

In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.

MATRIX FOR POROSITY CALCULATION: 2.65 G/CC
ANNULAR VOLUME BASED ON 5.5" PRODUCTION CASING
FOR HVOL AND AVOL PLEASE SEE LOG
CREW: ARVELO, GARCIA, TODD, MUIR

All plotted output is automatically scaled to obtain the best visual effect within the physical space available. The maximum scales being 1:50000(metric) and 1:48000(imperial), and the minimum 1:1.

The analysis is derived by integrating 10 cm sampled data down the borehole. The listing supplied will contain a maximum of 200 points in multiples of $1,2,5,10,20,50$ or 100 metres/feet depending on the total range of the analysis. However, the analysis is calculated for the entire range of the borehole and the final borehole position is included in the listing.

Computed verticality may only be fully derived in open sections of the borehole, away from the influence of any unusual magnetic effects, (as the azimuth calculations are derived from three solid state magnetometers). So the analysis will generally begin at the end of the casing and all borehole positional information will relate to this depth.

Up to ten cross sections may be requested for any borehole to be displayed at any scale, (the default scale is that of the cross-section for the entire hole).

Borehole positional error is derived assuming the following parameters.

|  | TILT (degrees) | AZIMUTH (degrees) |
| :--- | :--- | :--- |
| Typical Error | $+/-0.1000$ | $+/-5.0000$ |
| Maximum Error | $+/-0.2000$ | $+/-8.0000$ |

Error analysis may be calculated and plotted from the data listing as follows:
a) Plot the four coordinates from the error listing (based upon zero azimuth error) on a target plot. Origin at the start of the analysis.
b) Describe arcs of $+/-10.00$ degrees and $+/-15.00$ degrees (centre at the origin) through the inner and outer points respectively.
c) Connect the respective arcs together with straight lines to give the typical and maximum borehole positional error.

Given below is a full description of the parameters displayed on the ensuing listing:

## LOG DEPTH

TRUE DEPTH

HOLE TILT AND AZIMUTH

## AXIAL COORDINATES

POLAR COORDINATES
ERROR COORDINATES

The depth recorded on the field logs for the borehole.
The true vertical depth corresponding to the above depth. Corrected from the start of the analysis.

The sampled borehole orientation. Tilt measured from Vertical.
The coordinates North and East from the target origin.
The polar or radial coordinates of the borehole.
The polar coordinates corresponding to the typical and maximum tilt error.
N.B. The reference point for all bearing angles on this listing is given at the top of each sheet.

## Verticality Data Listing

C:ILOGSISNAKE RIVERIRVIN \#1-19IMP.dta
All Co-ordinates With Respect To True North, all depths in feet
First Depth 1125.00, 9.57 North, 4.28 East of Origin
Date Processed: 18-OCT-2022 DEPTHS BOREHOLE AXIAL CO-ORDS POLAR POLAR ERROR CO-ORDINATES (MAXIMUM \& TYPICAL)

| Log | rue | Tilt | Azi | North | Eas | Brg | Radius | Brg | Radius | Brg | Radius | Brg | Radius | Brg | Radius |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1125.00 | 1124.93 | 1.6 | 8.3 | 9.58 | 4.28 | 24 | 10.49 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 1150.00 | 1149.92 | 2.0 | 22.4 | 10.30 | 4.58 | 24 | 11.27 | 24 | 11.36 | 24 | 11.19 | 24 | 11.32 | 24 | 11.23 |
| 1175.00 | 1174.90 | 1.9 | 30.6 | 11.03 | 5.01 | 24 | 12.11 | 24 | 12.28 | 24 | 11.94 | 24 | 12.20 | 24 | 12.02 |
| 1200.00 | 1199.89 | 1.9 | 27.6 | 11.76 | 5.39 | 25 | 12.94 | 25 | 13.20 | 25 | 12.67 | 25 | 13.07 | 25 | 12.81 |
| 1225.00 | 1224.87 | 1.9 | 29.0 | 12.47 | 5.78 | 25 | 13.74 | 25 | 14.09 | 25 | 13.39 | 25 | 13.92 | 25 | 13.57 |
| 1250.00 | 1249.86 | 1.9 | 29.7 | 13.19 | 6.20 | 25 | 14.58 | 25 | 15.01 | 25 | 14.14 | 25 | 14.80 | 25 | 14.36 |
| 1275.00 | 1274.85 | 2.0 | 29.2 | 13.94 | 6.61 | 25 | 15.43 | 25 | 15.95 | 25 | 14.90 | 25 | 15.69 | 25 | 15.16 |
| 1300.00 | 1299.83 | 2.0 | 26.5 | 14.70 | 7.00 | 25 | 16.28 | 26 | 16.89 | 25 | 15.67 | 25 | 16.59 | 25 | 15.98 |
| 1325.00 | 1324.82 | 1.9 | 25.7 | 15.45 | 7.36 | 25 | 17.12 | 26 | 17.81 | 25 | 16.42 | 26 | 17.47 | 25 | 16.77 |
| 1350.00 | 1349.80 | 1.9 | 26.6 | 16.20 | 7.73 | 26 | 17.95 | 26 | 18.73 | 25 | 17.16 | 26 | 18.34 | 25 | 17.56 |
| 1375.00 | 1374.79 | 1.9 | 26.2 | 16.96 | 8.10 | 26 | 18.79 | 26 | 19.66 | 25 | 17.92 | 26 | 19.23 | 26 | 18.36 |
| 1400.00 | 1399.77 | 2.0 | 25.8 | 17.73 | 8.48 | 26 | 19.65 | 26 | 20.61 | 25 | 18.69 | 26 | 20.13 | 26 | 19.17 |
| 1425.00 | 1424.76 | 1.9 | 25.5 | 18.49 | 8.84 | 26 | 20.50 | 26 | 21.54 | 25 | 19.45 | 26 | 21.02 | 26 | 19.97 |
| 1450.00 | 1449.75 | 1.8 | 24.6 | 19.21 | 9.17 | 26 | 21.29 | 26 | 22.42 | 25 | 20.16 | 26 | 21.86 | 25 | 20.72 |
| 1475.00 | 1474.73 | 1.8 | 24.3 | 19.94 | 9.50 | 25 | 22.08 | 26 | 23.30 | 25 | 20.86 | 26 | 22.69 | 25 | 21.47 |
| 1500.00 | 1499.72 | 1.8 | 24.7 | 20.67 | 9.83 | 25 | 22.89 | 26 | 24.20 | 25 | 21.58 | 25 | 23.54 | 25 | 22.23 |
| 1525.00 | 1524.71 | 1.8 | 24.0 | 21.40 | 10.16 | 25 | 23.69 | 25 | 25.08 | 25 | 22.29 | 25 | 24.38 | 25 | 22.99 |
| 1550.00 | 1549.70 | 1.8 | 22.8 | 22.12 | 10.46 | 25 | 24.47 | 25 | 25.96 | 25 | 22.99 | 25 | 25.21 | 25 | 23.73 |
| 1575.00 | 1574.68 | 1.8 | 23.7 | 22.83 | 10.77 | 25 | 25.25 | 25 | 26.82 | 25 | 23.68 | 25 | 26.03 | 25 | 24.46 |
| 1600.00 | 1599.67 | 1.8 | 22.4 | 23.55 | 11.07 | 25 | 26.02 | 25 | 27.68 | 25 | 24.37 | 25 | 26.85 | 25 | 25.20 |
| 1625.00 | 1624.66 | 1.8 | 22.0 | 24.30 | 11.37 | 25 | 26.83 | 25 | 28.57 | 25 | 25.08 | 25 | 27.70 | 25 | 25.96 |
| 1650.00 | 1649.65 | 1.8 | 23.7 | 25.03 | 11.70 | 25 | 27.63 | 25 | 29.46 | 25 | 25.80 | 25 | 28.54 | 25 | 26.71 |
| 1675.00 | 1674.63 | 1.9 | 25.5 | 25.77 | 12.05 | 25 | 28.44 | 25 | 30.36 | 25 | 26.52 | 25 | 29.40 | 25 | 27.48 |
| 1700.00 | 1699.62 | 1.9 | 25.3 | 26.50 | 12.39 | 25 | 29.25 | 25 | 31.26 | 25 | 27.25 | 25 | 30.26 | 25 | 28.25 |
| 1725.00 | 1724.61 | 1.9 | 25.0 | 27.23 | 12.73 | 25 | 30.06 | 25 | 32.16 | 25 | 27.97 | 25 | 31.11 | 25 | 29.02 |
| 1750.00 | 1749.59 | 1.9 | 24.8 | 27.98 | 13.08 | 25 | 30.89 | 25 | 33.07 | 25 | 28.71 | 25 | 31.98 | 25 | 29.80 |
| 1775.00 | 1774.58 | 1.7 | 25.4 | 28.66 | 13.40 | 25 | 31.63 | 25 | 33.90 | 25 | 29.37 | 25 | 32.77 | 25 | 30.50 |
| 1800.00 | 1799.57 | 1.8 | 26.4 | 29.35 | 13.74 | 25 | 32.40 | 25 | 34.76 | 25 | 30.05 | 25 | 33.58 | 25 | 31.23 |
| 1825.00 | 1824.56 | 1.8 | 28.3 | 30.04 | 14.12 | 25 | 33.19 | 25 | 35.63 | 25 | 30.75 | 25 | 34.41 | 25 | 31.97 |
| 1850.00 | 1849.55 | 1.8 | 28.2 | 30.73 | 14.49 | 25 | 33.98 | 25 | 36.51 | 25 | 31.45 | 25 | 35.24 | 25 | 32.71 |
| 1875.00 | 1874.53 | 1.8 | 26.5 | 31.43 | 14.84 | 25 | 34.75 | 25 | 37.37 | 25 | 32.14 | 25 | 36.06 | 25 | 33.45 |
| 1900.00 | 1899.52 | 1.8 | 29.9 | 32.09 | 15.22 | 25 | 35.51 | 25 | 38.22 | 25 | 32.81 | 25 | 36.87 | 25 | 34.16 |
| 1925.00 | 1924.51 | 1.7 | 28.8 | 32.75 | 15.58 | 25 | 36.27 | 25 | 39.06 | 25 | 33.48 | 25 | 37.66 | 25 | 34.87 |
| 1950.00 | 1949.50 | 1.7 | 29.8 | 33.39 | 15.95 | 26 | 37.01 | 26 | 39.88 | 25 | 34.13 | 26 | 38.44 | 26 | 35.57 |
| 1975.00 | 1974.49 | 1.7 | 29.5 | 34.05 | 16.32 | 26 | 37.76 | 26 | 40.72 | 26 | 34.79 | 26 | 39.24 | 26 | 36.27 |
| 2000.00 | 1999.48 | 1.7 | 31.0 | 34.69 | 16.70 | 26 | 38.50 | 26 | 41.55 | 26 | 35.44 | 26 | 40.02 | 26 | 36.97 |
| 2025.00 | 2024.47 | 1.7 | 29.1 | 35.34 | 17.06 | 26 | 39.24 | 26 | 42.38 | 26 | 36.10 | 26 | 40.81 | 26 | 37.67 |
| 2050.00 | 2049.45 | 1.8 | 30.5 | 36.00 | 17.45 | 26 | 40.00 | 26 | 43.23 | 26 | 36.78 | 26 | 41.62 | 26 | 38.39 |
| 2075.00 | 2074.44 | 1.7 | 29.7 | 36.64 | 17.81 | 26 | 40.74 | 26 | 44.05 | 26 | 37.42 | 26 | 42.40 | 26 | 39.08 |
| 2100.00 | 2099.43 | 1.7 | 28.9 | 37.29 | 18.18 | 26 | 41.49 | 26 | 44.89 | 26 | 38.09 | 26 | 43.19 | 26 | 39.79 |
| 2125.00 | 2124.42 | 1.7 | 28.9 | 37.96 | 18.55 | 26 | 42.25 | 26 | 45.74 | 26 | 38.76 | 26 | 43.99 | 26 | 40.51 |
| 2150.00 | 2149.41 | 1.7 | 27.9 | 38.63 | 18.90 | 26 | 43.01 | 26 | 46.58 | 26 | 39.43 | 26 | 44.80 | 26 | 41.22 |
| 2175.00 | 2174.40 | 1.7 | 26.7 | 39.29 | 19.23 | 26 | 43.75 | 26 | 47.41 | 26 | 40.09 | 26 | 45.58 | 26 | 41.92 |
| 2200.00 | 2199.39 | 1.7 | 27.1 | 39.95 | 19.57 | 26 | 44.49 | 26 | 48.24 | 26 | 40.74 | 26 | 46.36 | 26 | 42.61 |
| 2225.00 | 2224.38 | 1.7 | 26.8 | 40.62 | 19.91 | 26 | 45.24 | 26 | 49.07 | 26 | 41.40 | 26 | 47.15 | 26 | 43.32 |
| 2250.00 | 2249.36 | 1.7 | 27.4 | 41.29 | 20.25 | 26 | 45.99 | 26 | 49.91 | 26 | 42.06 | 26 | 47.95 | 26 | 44.03 |
| 2275.00 | 2274.35 | 1.7 | 26.7 | 41.94 | 20.58 | 26 | 46.71 | 26 | 50.72 | 26 | 42.70 | 26 | 48.72 | 26 | 44.71 |
| 2300.00 | 2299.34 | 1.7 | 26.7 | 42.58 | 20.90 | 26 | 47.44 | 26 | 51.54 | 26 | 43.34 | 26 | 49.49 | 26 | 45.39 |
| 2325.00 | 2324.33 | 1.7 | 26.8 | 43.24 | 21.24 | 26 | 48.18 | 26 | 52.36 | 26 | 43.99 | 26 | 50.27 | 26 | 46.08 |
| 2350.00 | 2349.32 | 1.7 | 27.8 | 43.89 | 21.58 | 26 | 48.91 | 26 | 53.18 | 26 | 44.63 | 26 | 51.04 | 26 | 46.77 |
| 2375.00 | 2374.31 | 1.7 | 27.9 | 44.55 | 21.93 | 26 | 49.66 | 26 | 54.02 | 26 | 45.30 | 26 | 51.84 | 26 | 47.48 |
| 2400.00 | 2399.30 | 1.7 | 27.8 | 45.20 | 22.27 | 26 | 50.39 | 26 | 54.84 | 26 | 45.94 | 26 | 52.61 | 26 | 48.17 |
| 2425.00 | 2424.29 | 1.7 | 28.4 | 45.84 | 22.62 | 26 | 51.12 | 26 | 55.66 | 26 | 46.59 | 26 | 53.39 | 26 | 48.85 |
| 2450.00 | 2449.28 | 1.7 | 28.3 | 46.48 | 22.96 | 26 | 51.85 | 26 | 56.47 | 26 | 47.22 | 26 | 54.16 | 26 | 49.54 |
| 2475.00 | 2474.27 | 1.7 | 27.8 | 47.12 | 23.30 | 26 | 52.57 | 26 | 57.28 | 26 | 47.86 | 26 | 54.92 | 26 | 50.21 |
| 2500.00 | 2499.26 | 1.7 | 27.3 | 47.78 | 23.64 | 26 | 53.30 | 26 | 58.10 | 26 | 48.51 | 26 | 55.70 | 26 | 50.91 |
| 2525.00 | 2524.25 | 1.7 | 26.0 | 48.42 | 23.95 | 26 | 54.02 | 26 | 58.91 | 26 | 49.14 | 26 | 56.46 | 26 | 51.58 |
| 2550.00 | 2549.24 | 1.6 | 27.0 | 49.06 | 24.28 | 26 | 54.74 | 26 | 59.71 | 26 | 49.76 | 26 | 57.22 | 26 | 52.25 |


| 2575.00 | 2574.23 | 1.6 | 25.1 | 49.70 | 24.58 | 26 | 55.45 | 26 | 60.51 | 26 | 50.39 | 26 | 57.98 | 26 | 52.92 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2600.00 | 2599.22 | 1.6 | 26.0 | 50.34 | 24.89 | 26 | 56.16 | 26 | 61.30 | 26 | 51.01 | 26 | 58.73 | 26 | 53.59 |
| 2625.00 | 2624.21 | 1.6 | 26.7 | 50.97 | 25.21 | 26 | 56.87 | 26 | 62.10 | 26 | 51.63 | 26 | 59.48 | 26 | 54.25 |
| 2650.00 | 2649.20 | 1.6 | 26.9 | 51.59 | 25.52 | 26 | 57.55 | 26 | 62.87 | 26 | 52.23 | 26 | 60.21 | 26 | 54.89 |
| 2675.00 | 2674.19 | 1.6 | 27.6 | 52.21 | 25.85 | 26 | 58.26 | 26 | 63.67 | 26 | 52.85 | 26 | 60.96 | 26 | 55.55 |
| 2700.00 | 2699.18 | 1.6 | 27.7 | 52.82 | 26.16 | 26 | 58.94 | 26 | 64.44 | 26 | 53.45 | 26 | 61.69 | 26 | 56.19 |
| 2725.00 | 2724.17 | 1.6 | 28.2 | 53.42 | 26.49 | 26 | 59.63 | 26 | 65.21 | 26 | 54.04 | 26 | 62.42 | 26 | 56.84 |
| 2750.00 | 2749.16 | 1.5 | 28.4 | 54.01 | 26.81 | 26 | 60.30 | 26 | 65.97 | 26 | 54.63 | 26 | 63.13 | 26 | 57.46 |
| 2775.00 | 2774.15 | 1.5 | 28.1 | 54.60 | 27.12 | 26 | 60.96 | 26 | 66.72 | 26 | 55.20 | 26 | 63.84 | 26 | 58.08 |
| 2800.00 | 2799.14 | 1.5 | 29.4 | 55.18 | 27.45 | 26 | 61.63 | 26 | 67.47 | 26 | 55.78 | 26 | 64.55 | 26 | 58.71 |
| 2825.00 | 2824.13 | 1.5 | 28.1 | 55.76 | 27.76 | 26 | 62.29 | 27 | 68.22 | 26 | 56.36 | 26 | 65.25 | 26 | 59.32 |
| 2850.00 | 2849.12 | 1.6 | 29.2 | 56.35 | 28.09 | 26 | 62.96 | 27 | 68.98 | 26 | 56.94 | 27 | 65.97 | 26 | 59.95 |
| 2875.00 | 2874.11 | 1.5 | 28.6 | 56.94 | 28.41 | 27 | 63.64 | 27 | 69.74 | 26 | 57.53 | 27 | 66.69 | 26 | 60.58 |
| 2900.00 | 2899.11 | 1.5 | 29.6 | 57.51 | 28.73 | 27 | 64.29 | 27 | 70.48 | 26 | 58.10 | 27 | 67.39 | 27 | 61.19 |
| 2925.00 | 2924.10 | 1.5 | 29.4 | 58.07 | 29.05 | 27 | 64.93 | 27 | 71.21 | 27 | 58.65 | 27 | 68.07 | 27 | 61.79 |
| 2950.00 | 2949.09 | 1.5 | 28.9 | 58.64 | 29.37 | 27 | 65.59 | 27 | 71.95 | 27 | 59.22 | 27 | 68.77 | 27 | 62.40 |
| 2975.00 | 2974.08 | 1.5 | 28.2 | 59.22 | 29.67 | 27 | 66.23 | 27 | 72.69 | 27 | 59.78 | 27 | 69.46 | 27 | 63.01 |
| 3000.00 | 2999.07 | 1.4 | 27.6 | 59.78 | 29.97 | 27 | 66.87 | 27 | 73.41 | 27 | 60.33 | 27 | 70.14 | 27 | 63.60 |
| 3025.00 | 3024.06 | 1.4 | 29.8 | 60.32 | 30.28 | 27 | 67.50 | 27 | 74.12 | 27 | 60.87 | 27 | 70.81 | 27 | 64.18 |
| 3050.00 | 3049.06 | 1.5 | 29.7 | 60.87 | 30.59 | 27 | 68.13 | 27 | 74.84 | 27 | 61.41 | 27 | 71.49 | 27 | 64.77 |
| 3075.00 | 3074.05 | 1.4 | 31.6 | 61.39 | 30.91 | 27 | 68.73 | 27 | 75.54 | 27 | 61.93 | 27 | 72.13 | 27 | 65.33 |
| 3100.00 | 3099.04 | 1.4 | 32.9 | 61.91 | 31.25 | 27 | 69.35 | 27 | 76.24 | 27 | 62.46 | 27 | 72.79 | 27 | 65.90 |
| 3125.00 | 3124.03 | 1.5 | 32.5 | 62.45 | 31.59 | 27 | 69.99 | 27 | 76.96 | 27 | 63.01 | 27 | 73.47 | 27 | 66.50 |
| 3150.00 | 3149.03 | 1.5 | 31.8 | 62.99 | 31.93 | 27 | 70.62 | 27 | 77.68 | 27 | 63.55 | 27 | 74.15 | 27 | 67.08 |
| 3175.00 | 3174.02 | 1.5 | 34.3 | 63.52 | 32.28 | 27 | 71.25 | 27 | 78.40 | 27 | 64.10 | 27 | 74.83 | 27 | 67.67 |
| 3200.00 | 3199.01 | 1.5 | 34.9 | 64.07 | 32.67 | 27 | 71.92 | 27 | 79.15 | 27 | 64.68 | 27 | 75.54 | 27 | 68.30 |
| 3225.00 | 3224.00 | 1.6 | 36.2 | 64.62 | 33.08 | 27 | 72.60 | 27 | 79.92 | 27 | 65.27 | 27 | 76.26 | 27 | 68.93 |
| 3250.00 | 3248.99 | 1.6 | 38.4 | 65.17 | 33.51 | 27 | 73.28 | 27 | 80.69 | 27 | 65.86 | 27 | 76.98 | 27 | 69.57 |
| 3275.00 | 3273.98 | 1.6 | 40.4 | 65.69 | 33.95 | 27 | 73.95 | 27 | 81.45 | 27 | 66.45 | 27 | 77.70 | 27 | 70.20 |
| 3300.00 | 3298.97 | 1.6 | 39.4 | 66.22 | 34.39 | 27 | 74.61 | 27 | 82.20 | 27 | 67.02 | 27 | 78.41 | 27 | 70.82 |
| 3325.00 | 3323.96 | 1.6 | 41.0 | 66.73 | 34.83 | 28 | 75.27 | 28 | 82.95 | 27 | 67.60 | 28 | 79.11 | 28 | 71.43 |
| 3350.00 | 3348.95 | 1.6 | 40.3 | 67.26 | 35.28 | 28 | 75.95 | 28 | 83.71 | 28 | 68.18 | 28 | 79.83 | 28 | 72.07 |
| 3375.00 | 3373.94 | 1.5 | 40.3 | 67.75 | 35.69 | 28 | 76.58 | 28 | 84.43 | 28 | 68.73 | 28 | 80.50 | 28 | 72.65 |
| 3400.00 | 3398.94 | 1.4 | 37.3 | 68.25 | 36.07 | 28 | 77.19 | 28 | 85.13 | 28 | 69.26 | 28 | 81.16 | 28 | 73.23 |
| 3425.00 | 3423.93 | 1.4 | 37.3 | 68.72 | 36.43 | 28 | 77.78 | 28 | 85.80 | 28 | 69.76 | 28 | 81.79 | 28 | 73.77 |
| 3450.00 | 3448.92 | 1.4 | 35.8 | 69.20 | 36.78 | 28 | 78.36 | 28 | 86.47 | 28 | 70.25 | 28 | 82.42 | 28 | 74.31 |
| 3475.00 | 3473.91 | 1.3 | 37.6 | 69.64 | 37.12 | 28 | 78.92 | 28 | 87.12 | 28 | 70.72 | 28 | 83.02 | 28 | 74.82 |
| 3500.00 | 3498.91 | 1.3 | 33.5 | 70.11 | 37.43 | 28 | 79.47 | 28 | 87.76 | 28 | 71.18 | 28 | 83.61 | 28 | 75.33 |
| 3525.00 | 3523.90 | 1.2 | 31.1 | 70.56 | 37.70 | 28 | 80.00 | 28 | 88.37 | 28 | 71.62 | 28 | 84.18 | 28 | 75.81 |
| 3550.00 | 3548.90 | 1.2 | 30.0 | 70.99 | 37.95 | 28 | 80.50 | 28 | 88.96 | 28 | 72.04 | 28 | 84.73 | 28 | 76.27 |
| 3575.00 | 3573.89 | 1.2 | 26.9 | 71.46 | 38.19 | 28 | 81.02 | 28 | 89.57 | 28 | 72.47 | 28 | 85.29 | 28 | 76.74 |
| 3600.00 | 3598.89 | 1.2 | 22.1 | 71.92 | 38.37 | 28 | 81.52 | 28 | 90.15 | 28 | 72.88 | 28 | 85.83 | 28 | 77.20 |
| 3625.00 | 3623.88 | 1.1 | 23.0 | 72.39 | 38.57 | 28 | 82.02 | 28 | 90.74 | 28 | 73.30 | 28 | 86.38 | 28 | 77.66 |
| 3650.00 | 3648.88 | 1.2 | 23.6 | 72.87 | 38.78 | 28 | 82.55 | 28 | 91.36 | 28 | 73.74 | 28 | 86.95 | 28 | 78.14 |
| 3675.00 | 3673.87 | 1.3 | 26.1 | 73.36 | 39.03 | 28 | 83.09 | 28 | 91.99 | 28 | 74.20 | 28 | 87.54 | 28 | 78.65 |
| 3700.00 | 3698.86 | 1.3 | 24.8 | 73.87 | 39.26 | 28 | 83.65 | 28 | 92.63 | 28 | 74.67 | 28 | 88.14 | 28 | 79.16 |
| 3725.00 | 3723.86 | 1.2 | 24.9 | 74.36 | 39.49 | 28 | 84.19 | 28 | 93.26 | 28 | 75.12 | 28 | 88.73 | 28 | 79.65 |
| 3750.00 | 3748.85 | 1.2 | 24.9 | 74.85 | 39.72 | 28 | 84.74 | 28 | 93.90 | 28 | 75.58 | 28 | 89.32 | 28 | 80.16 |
| 3775.00 | 3773.85 | 1.3 | 23.3 | 75.37 | 39.94 | 28 | 85.30 | 28 | 94.55 | 28 | 76.05 | 28 | 89.92 | 28 | 80.68 |
| 3800.00 | 3798.84 | 1.2 | 22.4 | 75.87 | 40.15 | 28 | 85.84 | 28 | 95.17 | 28 | 76.50 | 28 | 90.50 | 28 | 81.17 |
| 3825.00 | 3823.83 | 1.2 | 25.1 | 76.33 | 40.36 | 28 | 86.35 | 28 | 95.77 | 28 | 76.93 | 28 | 91.06 | 28 | 81.64 |
| 3850.00 | 3848.83 | 1.2 | 22.4 | 76.80 | 40.56 | 28 | 86.85 | 28 | 96.36 | 28 | 77.34 | 28 | 91.61 | 28 | 82.10 |
| 3875.00 | 3873.82 | 1.1 | 24.6 | 77.25 | 40.76 | 28 | 87.35 | 28 | 96.94 | 28 | 77.75 | 28 | 92.14 | 28 | 82.55 |
| 3900.00 | 3898.82 | 1.1 | 24.0 | 77.71 | 40.96 | 28 | 87.84 | 28 | 97.53 | 28 | 78.16 | 28 | 92.69 | 28 | 83.00 |
| 3925.00 | 3923.82 | 1.0 | 23.3 | 78.12 | 41.14 | 28 | 88.29 | 28 | 98.06 | 28 | 78.52 | 28 | 93.18 | 28 | 83.41 |
| 3950.00 | 3948.81 | 1.0 | 23.2 | 78.51 | 41.31 | 28 | 88.71 | 28 | 98.57 | 28 | 78.86 | 28 | 93.64 | 28 | 83.78 |
| 3975.00 | 3973.81 | 0.9 | 22.8 | 78.87 | 41.46 | 28 | 89.11 | 28 | 99.05 | 28 | 79.16 | 28 | 94.08 | 28 | 84.14 |
| 4000.00 | 3998.81 | 0.9 | 19.8 | 79.26 | 41.60 | 28 | 89.51 | 28 | 99.54 | 28 | 79.48 | 28 | 94.53 | 28 | 84.50 |
| 4025.00 | 4023.80 | 0.8 | 20.3 | 79.59 | 41.72 | 28 | 89.86 | 28 | 99.98 | 28 | 79.74 | 28 | 94.92 | 28 | 84.80 |
| 4050.00 | 4048.80 | 0.8 | 24.8 | 79.92 | 41.87 | 28 | 90.22 | 28 | 100.43 | 28 | 80.01 | 28 | 95.32 | 28 | 85.12 |
| 4075.00 | 4073.80 | 0.7 | 28.8 | 80.19 | 42.03 | 28 | 90.54 | 28 | 100.83 | 28 | 80.24 | 28 | 95.68 | 28 | 85.39 |
| 4100.00 | 4098.80 | 0.8 | 31.3 | 80.48 | 42.20 | 28 | 90.87 | 28 | 101.25 | 28 | 80.49 | 28 | 96.06 | 28 | 85.68 |
| 4125.00 | 4123.79 | 0.7 | 32.7 | 80.72 | 42.35 | 28 | 91.15 | 28 | 101.62 | 28 | 80.69 | 28 | 96.39 | 28 | 85.92 |
| 4150.00 | 4148.79 | 0.6 | 32.1 | 80.94 | 42.49 | 28 | 91.42 | 28 | 101.97 | 28 | 80.86 | 28 | 96.70 | 28 | 86.14 |
| 4175.00 | 4173.79 | 0.7 | 31.6 | 81.18 | 42.64 | 28 | 91.70 | 28 | 102.34 | 28 | 81.06 | 28 | 97.02 | 28 | 86.38 |
| 4200.00 | 4198.79 | 0.7 | 31.7 | 81.43 | 42.80 | 28 | 91.99 | 28 | 102.72 | 28 | 81.26 | 28 | 97.36 | 28 | 86.63 |
| 4225.00 | 4223.79 | 0.7 | 31.3 | 81.69 | 42.95 | 28 | 92.29 | 28 | 103.11 | 28 | 81.48 | 28 | 97.70 | 28 | 86.88 |
| 4250.00 | 4248.79 | 0.6 | 34.0 | 81.90 | 43.10 | 28 | 92.55 | 28 | 103.45 | 28 | 81.64 | 28 | 98.00 | 28 | 87.10 |
| 4275.00 | 4273.79 | 0.5 | 39.6 | 82.07 | 43.24 | 28 | 92.76 | 28 | 103.76 | 28 | 81.77 | 28 | 98.26 | 28 | 87.27 |
| 4300.00 | 4298.78 | 0.5 | 37.2 | 82.23 | 43.35 | 28 | 92.96 | 28 | 104.03 | 28 | 81.88 | 28 | 98.50 | 28 | 87.42 |
| 4325.00 | 4323.78 | 0.5 | 31.3 | 82.42 | 43.47 | 28 | 93.18 | 28 | 104.34 | 28 | 82.01 | 28 | 98.76 | 28 | 87.59 |


| 4350.00 | 4348.78 | 0.4 | 36.2 | 82.55 | 43.56 | 28 | 93.34 | 28 | 104.59 | 28 | 82.08 | 28 | 98.96 | 28 | 87.71 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4375.00 | 4373.78 | 0.5 | 40.8 | 82.70 | 43.70 | 28 | 93.53 | 28 | 104.87 | 28 | 82.19 | 28 | 99.20 | 28 | 87.86 |
| 4400.00 | 4398.78 | 0.5 | 53.1 | 82.82 | 43.86 | 28 | 93.72 | 28 | 105.14 | 28 | 82.29 | 28 | 99.43 | 28 | 88.00 |
| 4425.00 | 4423.78 | 0.5 | 40.6 | 82.99 | 44.00 | 28 | 93.93 | 28 | 105.44 | 28 | 82.41 | 28 | 99.69 | 28 | 88.17 |
| 4450.00 | 4448.78 | 0.5 | 58.5 | 83.11 | 44.19 | 28 | 94.13 | 28 | 105.73 | 28 | 82.52 | 28 | 99.93 | 28 | 88.32 |
| 4475.00 | 4473.78 | 0.6 | 57.3 | 83.25 | 44.42 | 28 | 94.36 | 28 | 106.05 | 28 | 82.67 | 28 | 100.20 | 28 | 88.51 |
| 4500.00 | 4498.78 | 0.5 | 66.6 | 83.34 | 44.62 | 28 | 94.53 | 28 | 106.31 | 28 | 82.75 | 28 | 100.42 | 28 | 88.64 |
| 4525.00 | 4523.78 | 0.5 | 66.3 | 83.42 | 44.82 | 28 | 94.70 | 28 | 106.56 | 28 | 82.84 | 28 | 100.63 | 28 | 88.77 |
| 4550.00 | 4548.78 | 0.3 | 100.7 | 83.40 | 44.93 | 28 | 94.74 | 28 | 106.69 | 28 | 82.79 | 28 | 100.71 | 28 | 88.76 |
| 4575.00 | 4573.77 | 0.5 | 79.7 | 83.43 | 45.10 | 28 | 94.84 | 28 | 106.88 | 28 | 82.80 | 28 | 100.86 | 28 | 88.82 |
| 4600.00 | 4598.77 | 0.7 | 51.7 | 83.60 | 45.31 | 28 | 95.09 | 29 | 107.21 | 28 | 82.96 | 28 | 101.15 | 28 | 89.03 |
| 4625.00 | 4623.77 | 0.8 | 68.8 | 83.72 | 45.61 | 29 | 95.33 | 29 | 107.55 | 28 | 83.12 | 29 | 101.44 | 29 | 89.23 |
| 4650.00 | 4648.77 | 0.9 | 90.8 | 83.71 | 45.97 | 29 | 95.50 | 29 | 107.80 | 29 | 83.20 | 29 | 101.65 | 29 | 89.35 |
| 4675.00 | 4673.77 | 1.0 | 49.4 | 83.97 | 46.28 | 29 | 95.88 | 29 | 108.27 | 29 | 83.49 | 29 | 102.07 | 29 | 89.69 |
| 4700.00 | 4698.76 | 1.0 | 44.5 | 84.28 | 46.58 | 29 | 96.30 | 29 | 108.77 | 29 | 83.82 | 29 | 102.54 | 29 | 90.06 |
| 4725.00 | 4723.76 | 1.0 | 56.3 | 84.51 | 46.93 | 29 | 96.67 | 29 | 109.23 | 29 | 84.11 | 29 | 102.95 | 29 | 90.39 |
| 4750.00 | 4748.75 | 0.8 | 67.5 | 84.66 | 47.27 | 29 | 96.96 | 29 | 109.61 | 29 | 84.31 | 29 | 103.29 | 29 | 90.64 |
| 4775.00 | 4773.75 | 0.8 | 66.7 | 84.79 | 47.59 | 29 | 97.24 | 29 | 109.97 | 29 | 84.50 | 29 | 103.60 | 29 | 90.87 |
| 4800.00 | 4798.75 | 0.8 | 70.4 | 84.91 | 47.91 | 29 | 97.49 | 30 | 110.32 | 29 | 84.67 | 29 | 103.91 | 29 | 91.08 |
| 4825.00 | 4823.75 | 0.8 | 60.6 | 85.07 | 48.21 | 30 | 97.78 | 30 | 110.69 | 29 | 84.87 | 30 | 104.23 | 29 | 91.32 |
| 4850.00 | 4848.74 | 1.1 | 350.1 | 85.27 | 48.17 | 29 | 97.93 | 30 | 110.93 | 29 | 84.93 | 30 | 104.43 | 29 | 91.43 |
| 4875.00 | 4873.74 | 1.1 | 35.7 | 85.67 | 48.46 | 29 | 98.42 | 30 | 111.51 | 29 | 85.34 | 30 | 104.96 | 29 | 91.88 |
| 4900.00 | 4898.73 | 1.3 | 37.1 | 86.12 | 48.80 | 30 | 98.98 | 30 | 112.15 | 29 | 85.81 | 30 | 105.57 | 29 | 92.39 |
| 4925.00 | 4923.73 | 1.3 | 34.3 | 86.59 | 49.13 | 30 | 99.56 | 30 | 112.82 | 29 | 86.30 | 30 | 106.19 | 30 | 92.93 |
| 4950.00 | 4948.72 | 1.2 | 33.4 | 87.02 | 49.41 | 30 | 100.07 | 30 | 113.42 | 29 | 86.72 | 30 | 106.75 | 30 | 93.40 |
| 4975.00 | 4973.72 | 1.1 | 37.8 | 87.39 | 49.70 | 30 | 100.54 | 30 | 113.97 | 30 | 87.10 | 30 | 107.25 | 30 | 93.82 |
| 5000.00 | 4998.71 | 1.0 | 38.1 | 87.74 | 49.97 | 30 | 100.97 | 30 | 114.50 | 30 | 87.45 | 30 | 107.74 | 30 | 94.21 |
| 5025.00 | 5023.71 | 1.0 | 38.4 | 88.09 | 50.25 | 30 | 101.42 | 30 | 115.03 | 30 | 87.81 | 30 | 108.22 | 30 | 94.61 |
| 5050.00 | 5048.70 | 1.0 | 40.7 | 88.43 | 50.53 | 30 | 101.85 | 30 | 115.54 | 30 | 88.15 | 30 | 108.70 | 30 | 95.00 |
| 5075.00 | 5073.70 | 1.0 | 41.9 | 88.77 | 50.84 | 30 | 102.29 | 30 | 116.08 | 30 | 88.51 | 30 | 109.18 | 30 | 95.40 |
| 5100.00 | 5098.70 | 1.1 | 42.2 | 89.11 | 51.15 | 30 | 102.74 | 30 | 116.61 | 30 | 88.87 | 30 | 109.68 | 30 | 95.81 |
| 5125.00 | 5123.69 | 1.0 | 38.2 | 89.44 | 51.41 | 30 | 103.16 | 30 | 117.12 | 30 | 89.21 | 30 | 110.14 | 30 | 96.18 |
| 5150.00 | 5148.69 | 0.8 | 30.9 | 89.73 | 51.58 | 30 | 103.50 | 30 | 117.54 | 30 | 89.45 | 30 | 110.52 | 30 | 96.47 |
| 5175.00 | 5173.69 | 0.7 | 31.8 | 89.98 | 51.74 | 30 | 103.80 | 30 | 117.93 | 30 | 89.67 | 30 | 110.86 | 30 | 96.73 |
| 5200.00 | 5198.69 | 0.7 | 34.3 | 90.22 | 51.90 | 30 | 104.09 | 30 | 118.31 | 30 | 89.87 | 30 | 111.20 | 30 | 96.98 |
| 5225.00 | 5223.68 | 0.7 | 40.3 | 90.45 | 52.10 | 30 | 104.38 | 30 | 118.69 | 30 | 90.07 | 30 | 111.53 | 30 | 97.22 |
| 5250.00 | 5248.68 | 0.7 | 35.0 | 90.69 | 52.26 | 30 | 104.67 | 30 | 119.06 | 30 | 90.27 | 30 | 111.86 | 30 | 97.47 |
| 5275.00 | 5273.68 | 0.8 | 25.2 | 90.98 | 52.40 | 30 | 104.99 | 30 | 119.47 | 30 | 90.51 | 30 | 112.23 | 30 | 97.75 |
| 5300.00 | 5298.68 | 0.8 | 21.1 | 91.29 | 52.52 | 30 | 105.32 | 30 | 119.89 | 30 | 90.75 | 30 | 112.60 | 30 | 98.04 |
| 5325.00 | 5323.67 | 0.9 | 24.9 | 91.65 | 52.69 | 30 | 105.72 | 30 | 120.37 | 30 | 91.06 | 30 | 113.05 | 30 | 98.39 |
| 5350.00 | 5348.67 | 1.0 | 13.2 | 92.09 | 52.79 | 30 | 106.14 | 30 | 120.89 | 30 | 91.40 | 30 | 113.52 | 30 | 98.77 |
| 5375.00 | 5373.67 | 1.0 | 12.1 | 92.52 | 52.89 | 30 | 106.57 | 30 | 121.40 | 30 | 91.74 | 30 | 113.99 | 30 | 99.16 |
| 5400.00 | 5398.66 | 1.1 | 0.9 | 93.02 | 52.89 | 30 | 107.01 | 30 | 121.92 | 30 | 92.09 | 30 | 114.46 | 30 | 99.55 |
| 5425.00 | 5423.66 | 1.2 | 4.1 | 93.55 | 52.93 | 30 | 107.48 | 30 | 122.49 | 29 | 92.48 | 30 | 114.99 | 29 | 99.98 |
| 5450.00 | 5448.65 | 1.4 | 359.6 | 94.16 | 52.93 | 29 | 108.02 | 29 | 123.11 | 29 | 92.92 | 29 | 115.56 | 29 | 100.47 |

## Cross Section

All Figures are Log Depths in feet
Plot With Respect to True North

Target Origin Depth 1125.00
Last Plotted Depth 5451.27
Depth Markers annotated in multiples of 1200
First Depth Marker at 1200
Last Depth Marker at 4800

Scale 1:480
Declination 13.3 deg East Origin From Hole Top 9.57 feet North 4.28 feet East


Borehole Positional Error
Final Borehole Position
The two boxes surrounding the last plotted depth show the typical and maximum positional error at that depth.

The last plotted depth is at 84.59 feet North 48.65 feet East
ie 97.58 feet from the origin
30 deg from True North

## Vertical Sections




## Depth Correction Analysis




Correction For True Depth

| 2250.00 | 2249.36 | 3925.00 | 3923.82 |
| :--- | :--- | :--- | :--- |
| 2275.00 | 2274.35 | 3950.00 | 3948.81 |
| 2300.00 | 2299.34 | 395.00 | 3973.81 |
| 2325.00 | 2324.33 | 4000.00 | 3998.81 |
| 2350.00 | 2349.32 | 4025.00 | 4023.80 |
| 2375.00 | 2374.31 | 4050.00 | 4038.80 |
| 2400.00 | 2399.30 | 4075.00 | 4073.80 |
| 245.00 | 2424.29 | 4100.00 | 4098.80 |
| 2450.00 | 2449.28 | 4125.00 | 4123.79 |
| 2455.00 | 2474.27 | 4150.00 | 4148.79 |
| 2500.00 | 2499.26 | 4175.00 | 4173.79 |
| 2525.00 | 2524.25 | 4200.00 | 41988.79 |
| 2550.00 | 2549.24 | 4225.00 | 4223.79 |
| 2575.00 | 2574.23 | 4250.00 | 4248.79 |
| 2600.00 | 2599.22 | 4275.00 | 4273.79 |
| 2625.00 | 2624.21 | 4300.00 | 4298.78 |
| 2650.00 | 2649.20 | 4325.00 | 4323.78 |
| 2675.00 | 2674.19 | 4350.00 | 4348.78 |
| 2700.00 | 2699.18 | 4375.00 | 4373.78 |
| 2725.00 | 2724.17 | 4400.00 | 4398.78 |
| 2750.00 | 2749.16 | 425.00 | 4423.78 |
| 2775.00 | 2774.15 | 4450.00 | 4448.78 |

## 3D Borehole Deviation

All figures are True Depths / displacements in feet
Origin Depth 1125.00
Last Plotted Depth 5451.27

Plot With Respect to True North
Declination 13.3 deg East
Origin From Hole Top 9.57 feet North 4.28 feet East


The last plotted depth is at 84.59 feet North 48.65 feet East ie 97.58 feet from the origin 30 deg from True North

| COMPANY |  | SNAKE RIVER OIL AND GAS, LLC |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| WELL |  | IRVIN \#1-19 |  |  |  |
| FIELD |  | WILDCAT |  |  |  |
| PROVINCE/COUNTY |  | PAYETTE |  |  |  |
| COUNTRYISTATE |  | U.S.A. / IDAHO |  |  |  |
| Elevation Kelly Bushing | 2204.50 | feet | Last Reading | 1127.00 | feet |
| Elevation Drill Floor | 2204.50 | feet | First Reading | 5440.85 | feet |
| Elevation Ground Level | 2192.00 | feet | Depth Driller | 5500.00 | feet |

## VERTICALITY ANALYSIS

