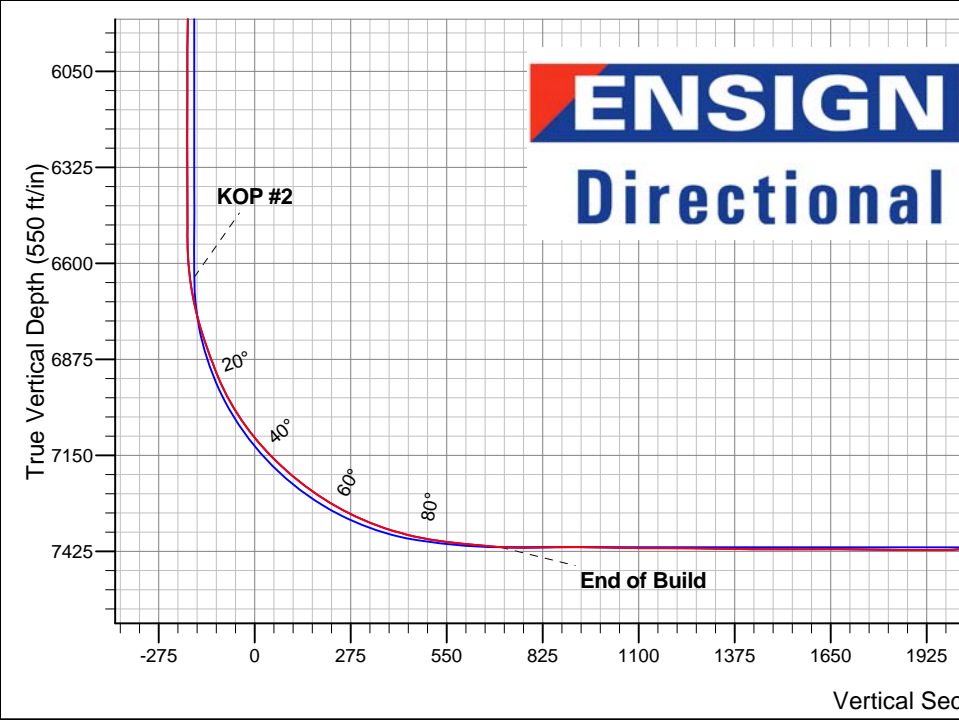
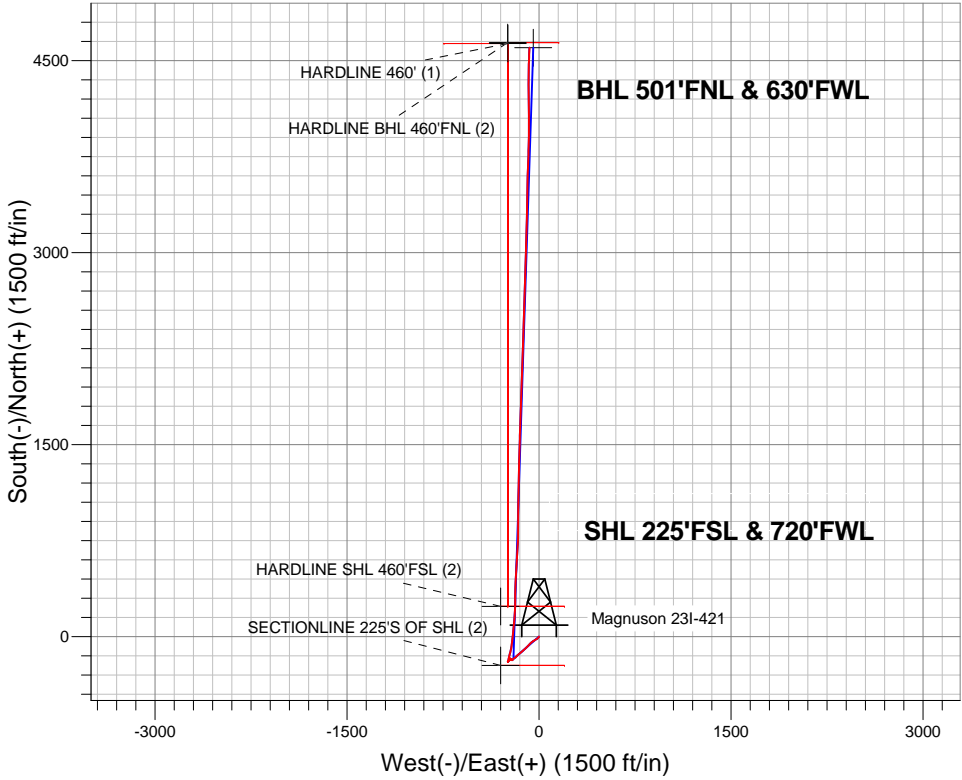


PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Magnuson 23I-421**
Surface Location: Magnuson Pad Sec.23-T7N-R66W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4899.0
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1445544.13 3207936.15 40.554010 -104.751690
Ensign 14 - RKB 15' WELL @ 4914.0ft (Ensign 14 - RKB 15')

FINAL SURVEY

Projected Bottom Hole Location
11863' MD 7455' TVD 4600' N & 75' W of SHL
92.3 degree Incl @ 1.8 degree AZM



| | |
|--|----------------------------------|
| Magnuson Pad Sec.23-T7N-R66W Magnuson 23I-421 Wellbore #1 16:04, February 13 2013 | ANNOTATIONS |
| | No annotation data is available. |
| LEGEND | |
| ▲ Magnuson 23I-421, Wellbore #1, Plan #2 (1-24-13) R V0 | |
| □ Wellbore #1 | |
| ○ Survey #1 | |



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.23-T7N-R66W

Magnuson Pad Sec.23-T7N-R66W

Magnuson 23I-421

Wellbore #1

Survey: Survey #1

Standard Survey Report

13 February, 2013

| | | | |
|------------------|---|-------------------------------------|---------------------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Magnuson 23I-421 |
| Project: | SEC.23-T7N-R66W | TVD Reference: | WELL @ 4914.0ft (Ensign 14 - RKB 15') |
| Site: | Magnuson Pad Sec.23-T7N-R66W | MD Reference: | WELL @ 4914.0ft (Ensign 14 - RKB 15') |
| Well: | Magnuson 23I-421 | North Reference: | True |
| Wellbore: | Wellbore #1 | Survey Calculation Method: | Minimum Curvature |
| Design: | Wellbore #1 | Database: | Landmark |

| 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) |
| 649.0 | 3.40 | 229.60 | 648.5 | -16.2 | -12.7 | -16.1 | 0.67 | 0.22 | 10.97 |
| 741.0 | 4.00 | 243.00 | 740.3 | -19.4 | -17.6 | -19.3 | 1.14 | 0.65 | 14.57 |
| 834.0 | 5.30 | 242.80 | 833.0 | -22.9 | -24.4 | -22.6 | 1.40 | 1.40 | -0.22 |
| 904.0 | 6.40 | 239.50 | 902.7 | -26.3 | -30.6 | -26.0 | 1.64 | 1.57 | -4.71 |
| 960.0 | 7.60 | 239.30 | 958.3 | -29.8 | -36.5 | -29.5 | 2.14 | 2.14 | -0.36 |
| 1,084.0 | 10.50 | 232.80 | 1,080.7 | -40.8 | -52.5 | -40.3 | 2.48 | 2.34 | -5.24 |
| 1,207.0 | 11.30 | 225.20 | 1,201.5 | -56.1 | -70.0 | -55.4 | 1.34 | 0.65 | -6.18 |
| 1,330.0 | 11.70 | 224.20 | 1,322.0 | -73.5 | -87.2 | -72.7 | 0.36 | 0.33 | -0.81 |
| 1,452.0 | 11.40 | 224.20 | 1,441.5 | -91.0 | -104.3 | -90.0 | 0.25 | -0.25 | 0.00 |
| 1,575.0 | 10.60 | 229.40 | 1,562.3 | -107.1 | -121.3 | -105.9 | 1.04 | -0.65 | 4.23 |
| 1,697.0 | 9.40 | 231.60 | 1,682.4 | -120.6 | -137.7 | -119.3 | 1.03 | -0.98 | 1.80 |
| 1,819.0 | 9.30 | 226.20 | 1,802.8 | -133.6 | -152.6 | -132.1 | 0.72 | -0.08 | -4.43 |
| 1,947.0 | 8.40 | 228.70 | 1,929.3 | -146.9 | -167.1 | -145.3 | 0.76 | -0.70 | 1.95 |
| 2,074.0 | 7.20 | 230.50 | 2,055.1 | -158.1 | -180.2 | -156.4 | 0.96 | -0.94 | 1.42 |
| 2,201.0 | 6.30 | 231.20 | 2,181.2 | -167.6 | -191.8 | -165.7 | 0.71 | -0.71 | 0.55 |
| 2,328.0 | 3.60 | 231.70 | 2,307.7 | -174.4 | -200.3 | -172.5 | 2.13 | -2.13 | 0.39 |
| 2,455.0 | 2.70 | 193.80 | 2,434.6 | -179.8 | -204.2 | -177.8 | 1.74 | -0.71 | -29.84 |
| 2,581.0 | 0.60 | 248.20 | 2,560.5 | -182.9 | -205.5 | -180.9 | 1.91 | -1.67 | 43.17 |
| 2,708.0 | 0.90 | 258.40 | 2,687.5 | -183.4 | -207.1 | -181.3 | 0.26 | 0.24 | 8.03 |
| 2,835.0 | 0.90 | 262.70 | 2,814.5 | -183.7 | -209.1 | -181.7 | 0.05 | 0.00 | 3.39 |
| 2,962.0 | 0.80 | 266.50 | 2,941.5 | -183.9 | -210.9 | -181.8 | 0.09 | -0.08 | 2.99 |
| 3,089.0 | 1.00 | 278.10 | 3,068.5 | -183.8 | -212.9 | -181.7 | 0.21 | 0.16 | 9.13 |
| 3,216.0 | 1.10 | 325.80 | 3,195.4 | -182.6 | -214.7 | -180.5 | 0.67 | 0.08 | 37.56 |
| 3,343.0 | 1.40 | 317.20 | 3,322.4 | -180.4 | -216.4 | -178.3 | 0.28 | 0.24 | -6.77 |
| 3,470.0 | 1.10 | 355.50 | 3,449.4 | -178.1 | -217.6 | -176.0 | 0.68 | -0.24 | 30.16 |
| 3,597.0 | 1.30 | 304.00 | 3,576.4 | -176.1 | -218.9 | -174.0 | 0.83 | 0.16 | -40.55 |
| 3,724.0 | 1.30 | 307.00 | 3,703.3 | -174.4 | -221.2 | -172.3 | 0.05 | 0.00 | 2.36 |
| 3,851.0 | 1.00 | 278.50 | 3,830.3 | -173.4 | -223.5 | -171.2 | 0.50 | -0.24 | -22.44 |
| 3,978.0 | 0.60 | 37.00 | 3,957.3 | -172.7 | -224.2 | -170.5 | 1.09 | -0.31 | 93.31 |
| 4,105.0 | 0.40 | 21.00 | 4,084.3 | -171.7 | -223.6 | -169.6 | 0.19 | -0.16 | -12.60 |
| 4,232.0 | 0.80 | 347.70 | 4,211.3 | -170.4 | -223.6 | -168.3 | 0.41 | 0.31 | -26.22 |
| 4,359.0 | 1.10 | 217.70 | 4,338.3 | -170.5 | -224.6 | -168.4 | 1.36 | 0.24 | -102.36 |
| 4,486.0 | 2.20 | 172.00 | 4,465.2 | -173.9 | -225.0 | -171.7 | 1.29 | 0.87 | -35.98 |
| 4,613.0 | 2.10 | 186.60 | 4,592.1 | -178.7 | -224.9 | -176.5 | 0.44 | -0.08 | 11.50 |
| 4,740.0 | 1.60 | 220.70 | 4,719.1 | -182.3 | -226.3 | -180.1 | 0.93 | -0.39 | 26.85 |
| 4,868.0 | 1.80 | 245.40 | 4,847.0 | -184.5 | -229.3 | -182.3 | 0.59 | 0.16 | 19.30 |
| 4,994.0 | 2.60 | 263.90 | 4,972.9 | -185.6 | -234.0 | -183.4 | 0.84 | 0.63 | 14.68 |
| 5,122.0 | 0.60 | 195.00 | 5,100.9 | -186.6 | -237.0 | -184.3 | 1.91 | -1.56 | -53.83 |
| 5,249.0 | 0.60 | 185.80 | 5,227.9 | -187.9 | -237.3 | -185.6 | 0.08 | 0.00 | -7.24 |
| 5,376.0 | 0.60 | 176.90 | 5,354.9 | -189.2 | -237.3 | -186.9 | 0.07 | 0.00 | -7.01 |
| 5,503.0 | 0.80 | 179.50 | 5,481.8 | -190.8 | -237.2 | -188.5 | 0.16 | 0.16 | 2.05 |
| 5,630.0 | 0.60 | 240.00 | 5,608.8 | -192.0 | -237.8 | -189.7 | 0.57 | -0.16 | 47.64 |
| 5,757.0 | 1.40 | 241.00 | 5,735.8 | -193.1 | -239.7 | -190.7 | 0.63 | 0.63 | 0.79 |
| 5,884.0 | 0.70 | 228.60 | 5,862.8 | -194.3 | -241.7 | -192.0 | 0.58 | -0.55 | -9.76 |
| 6,011.0 | 0.20 | 184.80 | 5,989.8 | -195.1 | -242.3 | -192.7 | 0.45 | -0.39 | -34.49 |
| 6,137.0 | 0.20 | 174.80 | 6,115.8 | -195.5 | -242.3 | -193.2 | 0.03 | 0.00 | -7.94 |
| 6,264.0 | 0.10 | 179.30 | 6,242.8 | -195.8 | -242.3 | -193.5 | 0.08 | -0.08 | 3.54 |
| 6,391.0 | 0.40 | 3.20 | 6,369.8 | -195.5 | -242.2 | -193.2 | 0.39 | 0.24 | -138.66 |
| 6,518.0 | 0.20 | 44.70 | 6,496.8 | -194.9 | -242.1 | -192.6 | 0.22 | -0.16 | 32.68 |
| 6,546.0 | 0.00 | 244.60 | 6,524.8 | -194.9 | -242.0 | -192.5 | 0.71 | -0.71 | 0.00 |
| 6,578.0 | 1.30 | 359.90 | 6,556.8 | -194.5 | -242.0 | -192.2 | 4.06 | 4.06 | 0.00 |
| 6,610.0 | 3.70 | 8.10 | 6,588.8 | -193.1 | -241.9 | -190.8 | 7.56 | 7.50 | 25.63 |
| 6,641.0 | 6.40 | 16.60 | 6,619.6 | -190.5 | -241.2 | -188.1 | 9.01 | 8.71 | 27.42 |

| | | | |
|------------------|---|-------------------------------------|---------------------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Magnuson 231-421 |
| Project: | SEC.23-T7N-R66W | TVD Reference: | WELL @ 4914.0ft (Ensign 14 - RKB 15') |
| Site: | Magnuson Pad Sec.23-T7N-R66W | MD Reference: | WELL @ 4914.0ft (Ensign 14 - RKB 15') |
| Well: | Magnuson 231-421 | North Reference: | True |
| Wellbore: | Wellbore #1 | Survey Calculation Method: | Minimum Curvature |
| Design: | Wellbore #1 | Database: | Landmark |

| 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) |
| 6,673.0 | 8.30 | 16.00 | 6,651.4 | -186.5 | -240.1 | -184.2 | 5.94 | 5.94 | -1.88 |
| 6,705.0 | 10.20 | 15.00 | 6,682.9 | -181.6 | -238.7 | -179.3 | 5.96 | 5.94 | -3.13 |
| 6,737.0 | 12.20 | 14.30 | 6,714.3 | -175.6 | -237.2 | -173.3 | 6.26 | 6.25 | -2.19 |
| 6,769.0 | 14.30 | 11.10 | 6,745.5 | -168.4 | -235.6 | -166.1 | 6.95 | 6.56 | -10.00 |
| 6,801.0 | 16.60 | 12.20 | 6,776.3 | -160.1 | -233.8 | -157.8 | 7.25 | 7.19 | 3.44 |
| 6,833.0 | 18.10 | 12.20 | 6,806.9 | -150.7 | -231.8 | -148.5 | 4.69 | 4.69 | 0.00 |
| 6,864.0 | 19.90 | 16.00 | 6,836.2 | -141.0 | -229.3 | -138.7 | 7.04 | 5.81 | 12.26 |
| 6,896.0 | 20.80 | 16.20 | 6,866.2 | -130.3 | -226.3 | -128.1 | 2.82 | 2.81 | 0.63 |
| 6,928.0 | 23.00 | 14.10 | 6,895.9 | -118.8 | -223.1 | -116.6 | 7.30 | 6.88 | -6.56 |
| 6,959.0 | 23.60 | 13.40 | 6,924.3 | -106.8 | -220.2 | -104.7 | 2.13 | 1.94 | -2.26 |
| 6,991.0 | 25.10 | 10.90 | 6,953.5 | -93.9 | -217.5 | -91.8 | 5.69 | 4.69 | -7.81 |
| 7,023.0 | 27.30 | 8.80 | 6,982.2 | -80.0 | -215.1 | -77.9 | 7.46 | 6.88 | -6.56 |
| 7,055.0 | 30.20 | 6.60 | 7,010.3 | -64.8 | -213.0 | -62.7 | 9.65 | 9.06 | -6.88 |
| 7,086.0 | 33.60 | 6.40 | 7,036.6 | -48.5 | -211.2 | -46.5 | 10.97 | 10.97 | -0.65 |
| 7,118.0 | 36.70 | 7.40 | 7,062.7 | -30.2 | -208.9 | -28.2 | 9.85 | 9.69 | 3.13 |
| 7,150.0 | 39.20 | 7.40 | 7,088.0 | -10.7 | -206.4 | -8.7 | 7.81 | 7.81 | 0.00 |
| 7,182.0 | 40.40 | 6.60 | 7,112.6 | 9.6 | -203.9 | 11.6 | 4.08 | 3.75 | -2.50 |
| 7,213.0 | 42.80 | 6.60 | 7,135.7 | 30.1 | -201.5 | 32.0 | 7.74 | 7.74 | 0.00 |
| 7,245.0 | 45.30 | 4.80 | 7,158.7 | 52.2 | -199.3 | 54.1 | 8.74 | 7.81 | -5.63 |
| 7,277.0 | 47.10 | 5.50 | 7,180.9 | 75.2 | -197.3 | 77.1 | 5.84 | 5.63 | 2.19 |
| 7,308.0 | 49.50 | 4.80 | 7,201.5 | 98.3 | -195.2 | 100.1 | 7.92 | 7.74 | -2.26 |
| 7,340.0 | 50.70 | 4.40 | 7,222.0 | 122.7 | -193.2 | 124.6 | 3.87 | 3.75 | -1.25 |
| 7,372.0 | 53.60 | 4.30 | 7,241.7 | 147.9 | -191.3 | 149.8 | 9.07 | 9.06 | -0.31 |
| 7,404.0 | 56.30 | 3.90 | 7,260.0 | 174.1 | -189.4 | 175.9 | 8.50 | 8.44 | -1.25 |
| 7,435.0 | 57.90 | 3.00 | 7,276.9 | 200.0 | -187.9 | 201.8 | 5.71 | 5.16 | -2.90 |
| 7,467.0 | 59.80 | 2.70 | 7,293.4 | 227.4 | -186.5 | 229.2 | 5.99 | 5.94 | -0.94 |
| 7,499.0 | 62.10 | 1.60 | 7,309.0 | 255.3 | -185.5 | 257.1 | 7.79 | 7.19 | -3.44 |
| 7,530.0 | 64.90 | 359.90 | 7,322.8 | 283.1 | -185.1 | 284.8 | 10.28 | 9.03 | -5.48 |
| 7,562.0 | 66.80 | 359.90 | 7,335.9 | 312.3 | -185.2 | 314.0 | 5.94 | 5.94 | 0.00 |
| 7,594.0 | 69.00 | 0.20 | 7,347.9 | 341.9 | -185.1 | 343.7 | 6.93 | 6.88 | 0.94 |
| 7,625.0 | 71.50 | 1.30 | 7,358.4 | 371.1 | -184.7 | 372.9 | 8.73 | 8.06 | 3.55 |
| 7,657.0 | 73.90 | 2.70 | 7,367.9 | 401.6 | -183.7 | 403.4 | 8.58 | 7.50 | 4.38 |
| 7,689.0 | 75.40 | 3.70 | 7,376.4 | 432.4 | -182.0 | 434.2 | 5.57 | 4.69 | 3.13 |
| 7,720.0 | 77.70 | 2.70 | 7,383.6 | 462.5 | -180.3 | 464.2 | 8.06 | 7.42 | -3.23 |
| 7,752.0 | 80.00 | 2.50 | 7,389.8 | 493.9 | -178.9 | 495.6 | 7.21 | 7.19 | -0.63 |
| 7,784.0 | 82.20 | 2.70 | 7,394.7 | 525.5 | -177.4 | 527.2 | 6.90 | 6.88 | 0.63 |
| 7,796.0 | 82.60 | 2.90 | 7,396.3 | 537.3 | -176.8 | 539.0 | 3.72 | 3.33 | 1.67 |
| 7,845.0 | 84.20 | 3.90 | 7,402.0 | 585.9 | -173.9 | 587.6 | 3.84 | 3.27 | 2.04 |
| 7,875.0 | 84.60 | 3.90 | 7,404.9 | 615.7 | -171.9 | 617.4 | 1.33 | 1.33 | 0.00 |
| 7,906.0 | 84.80 | 3.90 | 7,407.7 | 646.5 | -169.8 | 648.1 | 0.65 | 0.65 | 0.00 |
| 7,937.0 | 85.10 | 3.40 | 7,410.5 | 677.3 | -167.9 | 678.9 | 1.88 | 0.97 | -1.61 |
| 7,967.0 | 86.50 | 3.20 | 7,412.7 | 707.2 | -166.1 | 708.8 | 4.71 | 4.67 | -0.67 |
| 7,998.0 | 88.20 | 2.00 | 7,414.1 | 738.1 | -164.7 | 739.7 | 6.71 | 5.48 | -3.87 |
| 8,028.0 | 90.50 | 2.00 | 7,414.4 | 768.1 | -163.7 | 769.7 | 7.67 | 7.67 | 0.00 |
| 8,059.0 | 91.40 | 1.50 | 7,413.9 | 799.1 | -162.7 | 800.6 | 3.32 | 2.90 | -1.61 |
| 8,089.0 | 90.80 | 0.70 | 7,413.4 | 829.1 | -162.2 | 830.6 | 3.33 | -2.00 | -2.67 |
| 8,121.0 | 90.90 | 0.60 | 7,412.9 | 861.1 | -161.8 | 862.6 | 0.44 | 0.31 | -0.31 |
| 8,151.0 | 90.50 | 0.00 | 7,412.5 | 891.1 | -161.6 | 892.6 | 2.40 | -1.33 | -2.00 |
| 8,182.0 | 89.80 | 359.70 | 7,412.4 | 922.1 | -161.7 | 923.6 | 2.46 | -2.26 | -0.97 |
| 8,212.0 | 89.20 | 0.40 | 7,412.7 | 952.1 | -161.7 | 953.6 | 3.07 | -2.00 | 2.33 |
| 8,243.0 | 89.00 | 0.40 | 7,413.2 | 983.1 | -161.5 | 984.6 | 0.65 | -0.65 | 0.00 |
| 8,273.0 | 89.10 | 0.20 | 7,413.7 | 1,013.1 | -161.3 | 1,014.6 | 0.75 | 0.33 | -0.67 |
| 8,304.0 | 88.80 | 359.90 | 7,414.2 | 1,044.1 | -161.3 | 1,045.6 | 1.37 | -0.97 | -0.97 |

| | | | |
|------------------|---|-------------------------------------|---------------------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Magnuson 23I-421 |
| Project: | SEC.23-T7N-R66W | TVD Reference: | WELL @ 4914.0ft (Ensign 14 - RKB 15') |
| Site: | Magnuson Pad Sec.23-T7N-R66W | MD Reference: | WELL @ 4914.0ft (Ensign 14 - RKB 15') |
| Well: | Magnuson 23I-421 | North Reference: | True |
| Wellbore: | Wellbore #1 | Survey Calculation Method: | Minimum Curvature |
| Design: | Wellbore #1 | Database: | Landmark |

| 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) |
| 8,334.0 | 88.70 | 0.40 | 7,414.9 | 1,074.1 | -161.2 | 1,075.6 | 1.70 | -0.33 | 1.67 |
| 8,365.0 | 89.40 | 0.90 | 7,415.4 | 1,105.0 | -160.9 | 1,106.6 | 2.77 | 2.26 | 1.61 |
| 8,395.0 | 89.90 | 1.50 | 7,415.6 | 1,135.0 | -160.2 | 1,136.5 | 2.60 | 1.67 | 2.00 |
| 8,425.0 | 89.70 | 1.10 | 7,415.7 | 1,165.0 | -159.6 | 1,166.5 | 1.49 | -0.67 | -1.33 |
| 8,456.0 | 89.50 | 2.00 | 7,415.9 | 1,196.0 | -158.7 | 1,197.5 | 2.97 | -0.65 | 2.90 |
| 8,486.0 | 89.60 | 1.30 | 7,416.2 | 1,226.0 | -157.9 | 1,227.5 | 2.36 | 0.33 | -2.33 |
| 8,517.0 | 89.80 | 1.30 | 7,416.3 | 1,257.0 | -157.1 | 1,258.5 | 0.65 | 0.65 | 0.00 |
| 8,547.0 | 89.80 | 1.50 | 7,416.4 | 1,287.0 | -156.4 | 1,288.4 | 0.67 | 0.00 | 0.67 |
| 8,579.0 | 88.70 | 1.30 | 7,416.8 | 1,319.0 | -155.6 | 1,320.4 | 3.49 | -3.44 | -0.63 |
| 8,611.0 | 88.20 | 1.30 | 7,417.7 | 1,351.0 | -154.9 | 1,352.4 | 1.56 | -1.56 | 0.00 |
| 8,643.0 | 89.50 | 1.50 | 7,418.3 | 1,382.9 | -154.1 | 1,384.4 | 4.11 | 4.06 | 0.63 |
| 8,674.0 | 90.00 | 1.50 | 7,418.5 | 1,413.9 | -153.3 | 1,415.3 | 1.61 | 1.61 | 0.00 |
| 8,706.0 | 89.90 | 1.60 | 7,418.5 | 1,445.9 | -152.4 | 1,447.3 | 0.44 | -0.31 | 0.31 |
| 8,738.0 | 89.30 | 1.30 | 7,418.7 | 1,477.9 | -151.6 | 1,479.3 | 2.10 | -1.88 | -0.94 |
| 8,770.0 | 89.80 | 1.60 | 7,419.0 | 1,509.9 | -150.8 | 1,511.3 | 1.82 | 1.56 | 0.94 |
| 8,802.0 | 90.10 | 1.10 | 7,419.0 | 1,541.9 | -150.1 | 1,543.3 | 1.82 | 0.94 | -1.56 |
| 8,833.0 | 90.20 | 2.20 | 7,418.9 | 1,572.9 | -149.2 | 1,574.2 | 3.56 | 0.32 | 3.55 |
| 8,865.0 | 89.80 | 1.80 | 7,418.9 | 1,604.9 | -148.1 | 1,606.2 | 1.77 | -1.25 | -1.25 |
| 8,897.0 | 89.70 | 2.00 | 7,419.1 | 1,636.8 | -147.0 | 1,638.2 | 0.70 | -0.31 | 0.63 |
| 8,929.0 | 90.00 | 2.30 | 7,419.2 | 1,668.8 | -145.8 | 1,670.1 | 1.33 | 0.94 | 0.94 |
| 8,960.0 | 89.90 | 2.00 | 7,419.2 | 1,699.8 | -144.6 | 1,701.1 | 1.02 | -0.32 | -0.97 |
| 8,992.0 | 89.80 | 3.70 | 7,419.3 | 1,731.7 | -143.1 | 1,733.1 | 5.32 | -0.31 | 5.31 |
| 9,024.0 | 90.00 | 2.50 | 7,419.3 | 1,763.7 | -141.3 | 1,765.0 | 3.80 | 0.63 | -3.75 |
| 9,055.0 | 89.30 | 1.10 | 7,419.5 | 1,794.7 | -140.3 | 1,796.0 | 5.05 | -2.26 | -4.52 |
| 9,087.0 | 88.50 | 1.80 | 7,420.1 | 1,826.7 | -139.5 | 1,827.9 | 3.32 | -2.50 | 2.19 |
| 9,119.0 | 88.70 | 1.60 | 7,420.9 | 1,858.6 | -138.6 | 1,859.9 | 0.88 | 0.63 | -0.63 |
| 9,151.0 | 89.30 | 1.50 | 7,421.5 | 1,890.6 | -137.7 | 1,891.9 | 1.90 | 1.88 | -0.31 |
| 9,183.0 | 90.00 | 2.00 | 7,421.7 | 1,922.6 | -136.7 | 1,923.8 | 2.69 | 2.19 | 1.56 |
| 9,215.0 | 90.60 | 2.30 | 7,421.5 | 1,954.6 | -135.5 | 1,955.8 | 2.10 | 1.88 | 0.94 |
| 9,247.0 | 92.30 | 2.20 | 7,420.7 | 1,986.6 | -134.3 | 1,987.8 | 5.32 | 5.31 | -0.31 |
| 9,278.0 | 93.60 | 3.00 | 7,419.1 | 2,017.5 | -132.9 | 2,018.7 | 4.92 | 4.19 | 2.58 |
| 9,312.0 | 89.10 | 2.00 | 7,418.3 | 2,051.4 | -131.4 | 2,052.6 | 13.56 | -13.24 | -2.94 |
| 9,344.0 | 86.30 | 1.60 | 7,419.6 | 2,083.4 | -130.4 | 2,084.5 | 8.84 | -8.75 | -1.25 |
| 9,376.0 | 87.10 | 2.00 | 7,421.4 | 2,115.3 | -129.4 | 2,116.5 | 2.79 | 2.50 | 1.25 |
| 9,408.0 | 85.80 | 0.90 | 7,423.4 | 2,147.2 | -128.6 | 2,148.4 | 5.32 | -4.06 | -3.44 |
| 9,439.0 | 86.30 | 0.20 | 7,425.5 | 2,178.2 | -128.3 | 2,179.3 | 2.77 | 1.61 | -2.26 |
| 9,471.0 | 87.20 | 0.60 | 7,427.3 | 2,210.1 | -128.1 | 2,211.2 | 3.08 | 2.81 | 1.25 |
| 9,503.0 | 88.60 | 1.60 | 7,428.5 | 2,242.1 | -127.5 | 2,243.2 | 5.38 | 4.38 | 3.13 |
| 9,534.0 | 90.00 | 1.60 | 7,428.9 | 2,273.1 | -126.6 | 2,274.2 | 4.52 | 4.52 | 0.00 |
| 9,566.0 | 90.40 | 2.00 | 7,428.8 | 2,305.1 | -125.6 | 2,306.2 | 1.77 | 1.25 | 1.25 |
| 9,598.0 | 89.70 | 2.00 | 7,428.8 | 2,337.0 | -124.5 | 2,338.1 | 2.19 | -2.19 | 0.00 |
| 9,630.0 | 88.90 | 2.00 | 7,429.1 | 2,369.0 | -123.3 | 2,370.1 | 2.50 | -2.50 | 0.00 |
| 9,661.0 | 88.90 | 2.00 | 7,429.7 | 2,400.0 | -122.3 | 2,401.1 | 0.00 | 0.00 | 0.00 |
| 9,693.0 | 88.90 | 1.80 | 7,430.4 | 2,432.0 | -121.2 | 2,433.0 | 0.62 | 0.00 | -0.63 |
| 9,725.0 | 89.40 | 2.00 | 7,430.8 | 2,463.9 | -120.1 | 2,465.0 | 1.68 | 1.56 | 0.63 |
| 9,757.0 | 90.10 | 2.90 | 7,431.0 | 2,495.9 | -118.8 | 2,496.9 | 3.56 | 2.19 | 2.81 |
| 9,788.0 | 90.10 | 2.70 | 7,430.9 | 2,526.9 | -117.3 | 2,527.9 | 0.65 | 0.00 | -0.65 |
| 9,820.0 | 90.20 | 3.00 | 7,430.8 | 2,558.8 | -115.7 | 2,559.8 | 0.99 | 0.31 | 0.94 |
| 9,852.0 | 90.50 | 3.00 | 7,430.6 | 2,590.8 | -114.0 | 2,591.8 | 0.94 | 0.94 | 0.00 |
| 9,883.0 | 90.30 | 2.50 | 7,430.4 | 2,621.8 | -112.5 | 2,622.7 | 1.74 | -0.65 | -1.61 |
| 9,915.0 | 89.70 | 1.60 | 7,430.4 | 2,653.7 | -111.4 | 2,654.7 | 3.38 | -1.88 | -2.81 |
| 9,947.0 | 88.70 | 1.30 | 7,430.9 | 2,685.7 | -110.6 | 2,686.7 | 3.26 | -3.13 | -0.94 |
| 9,979.0 | 89.10 | 1.60 | 7,431.5 | 2,717.7 | -109.7 | 2,718.6 | 1.56 | 1.25 | 0.94 |
| 10,010.0 | 89.50 | 2.20 | 7,431.9 | 2,748.7 | -108.7 | 2,749.6 | 2.33 | 1.29 | 1.94 |

| | | | |
|------------------|---|-------------------------------------|---------------------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Magnuson 23I-421 |
| Project: | SEC.23-T7N-R66W | TVD Reference: | WELL @ 4914.0ft (Ensign 14 - RKB 15') |
| Site: | Magnuson Pad Sec.23-T7N-R66W | MD Reference: | WELL @ 4914.0ft (Ensign 14 - RKB 15') |
| Well: | Magnuson 23I-421 | North Reference: | True |
| Wellbore: | Wellbore #1 | Survey Calculation Method: | Minimum Curvature |
| Design: | Wellbore #1 | Database: | Landmark |

| 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) |
| 10,042.0 | 89.60 | 2.20 | 7,432.1 | 2,780.7 | -107.5 | 2,781.6 | 0.31 | 0.31 | 0.00 |
| 10,073.0 | 90.00 | 1.80 | 7,432.2 | 2,811.6 | -106.4 | 2,812.5 | 1.82 | 1.29 | -1.29 |
| 10,105.0 | 90.10 | 2.00 | 7,432.2 | 2,843.6 | -105.3 | 2,844.5 | 0.70 | 0.31 | 0.63 |
| 10,137.0 | 88.60 | 1.30 | 7,432.6 | 2,875.6 | -104.4 | 2,876.5 | 5.17 | -4.69 | -2.19 |
| 10,168.0 | 88.70 | 1.50 | 7,433.3 | 2,906.6 | -103.7 | 2,907.5 | 0.72 | 0.32 | 0.65 |
| 10,200.0 | 89.20 | 1.50 | 7,433.9 | 2,938.6 | -102.8 | 2,939.4 | 1.56 | 1.56 | 0.00 |
| 10,232.0 | 89.30 | 1.50 | 7,434.3 | 2,970.6 | -102.0 | 2,971.4 | 0.31 | 0.31 | 0.00 |
| 10,264.0 | 89.50 | 1.30 | 7,434.6 | 3,002.5 | -101.2 | 3,003.4 | 0.88 | 0.63 | -0.63 |
| 10,296.0 | 89.70 | 1.50 | 7,434.8 | 3,034.5 | -100.4 | 3,035.4 | 0.88 | 0.63 | 0.63 |
| 10,327.0 | 90.00 | 1.60 | 7,434.9 | 3,065.5 | -99.6 | 3,066.3 | 1.02 | 0.97 | 0.32 |
| 10,359.0 | 90.10 | 1.30 | 7,434.9 | 3,097.5 | -98.8 | 3,098.3 | 0.99 | 0.31 | -0.94 |
| 10,391.0 | 90.30 | 1.80 | 7,434.8 | 3,129.5 | -97.9 | 3,130.3 | 1.68 | 0.63 | 1.56 |
| 10,422.0 | 90.80 | 1.80 | 7,434.5 | 3,160.5 | -96.9 | 3,161.3 | 1.61 | 1.61 | 0.00 |
| 10,454.0 | 89.30 | 2.00 | 7,434.5 | 3,192.5 | -95.9 | 3,193.2 | 4.73 | -4.69 | 0.63 |
| 10,486.0 | 88.50 | 0.90 | 7,435.1 | 3,224.4 | -95.1 | 3,225.2 | 4.25 | -2.50 | -3.44 |
| 10,518.0 | 88.80 | 0.70 | 7,435.8 | 3,256.4 | -94.6 | 3,257.2 | 1.13 | 0.94 | -0.63 |
| 10,550.0 | 89.10 | 1.10 | 7,436.4 | 3,288.4 | -94.1 | 3,289.2 | 1.56 | 0.94 | 1.25 |
| 10,581.0 | 89.20 | 0.90 | 7,436.9 | 3,319.4 | -93.6 | 3,320.2 | 0.72 | 0.32 | -0.65 |
| 10,613.0 | 89.20 | 1.30 | 7,437.3 | 3,351.4 | -93.0 | 3,352.2 | 1.25 | 0.00 | 1.25 |
| 10,644.0 | 89.10 | 0.60 | 7,437.8 | 3,382.4 | -92.5 | 3,383.1 | 2.28 | -0.32 | -2.26 |
| 10,676.0 | 89.20 | 0.90 | 7,438.3 | 3,414.4 | -92.0 | 3,415.1 | 0.99 | 0.31 | 0.94 |
| 10,708.0 | 89.20 | 1.10 | 7,438.7 | 3,446.4 | -91.5 | 3,447.1 | 0.62 | 0.00 | 0.63 |
| 10,740.0 | 89.50 | 1.50 | 7,439.1 | 3,478.4 | -90.7 | 3,479.1 | 1.56 | 0.94 | 1.25 |
| 10,771.0 | 89.80 | 1.60 | 7,439.3 | 3,509.4 | -89.9 | 3,510.1 | 1.02 | 0.97 | 0.32 |
| 10,803.0 | 89.90 | 1.60 | 7,439.3 | 3,541.4 | -89.0 | 3,542.0 | 0.31 | 0.31 | 0.00 |
| 10,835.0 | 90.20 | 2.00 | 7,439.3 | 3,573.3 | -88.0 | 3,574.0 | 1.56 | 0.94 | 1.25 |
| 10,866.0 | 90.40 | 1.60 | 7,439.2 | 3,604.3 | -87.0 | 3,605.0 | 1.44 | 0.65 | -1.29 |
| 10,898.0 | 91.10 | 2.00 | 7,438.7 | 3,636.3 | -86.0 | 3,637.0 | 2.52 | 2.19 | 1.25 |
| 10,930.0 | 88.40 | 0.70 | 7,438.9 | 3,668.3 | -85.3 | 3,668.9 | 9.36 | -8.44 | -4.06 |
| 10,961.0 | 87.80 | 1.10 | 7,439.9 | 3,699.3 | -84.8 | 3,699.9 | 2.33 | -1.94 | 1.29 |
| 10,994.0 | 88.30 | 1.60 | 7,441.0 | 3,732.2 | -84.0 | 3,732.9 | 2.14 | 1.52 | 1.52 |
| 11,025.0 | 88.90 | 2.30 | 7,441.8 | 3,763.2 | -83.0 | 3,763.8 | 2.97 | 1.94 | 2.26 |
| 11,057.0 | 89.20 | 2.70 | 7,442.3 | 3,795.2 | -81.6 | 3,795.8 | 1.56 | 0.94 | 1.25 |
| 11,089.0 | 88.50 | 2.20 | 7,443.0 | 3,827.1 | -80.2 | 3,827.7 | 2.69 | -2.19 | -1.56 |
| 11,120.0 | 87.40 | 1.30 | 7,444.1 | 3,858.1 | -79.3 | 3,858.7 | 4.58 | -3.55 | -2.90 |
| 11,152.0 | 87.30 | 0.90 | 7,445.5 | 3,890.1 | -78.6 | 3,890.6 | 1.29 | -0.31 | -1.25 |
| 11,184.0 | 87.90 | 1.10 | 7,446.9 | 3,922.0 | -78.1 | 3,922.6 | 1.98 | 1.88 | 0.63 |
| 11,215.0 | 88.50 | 1.10 | 7,447.9 | 3,953.0 | -77.5 | 3,953.6 | 1.94 | 1.94 | 0.00 |
| 11,247.0 | 86.60 | 359.90 | 7,449.2 | 3,985.0 | -77.2 | 3,985.5 | 7.02 | -5.94 | -3.75 |
| 11,278.0 | 85.10 | 358.80 | 7,451.5 | 4,015.9 | -77.6 | 4,016.5 | 5.99 | -4.84 | -3.55 |
| 11,309.0 | 85.70 | 358.80 | 7,454.0 | 4,046.8 | -78.2 | 4,047.4 | 1.94 | 1.94 | 0.00 |
| 11,341.0 | 86.30 | 359.30 | 7,456.2 | 4,078.7 | -78.7 | 4,079.3 | 2.44 | 1.88 | 1.56 |
| 11,373.0 | 86.80 | 359.30 | 7,458.1 | 4,110.6 | -79.1 | 4,111.2 | 1.56 | 1.56 | 0.00 |
| 11,405.0 | 87.60 | 359.20 | 7,459.7 | 4,142.6 | -79.5 | 4,143.2 | 2.52 | 2.50 | -0.31 |
| 11,436.0 | 88.80 | 359.30 | 7,460.6 | 4,173.6 | -79.9 | 4,174.2 | 3.88 | 3.87 | 0.32 |
| 11,468.0 | 89.30 | 359.20 | 7,461.2 | 4,205.6 | -80.4 | 4,206.2 | 1.59 | 1.56 | -0.31 |
| 11,499.0 | 89.10 | 359.00 | 7,461.6 | 4,236.6 | -80.9 | 4,237.2 | 0.91 | -0.65 | -0.65 |
| 11,531.0 | 89.30 | 359.90 | 7,462.1 | 4,268.6 | -81.2 | 4,269.2 | 2.88 | 0.63 | 2.81 |
| 11,563.0 | 89.30 | 359.90 | 7,462.5 | 4,300.6 | -81.2 | 4,301.1 | 0.00 | 0.00 | 0.00 |
| 11,595.0 | 90.00 | 0.40 | 7,462.6 | 4,332.6 | -81.1 | 4,333.1 | 2.69 | 2.19 | 1.56 |
| 11,626.0 | 90.90 | 0.70 | 7,462.4 | 4,363.6 | -80.8 | 4,364.1 | 3.06 | 2.90 | 0.97 |
| 11,658.0 | 91.30 | 1.10 | 7,461.8 | 4,395.6 | -80.3 | 4,396.1 | 1.77 | 1.25 | 1.25 |
| 11,689.0 | 91.40 | 1.30 | 7,461.1 | 4,426.5 | -79.7 | 4,427.1 | 0.72 | 0.32 | 0.65 |

| | | | |
|------------------|---|-------------------------------------|---------------------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Magnuson 23I-421 |
| Project: | SEC.23-T7N-R66W | TVD Reference: | WELL @ 4914.0ft (Ensign 14 - RKB 15') |
| Site: | Magnuson Pad Sec.23-T7N-R66W | MD Reference: | WELL @ 4914.0ft (Ensign 14 - RKB 15') |
| Well: | Magnuson 23I-421 | North Reference: | True |
| Wellbore: | Wellbore #1 | Survey Calculation Method: | Minimum Curvature |
| Design: | Wellbore #1 | Database: | Landmark |

| 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) |
| 11,721.0 | 91.40 | 1.30 | 7,460.3 | 4,458.5 | -79.0 | 4,459.1 | 0.00 | 0.00 | 0.00 |
| 11,754.0 | 91.50 | 2.30 | 7,459.4 | 4,491.5 | -77.9 | 4,492.0 | 3.04 | 0.30 | 3.03 |
| 11,785.0 | 92.20 | 1.60 | 7,458.4 | 4,522.5 | -76.9 | 4,523.0 | 3.19 | 2.26 | -2.26 |
| 11,811.0 | 92.30 | 1.80 | 7,457.4 | 4,548.4 | -76.1 | 4,548.9 | 0.86 | 0.38 | 0.77 |
| 11,863.0 | 92.30 | 1.80 | 7,455.3 | 4,600.4 | -74.5 | 4,600.9 | 0.00 | 0.00 | 0.00 |
| BHL 500'FNL & 660'FWL | | | | | | | | | |

| Design Targets | | | | | | | | | |
|---|---------------|--------------|----------|------------|------------|---------------|--------------|-----------|-------------|
| Target Name | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (ft) | Easting (ft) | Latitude | Longitude |
| - hit/miss target | | | | | | | | | |
| - Shape | | | | | | | | | |
| HARDLINE 460' (1) | 0.00 | 0.00 | 1.0 | 4,634.1 | -242.9 | 1,450,175.87 | 3,207,654.20 | 40.566730 | -104.752564 |
| - survey misses target center by 4640.5ft at 0.8ft MD (0.8 TVD, 0.0 N, 0.0 E) | | | | | | | | | |
| - Polygon | | | | | | | | | |
| Point 1 | | | 1.0 | 0.0 | 0.0 | 1,450,175.87 | 3,207,654.20 | | |
| Point 2 | | | 1.0 | 0.0 | -500.0 | 1,450,171.65 | 3,207,154.23 | | |
| Point 3 | | | 1.0 | 0.0 | 0.0 | 1,450,175.87 | 3,207,654.20 | | |
| Point 4 | | | 1.0 | -4,400.0 | 0.0 | 1,445,776.17 | 3,207,691.33 | | |
| HARDLINE SHL 460'f | 0.00 | 0.00 | 1.0 | 235.0 | -300.0 | 1,445,776.58 | 3,207,634.18 | 40.554655 | -104.752770 |
| - survey misses target center by 381.1ft at 1.0ft MD (1.0 TVD, 0.0 N, 0.0 E) | | | | | | | | | |
| - Polygon | | | | | | | | | |
| Point 1 | | | 1.0 | 0.0 | 0.0 | 1,445,776.58 | 3,207,634.18 | | |
| Point 2 | | | 1.0 | 0.0 | 500.0 | 1,445,780.80 | 3,208,134.15 | | |
| HARDLINE BHL 460'f | 0.00 | 0.00 | 1.0 | 4,641.4 | -244.5 | 1,450,183.16 | 3,207,652.50 | 40.566750 | -104.752570 |
| - survey misses target center by 4647.8ft at 0.8ft MD (0.8 TVD, 0.0 N, 0.0 E) | | | | | | | | | |
| - Polygon | | | | | | | | | |
| Point 1 | | | 1.0 | 0.0 | 0.0 | 1,450,183.16 | 3,207,652.50 | | |
| Point 2 | | | 1.0 | 0.0 | 400.0 | 1,450,186.53 | 3,208,052.47 | | |
| SECTIONLINE 225'S | 0.00 | 0.00 | 1.0 | -225.0 | -300.0 | 1,445,316.62 | 3,207,638.06 | 40.553392 | -104.752770 |
| - survey misses target center by 375.0ft at 1.1ft MD (1.1 TVD, 0.0 N, 0.0 E) | | | | | | | | | |
| - Polygon | | | | | | | | | |
| Point 1 | | | 1.0 | 0.0 | 0.0 | 1,445,316.62 | 3,207,638.06 | | |
| Point 2 | | | 1.0 | 0.0 | 500.0 | 1,445,320.83 | 3,208,138.03 | | |
| BHL 500'FNL & 660'F | 0.00 | 0.00 | 7,414.0 | 4,601.4 | -44.5 | 1,450,144.85 | 3,207,852.87 | 40.566640 | -104.751850 |
| - survey misses target center by 51.1ft at 11863.0ft MD (7455.3 TVD, 4600.4 N, -74.5 E) | | | | | | | | | |
| - Point | | | | | | | | | |

Checked By: _____ Approved By: _____ Date: _____