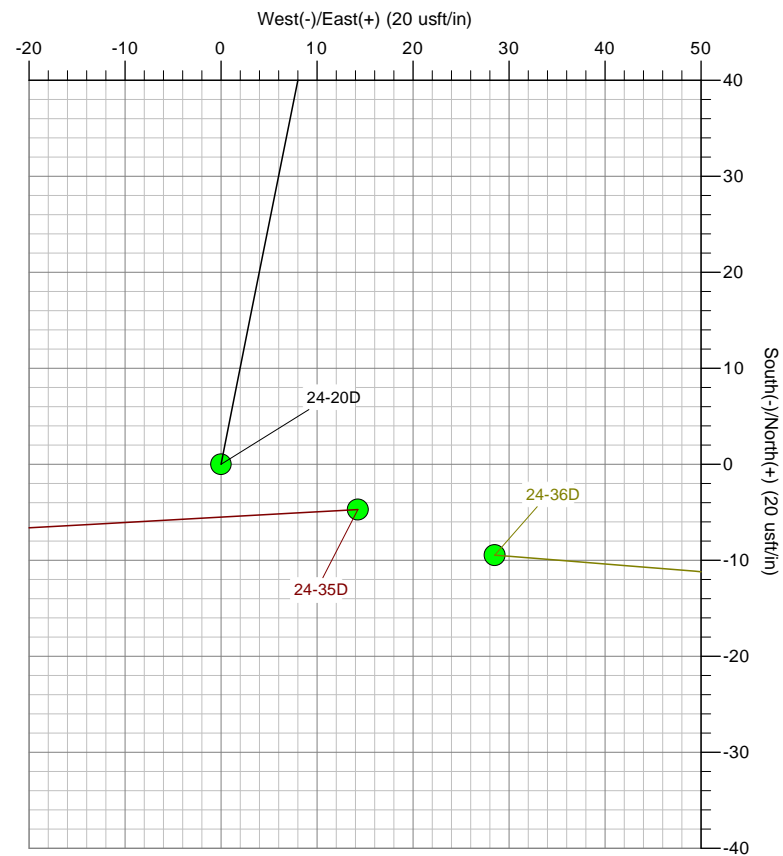
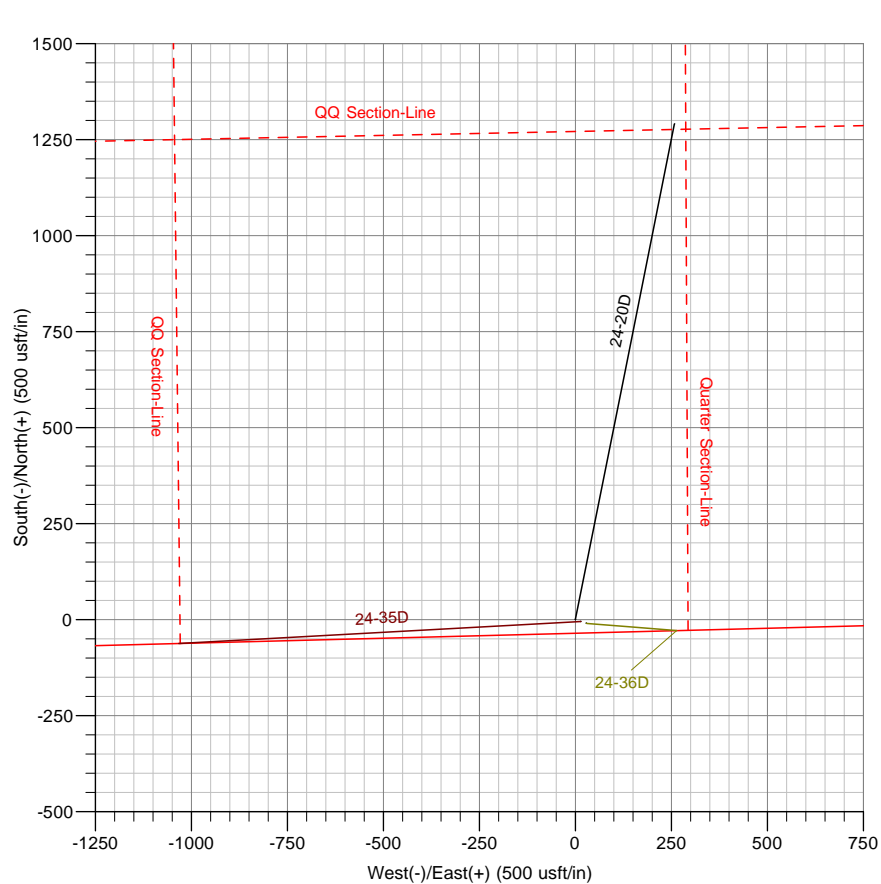
The customer should only rely on this document after independently verifying all paths, targets, coordinates, lease and hard lines represented. Any decisions made or wells drilled utilizing this or any other information supplied by MS Energy are at the sole risk and responsibility of the customer. MS Energy is not responsible for the accuracy of this schematic or the information contained herein.



Company: Great Western  
Site: HCW FD  
Project: Weld County, Colorado (NAD 83)  
Rig Name: Cade 22



Planning: 936.442.2510 Fax: 936.442.2515  
Operations: 936.442.2500 Fax: 936.442.2599



The customer should only rely on this document after independently verifying all paths, targets, coordinates, lease and hard lines represented.  
Any decisions made or wells drilled utilizing this or any other information supplied by MS Energy are at the sole risk and responsibility of the customer.  
MS Energy is not responsible for the accuracy of this schematic or the information contained herein.



# **Great Western**

**Weld County, Colorado (NAD 83)**

**HCW FD**

**24-20D**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**28 March, 2012**

|                  |                                |                                     |                              |
|------------------|--------------------------------|-------------------------------------|------------------------------|
| <b>Database:</b> | Southern Region                | <b>Local Co-ordinate Reference:</b> | Well 24-20D                  |
| <b>Company:</b>  | Great Western                  | <b>TVD Reference:</b>               | WELL @ 4760.00usft (Cade 22) |
| <b>Project:</b>  | Weld County, Colorado (NAD 83) | <b>MD Reference:</b>                | WELL @ 4760.00usft (Cade 22) |
| <b>Site:</b>     | HCW FD                         | <b>North Reference:</b>             | Grid                         |
| <b>Well:</b>     | 24-20D                         | <b>Survey Calculation Method:</b>   | Minimum Curvature            |
| <b>Wellbore:</b> | Wellbore #1                    |                                     |                              |
| <b>Design:</b>   | Design #1                      |                                     |                              |

|                    |                                |                      |                |
|--------------------|--------------------------------|----------------------|----------------|
| <b>Project</b>     | Weld County, Colorado (NAD 83) |                      |                |
| <b>Map System:</b> | US State Plane 1983            | <b>System Datum:</b> | Mean Sea Level |
| <b>Geo Datum:</b>  | North American Datum 1983      |                      |                |
| <b>Map Zone:</b>   | Colorado Northern Zone         |                      |                |

|                             |              |                   |                            |                   |
|-----------------------------|--------------|-------------------|----------------------------|-------------------|
| <b>Well</b>                 | 24-20D       |                   |                            |                   |
| <b>Well Position</b>        | <b>+N/-S</b> | 1,413,056.71 usft | <b>Northing:</b>           | 1,413,056.71 usft |
|                             | <b>+E/-W</b> | 3,182,816.84 usft | <b>Easting:</b>            | 3,182,816.84 usft |
| <b>Position Uncertainty</b> |              | 0.00 usft         | <b>Wellhead Elevation:</b> |                   |
|                             |              |                   | <b>Latitude:</b>           | 40° 27' 55.3789 N |
|                             |              |                   | <b>Longitude:</b>          | 104° 50' 34.623 W |
|                             |              |                   | <b>Ground Level:</b>       | 4,744.00 usft     |

|                  |                   |                    |                        |                      |                            |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| <b>Wellbore</b>  | Wellbore #1       |                    |                        |                      |                            |
| <b>Magnetics</b> | <b>Model Name</b> | <b>Sample Date</b> | <b>Declination (°)</b> | <b>Dip Angle (°)</b> | <b>Field Strength (nT)</b> |
|                  | WMM_2010          | 3/27/2012          | 8.80                   | 67.06                | 53,084                     |

|                          |                                |                     |                      |                      |
|--------------------------|--------------------------------|---------------------|----------------------|----------------------|
| <b>Design</b>            | Design #1                      |                     |                      |                      |
| <b>Audit Notes:</b>      |                                |                     |                      |                      |
| <b>Version:</b>          | <b>Phase:</b>                  | PROTOTYPE           | <b>Tie On Depth:</b> | 0.00                 |
| <b>Vertical Section:</b> | <b>Depth From (TVD) (usft)</b> | <b>+N/-S (usft)</b> | <b>+E/-W (usft)</b>  | <b>Direction (°)</b> |
|                          | 0.00                           | 0.00                | 0.00                 | 11.30                |

| <b>Plan Sections</b>  |                 |             |                       |              |              |                         |                        |                       |         |                  |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|------------------------|-----------------------|---------|------------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | TFO (°) | Target           |
| 0.00                  | 0.00            | 0.00        | 0.00                  | 0.00         | 0.00         | 0.00                    | 0.00                   | 0.00                  | 0.00    |                  |
| 200.00                | 0.00            | 0.00        | 200.00                | 0.00         | 0.00         | 0.00                    | 0.00                   | 0.00                  | 0.00    |                  |
| 600.00                | 8.00            | 11.30       | 598.70                | 27.34        | 5.46         | 2.00                    | 2.00                   | 0.00                  | 11.30   | PBHL v1 - HCW FC |
| 1,600.00              | 8.00            | 11.30       | 1,588.97              | 163.81       | 32.74        | 0.00                    | 0.00                   | 0.00                  | 0.00    |                  |
| 1,999.78              | 16.00           | 11.30       | 1,979.70              | 245.24       | 49.01        | 2.00                    | 2.00                   | 0.00                  | 0.00    |                  |
| 5,334.62              | 16.00           | 11.30       | 5,185.43              | 1,146.38     | 229.09       | 0.00                    | 0.00                   | 0.00                  | 0.00    |                  |
| 6,400.99              | 0.00            | 0.00        | 6,238.00              | 1,291.40     | 258.07       | 1.50                    | -1.50                  | 0.00                  | 180.00  |                  |
| 7,434.99              | 0.00            | 0.00        | 7,272.00              | 1,291.40     | 258.07       | 0.00                    | 0.00                   | 0.00                  | 0.00    | PBHL v1 - HCW FC |

|                  |                                |                                     |                              |
|------------------|--------------------------------|-------------------------------------|------------------------------|
| <b>Database:</b> | Southern Region                | <b>Local Co-ordinate Reference:</b> | Well 24-20D                  |
| <b>Company:</b>  | Great Western                  | <b>TVD Reference:</b>               | WELL @ 4760.00usft (Cade 22) |
| <b>Project:</b>  | Weld County, Colorado (NAD 83) | <b>MD Reference:</b>                | WELL @ 4760.00usft (Cade 22) |
| <b>Site:</b>     | HCW FD                         | <b>North Reference:</b>             | Grid                         |
| <b>Well:</b>     | 24-20D                         | <b>Survey Calculation Method:</b>   | Minimum Curvature            |
| <b>Wellbore:</b> | Wellbore #1                    |                                     |                              |
| <b>Design:</b>   | Design #1                      |                                     |                              |

| Planned Survey                    |                 |             |                       |              |              |                         |                         |                        |                       |
|-----------------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (usft)             | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 0.00                              | 0.00            | 0.00        | 0.00                  | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 100.00                            | 0.00            | 0.00        | 100.00                | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 200.00                            | 0.00            | 0.00        | 200.00                | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| <b>KOP, 2.00°/100' Build</b>      |                 |             |                       |              |              |                         |                         |                        |                       |
| 300.00                            | 2.00            | 11.30       | 299.98                | 1.71         | 0.34         | 1.75                    | 2.00                    | 2.00                   | 0.00                  |
| 400.00                            | 4.00            | 11.30       | 399.84                | 6.84         | 1.37         | 6.98                    | 2.00                    | 2.00                   | 0.00                  |
| 500.00                            | 6.00            | 11.30       | 499.45                | 15.39        | 3.08         | 15.69                   | 2.00                    | 2.00                   | 0.00                  |
| 600.00                            | 8.00            | 11.30       | 598.70                | 27.34        | 5.46         | 27.88                   | 2.00                    | 2.00                   | 0.00                  |
| <b>Hold 8.00° Inc, 11.30° Azm</b> |                 |             |                       |              |              |                         |                         |                        |                       |
| 601.31                            | 8.00            | 11.30       | 600.00                | 27.52        | 5.50         | 28.06                   | 0.00                    | 0.00                   | 0.00                  |
| <b>8-5/8"</b>                     |                 |             |                       |              |              |                         |                         |                        |                       |
| 700.00                            | 8.00            | 11.30       | 697.73                | 40.99        | 8.19         | 41.80                   | 0.00                    | 0.00                   | 0.00                  |
| 800.00                            | 8.00            | 11.30       | 796.76                | 54.63        | 10.92        | 55.71                   | 0.00                    | 0.00                   | 0.00                  |
| 900.00                            | 8.00            | 11.30       | 895.78                | 68.28        | 13.65        | 69.63                   | 0.00                    | 0.00                   | 0.00                  |
| 1,000.00                          | 8.00            | 11.30       | 994.81                | 81.93        | 16.37        | 83.55                   | 0.00                    | 0.00                   | 0.00                  |
| 1,100.00                          | 8.00            | 11.30       | 1,093.84              | 95.58        | 19.10        | 97.47                   | 0.00                    | 0.00                   | 0.00                  |
| 1,200.00                          | 8.00            | 11.30       | 1,192.86              | 109.22       | 21.83        | 111.38                  | 0.00                    | 0.00                   | 0.00                  |
| 1,300.00                          | 8.00            | 11.30       | 1,291.89              | 122.87       | 24.55        | 125.30                  | 0.00                    | 0.00                   | 0.00                  |
| 1,400.00                          | 8.00            | 11.30       | 1,390.92              | 136.52       | 27.28        | 139.22                  | 0.00                    | 0.00                   | 0.00                  |
| 1,500.00                          | 8.00            | 11.30       | 1,489.94              | 150.17       | 30.01        | 153.14                  | 0.00                    | 0.00                   | 0.00                  |
| 1,600.00                          | 8.00            | 11.30       | 1,588.97              | 163.81       | 32.74        | 167.05                  | 0.00                    | 0.00                   | 0.00                  |
| <b>Begin 2.00°/100' Build</b>     |                 |             |                       |              |              |                         |                         |                        |                       |
| 1,700.00                          | 10.00           | 11.30       | 1,687.73              | 179.15       | 35.80        | 182.70                  | 2.00                    | 2.00                   | 0.00                  |
| 1,800.00                          | 12.00           | 11.30       | 1,785.89              | 197.86       | 39.54        | 201.78                  | 2.00                    | 2.00                   | 0.00                  |
| 1,900.00                          | 14.00           | 11.30       | 1,883.32              | 219.92       | 43.95        | 224.27                  | 2.00                    | 2.00                   | 0.00                  |
| 1,999.78                          | 16.00           | 11.30       | 1,979.70              | 245.24       | 49.01        | 250.09                  | 2.00                    | 2.00                   | 0.00                  |
| <b>Begin 16.00° Tangent</b>       |                 |             |                       |              |              |                         |                         |                        |                       |
| 2,000.00                          | 16.00           | 11.30       | 1,979.91              | 245.30       | 49.02        | 250.15                  | 0.00                    | 0.00                   | 0.00                  |
| 2,100.00                          | 16.00           | 11.30       | 2,076.04              | 272.32       | 54.42        | 277.71                  | 0.00                    | 0.00                   | 0.00                  |
| 2,200.00                          | 16.00           | 11.30       | 2,172.17              | 299.34       | 59.82        | 305.26                  | 0.00                    | 0.00                   | 0.00                  |
| 2,300.00                          | 16.00           | 11.30       | 2,268.30              | 326.37       | 65.22        | 332.82                  | 0.00                    | 0.00                   | 0.00                  |
| 2,400.00                          | 16.00           | 11.30       | 2,364.42              | 353.39       | 70.62        | 360.38                  | 0.00                    | 0.00                   | 0.00                  |
| 2,463.02                          | 16.00           | 11.30       | 2,425.00              | 370.42       | 74.02        | 377.74                  | 0.00                    | 0.00                   | 0.00                  |
| <b>Greeley Sand</b>               |                 |             |                       |              |              |                         |                         |                        |                       |
| 2,500.00                          | 16.00           | 11.30       | 2,460.55              | 380.41       | 76.02        | 387.93                  | 0.00                    | 0.00                   | 0.00                  |
| 2,600.00                          | 16.00           | 11.30       | 2,556.68              | 407.43       | 81.42        | 415.49                  | 0.00                    | 0.00                   | 0.00                  |
| 2,700.00                          | 16.00           | 11.30       | 2,652.81              | 434.45       | 86.82        | 443.04                  | 0.00                    | 0.00                   | 0.00                  |
| 2,800.00                          | 16.00           | 11.30       | 2,748.94              | 461.48       | 92.22        | 470.60                  | 0.00                    | 0.00                   | 0.00                  |
| 2,900.00                          | 16.00           | 11.30       | 2,845.07              | 488.50       | 97.62        | 498.16                  | 0.00                    | 0.00                   | 0.00                  |
| 3,000.00                          | 16.00           | 11.30       | 2,941.19              | 515.52       | 103.02       | 525.71                  | 0.00                    | 0.00                   | 0.00                  |
| 3,100.00                          | 16.00           | 11.30       | 3,037.32              | 542.54       | 108.42       | 553.27                  | 0.00                    | 0.00                   | 0.00                  |
| 3,200.00                          | 16.00           | 11.30       | 3,133.45              | 569.56       | 113.82       | 580.83                  | 0.00                    | 0.00                   | 0.00                  |
| 3,300.00                          | 16.00           | 11.30       | 3,229.58              | 596.59       | 119.22       | 608.38                  | 0.00                    | 0.00                   | 0.00                  |
| 3,400.00                          | 16.00           | 11.30       | 3,325.71              | 623.61       | 124.62       | 635.94                  | 0.00                    | 0.00                   | 0.00                  |
| 3,500.00                          | 16.00           | 11.30       | 3,421.84              | 650.63       | 130.02       | 663.49                  | 0.00                    | 0.00                   | 0.00                  |
| 3,586.51                          | 16.00           | 11.30       | 3,505.00              | 674.01       | 134.69       | 687.33                  | 0.00                    | 0.00                   | 0.00                  |
| <b>Parkman</b>                    |                 |             |                       |              |              |                         |                         |                        |                       |
| 3,600.00                          | 16.00           | 11.30       | 3,517.96              | 677.65       | 135.42       | 691.05                  | 0.00                    | 0.00                   | 0.00                  |
| 3,700.00                          | 16.00           | 11.30       | 3,614.09              | 704.67       | 140.82       | 718.61                  | 0.00                    | 0.00                   | 0.00                  |
| 3,800.00                          | 16.00           | 11.30       | 3,710.22              | 731.70       | 146.22       | 746.16                  | 0.00                    | 0.00                   | 0.00                  |
| 3,900.00                          | 16.00           | 11.30       | 3,806.35              | 758.72       | 151.62       | 773.72                  | 0.00                    | 0.00                   | 0.00                  |
| 4,000.00                          | 16.00           | 11.30       | 3,902.48              | 785.74       | 157.02       | 801.28                  | 0.00                    | 0.00                   | 0.00                  |
| 4,100.00                          | 16.00           | 11.30       | 3,998.61              | 812.76       | 162.42       | 828.83                  | 0.00                    | 0.00                   | 0.00                  |

|                  |                                |                                     |                              |
|------------------|--------------------------------|-------------------------------------|------------------------------|
| <b>Database:</b> | Southern Region                | <b>Local Co-ordinate Reference:</b> | Well 24-20D                  |
| <b>Company:</b>  | Great Western                  | <b>TVD Reference:</b>               | WELL @ 4760.00usft (Cade 22) |
| <b>Project:</b>  | Weld County, Colorado (NAD 83) | <b>MD Reference:</b>                | WELL @ 4760.00usft (Cade 22) |
| <b>Site:</b>     | HCW FD                         | <b>North Reference:</b>             | Grid                         |
| <b>Well:</b>     | 24-20D                         | <b>Survey Calculation Method:</b>   | Minimum Curvature            |
| <b>Wellbore:</b> | Wellbore #1                    |                                     |                              |
| <b>Design:</b>   | Design #1                      |                                     |                              |

| Planned Survey               |                 |             |                       |              |              |                         |                         |                        |                       |
|------------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (usft)        | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 4,200.00                     | 16.00           | 11.30       | 4,094.73              | 839.78       | 167.82       | 856.39                  | 0.00                    | 0.00                   | 0.00                  |
| 4,300.00                     | 16.00           | 11.30       | 4,190.86              | 866.81       | 173.22       | 883.94                  | 0.00                    | 0.00                   | 0.00                  |
| 4,300.14                     | 16.00           | 11.30       | 4,191.00              | 866.85       | 173.23       | 883.98                  | 0.00                    | 0.00                   | 0.00                  |
| <b>Sussex</b>                |                 |             |                       |              |              |                         |                         |                        |                       |
| 4,400.00                     | 16.00           | 11.30       | 4,286.99              | 893.83       | 178.62       | 911.50                  | 0.00                    | 0.00                   | 0.00                  |
| 4,500.00                     | 16.00           | 11.30       | 4,383.12              | 920.85       | 184.02       | 939.06                  | 0.00                    | 0.00                   | 0.00                  |
| 4,600.00                     | 16.00           | 11.30       | 4,479.25              | 947.87       | 189.42       | 966.61                  | 0.00                    | 0.00                   | 0.00                  |
| 4,700.00                     | 16.00           | 11.30       | 4,575.38              | 974.89       | 194.82       | 994.17                  | 0.00                    | 0.00                   | 0.00                  |
| 4,701.69                     | 16.00           | 11.30       | 4,577.00              | 975.35       | 194.91       | 994.64                  | 0.00                    | 0.00                   | 0.00                  |
| <b>Shannon</b>               |                 |             |                       |              |              |                         |                         |                        |                       |
| 4,800.00                     | 16.00           | 11.30       | 4,671.50              | 1,001.92     | 200.22       | 1,021.73                | 0.00                    | 0.00                   | 0.00                  |
| 4,900.00                     | 16.00           | 11.30       | 4,767.63              | 1,028.94     | 205.62       | 1,049.28                | 0.00                    | 0.00                   | 0.00                  |
| 5,000.00                     | 16.00           | 11.30       | 4,863.76              | 1,055.96     | 211.02       | 1,076.84                | 0.00                    | 0.00                   | 0.00                  |
| 5,100.00                     | 16.00           | 11.30       | 4,959.89              | 1,082.98     | 216.42       | 1,104.39                | 0.00                    | 0.00                   | 0.00                  |
| 5,200.00                     | 16.00           | 11.30       | 5,056.02              | 1,110.00     | 221.82       | 1,131.95                | 0.00                    | 0.00                   | 0.00                  |
| 5,300.00                     | 16.00           | 11.30       | 5,152.15              | 1,137.03     | 227.22       | 1,159.51                | 0.00                    | 0.00                   | 0.00                  |
| 5,334.62                     | 16.00           | 11.30       | 5,185.43              | 1,146.38     | 229.09       | 1,169.05                | 0.00                    | 0.00                   | 0.00                  |
| <b>Begin 1.50°/100' Drop</b> |                 |             |                       |              |              |                         |                         |                        |                       |
| 5,400.00                     | 15.01           | 11.30       | 5,248.42              | 1,163.52     | 232.51       | 1,186.53                | 1.50                    | -1.50                  | 0.00                  |
| 5,500.00                     | 13.51           | 11.30       | 5,345.34              | 1,187.68     | 237.34       | 1,211.16                | 1.50                    | -1.50                  | 0.00                  |
| 5,600.00                     | 12.01           | 11.30       | 5,442.86              | 1,209.35     | 241.67       | 1,233.26                | 1.50                    | -1.50                  | 0.00                  |
| 5,700.00                     | 10.51           | 11.30       | 5,540.93              | 1,228.50     | 245.50       | 1,252.79                | 1.50                    | -1.50                  | 0.00                  |
| 5,800.00                     | 9.01            | 11.30       | 5,639.48              | 1,245.14     | 248.82       | 1,269.75                | 1.50                    | -1.50                  | 0.00                  |
| 5,900.00                     | 7.51            | 11.30       | 5,738.44              | 1,259.23     | 251.64       | 1,284.13                | 1.50                    | -1.50                  | 0.00                  |
| 6,000.00                     | 6.01            | 11.30       | 5,837.74              | 1,270.78     | 253.95       | 1,295.91                | 1.50                    | -1.50                  | 0.00                  |
| 6,100.00                     | 4.51            | 11.30       | 5,937.32              | 1,279.78     | 255.74       | 1,305.08                | 1.50                    | -1.50                  | 0.00                  |
| 6,200.00                     | 3.01            | 11.30       | 6,037.10              | 1,286.22     | 257.03       | 1,311.65                | 1.50                    | -1.50                  | 0.00                  |
| 6,300.00                     | 1.51            | 11.30       | 6,137.02              | 1,290.09     | 257.81       | 1,315.60                | 1.50                    | -1.50                  | 0.00                  |
| 6,400.00                     | 0.01            | 11.30       | 6,237.01              | 1,291.40     | 258.07       | 1,316.94                | 1.50                    | -1.50                  | 0.00                  |
| 6,400.99                     | 0.00            | 0.00        | 6,238.00              | 1,291.40     | 258.07       | 1,316.94                | 1.50                    | -1.50                  | 0.00                  |
| <b>Begin Vertical Hold</b>   |                 |             |                       |              |              |                         |                         |                        |                       |
| 6,500.00                     | 0.00            | 0.00        | 6,337.01              | 1,291.40     | 258.07       | 1,316.94                | 0.00                    | 0.00                   | 0.00                  |
| 6,600.00                     | 0.00            | 0.00        | 6,437.01              | 1,291.40     | 258.07       | 1,316.94                | 0.00                    | 0.00                   | 0.00                  |
| 6,700.00                     | 0.00            | 0.00        | 6,537.01              | 1,291.40     | 258.07       | 1,316.94                | 0.00                    | 0.00                   | 0.00                  |
| 6,800.00                     | 0.00            | 0.00        | 6,637.01              | 1,291.40     | 258.07       | 1,316.94                | 0.00                    | 0.00                   | 0.00                  |
| 6,900.00                     | 0.00            | 0.00        | 6,737.01              | 1,291.40     | 258.07       | 1,316.94                | 0.00                    | 0.00                   | 0.00                  |
| 6,942.99                     | 0.00            | 0.00        | 6,780.00              | 1,291.40     | 258.07       | 1,316.94                | 0.00                    | 0.00                   | 0.00                  |
| <b>Niobrara</b>              |                 |             |                       |              |              |                         |                         |                        |                       |
| 7,000.00                     | 0.00            | 0.00        | 6,837.01              | 1,291.40     | 258.07       | 1,316.94                | 0.00                    | 0.00                   | 0.00                  |
| 7,100.00                     | 0.00            | 0.00        | 6,937.01              | 1,291.40     | 258.07       | 1,316.94                | 0.00                    | 0.00                   | 0.00                  |
| 7,200.00                     | 0.00            | 0.00        | 7,037.01              | 1,291.40     | 258.07       | 1,316.94                | 0.00                    | 0.00                   | 0.00                  |
| 7,251.99                     | 0.00            | 0.00        | 7,089.00              | 1,291.40     | 258.07       | 1,316.94                | 0.00                    | 0.00                   | 0.00                  |
| <b>Fort Hayes</b>            |                 |             |                       |              |              |                         |                         |                        |                       |
| 7,274.99                     | 0.00            | 0.00        | 7,112.00              | 1,291.40     | 258.07       | 1,316.94                | 0.00                    | 0.00                   | 0.00                  |
| <b>Codell</b>                |                 |             |                       |              |              |                         |                         |                        |                       |
| 7,300.00                     | 0.00            | 0.00        | 7,137.01              | 1,291.40     | 258.07       | 1,316.94                | 0.00                    | 0.00                   | 0.00                  |
| 7,400.00                     | 0.00            | 0.00        | 7,237.01              | 1,291.40     | 258.07       | 1,316.94                | 0.00                    | 0.00                   | 0.00                  |
| 7,434.99                     | 0.00            | 0.00        | 7,272.00              | 1,291.40     | 258.07       | 1,316.94                | 0.00                    | 0.00                   | 0.00                  |
| <b>PBHL</b>                  |                 |             |                       |              |              |                         |                         |                        |                       |

|                  |                                |                                     |                              |
|------------------|--------------------------------|-------------------------------------|------------------------------|
| <b>Database:</b> | Southern Region                | <b>Local Co-ordinate Reference:</b> | Well 24-20D                  |
| <b>Company:</b>  | Great Western                  | <b>TVD Reference:</b>               | WELL @ 4760.00usft (Cade 22) |
| <b>Project:</b>  | Weld County, Colorado (NAD 83) | <b>MD Reference:</b>                | WELL @ 4760.00usft (Cade 22) |
| <b>Site:</b>     | HCW FD                         | <b>North Reference:</b>             | Grid                         |
| <b>Well:</b>     | 24-20D                         | <b>Survey Calculation Method:</b>   | Minimum Curvature            |
| <b>Wellbore:</b> | Wellbore #1                    |                                     |                              |
| <b>Design:</b>   | Design #1                      |                                     |                              |

| Design Targets  |               |              |            |              |              |                 |                |                  |                   |
|---|---------------|--------------|------------|--------------|--------------|-----------------|----------------|------------------|-------------------|
| Target Name   | Dip Angle (°) | Dip Dir. (°) | TVD (usft) | +N/-S (usft) | +E/-W (usft) | Northing (usft) | Easting (usft) | Latitude         | Longitude         |
| PBHL v1 - HCW FD 2<br>- hit/miss target<br>- Shape<br>- plan hits target center<br>- Circle (radius 200.00) | 0.00          | 0.00         | 7,272.00   | 1,291.40     | 258.07       | 1,414,348.11    | 3,183,074.91   | 40° 28' 8.1211 N | 104° 50' 31.160 W |

| Casing Points         |                       |        |                     |                   |  |
|-----------------------|-----------------------|--------|---------------------|-------------------|--|
| Measured Depth (usft) | Vertical Depth (usft) | Name   | Casing Diameter (") | Hole Diameter (") |  |
| 601.31                | 600.00                | 8-5/8" | 8-5/8               | 12-1/4            |  |

| Formations            |                       |              |           |         |                   |  |
|-----------------------|-----------------------|--------------|-----------|---------|-------------------|--|
| Measured Depth (usft) | Vertical Depth (usft) | Name         | Lithology | Dip (°) | Dip Direction (°) |  |
| 2,463.02              | 2,425.00              | Greeley Sand |           | 0.00    |                   |  |
| 3,586.51              | 3,505.00              | Parkman      |           | 0.00    |                   |  |
| 4,300.14              | 4,191.00              | Sussex       |           | 0.00    |                   |  |
| 4,701.69              | 4,577.00              | Shannon      |           | 0.00    |                   |  |
| 6,942.99              | 6,780.00              | Niobrara     |           | 0.00    |                   |  |
| 7,251.99              | 7,089.00              | Fort Hayes   |           | 0.00    |                   |  |
| 7,274.99              | 7,112.00              | Codell       |           | 0.00    |                   |  |

| Plan Annotations      |                       |                   |              |                            |
|-----------------------|-----------------------|-------------------|--------------|----------------------------|
| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates |              | Comment                    |
|                       |                       | +N/-S (usft)      | +E/-W (usft) |                            |
| 200.00                | 200.00                | 0.00              | 0.00         | KOP, 2.00°/100' Build      |
| 600.00                | 598.70                | 27.34             | 5.46         | Hold 8.00° Inc, 11.30° Azm |
| 1,600.00              | 1,588.97              | 163.81            | 32.74        | Begin 2.00°/100' Build     |
| 1,999.78              | 1,979.70              | 245.24            | 49.01        | Begin 16.00° Tangent       |
| 5,334.62              | 5,185.43              | 1,146.38          | 229.09       | Begin 1.50°/100' Drop      |
| 6,400.99              | 6,238.00              | 1,291.40          | 258.07       | Begin Vertical Hold        |
| 7,434.99              | 7,272.00              | 1,291.40          | 258.07       | PBHL                       |