

ENSIGN

Directional



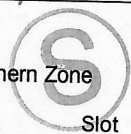
01785600

Well Name: **Quarter Circle S 1-7JI**

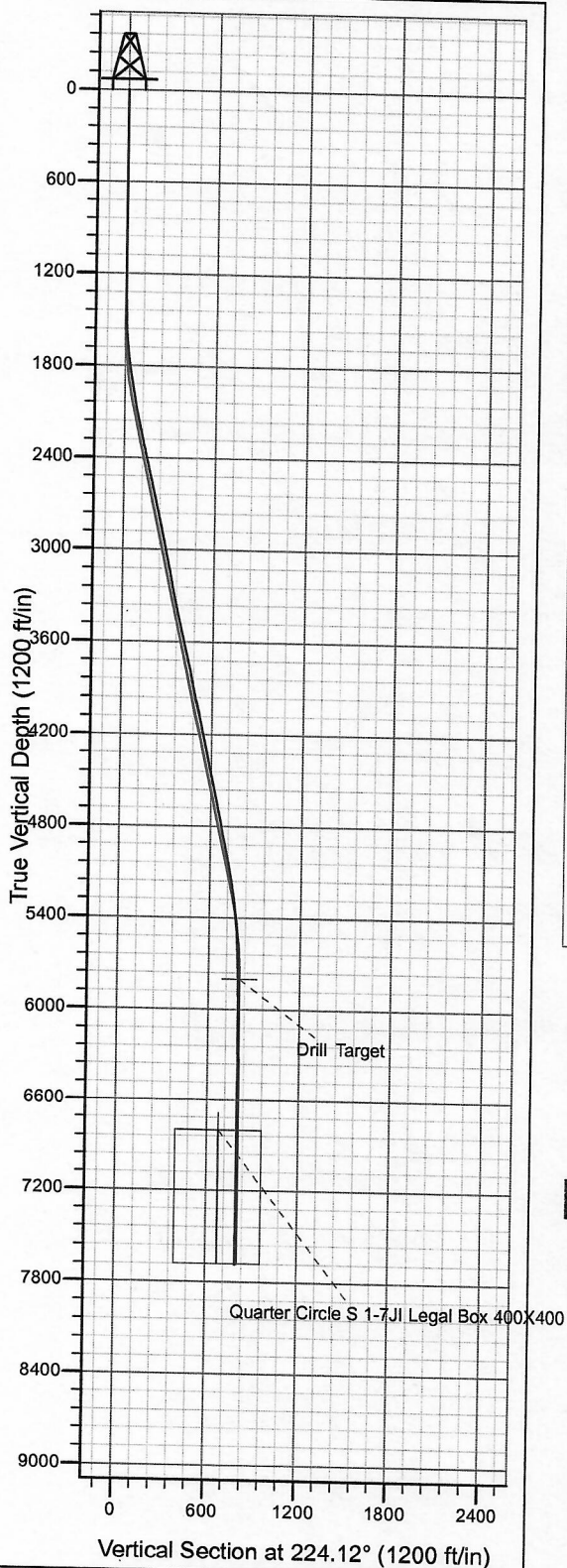
Surface Location: Quarter Circle Pad SEC.1-T4N-R68W
North American Datum 1983, US State Plane 1983, Colorado Northern Zone

Ground Elevation: 4911.0

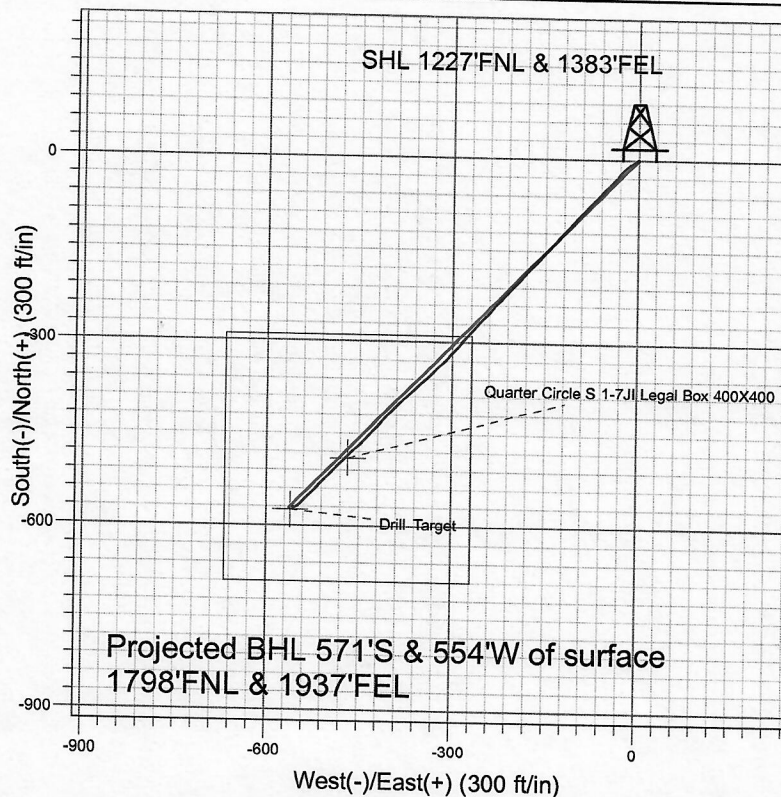
+N/-S+E/-W Northing Easting Latitude Longitude
0.0 0.0 1369272.62 3153856.98 40° 20' 44.664 N 104° 56' 52.836 W
Original Well Elev WELL @ 4923.5ft (Original Well Elev)



Slot



NOBLE ENERGY INC WELD COUNTY CO



LEGEND

- ✕ Quarter Circle S 1-7JI, Wellbore #1, Design #1 V0
- Wellbore #1

Final Survey Plot

Projected Final Survey -
7764'MD & 7683.5'TVD @ 795' VS
0.2 deg Inc 163.9 deg AZ

RECEIVED

APR 09 2009

COGCC

Project: SEC.1-T4N-R68W
Site: Quarter Circle Pad SEC.1-T4N-R68W
Well: Quarter Circle S 1-7JI
Plan: Wellbore #1



ENSIGN

Directional

**NOBLE ENERGY INC WELD
COUNTY CO**

SEC.1-T4N-R68W

Quarter Circle Pad SEC.1-T4N-R68W

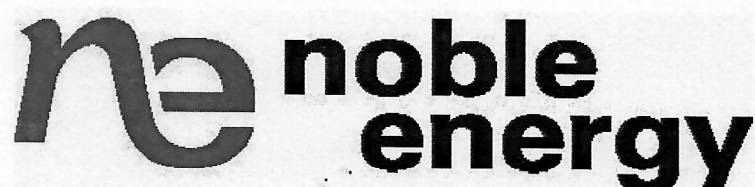
Quarter Circle S 1-7JI

Wellbore #1

Design: Wellbore #1

Standard Survey Report

24 March, 2009



| | | | |
|------------------|-----------------------------------|-------------------------------------|--------------------------------------|
| Company: | NOBLE ENERGY INC WELD COUNTY CO | Local Co-ordinate Reference: | Well Quarter Circle S 1-7JI |
| Project: | SEC.1-T4N-R68W | TVD Reference: | WELL @ 4923.5ft (Original Well Elev) |
| Site: | Quarter Circle Pad SEC.1-T4N-R68W | MD Reference: | WELL @ 4923.5ft (Original Well Elev) |
| Well: | Quarter Circle S 1-7JI | North Reference: | True |
| Wellbore: | Wellbore #1 | Survey Calculation Method: | Minimum Curvature |
| Design: | Wellbore #1 | Database: | EDM den0-adp01 Server Data |

| | | | |
|--------------------|--------------------------------------|----------------------|-----------------------------|
| Project | SEC.1-T4N-R68W, Weld County Colorado | | |
| Map System: | US State Plane 1983 | System Datum: | Mean Sea Level |
| Geo Datum: | North American Datum 1983 | | Using Well Reference Point |
| Map Zone: | Colorado Northern Zone | | Using geodetic scale factor |

| Site | | | | | | Quarter Circle Pad SEC.1-T4N-R68W | | | | | | | | | | | |
|-----------------------|--|----------|-----------|--|--|-----------------------------------|--|--|------------|--|-----------------|-------------------|--|--|--------|--|--|
| Site Position: | | | Northing: | | | 1,372,329.91 ft | | | Latitude: | | | 40° 20' 44.664 N | | | | | |
| From: | | Lat/Long | Easting: | | | 3,418,079.96 ft | | | Longitude: | | 104° 0' 0.000 W | | | | | | |
| Position Uncertainty: | | | 0.0 ft | | | Slot Radius: | | | " | | | Grid Convergence: | | | 0.97 ° | | |

| | | | | | | |
|----------------------|------------------------|--------|---------------------|-----------------|---------------|-------------------|
| Well | Quarter Circle S 1-7JI | | | | | |
| Well Position | +N/-S | 0.0 ft | Northing: | 1,369,272.62 ft | Latitude: | 40° 20' 44.664 N |
| | +E/-W | 0.0 ft | Easting: | 3,153,856.98 ft | Longitude: | 104° 56' 52.836 W |
| Position Uncertainty | | 0.0 ft | Wellhead Elevation: | ft | Ground Level: | 4,911.0 ft |

| | | | | | |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore | Wellbore #1 | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | IGRF200510 | 10/9/2007 | 9.42 | 67.11 | 53,485 |

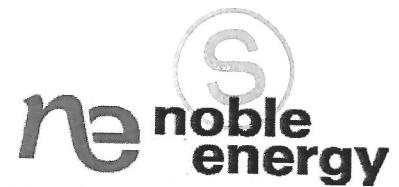
| | | | | | |
|--------------------------|-------------------------|---------------|--------------|----------------------|-----|
| Design | Wellbore #1 | | | | |
| Audit Notes: | | | | | |
| Version: | 1.0 | Phase: | ACTUAL | Tie On Depth: | 0.0 |
| Vertical Section: | Depth From (TVD) | +N/-S | +E/-W | Direction | |
| | (ft) | (ft) | (ft) | (°) | |
| | 0.0 | 0.0 | 0.0 | 224.12 | |

| | | | | | |
|-----------------------|-----------------|--------------------------|------------------|--------------------|--|
| Survey Program | Date 11/12/2007 | | | | |
| From (ft) | To (ft) | Survey (Wellbore) | Tool Name | Description | |
| 524.0 | 7,764.0 | Survey #1 (Wellbore #1) | MWD | MWD - Standard | |

| | | | | | | | | | |
|----------------------------|------------------------|--------------------|----------------------------|-------------------|-------------------|------------------------------|------------------------------|-----------------------------|----------------------------|
| 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) |
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 524.0 | 0.00 | 0.00 | 524.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 723.0 | 0.00 | 119.70 | 723.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 808.0 | 0.10 | 290.50 | 808.0 | 0.0 | -0.1 | 0.0 | 0.12 | 0.12 | 0.00 |
| 894.0 | 0.10 | 259.40 | 894.0 | 0.0 | -0.2 | 0.1 | 0.06 | 0.00 | -36.16 |
| 980.0 | 0.20 | 260.00 | 980.0 | 0.0 | -0.4 | 0.3 | 0.12 | 0.12 | 0.70 |
| 1,065.0 | 0.40 | 283.20 | 1,065.0 | 0.0 | -0.9 | 0.6 | 0.27 | 0.24 | 27.29 |
| 1,151.0 | 0.40 | 276.90 | 1,151.0 | 0.1 | -1.5 | 0.9 | 0.05 | 0.00 | -7.33 |
| 1,236.0 | 0.50 | 256.20 | 1,236.0 | 0.1 | -2.1 | 1.4 | 0.22 | 0.12 | -24.35 |
| 1,322.0 | 0.40 | 202.30 | 1,322.0 | -0.3 | -2.6 | 2.0 | 0.49 | -0.12 | -62.67 |
| 1,407.0 | 0.50 | 229.80 | 1,407.0 | -0.8 | -3.0 | 2.6 | 0.28 | 0.12 | 32.35 |
| 1,493.0 | 1.80 | 240.60 | 1,493.0 | -1.7 | -4.5 | 4.3 | 1.53 | 1.51 | 12.56 |
| 1,579.0 | 3.60 | 236.00 | 1,578.9 | -3.9 | -7.9 | 8.3 | 2.11 | 2.09 | -5.35 |

ENSIGN Directional

ENSIGN DIRECTIONAL Survey Report



| | | | |
|------------------|-----------------------------------|-------------------------------------|--------------------------------------|
| Company: | NOBLE ENERGY INC WELD COUNTY CO | Local Co-ordinate Reference: | Well Quarter Circle S 1-7JI |
| Project: | SEC.1-T4N-R68W | TVD Reference: | WELL @ 4923.5ft (Original Well Elev) |
| Site: | Quarter Circle Pad SEC.1-T4N-R68W | MD Reference: | WELL @ 4923.5ft (Original Well Elev) |
| Well: | Quarter Circle S 1-7JI | North Reference: | True |
| Wellbore: | Wellbore #1 | Survey Calculation Method: | Minimum Curvature |
| Design: | Wellbore #1 | Database: | EDM den0-adp01 Server Data |

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) |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| 1,664.0 | 4.80 | 233.70 | 1,663.6 | -7.5 | -12.9 | 14.4 | 1.43 | 1.41 | -2.71 |
| 1,750.0 | 6.80 | 227.00 | 1,749.2 | -13.1 | -19.6 | 23.0 | 2.45 | 2.33 | -7.79 |
| 1,836.0 | 8.40 | 223.10 | 1,834.4 | -21.1 | -27.6 | 34.4 | 1.95 | 1.86 | -4.53 |
| 1,921.0 | 9.80 | 220.80 | 1,918.4 | -31.1 | -36.6 | 47.8 | 1.70 | 1.65 | -2.71 |
| 2,007.0 | 10.70 | 224.00 | 2,003.0 | -42.4 | -46.9 | 63.1 | 1.24 | 1.05 | 3.72 |
| 2,093.0 | 11.20 | 224.10 | 2,087.4 | -54.2 | -58.2 | 79.4 | 0.58 | 0.58 | 0.12 |
| 2,179.0 | 12.10 | 222.10 | 2,171.7 | -66.8 | -70.1 | 96.8 | 1.15 | 1.05 | -2.33 |
| 2,264.0 | 13.10 | 224.80 | 2,254.6 | -80.3 | -82.9 | 115.3 | 1.37 | 1.18 | 3.18 |
| 2,350.0 | 13.50 | 224.30 | 2,338.3 | -94.4 | -96.7 | 135.1 | 0.48 | 0.47 | -0.58 |
| 2,435.0 | 13.50 | 222.50 | 2,421.0 | -108.8 | -110.4 | 154.9 | 0.49 | 0.00 | -2.12 |
| 2,520.0 | 12.30 | 221.30 | 2,503.8 | -122.9 | -123.0 | 173.9 | 1.45 | -1.41 | -1.41 |
| 2,606.5 | 12.90 | 221.90 | 2,588.2 | -137.0 | -135.6 | 192.8 | 0.71 | 0.69 | 0.69 |
| 2,692.3 | 12.70 | 222.70 | 2,671.9 | -151.1 | -148.4 | 211.8 | 0.31 | -0.23 | 0.93 |
| 2,778.0 | 12.00 | 221.10 | 2,755.6 | -164.7 | -160.6 | 230.1 | 0.91 | -0.82 | -1.87 |
| 2,863.8 | 12.00 | 222.60 | 2,839.6 | -178.0 | -172.5 | 247.9 | 0.36 | 0.00 | 1.75 |
| 2,949.4 | 12.50 | 222.60 | 2,923.2 | -191.4 | -184.8 | 266.1 | 0.58 | 0.58 | 0.00 |
| 3,035.0 | 12.00 | 224.30 | 3,006.9 | -204.6 | -197.3 | 284.2 | 0.72 | -0.58 | 1.99 |
| 3,120.8 | 12.40 | 224.80 | 3,090.7 | -217.5 | -210.0 | 302.3 | 0.48 | 0.47 | 0.58 |
| 3,206.4 | 11.00 | 221.20 | 3,174.5 | -230.2 | -221.9 | 319.7 | 1.84 | -1.64 | -4.21 |
| 3,292.1 | 11.30 | 222.80 | 3,258.6 | -242.5 | -233.0 | 336.2 | 0.50 | 0.35 | 1.87 |
| 3,377.7 | 11.40 | 223.50 | 3,342.5 | -254.8 | -244.5 | 353.1 | 0.20 | 0.12 | 0.82 |
| 3,463.4 | 12.10 | 222.30 | 3,426.5 | -267.6 | -256.4 | 370.5 | 0.86 | 0.82 | -1.40 |
| 3,549.1 | 13.50 | 221.40 | 3,510.0 | -281.7 | -269.0 | 389.5 | 1.65 | 1.63 | -1.05 |
| 3,634.7 | 13.80 | 220.60 | 3,593.2 | -297.0 | -282.3 | 409.7 | 0.41 | 0.35 | -0.93 |
| 3,720.4 | 13.70 | 221.00 | 3,676.4 | -312.4 | -295.6 | 430.0 | 0.16 | -0.12 | 0.47 |
| 3,806.0 | 12.50 | 224.20 | 3,759.8 | -326.7 | -308.7 | 449.4 | 1.64 | -1.40 | 3.74 |
| 3,891.7 | 11.90 | 225.80 | 3,843.5 | -339.5 | -321.5 | 467.5 | 0.80 | -0.70 | 1.87 |
| 3,977.3 | 11.40 | 226.20 | 3,927.4 | -351.5 | -333.9 | 484.8 | 0.59 | -0.58 | 0.47 |
| 4,062.9 | 12.50 | 225.50 | 4,011.1 | -363.8 | -346.6 | 502.5 | 1.30 | 1.29 | -0.82 |
| 4,148.4 | 12.40 | 226.90 | 4,094.6 | -376.6 | -359.9 | 520.9 | 0.37 | -0.12 | 1.64 |
| 4,234.1 | 12.70 | 225.50 | 4,178.3 | -389.5 | -373.4 | 539.5 | 0.50 | 0.35 | -1.63 |
| 4,319.0 | 12.00 | 226.90 | 4,261.2 | -402.0 | -386.5 | 557.7 | 0.90 | -0.82 | 1.65 |
| 4,405.0 | 11.80 | 222.90 | 4,345.4 | -414.6 | -399.0 | 575.4 | 0.99 | -0.23 | -4.65 |
| 4,491.0 | 11.60 | 224.00 | 4,429.6 | -427.3 | -411.0 | 592.8 | 0.35 | -0.23 | 1.28 |
| 4,576.0 | 12.80 | 222.80 | 4,512.7 | -440.3 | -423.3 | 610.8 | 1.44 | 1.41 | -1.41 |
| 4,662.0 | 12.10 | 222.40 | 4,596.6 | -454.0 | -435.9 | 629.3 | 0.82 | -0.81 | -0.47 |
| 4,748.0 | 12.10 | 225.50 | 4,680.7 | -466.9 | -448.4 | 647.3 | 0.76 | 0.00 | 3.60 |
| 4,833.0 | 11.30 | 228.20 | 4,764.0 | -478.7 | -460.9 | 664.6 | 1.14 | -0.94 | 3.18 |
| 4,919.0 | 11.60 | 224.90 | 4,848.3 | -490.5 | -473.3 | 681.6 | 0.84 | 0.35 | -3.84 |
| 5,005.0 | 11.60 | 223.30 | 4,932.5 | -502.9 | -485.4 | 698.9 | 0.37 | 0.00 | -1.86 |
| 5,090.0 | 11.10 | 224.00 | 5,015.8 | -515.0 | -496.9 | 715.6 | 0.61 | -0.59 | 0.82 |
| 5,176.0 | 10.60 | 223.70 | 5,100.3 | -526.7 | -508.1 | 731.8 | 0.59 | -0.58 | -0.35 |
| 5,261.0 | 9.30 | 224.80 | 5,184.0 | -537.2 | -518.4 | 746.5 | 1.55 | -1.53 | 1.29 |
| 5,347.0 | 7.60 | 223.00 | 5,269.1 | -546.3 | -527.1 | 759.1 | 2.00 | -1.98 | -2.09 |
| 5,433.0 | 5.80 | 224.20 | 5,354.5 | -553.6 | -534.0 | 769.2 | 2.10 | -2.09 | 1.40 |
| 5,518.0 | 5.20 | 225.50 | 5,439.1 | -559.3 | -539.8 | 777.3 | 0.72 | -0.71 | 1.53 |
| 5,604.0 | 4.10 | 225.70 | 5,524.8 | -564.2 | -544.8 | 784.3 | 1.28 | -1.28 | 0.23 |
| 5,690.0 | 3.00 | 226.90 | 5,610.6 | -567.9 | -548.6 | 789.6 | 1.28 | -1.28 | 1.40 |
| 5,775.0 | 1.30 | 239.50 | 5,695.6 | -569.9 | -551.1 | 792.8 | 2.06 | -2.00 | 14.82 |
| 5,861.3 | 1.10 | 239.60 | 5,781.9 | -570.8 | -552.6 | 794.5 | 0.23 | -0.23 | 0.12 |
| 5,879.6 | 1.04 | 238.81 | 5,800.2 | -571.0 | -552.9 | 794.8 | 0.36 | -0.35 | -4.33 |
| Drill Target | | | | | | | | | |
| 5,946.9 | 0.80 | 234.80 | 5,867.4 | -571.6 | -553.8 | 795.9 | 0.36 | -0.35 | -5.96 |
| 6,032.5 | 0.60 | 229.60 | 5,953.1 | -572.2 | -554.6 | 796.9 | 0.24 | -0.23 | -6.07 |

ENSIGN Directional

ENSIGN DIRECTIONAL Survey Report



| | | | |
|------------------|-----------------------------------|-------------------------------------|--------------------------------------|
| Company: | NOBLE ENERGY INC WELD COUNTY CO | Local Co-ordinate Reference: | Well Quarter Circle S 1-7JI |
| Project: | SEC.1-T4N-R68W | TVD Reference: | WELL @ 4923.5ft (Original Well Elev) |
| Site: | Quarter Circle Pad SEC.1-T4N-R68W | MD Reference: | WELL @ 4923.5ft (Original Well Elev) |
| Well: | Quarter Circle S 1-7JI | North Reference: | True |
| Wellbore: | Wellbore #1 | Survey Calculation Method: | Minimum Curvature |
| Design: | Wellbore #1 | Database: | EDM den0-adp01 Server Data |

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) |
|---|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| 6,118.1 | 0.40 | 226.50 | 6,038.7 | -572.7 | -555.2 | 797.7 | 0.24 | -0.23 | -3.62 |
| 6,203.7 | 0.30 | 254.70 | 6,124.3 | -573.0 | -555.6 | 798.1 | 0.23 | -0.12 | 32.94 |
| 6,289.4 | 0.10 | 313.20 | 6,209.9 | -573.0 | -555.9 | 798.3 | 0.31 | -0.23 | 68.31 |
| 6,375.0 | 0.20 | 311.30 | 6,295.6 | -572.8 | -556.1 | 798.4 | 0.12 | 0.12 | -2.22 |
| 6,460.7 | 0.10 | 257.40 | 6,381.2 | -572.8 | -556.3 | 798.4 | 0.19 | -0.12 | -62.95 |
| 6,546.5 | 0.10 | 271.30 | 6,467.0 | -572.8 | -556.4 | 798.5 | 0.03 | 0.00 | 16.19 |
| 6,632.2 | 0.20 | 276.90 | 6,552.8 | -572.8 | -556.6 | 798.7 | 0.12 | 0.12 | 6.53 |
| 6,717.9 | 0.20 | 274.80 | 6,638.4 | -572.7 | -556.9 | 798.9 | 0.01 | 0.00 | -2.45 |
| 6,803.5 | 0.10 | 256.40 | 6,724.0 | -572.7 | -557.2 | 799.0 | 0.13 | -0.12 | -21.49 |
| 6,879.3 | 0.19 | 296.02 | 6,799.8 | -572.7 | -557.3 | 799.1 | 0.17 | 0.11 | 52.27 |
| Quarter Circle S 1-7JI Legal Box 400X400 | | | | | | | | | |
| 6,889.2 | 0.20 | 298.40 | 6,809.7 | -572.7 | -557.4 | 799.1 | 0.17 | 0.15 | 24.11 |
| 6,974.8 | 0.40 | 7.50 | 6,895.4 | -572.3 | -557.4 | 798.9 | 0.44 | 0.23 | 80.68 |
| 7,060.4 | 0.50 | 7.40 | 6,980.9 | -571.6 | -557.4 | 798.4 | 0.12 | 0.12 | -0.12 |
| 7,146.3 | 0.50 | 66.70 | 7,066.9 | -571.1 | -557.0 | 797.7 | 0.58 | 0.00 | 68.99 |
| 7,231.9 | 0.40 | 71.90 | 7,152.5 | -570.9 | -556.3 | 797.1 | 0.13 | -0.12 | 6.07 |
| 7,317.6 | 0.30 | 107.10 | 7,238.1 | -570.8 | -555.8 | 796.8 | 0.27 | -0.12 | 41.11 |
| 7,403.3 | 0.50 | 117.90 | 7,323.9 | -571.1 | -555.3 | 796.6 | 0.25 | 0.23 | 12.59 |
| 7,489.0 | 0.20 | 117.20 | 7,409.5 | -571.3 | -554.8 | 796.4 | 0.35 | -0.35 | -0.82 |
| 7,574.8 | 0.40 | 59.90 | 7,495.3 | -571.3 | -554.4 | 796.1 | 0.39 | 0.23 | -66.79 |
| 7,660.4 | 0.10 | 57.50 | 7,581.0 | -571.1 | -554.1 | 795.7 | 0.35 | -0.35 | -2.80 |
| 7,764.0 | 0.20 | 163.90 | 7,684.5 | -571.2 | -554.0 | 795.7 | 0.24 | 0.10 | 102.73 |

Wellbore Targets

| Target Name | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (ft) | Easting (ft) | Latitude | Longitude |
|---|---------------|--------------|----------|------------|------------|---------------|--------------|------------------|-------------------|
| Drill Target | 0.00 | 0.00 | 5,800.0 | -575.1 | -561.1 | 1,368,694.08 | 3,153,299.53 | 40° 20' 38.981 N | 104° 57' 0.082 W |
| - hit/miss target | | | | | | | | | |
| - Shape | | | | | | | | | |
| - actual wellpath misses target center by 9.1ft at 5879.6ft MD (5800.2 TVD, -571.0 N, -552.9 E) | | | | | | | | | |
| - Point | | | | | | | | | |
| Quarter Circle S 1-7JI | 0.00 | 0.00 | 6,800.0 | -490.1 | -468.1 | 1,368,779.65 | 3,153,391.99 | 40° 20' 39.821 N | 104° 56' 58.881 W |
| - actual wellpath misses target center by 121.6ft at 6879.3ft MD (6799.9 TVD, -572.7 N, -557.3 E) | | | | | | | | | |
| - Rectangle (sides W400.0 H400.0 D882.0) | | | | | | | | | |

Checked By: _____ Approved By: _____ Date: _____