

# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_HOWARD 20-29 PAD**

**Howard 15-29**

**Howard 15-29**

**Plan: Howard 15-29 (wp02)**

## **Standard Planning Report**

**18 May, 2011**



Project: COLORADO NORTHERN ZONE - 83  
Site: WELD\_HOWARD 20-29 PAD  
Well: Howard 15-29  
Wellbore: Howard 15-29  
Section:  
SHL:  
Design: Howard 15-29 (wp02)  
Latitude: 40.017827  
Longitude: -104.909515  
GL: 5023.00  
KB: 15'RKB + 5023' GL @ 5038.00ft

## FORMATION TOP DETAILS

| TVDPath | MDPath  | Formation |
|---------|---------|-----------|
| 3888.00 | 3988.73 | PK Depth  |
| 4838.00 | 4940.21 | SX Depth  |
| 7356.00 | 7458.21 | NIO Depth |
| 7775.00 | 7877.21 | CD Depth  |
| 7854.00 | 7956.21 | GH Depth  |
| 8208.00 | 8310.21 | J Depth   |



Azimuths to True North  
Magnetic North: 8.92°

Magnetic Field  
Strength: 52924.0snT  
Dip Angle: 66.72°  
Date: 5/6/2011  
Model: IGRF2010

## WELL DETAILS: Howard 15-29

| +N/-S | +E/-W | Northing   | Ground Level:<br>Easting | 5023.00<br>Latitude | Longitude   | Slot |
|-------|-------|------------|--------------------------|---------------------|-------------|------|
| 0.00  | 0.00  | 1249891.37 | 3165382.03               | 40.017827           | -104.909515 |      |

## CASING DETAILS

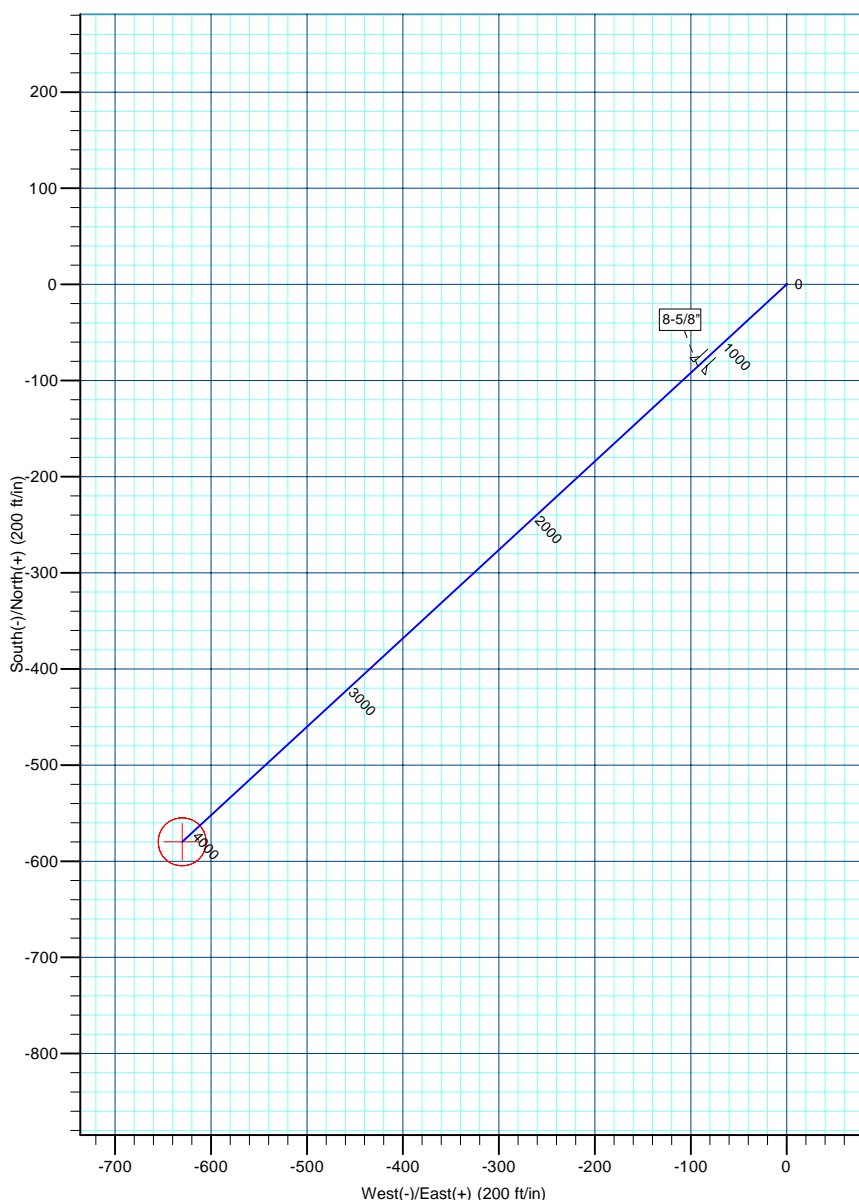
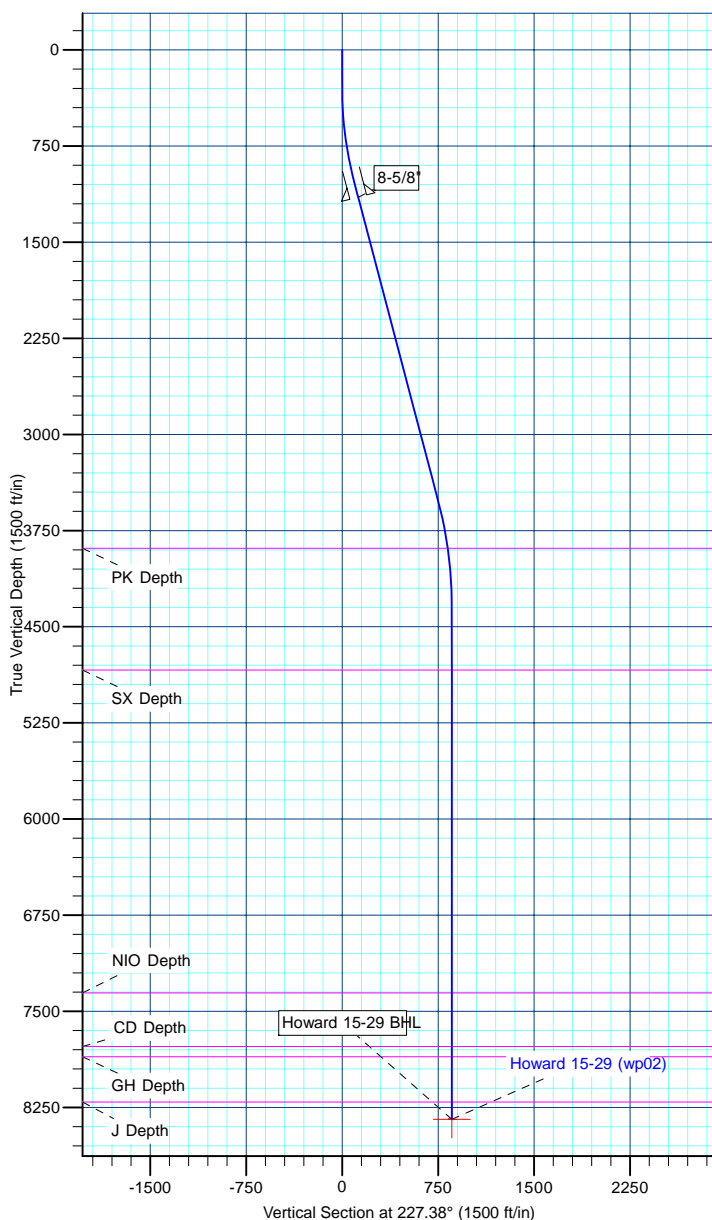
| TVD     | MD      | Name   | Size  |
|---------|---------|--------|-------|
| 1150.00 | 1162.24 | 8-5/8" | 8-5/8 |

## DESIGN TARGET DETAILS

| Name             | TVD     | +N/-S   | +E/-W   | Northing   | Easting    | Latitude  | Longitude   | Shape                  |
|------------------|---------|---------|---------|------------|------------|-----------|-------------|------------------------|
| Howard 15-29 BHL | 8343.00 | -579.90 | -630.20 | 1249307.28 | 3164755.71 | 40.016235 | -104.911765 | Circle (Radius: 25.00) |

## SECTION DETAILS

| MD      | Inc   | Azi    | TVD     | +N/-S   | +E/-W   | Dleg | TFace  | VSect  |
|---------|-------|--------|---------|---------|---------|------|--------|--------|
| 0.00    | 0.00  | 0.00   | 0.00    | 0.00    | 0.00    | 0.00 | 0.00   | 0.00   |
| 300.00  | 0.00  | 0.00   | 300.00  | 0.00    | 0.00    | 0.00 | 0.00   | 0.00   |
| 1038.76 | 14.78 | 227.38 | 1030.60 | -64.14  | -69.71  | 2.00 | 227.38 | 94.73  |
| 3600.91 | 14.78 | 227.38 | 3508.03 | -506.60 | -550.53 | 0.00 | 0.00   | 748.15 |
| 4445.21 | 0.00  | 0.00   | 4343.00 | -579.90 | -630.20 | 1.75 | 180.00 | 856.41 |
| 8445.21 | 0.00  | 0.00   | 8343.00 | -579.90 | -630.20 | 0.00 | 0.00   | 856.41 |



|                  |                             |                                     |                               |
|------------------|-----------------------------|-------------------------------------|-------------------------------|
| <b>Database:</b> | edm5000p                    | <b>Local Co-ordinate Reference:</b> | Well Howard 15-29             |
| <b>Company:</b>  | US ROCKIES REGION PLANNING  | <b>TVD Reference:</b>               | 15'RKB + 5023' GL @ 5038.00ft |
| <b>Project:</b>  | COLORADO NORTHERN ZONE - 83 | <b>MD Reference:</b>                | 15'RKB + 5023' GL @ 5038.00ft |
| <b>Site:</b>     | WELD_HOWARD 20-29 PAD       | <b>North Reference:</b>             | True                          |
| <b>Well:</b>     | Howard 15-29                | <b>Survey Calculation Method:</b>   | Minimum Curvature             |
| <b>Wellbore:</b> | Howard 15-29                |                                     |                               |
| <b>Design:</b>   | Howard 15-29 (wp02)         |                                     |                               |

|                    |                             |                      |                |
|--------------------|-----------------------------|----------------------|----------------|
| <b>Project</b>     | COLORADO NORTHERN ZONE - 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      |                      |                |

| Site                  |          | WELD_HOWARD 20-29 PAD |                 |                   |             |
|-----------------------|----------|-----------------------|-----------------|-------------------|-------------|
| Site Position:        |          | Northing:             | 1,249,878.45 ft | Latitude:         | 40.017791   |
| From:                 | Lat/Long | Easting:              | 3,165,409.00 ft | Longitude:        | -104.909419 |
| Position Uncertainty: | 0.00 ft  | Slot Radius:          | 0 "             | Grid Convergence: | 0.38        |

|                      |              |           |                     |                 |               |             |
|----------------------|--------------|-----------|---------------------|-----------------|---------------|-------------|
| Well                 | Howard 15-29 |           |                     |                 |               |             |
| Well Position        | +N/-S        | 13.10 ft  | Northing:           | 1,249,891.37 ft | Latitude:     | 40.017827   |
|                      | +E/-W        | -26.89 ft | Easting:            | 3,165,382.03 ft | Longitude:    | -104.909515 |
| Position Uncertainty |              | 0.00 ft   | Wellhead Elevation: |                 | Ground Level: | 5,023.00 ft |

|                  |                   |                    |                        |                      |                            |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| <b>Wellbore</b>  | Howard 15-29      |                    |                        |                      |                            |
| <b>Magnetics</b> | <b>Model Name</b> | <b>Sample Date</b> | <b>Declination (°)</b> | <b>Dip Angle (°)</b> | <b>Field Strength (nT)</b> |
|                  | IGRF2010          | 5/6/2011           | 8.92                   | 66.72                | 52,924                     |

|                          |                              |                   |                      |                      |  |
|--------------------------|------------------------------|-------------------|----------------------|----------------------|--|
| <b>Design</b>            | Howard 15-29 (wp02)          |                   |                      |                      |  |
| <b>Audit Notes:</b>      |                              |                   |                      |                      |  |
| <b>Version:</b>          | <b>Phase:</b>                | PLAN              | <b>Tie On Depth:</b> | 0.00                 |  |
| <b>Vertical Section:</b> | <b>Depth From (TVD) (ft)</b> | <b>+N/-S (ft)</b> | <b>+E/-W (ft)</b>    | <b>Direction (°)</b> |  |
|                          | 0.00                         | 0.00              | 0.00                 | 227.38               |  |

| <b>Plan Sections</b> |                 |             |                     |            |            |                       |                      |                     |         |                  |
|----------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|----------------------|---------------------|---------|------------------|
| Measured Depth (ft)  | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) | TFO (°) | Target           |
| 0.00                 | 0.00            | 0.00        | 0.00                | 0.00       | 0.00       | 0.00                  | 0.00                 | 0.00                | 0.00    |                  |
| 300.00               | 0.00            | 0.00        | 300.00              | 0.00       | 0.00       | 0.00                  | 0.00                 | 0.00                | 0.00    |                  |
| 1,038.76             | 14.78           | 227.38      | 1,030.60            | -64.14     | -69.71     | 2.00                  | 2.00                 | 0.00                | 227.38  |                  |
| 3,600.91             | 14.78           | 227.38      | 3,508.03            | -506.60    | -550.53    | 0.00                  | 0.00                 | 0.00                | 0.00    |                  |
| 4,445.21             | 0.00            | 0.00        | 4,343.00            | -579.90    | -630.20    | 1.75                  | -1.75                | 0.00                | 180.00  |                  |
| 8,445.21             | 0.00            | 0.00        | 8,343.00            | -579.90    | -630.20    | 0.00                  | 0.00                 | 0.00                | 0.00    | Howard 15-29 BHL |

|                  |                             |                                     |                               |
|------------------|-----------------------------|-------------------------------------|-------------------------------|
| <b>Database:</b> | edm5000p                    | <b>Local Co-ordinate Reference:</b> | Well Howard 15-29             |
| <b>Company:</b>  | US ROCKIES REGION PLANNING  | <b>TVD Reference:</b>               | 15'RKB + 5023' GL @ 5038.00ft |
| <b>Project:</b>  | COLORADO NORTHERN ZONE - 83 | <b>MD Reference:</b>                | 15'RKB + 5023' GL @ 5038.00ft |
| <b>Site:</b>     | WELD_HOWARD 20-29 PAD       | <b>North Reference:</b>             | True                          |
| <b>Well:</b>     | Howard 15-29                | <b>Survey Calculation Method:</b>   | Minimum Curvature             |
| <b>Wellbore:</b> | Howard 15-29                |                                     |                               |
| <b>Design:</b>   | Howard 15-29 (wp02)         |                                     |                               |

| Planned Survey      |                 |             |                     |            |            |                       |                       |                      |                     |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
| 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                |
| 300.00              | 0.00            | 0.00        | 300.00              | 0.00       | 0.00       | 0.00                  | 0.00                  | 0.00                 | 0.00                |
| 400.00              | 2.00            | 227.38      | 399.98              | -1.18      | -1.28      | 1.75                  | 2.00                  | 2.00                 | 0.00                |
| 500.00              | 4.00            | 227.38      | 499.84              | -4.73      | -5.14      | 6.98                  | 2.00                  | 2.00                 | 0.00                |
| 600.00              | 6.00            | 227.38      | 599.45              | -10.63     | -11.55     | 15.69                 | 2.00                  | 2.00                 | 0.00                |
| 700.00              | 8.00            | 227.38      | 698.70              | -18.88     | -20.52     | 27.88                 | 2.00                  | 2.00                 | 0.00                |
| 800.00              | 10.00           | 227.38      | 797.47              | -29.47     | -32.03     | 43.52                 | 2.00                  | 2.00                 | 0.00                |
| 900.00              | 12.00           | 227.38      | 895.62              | -42.39     | -46.07     | 62.60                 | 2.00                  | 2.00                 | 0.00                |
| 1,000.00            | 14.00           | 227.38      | 993.06              | -57.62     | -62.62     | 85.10                 | 2.00                  | 2.00                 | 0.00                |
| 1,038.76            | 14.78           | 227.38      | 1,030.60            | -64.14     | -69.71     | 94.73                 | 2.00                  | 2.00                 | 0.00                |
| 1,100.00            | 14.78           | 227.38      | 1,089.81            | -74.72     | -81.20     | 110.35                | 0.00                  | 0.00                 | 0.00                |
| 1,162.24            | 14.78           | 227.38      | 1,150.00            | -85.47     | -92.88     | 126.22                | 0.00                  | 0.00                 | 0.00                |
| 8-5/8"              |                 |             |                     |            |            |                       |                       |                      |                     |
| 1,200.00            | 14.78           | 227.38      | 1,186.51            | -91.99     | -99.97     | 135.85                | 0.00                  | 0.00                 | 0.00                |
| 1,300.00            | 14.78           | 227.38      | 1,283.20            | -109.26    | -118.73    | 161.35                | 0.00                  | 0.00                 | 0.00                |
| 1,400.00            | 14.78           | 227.38      | 1,379.89            | -126.53    | -137.50    | 186.85                | 0.00                  | 0.00                 | 0.00                |
| 1,500.00            | 14.78           | 227.38      | 1,476.59            | -143.79    | -156.26    | 212.36                | 0.00                  | 0.00                 | 0.00                |
| 1,600.00            | 14.78           | 227.38      | 1,573.28            | -161.06    | -175.03    | 237.86                | 0.00                  | 0.00                 | 0.00                |
| 1,700.00            | 14.78           | 227.38      | 1,669.97            | -178.33    | -193.80    | 263.36                | 0.00                  | 0.00                 | 0.00                |
| 1,800.00            | 14.78           | 227.38      | 1,766.67            | -195.60    | -212.56    | 288.87                | 0.00                  | 0.00                 | 0.00                |
| 1,900.00            | 14.78           | 227.38      | 1,863.36            | -212.87    | -231.33    | 314.37                | 0.00                  | 0.00                 | 0.00                |
| 2,000.00            | 14.78           | 227.38      | 1,960.05            | -230.14    | -250.10    | 339.87                | 0.00                  | 0.00                 | 0.00                |
| 2,100.00            | 14.78           | 227.38      | 2,056.75            | -247.41    | -268.86    | 365.37                | 0.00                  | 0.00                 | 0.00                |
| 2,200.00            | 14.78           | 227.38      | 2,153.44            | -264.68    | -287.63    | 390.88                | 0.00                  | 0.00                 | 0.00                |
| 2,300.00            | 14.78           | 227.38      | 2,250.13            | -281.95    | -306.40    | 416.38                | 0.00                  | 0.00                 | 0.00                |
| 2,400.00            | 14.78           | 227.38      | 2,346.83            | -299.21    | -325.16    | 441.88                | 0.00                  | 0.00                 | 0.00                |
| 2,500.00            | 14.78           | 227.38      | 2,443.52            | -316.48    | -343.93    | 467.38                | 0.00                  | 0.00                 | 0.00                |
| 2,600.00            | 14.78           | 227.38      | 2,540.21            | -333.75    | -362.70    | 492.89                | 0.00                  | 0.00                 | 0.00                |
| 2,700.00            | 14.78           | 227.38      | 2,636.91            | -351.02    | -381.46    | 518.39                | 0.00                  | 0.00                 | 0.00                |
| 2,800.00            | 14.78           | 227.38      | 2,733.60            | -368.29    | -400.23    | 543.89                | 0.00                  | 0.00                 | 0.00                |
| 2,900.00            | 14.78           | 227.38      | 2,830.29            | -385.56    | -419.00    | 569.40                | 0.00                  | 0.00                 | 0.00                |
| 3,000.00            | 14.78           | 227.38      | 2,926.99            | -402.83    | -437.76    | 594.90                | 0.00                  | 0.00                 | 0.00                |
| 3,100.00            | 14.78           | 227.38      | 3,023.68            | -420.10    | -456.53    | 620.40                | 0.00                  | 0.00                 | 0.00                |
| 3,200.00            | 14.78           | 227.38      | 3,120.37            | -437.36    | -475.29    | 645.90                | 0.00                  | 0.00                 | 0.00                |
| 3,300.00            | 14.78           | 227.38      | 3,217.07            | -454.63    | -494.06    | 671.41                | 0.00                  | 0.00                 | 0.00                |
| 3,400.00            | 14.78           | 227.38      | 3,313.76            | -471.90    | -512.83    | 696.91                | 0.00                  | 0.00                 | 0.00                |
| 3,500.00            | 14.78           | 227.38      | 3,410.45            | -489.17    | -531.59    | 722.41                | 0.00                  | 0.00                 | 0.00                |
| 3,600.00            | 14.78           | 227.38      | 3,507.15            | -506.44    | -550.36    | 747.92                | 0.00                  | 0.00                 | 0.00                |
| 3,600.91            | 14.78           | 227.38      | 3,508.03            | -506.60    | -550.53    | 748.15                | 0.00                  | 0.00                 | 0.00                |
| 3,700.00            | 13.04           | 227.38      | 3,604.21            | -522.72    | -568.06    | 771.97                | 1.75                  | -1.75                | 0.00                |
| 3,800.00            | 11.29           | 227.38      | 3,701.96            | -536.99    | -583.56    | 793.04                | 1.75                  | -1.75                | 0.00                |
| 3,900.00            | 9.54            | 227.38      | 3,800.31            | -549.24    | -596.87    | 811.12                | 1.75                  | -1.75                | 0.00                |
| 3,988.73            | 7.99            | 227.38      | 3,888.00            | -558.39    | -606.82    | 824.64                | 1.75                  | -1.75                | 0.00                |
| PK Depth            |                 |             |                     |            |            |                       |                       |                      |                     |
| 4,000.00            | 7.79            | 227.38      | 3,899.16            | -559.44    | -607.96    | 826.19                | 1.75                  | -1.75                | 0.00                |
| 4,100.00            | 6.04            | 227.38      | 3,998.43            | -567.59    | -616.82    | 838.23                | 1.75                  | -1.75                | 0.00                |
| 4,200.00            | 4.29            | 227.38      | 4,098.02            | -573.69    | -623.44    | 847.23                | 1.75                  | -1.75                | 0.00                |
| 4,300.00            | 2.54            | 227.38      | 4,197.84            | -577.72    | -627.83    | 853.19                | 1.75                  | -1.75                | 0.00                |
| 4,400.00            | 0.79            | 227.38      | 4,297.79            | -579.69    | -629.97    | 856.10                | 1.75                  | -1.75                | 0.00                |
| 4,445.21            | 0.00            | 0.00        | 4,343.00            | -579.90    | -630.20    | 856.41                | 1.75                  | -1.75                | 0.00                |
| 4,500.00            | 0.00            | 0.00        | 4,397.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 4,600.00            | 0.00            | 0.00        | 4,497.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |

|                  |                             |                                     |                               |
|------------------|-----------------------------|-------------------------------------|-------------------------------|
| <b>Database:</b> | edm5000p                    | <b>Local Co-ordinate Reference:</b> | Well Howard 15-29             |
| <b>Company:</b>  | US ROCKIES REGION PLANNING  | <b>TVD Reference:</b>               | 15'RKB + 5023' GL @ 5038.00ft |
| <b>Project:</b>  | COLORADO NORTHERN ZONE - 83 | <b>MD Reference:</b>                | 15'RKB + 5023' GL @ 5038.00ft |
| <b>Site:</b>     | WELD_HOWARD 20-29 PAD       | <b>North Reference:</b>             | True                          |
| <b>Well:</b>     | Howard 15-29                | <b>Survey Calculation Method:</b>   | Minimum Curvature             |
| <b>Wellbore:</b> | Howard 15-29                |                                     |                               |
| <b>Design:</b>   | Howard 15-29 (wp02)         |                                     |                               |

| Planned Survey          |                 |             |                     |            |            |                       |                       |                      |                     |
|-------------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| Measured Depth (ft)     | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
| 4,700.00                | 0.00            | 0.00        | 4,597.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 4,800.00                | 0.00            | 0.00        | 4,697.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 4,900.00                | 0.00            | 0.00        | 4,797.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 4,940.21                | 0.00            | 0.00        | 4,838.00            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| <b>SX Depth</b>         |                 |             |                     |            |            |                       |                       |                      |                     |
| 5,000.00                | 0.00            | 0.00        | 4,897.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 5,100.00                | 0.00            | 0.00        | 4,997.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 5,200.00                | 0.00            | 0.00        | 5,097.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 5,300.00                | 0.00            | 0.00        | 5,197.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 5,400.00                | 0.00            | 0.00        | 5,297.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 5,500.00                | 0.00            | 0.00        | 5,397.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 5,600.00                | 0.00            | 0.00        | 5,497.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 5,700.00                | 0.00            | 0.00        | 5,597.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 5,800.00                | 0.00            | 0.00        | 5,697.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 5,900.00                | 0.00            | 0.00        | 5,797.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 6,000.00                | 0.00            | 0.00        | 5,897.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 6,100.00                | 0.00            | 0.00        | 5,997.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 6,200.00                | 0.00            | 0.00        | 6,097.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 6,300.00                | 0.00            | 0.00        | 6,197.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 6,400.00                | 0.00            | 0.00        | 6,297.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 6,500.00                | 0.00            | 0.00        | 6,397.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 6,600.00                | 0.00            | 0.00        | 6,497.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 6,700.00                | 0.00            | 0.00        | 6,597.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 6,800.00                | 0.00            | 0.00        | 6,697.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 6,900.00                | 0.00            | 0.00        | 6,797.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 7,000.00                | 0.00            | 0.00        | 6,897.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 7,100.00                | 0.00            | 0.00        | 6,997.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 7,200.00                | 0.00            | 0.00        | 7,097.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 7,300.00                | 0.00            | 0.00        | 7,197.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 7,400.00                | 0.00            | 0.00        | 7,297.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 7,458.21                | 0.00            | 0.00        | 7,356.00            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| <b>NIO Depth</b>        |                 |             |                     |            |            |                       |                       |                      |                     |
| 7,500.00                | 0.00            | 0.00        | 7,397.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 7,600.00                | 0.00            | 0.00        | 7,497.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 7,700.00                | 0.00            | 0.00        | 7,597.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 7,800.00                | 0.00            | 0.00        | 7,697.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 7,877.21                | 0.00            | 0.00        | 7,775.00            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| <b>CD Depth</b>         |                 |             |                     |            |            |                       |                       |                      |                     |
| 7,900.00                | 0.00            | 0.00        | 7,797.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 7,956.21                | 0.00            | 0.00        | 7,854.00            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| <b>GH Depth</b>         |                 |             |                     |            |            |                       |                       |                      |                     |
| 8,000.00                | 0.00            | 0.00        | 7,897.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 8,100.00                | 0.00            | 0.00        | 7,997.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 8,200.00                | 0.00            | 0.00        | 8,097.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 8,300.00                | 0.00            | 0.00        | 8,197.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 8,310.21                | 0.00            | 0.00        | 8,208.00            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| <b>J Depth</b>          |                 |             |                     |            |            |                       |                       |                      |                     |
| 8,400.00                | 0.00            | 0.00        | 8,297.79            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| 8,445.21                | 0.00            | 0.00        | 8,343.00            | -579.90    | -630.20    | 856.41                | 0.00                  | 0.00                 | 0.00                |
| <b>Howard 15-29 BHL</b> |                 |             |                     |            |            |                       |                       |                      |                     |

|                  |                             |                                     |                               |
|------------------|-----------------------------|-------------------------------------|-------------------------------|
| <b>Database:</b> | edm5000p                    | <b>Local Co-ordinate Reference:</b> | Well Howard 15-29             |
| <b>Company:</b>  | US ROCKIES REGION PLANNING  | <b>TVD Reference:</b>               | 15'RKB + 5023' GL @ 5038.00ft |
| <b>Project:</b>  | COLORADO NORTHERN ZONE - 83 | <b>MD Reference:</b>                | 15'RKB + 5023' GL @ 5038.00ft |
| <b>Site:</b>     | WELD_HOWARD 20-29 PAD       | <b>North Reference:</b>             | True                          |
| <b>Well:</b>     | Howard 15-29                | <b>Survey Calculation Method:</b>   | Minimum Curvature             |
| <b>Wellbore:</b> | Howard 15-29                |                                     |                               |
| <b>Design:</b>   | Howard 15-29 (wp02)         |                                     |                               |

| Design Targets            |           |          |          |         |         |              |              |           |             |
|---------------------------|-----------|----------|----------|---------|---------|--------------|--------------|-----------|-------------|
| Target Name               |           |          |          |         |         |              |              |           |             |
| - hit/miss target         | Dip Angle | Dip Dir. | TVD      | +N/-S   | +E/-W   | Northing     | Easting      | Latitude  | Longitude   |
| - Shape                   | (°)       | (°)      | (ft)     | (ft)    | (ft)    | (ft)         | (ft)         |           |             |
| Howard 15-29 BHL          | 0.00      | 0.00     | 8,343.00 | -579.90 | -630.20 | 1,249,307.28 | 3,164,755.71 | 40.016235 | -104.911765 |
| - plan hits target center |           |          |          |         |         |              |              |           |             |
| - Circle (radius 25.00)   |           |          |          |         |         |              |              |           |             |

| Casing Points  |                |        |      |                 |               |
|----------------|----------------|--------|------|-----------------|---------------|
| Measured Depth | Vertical Depth |        |      | Casing Diameter | Hole Diameter |
| (ft)           | (ft)           |        | Name | (")             | (")           |
| 1,162.24       | 1,150.00       | 8-5/8" |      | 8-5/8           | 11            |

| Formations     |                |           |      |           |     |               |
|----------------|----------------|-----------|------|-----------|-----|---------------|
| Measured Depth | Vertical Depth |           |      |           | Dip | Dip Direction |
| (ft)           | (ft)           |           | Name | Lithology | (°) | (°)           |
| 3,988.73       | 3,888.00       | PK Depth  |      |           |     |               |
| 4,940.21       | 4,838.00       | SX Depth  |      |           |     |               |
| 7,458.21       | 7,356.00       | NIO Depth |      |           |     |               |
| 7,877.21       | 7,775.00       | CD Depth  |      |           |     |               |
| 7,956.21       | 7,854.00       | GH Depth  |      |           |     |               |
| 8,310.21       | 8,208.00       | J Depth   |      |           |     |               |