



TUG HILL
OPERATING

Well: Fitzgerald 19 HU (slot O)
Site: Fitzgerald
Project: Marshall County, West Virginia
Design: rev15
Rig: Nabors B28

Geodetic System: Universal Transverse Mercator (US Survey Feet)
Datum: NAD83 West Virginia - HARN
Ellipsoid: GRS 1980
Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level
Depth Reference: RKB=1292.91+26 @ 1318.91ft (Nabors B28)

| Northing | Easting | Latitude | Longitude |
|-------------|------------|-------------|--------------|
| 14454537.24 | 1741196.35 | 39.80117700 | -80.64117700 |

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.935°



Azimuths to Grid North
True North: -0.23°
Magnetic North: -8.94°

Magnetic Field
Strength: 51775.6nT
Dip Angle: 66.57°
Date: 3/8/2021
Model: IGRF2020



SECTION DETAILS

| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect | Annotation |
|-----|----------|-------|--------|----------|----------|----------|------|----------|----------|------------------------------------|
| 1 | 7102.00 | 13.01 | 296.66 | 6969.96 | 377.26 | -983.79 | 0.00 | 0.000 | -537.50 | Tie in survey @ 7102 MD |
| 2 | 7195.00 | 15.22 | 294.19 | 7060.15 | 386.96 | -1004.28 | 2.46 | -16.447 | -550.61 | S/T Begin 2°/100' drop/turn (135L) |
| 3 | 7225.00 | 14.80 | 292.53 | 7089.12 | 390.05 | -1011.41 | 2.00 | -135.000 | -554.85 | Begin 2°/100' turn (90L) |
| 4 | 7255.00 | 14.81 | 290.18 | 7118.13 | 392.84 | -1018.55 | 2.00 | -90.000 | -558.81 | Begin 2°/100' build/turn (45L) |
| 5 | 7285.00 | 15.24 | 288.57 | 7147.10 | 395.42 | -1025.89 | 2.00 | -45.000 | -562.58 | Begin 2°/100' build |
| 6 | 7522.82 | 20.00 | 288.57 | 7373.70 | 418.34 | -1094.12 | 2.00 | 0.000 | -596.67 | Begin 2°/100' build/turn |
| 7 | 7692.48 | 20.00 | 298.50 | 7533.17 | 441.43 | -1147.14 | 2.00 | 94.668 | -628.36 | Begin 20.00° tangent |
| 8 | 11342.43 | 20.00 | 298.50 | 10963.00 | 1037.09 | -2244.21 | 0.00 | 0.000 | -1400.32 | Begin 6°/100' build/turn |
| 9 | 11916.43 | 45.00 | 250.00 | 11450.40 | 1013.81 | -2529.83 | 6.00 | -69.459 | -1425.49 | Begin 8°/100' build/turn |
| 10 | 12601.61 | 75.00 | 195.15 | 11809.10 | 577.77 | -2870.33 | 8.00 | -75.096 | -1053.04 | Begin 8°/100' build/turn |
| 11 | 13189.14 | 89.00 | 149.69 | 11895.15 | 18.58 | -2791.81 | 8.00 | -76.990 | -488.61 | Begin 89.00° lateral |
| 12 | 20999.68 | 89.00 | 149.69 | 12031.59 | -6723.50 | 1149.03 | 0.00 | 0.000 | 6820.97 | PBHL/TD 20999.67 MD 12031.59 TVD |

DESIGN TARGET DETAILS

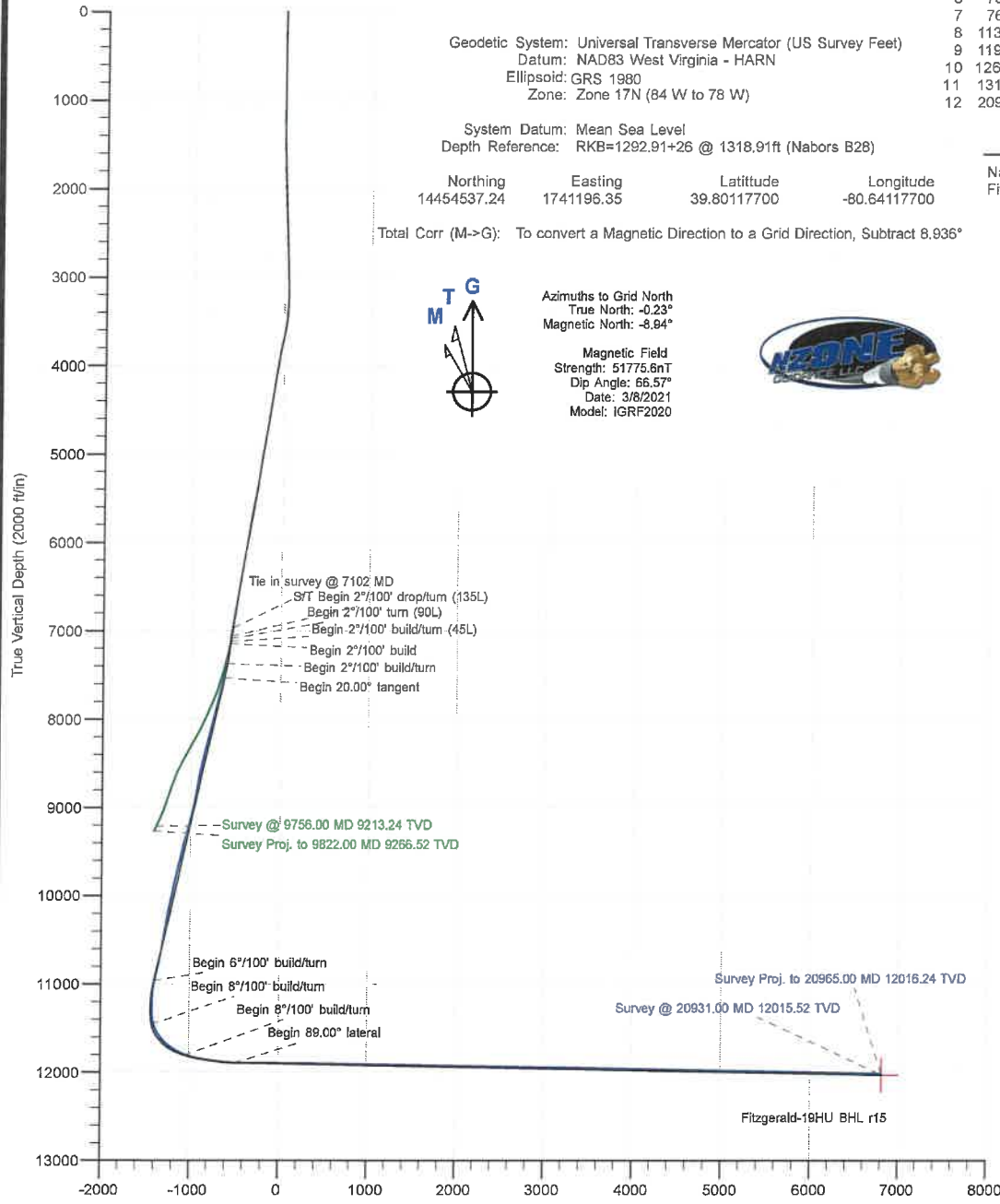
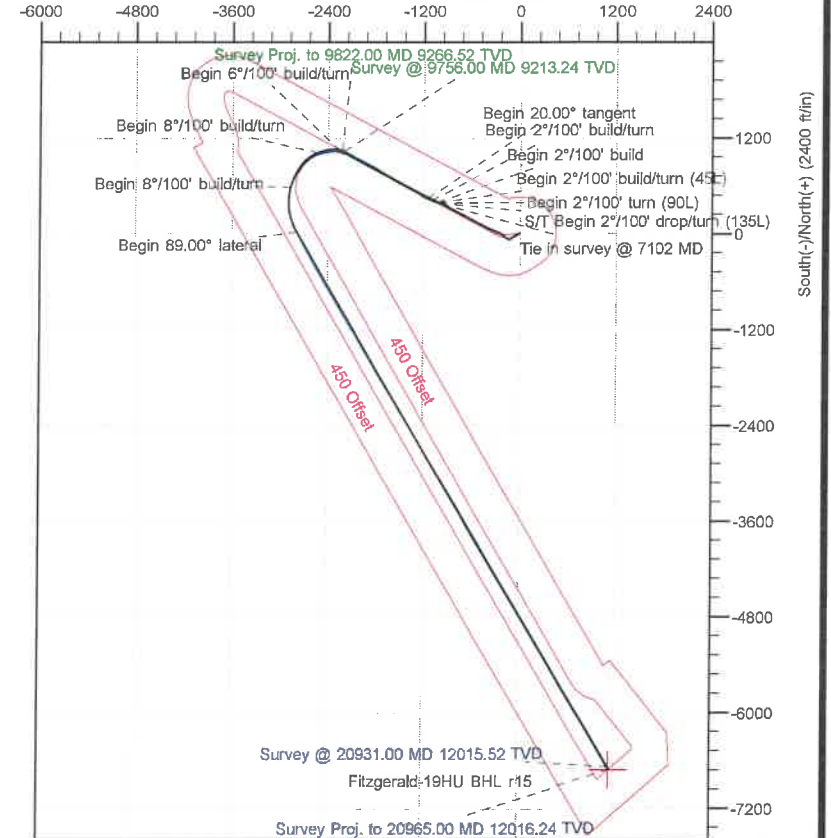
| Name | TVD | +N/-S | +E/-W | Northing | Easting | Latitude | Longitude |
|-------------------------|----------|----------|---------|-------------|------------|-------------|--------------|
| Fitzgerald-19HU BHL r15 | 12031.59 | -6723.50 | 1149.03 | 14447813.76 | 1742345.38 | 39.78270000 | -80.63718300 |

ANNOTATIONS SURVEYS ORIGINAL HOLE

| MD | Inc | Azi | TVD | +N/-S | +E/-W | VSect | Annotation |
|---------|-------|--------|---------|---------|----------|----------|--|
| 189.00 | 0.09 | 278.37 | 189.00 | 0.02 | -0.15 | -0.05 | MWD surveys |
| 9756.00 | 36.17 | 300.96 | 9213.24 | 1031.81 | -2193.78 | -1386.68 | Survey @ 9756.00 MD 9213.24 TVD |
| 9822.00 | 36.17 | 300.96 | 9266.52 | 1051.85 | -2227.18 | -1412.06 | Survey Proj. to 9822.00 MD 9266.52 TVD |

ANNOTATIONS SURVEYS SIDETRACK 01

| MD | Inc | Azi | TVD | +N/-S | +E/-W | VSect | Annotation |
|----------|-------|--------|----------|----------|---------|---------|--|
| 6962.00 | 15.47 | 295.07 | 6834.27 | 362.28 | -952.79 | -517.61 | Tie into original hole @ 6962 MD |
| 20931.00 | 88.78 | 149.13 | 12015.52 | -6686.90 | 1137.13 | 6782.90 | Survey @ 20931.00 MD 12015.52 TVD |
| 20965.00 | 88.78 | 149.13 | 12016.24 | -6716.08 | 1154.57 | 6814.60 | Survey Proj. to 20965.00 MD 12016.24 TVD |



| | | | |
|------------------|--------------------------------|-------------------------------------|---|
| Company: | Tug Hill Operating LLC | Local Co-ordinate Reference: | Well Fitzgerald 19 HU (slot O) |
| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Original Hole | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Original Hole | Database: | DB_Dec2220_v16 |

| | | | |
|--------------------|--|----------------------|----------------|
| Project | Marshall County, West Virginia | | |
| Map System: | Universal Transverse Mercator (US Survey Feet) | System Datum: | Mean Sea Level |
| Geo Datum: | NAD83 West Virginia - HARN | | |
| Map Zone: | Zone 17N (84 W to 78 W) | | |

| | | | | | |
|------------------------------|------------|---------------------|--------------------|-------------------|--------------|
| Site | Fitzgerald | | | | |
| Site Position: | | Northing: | 14,454,567.73 usft | Latitude: | 39.80126184 |
| From: | Lat/Long | Easting: | 1,741,096.26 usft | Longitude: | -80.64153292 |
| Position Uncertainty: | 0.00 ft | Slot Radius: | 13-3/16 " | | |

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|-----------------------------|---------------------------|---------|----------------------------|--------------------|----------------------|--------------|
| Well | Fitzgerald 19 HU (slot O) | | | | | |
| Well Position | +N/-S | 0.00 ft | Northing: | 14,454,537.24 usft | Latitude: | 39.80117700 |
| | +E/-W | 0.00 ft | Easting: | 1,741,196.35 usft | Longitude: | -80.64117700 |
| Position Uncertainty | 0.00 ft | | Wellhead Elevation: | ft | Ground Level: | 1,292.91 ft |
| Grid Convergence: | 0.230 ° | | | | | |

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|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore | Original Hole | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | IGRF2020 | 2/11/2021 | -8.706 | 66.574 | 51,782.68370307 |

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|--------------------------|------------------------------|-------------------|-------------------|----------------------|------|
| Design | Surveys Original Hole | | | | |
| Audit Notes: | | | | | |
| Version: | 1.0 | Phase: | ACTUAL | Tie On Depth: | 0.00 |
| Vertical Section: | Depth From (TVD) (ft) | +N/-S (ft) | +E/-W (ft) | Direction (°) | |
| | 0.00 | 0.00 | 0.00 | 170.30 | |

| | | | | | |
|-----------------------|----------------|----------------------------|------------------|--------------------|--|
| Survey Program | Date | 3/8/2021 | | | |
| From (ft) | To (ft) | Survey (Wellbore) | Tool Name | Description | |
| 189.00 | 1,151.00 | MWD surf (Original Hole) | MWD | MWD - Standard | |
| 1,201.00 | 2,855.00 | MWD int (Original Hole) | MWD | MWD - Standard | |
| 2,952.00 | 9,756.00 | MWD (Original Hole) | MWD | MWD - Standard | |
| 9,822.00 | 9,822.00 | Projection (Original Hole) | MWD | MWD - Standard | |

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|----------------------------|------------------------|--------------------|----------------------------|-------------------|-------------------|------------------------------|------------------------------|-----------------------------|----------------------------|------|
| 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 | 0.00 |
| 189.00 | 0.09 | 278.37 | 189.00 | 0.02 | -0.15 | -0.05 | 0.05 | 0.05 | 0.00 | 0.00 |
| MWD surveys | | | | | | | | | | |
| 204.00 | 0.18 | 261.41 | 204.00 | 0.02 | -0.18 | -0.05 | 0.65 | 0.60 | -113.07 | |
| 234.00 | 0.22 | 289.36 | 234.00 | 0.03 | -0.28 | -0.08 | 0.35 | 0.13 | 93.17 | |
| 264.00 | 0.18 | 295.25 | 264.00 | 0.07 | -0.38 | -0.13 | 0.15 | -0.13 | 19.63 | |
| 299.00 | 0.22 | 295.34 | 299.00 | 0.12 | -0.49 | -0.20 | 0.11 | 0.11 | 0.26 | |

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| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Original Hole | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Original Hole | Database: | DB_Dec2220_v16 |

| 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) |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| 329.00 | 0.17 | 302.98 | 329.00 | 0.17 | -0.58 | -0.27 | 0.19 | -0.17 | 25.47 |
| 359.00 | 0.17 | 294.63 | 359.00 | 0.21 | -0.66 | -0.32 | 0.08 | 0.00 | -27.83 |
| 389.00 | 0.21 | 297.07 | 389.00 | 0.26 | -0.75 | -0.38 | 0.14 | 0.13 | 8.13 |
| 418.00 | 0.17 | 255.61 | 418.00 | 0.27 | -0.84 | -0.41 | 0.48 | -0.14 | -142.97 |
| 448.00 | 0.17 | 286.72 | 448.00 | 0.27 | -0.92 | -0.43 | 0.30 | 0.00 | 103.70 |
| 478.00 | 0.17 | 292.34 | 478.00 | 0.30 | -1.01 | -0.47 | 0.06 | 0.00 | 18.73 |
| 508.00 | 0.21 | 302.72 | 508.00 | 0.35 | -1.09 | -0.53 | 0.18 | 0.13 | 34.60 |
| 538.00 | 0.39 | 304.83 | 538.00 | 0.44 | -1.22 | -0.64 | 0.60 | 0.60 | 7.03 |
| 568.00 | 0.35 | 291.65 | 568.00 | 0.53 | -1.39 | -0.76 | 0.31 | -0.13 | -43.93 |
| 598.00 | 0.44 | 272.22 | 598.00 | 0.57 | -1.59 | -0.83 | 0.53 | 0.30 | -64.77 |
| 628.00 | 0.53 | 296.74 | 628.00 | 0.64 | -1.83 | -0.93 | 0.75 | 0.30 | 81.73 |
| 657.00 | 0.40 | 304.65 | 656.99 | 0.75 | -2.03 | -1.09 | 0.50 | -0.45 | 27.28 |
| 688.00 | 0.48 | 290.06 | 687.99 | 0.86 | -2.25 | -1.23 | 0.44 | 0.26 | -47.06 |
| 717.00 | 0.44 | 315.55 | 716.99 | 0.98 | -2.44 | -1.38 | 0.71 | -0.14 | 87.90 |
| 748.00 | 0.35 | 322.23 | 747.99 | 1.14 | -2.58 | -1.56 | 0.33 | -0.29 | 21.55 |
| 778.00 | 0.57 | 293.76 | 777.99 | 1.27 | -2.77 | -1.72 | 1.04 | 0.73 | -94.90 |
| 809.00 | 0.57 | 301.84 | 808.99 | 1.42 | -3.04 | -1.91 | 0.26 | 0.00 | 26.06 |
| 841.00 | 0.39 | 320.29 | 840.99 | 1.58 | -3.25 | -2.11 | 0.73 | -0.56 | 57.66 |
| 872.00 | 0.57 | 318.45 | 871.99 | 1.78 | -3.42 | -2.33 | 0.58 | 0.58 | -5.94 |
| 903.00 | 0.39 | 318.19 | 902.99 | 1.97 | -3.59 | -2.55 | 0.58 | -0.58 | -0.84 |
| 935.00 | 0.44 | 306.94 | 934.99 | 2.13 | -3.76 | -2.73 | 0.30 | 0.16 | -35.16 |
| 964.00 | 0.62 | 318.01 | 963.98 | 2.31 | -3.96 | -2.95 | 0.71 | 0.62 | 38.17 |
| 997.00 | 0.48 | 319.16 | 996.98 | 2.55 | -4.17 | -3.22 | 0.43 | -0.42 | 3.48 |
| 1,029.00 | 0.48 | 316.70 | 1,028.98 | 2.75 | -4.34 | -3.44 | 0.06 | 0.00 | -7.69 |
| 1,061.00 | 0.62 | 309.05 | 1,060.98 | 2.96 | -4.57 | -3.68 | 0.49 | 0.44 | -23.91 |
| 1,092.00 | 0.62 | 319.33 | 1,091.98 | 3.19 | -4.81 | -3.95 | 0.36 | 0.00 | 33.16 |
| 1,124.00 | 0.66 | 296.04 | 1,123.98 | 3.40 | -5.09 | -4.21 | 0.82 | 0.13 | -72.78 |
| 1,151.00 | 0.57 | 322.32 | 1,150.97 | 3.58 | -5.31 | -4.42 | 1.09 | -0.33 | 97.33 |
| 1,201.00 | 0.88 | 304.13 | 1,200.97 | 3.99 | -5.78 | -4.91 | 0.76 | 0.62 | -36.38 |
| 1,218.00 | 1.01 | 299.12 | 1,217.97 | 4.13 | -6.02 | -5.09 | 0.91 | 0.76 | -29.47 |
| 1,249.00 | 0.97 | 273.37 | 1,248.96 | 4.28 | -6.52 | -5.32 | 1.43 | -0.13 | -83.06 |
| 1,281.00 | 1.32 | 271.87 | 1,280.96 | 4.31 | -7.16 | -5.46 | 1.10 | 1.09 | -4.69 |
| 1,312.00 | 1.49 | 263.35 | 1,311.95 | 4.28 | -7.92 | -5.55 | 0.87 | 0.55 | -27.48 |
| 1,344.00 | 1.71 | 246.12 | 1,343.94 | 4.03 | -8.77 | -5.45 | 1.64 | 0.69 | -53.84 |
| 1,375.00 | 2.11 | 241.46 | 1,374.92 | 3.57 | -9.69 | -5.16 | 1.38 | 1.29 | -15.03 |
| 1,407.00 | 2.64 | 240.49 | 1,406.89 | 2.93 | -10.85 | -4.72 | 1.66 | 1.66 | -3.03 |
| 1,438.00 | 3.38 | 238.38 | 1,437.85 | 2.10 | -12.25 | -4.13 | 2.41 | 2.39 | -6.81 |
| 1,470.00 | 3.78 | 234.61 | 1,469.79 | 0.99 | -13.91 | -3.32 | 1.45 | 1.25 | -11.78 |
| 1,501.00 | 4.13 | 234.43 | 1,500.71 | -0.25 | -15.65 | -2.39 | 1.13 | 1.13 | -0.58 |
| 1,533.00 | 4.17 | 230.73 | 1,532.63 | -1.65 | -17.49 | -1.32 | 0.85 | 0.13 | -11.56 |
| 1,564.00 | 4.00 | 232.50 | 1,563.55 | -3.03 | -19.22 | -0.26 | 0.68 | -0.55 | 5.71 |
| 1,627.00 | 3.52 | 238.56 | 1,626.41 | -5.37 | -22.61 | 1.49 | 0.99 | -0.76 | 9.62 |
| 1,721.00 | 3.52 | 241.72 | 1,720.24 | -8.24 | -27.62 | 3.47 | 0.21 | 0.00 | 3.36 |
| 1,816.00 | 4.26 | 235.40 | 1,815.02 | -11.63 | -33.09 | 5.89 | 0.90 | 0.78 | -6.65 |

| | | | |
|------------------|--------------------------------|-------------------------------------|---|
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| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Original Hole | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Original Hole | Database: | DB_Dec2220_v16 |

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) |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| 1,910.00 | 4.22 | 235.04 | 1,908.76 | -15.59 | -38.80 | 8.83 | 0.05 | -0.04 | -0.38 |
| 2,004.00 | 5.01 | 235.13 | 2,002.45 | -19.92 | -45.00 | 12.06 | 0.84 | 0.84 | 0.10 |
| 2,099.00 | 5.14 | 231.62 | 2,097.08 | -24.94 | -51.74 | 15.86 | 0.35 | 0.14 | -3.69 |
| 2,194.00 | 5.10 | 232.94 | 2,191.70 | -30.12 | -58.45 | 19.85 | 0.13 | -0.04 | 1.39 |
| 2,288.00 | 4.75 | 246.03 | 2,285.36 | -34.22 | -65.34 | 22.72 | 1.25 | -0.37 | 13.93 |
| 2,383.00 | 5.71 | 251.22 | 2,379.96 | -37.34 | -73.41 | 24.44 | 1.13 | 1.01 | 5.46 |
| 2,477.00 | 5.76 | 241.11 | 2,473.49 | -41.13 | -81.96 | 26.73 | 1.07 | 0.05 | -10.76 |
| 2,572.00 | 5.27 | 233.46 | 2,568.06 | -46.03 | -89.64 | 30.27 | 0.93 | -0.52 | -8.05 |
| 2,665.00 | 3.91 | 230.47 | 2,660.76 | -50.59 | -95.52 | 33.77 | 1.48 | -1.46 | -3.22 |
| 2,761.00 | 3.65 | 226.70 | 2,756.55 | -54.77 | -100.27 | 37.09 | 0.37 | -0.27 | -3.93 |
| 2,855.00 | 3.74 | 236.54 | 2,850.35 | -58.51 | -105.00 | 39.98 | 0.68 | 0.10 | 10.47 |
| 2,952.00 | 4.26 | 241.72 | 2,947.12 | -61.96 | -110.82 | 42.40 | 0.65 | 0.54 | 5.34 |
| 3,045.00 | 3.74 | 240.32 | 3,039.89 | -65.10 | -116.49 | 44.54 | 0.57 | -0.56 | -1.51 |
| 3,140.00 | 3.91 | 238.20 | 3,134.68 | -68.34 | -121.94 | 46.82 | 0.23 | 0.18 | -2.23 |
| 3,234.00 | 4.31 | 261.68 | 3,228.44 | -70.54 | -128.16 | 47.94 | 1.83 | 0.43 | 24.98 |
| 3,329.00 | 6.02 | 282.42 | 3,323.06 | -69.99 | -136.55 | 45.98 | 2.64 | 1.80 | 21.83 |
| 3,423.00 | 8.13 | 293.49 | 3,416.34 | -66.28 | -147.47 | 40.48 | 2.66 | 2.24 | 11.78 |
| 3,518.00 | 10.63 | 304.21 | 3,510.07 | -58.67 | -160.88 | 30.73 | 3.20 | 2.63 | 11.28 |
| 3,613.00 | 13.58 | 309.22 | 3,602.95 | -46.69 | -176.77 | 16.24 | 3.29 | 3.11 | 5.27 |
| 3,708.00 | 16.30 | 311.77 | 3,694.74 | -30.75 | -195.35 | -2.60 | 2.94 | 2.86 | 2.68 |
| 3,801.00 | 15.82 | 307.47 | 3,784.11 | -14.35 | -215.15 | -22.11 | 1.38 | -0.52 | -4.62 |
| 3,900.00 | 14.06 | 297.80 | 3,879.77 | -0.53 | -236.50 | -39.33 | 3.08 | -1.78 | -9.77 |
| 3,995.00 | 15.29 | 293.05 | 3,971.68 | 9.76 | -258.24 | -53.13 | 1.81 | 1.29 | -5.00 |
| 4,089.00 | 15.95 | 296.13 | 4,062.21 | 20.30 | -281.24 | -67.40 | 1.13 | 0.70 | 3.28 |
| 4,184.00 | 15.42 | 297.10 | 4,153.67 | 31.81 | -304.20 | -82.60 | 0.62 | -0.56 | 1.02 |
| 4,279.00 | 15.16 | 290.42 | 4,245.31 | 41.89 | -327.09 | -96.41 | 1.87 | -0.27 | -7.03 |
| 4,373.00 | 15.91 | 289.89 | 4,335.88 | 50.57 | -350.72 | -108.94 | 0.81 | 0.80 | -0.56 |
| 4,468.00 | 14.68 | 293.23 | 4,427.51 | 59.74 | -374.03 | -121.91 | 1.59 | -1.29 | 3.52 |
| 4,562.00 | 15.03 | 296.57 | 4,518.37 | 69.89 | -395.88 | -135.60 | 0.98 | 0.37 | 3.55 |
| 4,657.00 | 14.81 | 297.62 | 4,610.17 | 81.03 | -417.65 | -150.24 | 0.37 | -0.23 | 1.11 |
| 4,752.00 | 15.25 | 299.91 | 4,701.92 | 92.89 | -439.24 | -165.57 | 0.78 | 0.46 | 2.41 |
| 4,846.00 | 14.99 | 297.27 | 4,792.67 | 104.63 | -460.76 | -180.76 | 0.78 | -0.28 | -2.81 |
| 4,941.00 | 15.73 | 296.74 | 4,884.27 | 116.05 | -483.18 | -195.80 | 0.79 | 0.78 | -0.56 |
| 5,034.00 | 16.79 | 298.94 | 4,973.55 | 128.22 | -506.20 | -211.68 | 1.32 | 1.14 | 2.37 |
| 5,129.00 | 15.56 | 299.29 | 5,064.79 | 141.10 | -529.32 | -228.26 | 1.30 | -1.29 | 0.37 |
| 5,224.00 | 14.02 | 297.36 | 5,156.64 | 152.62 | -550.65 | -243.22 | 1.70 | -1.62 | -2.03 |
| 5,319.00 | 13.40 | 295.69 | 5,248.93 | 162.68 | -570.79 | -256.53 | 0.77 | -0.65 | -1.76 |
| 5,413.00 | 14.81 | 296.92 | 5,340.10 | 172.84 | -591.32 | -270.00 | 1.53 | 1.50 | 1.31 |
| 5,508.00 | 16.35 | 299.82 | 5,431.61 | 184.99 | -613.75 | -285.75 | 1.82 | 1.62 | 3.05 |
| 5,603.00 | 16.22 | 297.54 | 5,522.80 | 197.77 | -637.12 | -302.29 | 0.69 | -0.14 | -2.40 |
| 5,697.00 | 16.57 | 297.71 | 5,612.97 | 210.07 | -660.62 | -318.38 | 0.38 | 0.37 | 0.18 |
| 5,791.00 | 15.21 | 297.10 | 5,703.38 | 221.93 | -683.47 | -333.91 | 1.46 | -1.45 | -0.65 |
| 5,885.00 | 14.72 | 297.27 | 5,794.19 | 233.01 | -705.06 | -348.48 | 0.52 | -0.52 | 0.18 |

| | | | |
|------------------|--------------------------------|-------------------------------------|---|
| Company: | Tug Hill Operating LLC | Local Co-ordinate Reference: | Well Fitzgerald 19 HU (slot O) |
| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Original Hole | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Original Hole | Database: | DB_Dec2220_v16 |

| 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) |
|---|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| 5,979.00 | 15.25 | 299.21 | 5,884.99 | 244.52 | -726.47 | -363.43 | 0.78 | 0.56 | 2.06 |
| 6,074.00 | 14.59 | 296.48 | 5,976.79 | 255.95 | -748.08 | -378.34 | 1.01 | -0.69 | -2.87 |
| 6,168.00 | 15.42 | 297.36 | 6,067.59 | 266.97 | -769.78 | -392.86 | 0.92 | 0.88 | 0.94 |
| 6,261.00 | 14.90 | 297.01 | 6,157.35 | 278.09 | -791.41 | -407.46 | 0.57 | -0.56 | -0.38 |
| 6,356.00 | 14.99 | 297.62 | 6,249.14 | 289.33 | -813.18 | -422.21 | 0.19 | 0.09 | 0.64 |
| 6,450.00 | 15.34 | 298.77 | 6,339.86 | 300.95 | -834.85 | -437.31 | 0.49 | 0.37 | 1.22 |
| 6,544.00 | 14.68 | 297.45 | 6,430.66 | 312.42 | -856.32 | -452.24 | 0.79 | -0.70 | -1.40 |
| 6,639.00 | 14.85 | 299.29 | 6,522.52 | 323.93 | -877.62 | -467.17 | 0.53 | 0.18 | 1.94 |
| 6,734.00 | 14.63 | 300.35 | 6,614.39 | 335.95 | -898.59 | -482.55 | 0.37 | -0.23 | 1.12 |
| 6,837.00 | 15.34 | 295.07 | 6,713.89 | 348.29 | -922.16 | -498.69 | 1.49 | 0.69 | -5.13 |
| 6,867.00 | 15.82 | 294.02 | 6,742.79 | 351.64 | -929.48 | -503.22 | 1.86 | 1.60 | -3.50 |
| 6,962.00 | 15.47 | 295.07 | 6,834.27 | 362.28 | -952.79 | -517.63 | 0.47 | -0.37 | 1.11 |
| 7,102.00 | 13.01 | 296.66 | 6,969.96 | 377.26 | -983.79 | -537.63 | 1.78 | -1.76 | 1.14 |
| 7,211.00 | 15.60 | 293.84 | 7,075.57 | 388.69 | -1,008.16 | -553.00 | 2.46 | 2.38 | -2.59 |
| 7,305.00 | 18.57 | 296.83 | 7,165.42 | 400.56 | -1,033.09 | -568.90 | 3.29 | 3.16 | 3.18 |
| 7,399.00 | 20.57 | 299.47 | 7,253.98 | 415.44 | -1,060.82 | -588.24 | 2.33 | 2.13 | 2.81 |
| 7,494.00 | 23.03 | 297.62 | 7,342.18 | 432.27 | -1,091.82 | -610.05 | 2.69 | 2.59 | -1.95 |
| 7,587.00 | 24.70 | 295.78 | 7,427.23 | 449.16 | -1,125.44 | -632.36 | 1.97 | 1.80 | -1.98 |
| 7,681.00 | 27.11 | 294.90 | 7,511.78 | 466.72 | -1,162.56 | -655.93 | 2.60 | 2.56 | -0.94 |
| 7,776.00 | 28.52 | 295.34 | 7,595.80 | 485.54 | -1,202.69 | -681.24 | 1.50 | 1.48 | 0.46 |
| 7,824.00 | 29.40 | 296.57 | 7,637.80 | 495.72 | -1,223.59 | -694.79 | 2.21 | 1.83 | 2.56 |
| 7,871.00 | 30.89 | 297.18 | 7,678.44 | 506.39 | -1,244.64 | -708.86 | 3.24 | 3.17 | 1.30 |
| 7,965.00 | 33.18 | 297.80 | 7,758.12 | 529.41 | -1,288.86 | -739.00 | 2.46 | 2.44 | 0.66 |
| 8,059.00 | 33.49 | 297.10 | 7,836.66 | 553.22 | -1,334.70 | -770.19 | 0.53 | 0.33 | -0.74 |
| 8,153.00 | 35.11 | 297.54 | 7,914.31 | 577.53 | -1,381.76 | -802.09 | 1.74 | 1.72 | 0.47 |
| 8,435.00 | 39.38 | 300.26 | 8,138.76 | 660.15 | -1,531.02 | -908.68 | 1.62 | 1.51 | 0.96 |
| 8,813.00 | 41.75 | 300.79 | 8,425.89 | 785.02 | -1,742.74 | -1,067.43 | 0.63 | 0.63 | 0.14 |
| 8,906.00 | 39.29 | 300.00 | 8,496.59 | 815.60 | -1,794.85 | -1,106.35 | 2.70 | -2.65 | -0.85 |
| 9,001.00 | 36.39 | 299.38 | 8,571.60 | 844.47 | -1,845.46 | -1,143.34 | 3.08 | -3.05 | -0.65 |
| 9,095.00 | 34.37 | 296.13 | 8,648.25 | 869.84 | -1,893.59 | -1,176.46 | 2.94 | -2.15 | -3.46 |
| 9,190.00 | 33.18 | 294.37 | 8,727.21 | 892.38 | -1,941.35 | -1,206.72 | 1.62 | -1.25 | -1.85 |
| 9,284.00 | 28.61 | 294.55 | 8,807.85 | 912.35 | -1,985.27 | -1,233.81 | 4.86 | -4.86 | 0.19 |
| 9,379.00 | 26.72 | 297.10 | 8,891.99 | 931.54 | -2,024.98 | -1,259.41 | 2.35 | -1.99 | 2.68 |
| 9,474.00 | 28.52 | 300.61 | 8,976.17 | 952.82 | -2,063.52 | -1,286.88 | 2.55 | 1.89 | 3.69 |
| 9,568.00 | 31.73 | 301.49 | 9,057.46 | 977.16 | -2,103.92 | -1,317.68 | 3.45 | 3.41 | 0.94 |
| 9,662.00 | 34.10 | 301.40 | 9,136.37 | 1,003.81 | -2,147.49 | -1,351.28 | 2.52 | 2.52 | -0.10 |
| 9,756.00 | 36.17 | 300.96 | 9,213.24 | 1,031.81 | -2,193.78 | -1,386.68 | 2.22 | 2.20 | -0.47 |
| Survey @ 9756.00 MD 9213.24 TVD | | | | | | | | | |
| 9,822.00 | 36.17 | 300.96 | 9,266.52 | 1,051.85 | -2,227.18 | -1,412.06 | 0.00 | 0.00 | 0.00 |
| Survey Proj. to 9822.00 MD 9266.52 TVD | | | | | | | | | |

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|------------------|--------------------------------|-------------------------------------|---|
| Company: | Tug Hill Operating LLC | Local Co-ordinate Reference: | Well Fitzgerald 19 HU (slot O) |
| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Original Hole | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Original Hole | Database: | DB_Dec2220_v16 |

| Design Annotations | | | | |
|---------------------|---------------------|-------------------|------------|--|
| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates | | Comment |
| | | +N/-S (ft) | +E/-W (ft) | |
| 189.00 | 189.00 | 0.02 | -0.15 | MWD surveys |
| 9,756.00 | 9,213.24 | 1,031.81 | -2,193.78 | Survey @ 9756.00 MD 9213.24 TVD |
| 9,822.00 | 9,266.52 | 1,051.85 | -2,227.18 | Survey Proj. to 9822.00 MD 9266.52 TVD |

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|------------------|--------------------------------|-------------------------------------|---|
| Company: | Tug Hill Operating LLC | Local Co-ordinate Reference: | Well Fitzgerald 19 HU (slot O) |
| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Original Hole | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Original Hole | Database: | DB_Dec2220_v16 |

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|--------------------|--|----------------------|----------------|
| Project | Marshall County, West Virginia | | |
| Map System: | Universal Transverse Mercator (US Survey Feet) | System Datum: | Mean Sea Level |
| Geo Datum: | NAD83 West Virginia - HARN | | |
| Map Zone: | Zone 17N (84 W to 78 W) | | |

| | | | | | |
|------------------------------|------------|---------------------|--------------------|--------------------------|--------------|
| Site | Fitzgerald | | | | |
| Site Position: | | Northing: | 14,454,567.73 usft | Latitude: | 39.80126184 |
| From: | Lat/Long | Easting: | 1,741,096.26 usft | Longitude: | -80.64153292 |
| Position Uncertainty: | 0.00 ft | Slot Radius: | 13-3/16 " | Grid Convergence: | 0.229 ° |

| | | | | | | |
|-----------------------------|---------------------------|---------|----------------------------|--------------------|----------------------|--------------|
| Well | Fitzgerald 19 HU (slot O) | | | | | |
| Well Position | +N/-S | 0.00 ft | Northing: | 14,454,537.24 usft | Latitude: | 39.80117700 |
| | +E/-W | 0.00 ft | Easting: | 1,741,196.35 usft | Longitude: | -80.64117700 |
| Position Uncertainty | | 0.00 ft | Wellhead Elevation: | ft | Ground Level: | 1,292.91 ft |

| | | | | | |
|------------------|-------------------|--------------------|--------------------|------------------|-----------------------|
| Wellbore | Original Hole | | | | |
| Magnetics | Model Name | Sample Date | Declination | Dip Angle | Field Strength |
| | IGRF2020 | 2/11/2021 | (°) | (°) | (nT) |
| | | | -8.706 | 66.574 | 51,782.68370307 |

| | | | | | |
|--------------------------|-------------------------|---------------|--------------|----------------------|------|
| Design | Surveys Original Hole | | | | |
| Audit Notes: | | | | | |
| Version: | 1.0 | Phase: | ACTUAL | Tie On Depth: | 0.00 |
| Vertical Section: | Depth From (TVD) | +N/-S | +E/-W | Direction | |
| | (ft) | (ft) | (ft) | (°) | |
| | 0.00 | 0.00 | 0.00 | 170.30 | |

| | | | | | |
|-----------------------|----------------|----------------------------|------------------|--------------------|--|
| Survey Program | Date | 3/8/2021 | | | |
| From (ft) | To (ft) | Survey (Wellbore) | Tool Name | Description | |
| 189.00 | 1,151.00 | MWD surf (Original Hole) | MWD | MWD - Standard | |
| 1,201.00 | 2,855.00 | MWD int (Original Hole) | MWD | MWD - Standard | |
| 2,952.00 | 9,756.00 | MWD (Original Hole) | MWD | MWD - Standard | |
| 9,822.00 | 9,822.00 | Projection (Original Hole) | MWD | MWD - Standard | |

| | | | | | | | | | | |
|----------------------------|------------------------|--------------------|----------------------------|-------------------|-------------------|----------------------------|---------------------------|-----------------|------------------|--|
| Survey | | | | | | | | | | |
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude | |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14,454,537.24 | 1,741,196.35 | 39.80117700 | -80.64117700 | |
| 189.00 | 0.09 | 278.37 | 189.00 | 0.02 | -0.15 | 14,454,537.26 | 1,741,196.20 | 39.80117706 | -80.64117752 | |
| MWD surveys | | | | | | | | | | |
| 204.00 | 0.18 | 261.41 | 204.00 | 0.02 | -0.18 | 14,454,537.26 | 1,741,196.16 | 39.80117706 | -80.64117765 | |
| 234.00 | 0.22 | 289.36 | 234.00 | 0.03 | -0.28 | 14,454,537.27 | 1,741,196.06 | 39.80117709 | -80.64117801 | |
| 264.00 | 0.18 | 295.25 | 264.00 | 0.07 | -0.38 | 14,454,537.31 | 1,741,195.97 | 39.80117720 | -80.64117835 | |
| 299.00 | 0.22 | 295.34 | 299.00 | 0.12 | -0.49 | 14,454,537.37 | 1,741,195.86 | 39.80117735 | -80.64117874 | |
| 329.00 | 0.17 | 302.98 | 329.00 | 0.17 | -0.58 | 14,454,537.41 | 1,741,195.77 | 39.80117748 | -80.64117906 | |
| 359.00 | 0.17 | 294.63 | 359.00 | 0.21 | -0.66 | 14,454,537.46 | 1,741,195.69 | 39.80117760 | -80.64117934 | |

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|------------------|--------------------------------|-------------------------------------|---|
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| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Original Hole | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Original Hole | Database: | DB_Dec2220_v16 |

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---------------------|-----------------|-------------|---------------------|------------|------------|---------------------|--------------------|-------------|--------------|
| 389.00 | 0.21 | 297.07 | 389.00 | 0.26 | -0.75 | 14,454,537.50 | 1,741,195.60 | 39.80117772 | -80.64117966 |
| 418.00 | 0.17 | 255.61 | 418.00 | 0.27 | -0.84 | 14,454,537.51 | 1,741,195.51 | 39.80117776 | -80.64117997 |
| 448.00 | 0.17 | 286.72 | 448.00 | 0.27 | -0.92 | 14,454,537.52 | 1,741,195.42 | 39.80117776 | -80.64118028 |
| 478.00 | 0.17 | 292.34 | 478.00 | 0.30 | -1.01 | 14,454,537.55 | 1,741,195.34 | 39.80117785 | -80.64118057 |
| 508.00 | 0.21 | 302.72 | 508.00 | 0.35 | -1.09 | 14,454,537.59 | 1,741,195.25 | 39.80117798 | -80.64118089 |
| 538.00 | 0.39 | 304.83 | 538.00 | 0.44 | -1.22 | 14,454,537.68 | 1,741,195.12 | 39.80117822 | -80.64118135 |
| 568.00 | 0.35 | 291.65 | 568.00 | 0.53 | -1.39 | 14,454,537.77 | 1,741,194.95 | 39.80117847 | -80.64118195 |
| 598.00 | 0.44 | 272.22 | 598.00 | 0.57 | -1.59 | 14,454,537.81 | 1,741,194.75 | 39.80117858 | -80.64118266 |
| 628.00 | 0.53 | 296.74 | 628.00 | 0.64 | -1.83 | 14,454,537.88 | 1,741,194.52 | 39.80117877 | -80.64118351 |
| 657.00 | 0.40 | 304.65 | 656.99 | 0.75 | -2.03 | 14,454,538.00 | 1,741,194.31 | 39.80117909 | -80.64118423 |
| 688.00 | 0.48 | 290.06 | 687.99 | 0.86 | -2.25 | 14,454,538.10 | 1,741,194.10 | 39.80117939 | -80.64118498 |
| 717.00 | 0.44 | 315.55 | 716.99 | 0.98 | -2.44 | 14,454,538.22 | 1,741,193.91 | 39.80117972 | -80.64118566 |
| 748.00 | 0.35 | 322.23 | 747.99 | 1.14 | -2.58 | 14,454,538.38 | 1,741,193.77 | 39.80118016 | -80.64118616 |
| 778.00 | 0.57 | 293.76 | 777.99 | 1.27 | -2.77 | 14,454,538.52 | 1,741,193.58 | 39.80118053 | -80.64118685 |
| 809.00 | 0.57 | 301.84 | 808.99 | 1.42 | -3.04 | 14,454,538.66 | 1,741,193.30 | 39.80118093 | -80.64118782 |
| 841.00 | 0.39 | 320.29 | 840.99 | 1.58 | -3.25 | 14,454,538.83 | 1,741,193.10 | 39.80118139 | -80.64118854 |
| 872.00 | 0.57 | 318.45 | 871.99 | 1.78 | -3.42 | 14,454,539.02 | 1,741,192.93 | 39.80118193 | -80.64118914 |
| 903.00 | 0.39 | 318.19 | 902.99 | 1.97 | -3.59 | 14,454,539.22 | 1,741,192.76 | 39.80118246 | -80.64118976 |
| 935.00 | 0.44 | 306.94 | 934.99 | 2.13 | -3.76 | 14,454,539.37 | 1,741,192.59 | 39.80118289 | -80.64119036 |
| 964.00 | 0.62 | 318.01 | 963.98 | 2.31 | -3.96 | 14,454,539.56 | 1,741,192.39 | 39.80118340 | -80.64119105 |
| 997.00 | 0.48 | 319.16 | 996.98 | 2.55 | -4.17 | 14,454,539.79 | 1,741,192.18 | 39.80118405 | -80.64119179 |
| 1,029.00 | 0.48 | 316.70 | 1,028.98 | 2.75 | -4.34 | 14,454,539.99 | 1,741,192.00 | 39.80118460 | -80.64119243 |
| 1,061.00 | 0.62 | 309.05 | 1,060.98 | 2.96 | -4.57 | 14,454,540.20 | 1,741,191.78 | 39.80118517 | -80.64119323 |
| 1,092.00 | 0.62 | 319.33 | 1,091.98 | 3.19 | -4.81 | 14,454,540.43 | 1,741,191.54 | 39.80118581 | -80.64119408 |
| 1,124.00 | 0.66 | 296.04 | 1,123.98 | 3.40 | -5.09 | 14,454,540.64 | 1,741,191.26 | 39.80118640 | -80.64119507 |
| 1,151.00 | 0.57 | 322.32 | 1,150.97 | 3.58 | -5.31 | 14,454,540.82 | 1,741,191.04 | 39.80118688 | -80.64119586 |
| 1,201.00 | 0.88 | 304.13 | 1,200.97 | 3.99 | -5.78 | 14,454,541.23 | 1,741,190.57 | 39.80118802 | -80.64119752 |
| 1,218.00 | 1.01 | 299.12 | 1,217.97 | 4.13 | -6.02 | 14,454,541.38 | 1,741,190.33 | 39.80118842 | -80.64119837 |
| 1,249.00 | 0.97 | 273.37 | 1,248.96 | 4.28 | -6.52 | 14,454,541.53 | 1,741,189.83 | 39.80118883 | -80.64120015 |
| 1,281.00 | 1.32 | 271.87 | 1,280.96 | 4.31 | -7.16 | 14,454,541.55 | 1,741,189.19 | 39.80118892 | -80.64120243 |
| 1,312.00 | 1.49 | 263.35 | 1,311.95 | 4.28 | -7.92 | 14,454,541.52 | 1,741,188.43 | 39.80118883 | -80.64120512 |
| 1,344.00 | 1.71 | 246.12 | 1,343.94 | 4.03 | -8.77 | 14,454,541.28 | 1,741,187.58 | 39.80118818 | -80.64120815 |
| 1,375.00 | 2.11 | 241.46 | 1,374.92 | 3.57 | -9.69 | 14,454,540.82 | 1,741,186.66 | 39.80118692 | -80.64121145 |
| 1,407.00 | 2.64 | 240.49 | 1,406.89 | 2.93 | -10.85 | 14,454,540.17 | 1,741,185.50 | 39.80118517 | -80.64121559 |
| 1,438.00 | 3.38 | 238.38 | 1,437.85 | 2.10 | -12.25 | 14,454,539.34 | 1,741,184.10 | 39.80118290 | -80.64122058 |
| 1,470.00 | 3.78 | 234.61 | 1,469.79 | 0.99 | -13.91 | 14,454,538.24 | 1,741,182.43 | 39.80117988 | -80.64122652 |
| 1,501.00 | 4.13 | 234.43 | 1,500.71 | -0.25 | -15.65 | 14,454,536.99 | 1,741,180.69 | 39.80117649 | -80.64123273 |
| 1,533.00 | 4.17 | 230.73 | 1,532.63 | -1.65 | -17.49 | 14,454,535.59 | 1,741,178.86 | 39.80117265 | -80.64123930 |
| 1,564.00 | 4.00 | 232.50 | 1,563.55 | -3.03 | -19.22 | 14,454,534.22 | 1,741,177.13 | 39.80116890 | -80.64124548 |
| 1,627.00 | 3.52 | 238.56 | 1,626.41 | -5.37 | -22.61 | 14,454,531.87 | 1,741,173.73 | 39.80116250 | -80.64125759 |
| 1,721.00 | 3.52 | 241.72 | 1,720.24 | -8.24 | -27.62 | 14,454,529.00 | 1,741,168.73 | 39.80115466 | -80.64127545 |
| 1,816.00 | 4.26 | 235.40 | 1,815.02 | -11.63 | -33.09 | 14,454,525.61 | 1,741,163.26 | 39.80114543 | -80.64129498 |
| 1,910.00 | 4.22 | 235.04 | 1,908.76 | -15.59 | -38.80 | 14,454,521.65 | 1,741,157.55 | 39.80113460 | -80.64131536 |
| 2,004.00 | 5.01 | 235.13 | 2,002.45 | -19.92 | -45.00 | 14,454,517.32 | 1,741,151.35 | 39.80112278 | -80.64133751 |
| 2,099.00 | 5.14 | 231.62 | 2,097.08 | -24.94 | -51.74 | 14,454,512.31 | 1,741,144.61 | 39.80110909 | -80.64136157 |
| 2,194.00 | 5.10 | 232.94 | 2,191.70 | -30.12 | -58.45 | 14,454,507.12 | 1,741,137.90 | 39.80109492 | -80.64138552 |
| 2,288.00 | 4.75 | 246.03 | 2,285.36 | -34.22 | -65.34 | 14,454,503.02 | 1,741,131.01 | 39.80108374 | -80.64141011 |
| 2,383.00 | 5.71 | 251.22 | 2,379.96 | -37.34 | -73.41 | 14,454,499.90 | 1,741,122.94 | 39.80107526 | -80.64143888 |
| 2,477.00 | 5.76 | 241.11 | 2,473.49 | -41.13 | -81.96 | 14,454,496.12 | 1,741,114.38 | 39.80106496 | -80.64146941 |
| 2,572.00 | 5.27 | 233.46 | 2,568.06 | -46.03 | -89.64 | 14,454,491.22 | 1,741,106.70 | 39.80105159 | -80.64149682 |
| 2,665.00 | 3.91 | 230.47 | 2,660.76 | -50.59 | -95.52 | 14,454,486.65 | 1,741,100.83 | 39.80103912 | -80.64151781 |
| 2,761.00 | 3.65 | 226.70 | 2,756.55 | -54.77 | -100.27 | 14,454,482.47 | 1,741,096.08 | 39.80102770 | -80.64153477 |
| 2,855.00 | 3.74 | 236.54 | 2,850.35 | -58.51 | -105.00 | 14,454,478.73 | 1,741,091.34 | 39.80101748 | -80.64155169 |
| 2,952.00 | 4.26 | 241.72 | 2,947.12 | -61.96 | -110.82 | 14,454,475.28 | 1,741,085.53 | 39.80100806 | -80.64157243 |
| 3,045.00 | 3.74 | 240.32 | 3,039.89 | -65.10 | -116.49 | 14,454,472.14 | 1,741,079.85 | 39.80099950 | -80.64159269 |

| | | | |
|------------------|--------------------------------|-------------------------------------|---|
| Company: | Tug Hill Operating LLC | Local Co-ordinate Reference: | Well Fitzgerald 19 HU (slot O) |
| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Original Hole | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Original Hole | Database: | DB_Dec2220_v16 |

Survey

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---------------------|-----------------|-------------|---------------------|------------|------------|---------------------|--------------------|-------------|--------------|
| 3,140.00 | 3.91 | 238.20 | 3,134.68 | -68.34 | -121.94 | 14,454,468.90 | 1,741,074.41 | 39.80099066 | -80.64161212 |
| 3,234.00 | 4.31 | 261.68 | 3,228.44 | -70.54 | -128.16 | 14,454,466.70 | 1,741,068.19 | 39.80098469 | -80.64163429 |
| 3,329.00 | 6.02 | 282.42 | 3,323.06 | -69.99 | -136.55 | 14,454,467.26 | 1,741,059.79 | 39.80098631 | -80.64166419 |
| 3,423.00 | 8.13 | 293.49 | 3,416.34 | -66.28 | -147.47 | 14,454,470.97 | 1,741,048.88 | 39.80099662 | -80.64170298 |
| 3,518.00 | 10.63 | 304.21 | 3,510.07 | -58.67 | -160.88 | 14,454,478.57 | 1,741,035.47 | 39.80101765 | -80.64175062 |
| 3,613.00 | 13.58 | 309.22 | 3,602.95 | -46.69 | -176.77 | 14,454,490.55 | 1,741,019.58 | 39.80105073 | -80.64180703 |
| 3,708.00 | 16.30 | 311.77 | 3,694.74 | -30.75 | -195.35 | 14,454,506.49 | 1,741,000.99 | 39.80109470 | -80.64187298 |
| 3,801.00 | 15.82 | 307.47 | 3,784.11 | -14.35 | -215.15 | 14,454,522.90 | 1,740,981.20 | 39.80113997 | -80.64194322 |
| 3,900.00 | 14.06 | 297.80 | 3,879.77 | -0.53 | -236.50 | 14,454,536.72 | 1,740,959.84 | 39.80117816 | -80.64201905 |
| 3,995.00 | 15.29 | 293.05 | 3,971.68 | 9.76 | -258.24 | 14,454,547.00 | 1,740,938.11 | 39.80120665 | -80.64209629 |
| 4,089.00 | 15.95 | 296.13 | 4,062.21 | 20.30 | -281.24 | 14,454,557.55 | 1,740,915.11 | 39.80123585 | -80.64217803 |
| 4,184.00 | 15.42 | 297.10 | 4,153.67 | 31.81 | -304.20 | 14,454,569.05 | 1,740,892.15 | 39.80126769 | -80.64225962 |
| 4,279.00 | 15.16 | 290.42 | 4,245.31 | 41.89 | -327.09 | 14,454,579.14 | 1,740,869.26 | 39.80129565 | -80.64234097 |
| 4,373.00 | 15.91 | 289.89 | 4,335.88 | 50.57 | -350.72 | 14,454,587.81 | 1,740,845.62 | 39.80131972 | -80.64242499 |
| 4,468.00 | 14.68 | 293.23 | 4,427.51 | 59.74 | -374.03 | 14,454,596.99 | 1,740,822.32 | 39.80134518 | -80.64250784 |
| 4,562.00 | 15.03 | 296.57 | 4,518.37 | 69.89 | -395.88 | 14,454,607.14 | 1,740,800.47 | 39.80137329 | -80.64258548 |
| 4,657.00 | 14.81 | 297.62 | 4,610.17 | 81.03 | -417.65 | 14,454,618.27 | 1,740,778.70 | 39.80140412 | -80.64266285 |
| 4,752.00 | 15.25 | 299.91 | 4,701.92 | 92.89 | -439.24 | 14,454,630.13 | 1,740,757.11 | 39.80143693 | -80.64273955 |
| 4,846.00 | 14.99 | 297.27 | 4,792.67 | 104.63 | -460.76 | 14,454,641.87 | 1,740,735.59 | 39.80146939 | -80.64281601 |
| 4,941.00 | 15.73 | 296.74 | 4,884.27 | 116.05 | -483.18 | 14,454,653.29 | 1,740,713.17 | 39.80150101 | -80.64289567 |
| 5,034.00 | 16.79 | 298.94 | 4,973.55 | 128.22 | -506.20 | 14,454,665.46 | 1,740,690.15 | 39.80153469 | -80.64297744 |
| 5,129.00 | 15.56 | 299.29 | 5,064.79 | 141.10 | -529.32 | 14,454,678.34 | 1,740,667.03 | 39.80157029 | -80.64305958 |
| 5,224.00 | 14.02 | 297.36 | 5,156.64 | 152.62 | -550.65 | 14,454,689.86 | 1,740,645.70 | 39.80160217 | -80.64313537 |
| 5,319.00 | 13.40 | 295.69 | 5,248.93 | 162.68 | -570.79 | 14,454,699.92 | 1,740,625.56 | 39.80163002 | -80.64320694 |
| 5,413.00 | 14.81 | 296.92 | 5,340.10 | 172.84 | -591.32 | 14,454,710.08 | 1,740,605.03 | 39.80165815 | -80.64327988 |
| 5,508.00 | 16.35 | 299.82 | 5,431.61 | 184.99 | -613.75 | 14,454,722.23 | 1,740,582.60 | 39.80169176 | -80.64335957 |
| 5,603.00 | 16.22 | 297.54 | 5,522.80 | 197.77 | -637.12 | 14,454,735.01 | 1,740,559.23 | 39.80172712 | -80.64344258 |
| 5,697.00 | 16.57 | 297.71 | 5,612.97 | 210.07 | -660.62 | 14,454,747.32 | 1,740,535.73 | 39.80176116 | -80.64352610 |
| 5,791.00 | 15.21 | 297.10 | 5,703.38 | 221.93 | -683.47 | 14,454,759.17 | 1,740,512.88 | 39.80179396 | -80.64360727 |
| 5,885.00 | 14.72 | 297.27 | 5,794.19 | 233.01 | -705.06 | 14,454,770.26 | 1,740,491.29 | 39.80182465 | -80.64368399 |
| 5,979.00 | 15.25 | 299.21 | 5,884.99 | 244.52 | -726.47 | 14,454,781.76 | 1,740,469.88 | 39.80185648 | -80.64376004 |
| 6,074.00 | 14.59 | 296.48 | 5,976.79 | 255.95 | -748.08 | 14,454,793.19 | 1,740,448.27 | 39.80188811 | -80.64383684 |
| 6,168.00 | 15.42 | 297.36 | 6,067.59 | 266.97 | -769.78 | 14,454,804.22 | 1,740,426.57 | 39.80191982 | -80.64391393 |
| 6,261.00 | 14.90 | 297.01 | 6,157.35 | 278.09 | -791.41 | 14,454,815.33 | 1,740,404.94 | 39.80194937 | -80.64399080 |
| 6,356.00 | 14.99 | 297.62 | 6,249.14 | 289.33 | -813.18 | 14,454,826.57 | 1,740,383.17 | 39.80198048 | -80.64406814 |
| 6,450.00 | 15.34 | 298.77 | 6,339.86 | 300.95 | -834.85 | 14,454,838.19 | 1,740,361.50 | 39.80201263 | -80.64414513 |
| 6,544.00 | 14.68 | 297.45 | 6,430.66 | 312.42 | -856.32 | 14,454,849.67 | 1,740,340.03 | 39.80204438 | -80.64422141 |
| 6,639.00 | 14.85 | 299.29 | 6,522.52 | 323.93 | -877.62 | 14,454,861.17 | 1,740,318.73 | 39.80207621 | -80.64429708 |
| 6,734.00 | 14.63 | 300.35 | 6,614.39 | 335.95 | -898.59 | 14,454,873.19 | 1,740,297.76 | 39.80210944 | -80.64437158 |
| 6,837.00 | 15.34 | 295.07 | 6,713.89 | 348.29 | -922.16 | 14,454,885.54 | 1,740,274.19 | 39.80214360 | -80.64444531 |
| 6,867.00 | 15.82 | 294.02 | 6,742.79 | 351.64 | -929.48 | 14,454,888.88 | 1,740,266.86 | 39.80215287 | -80.64448136 |
| 6,962.00 | 15.47 | 295.07 | 6,834.27 | 362.28 | -952.79 | 14,454,899.52 | 1,740,243.56 | 39.80218234 | -80.64456419 |
| 7,102.00 | 13.01 | 296.66 | 6,969.96 | 377.26 | -983.79 | 14,454,914.51 | 1,740,212.56 | 39.80222363 | -80.64467435 |
| 7,211.00 | 15.60 | 293.84 | 7,075.57 | 388.69 | -1,008.16 | 14,454,925.94 | 1,740,188.18 | 39.80225549 | -80.64476097 |
| 7,305.00 | 18.57 | 296.83 | 7,165.42 | 400.56 | -1,033.09 | 14,454,937.80 | 1,740,163.26 | 39.80228835 | -80.64484954 |
| 7,399.00 | 20.57 | 299.47 | 7,253.98 | 415.44 | -1,060.82 | 14,454,952.69 | 1,740,135.52 | 39.80232952 | -80.64494809 |
| 7,494.00 | 23.03 | 297.62 | 7,342.18 | 432.27 | -1,091.82 | 14,454,969.51 | 1,740,104.52 | 39.80237607 | -80.64505823 |
| 7,587.00 | 24.70 | 295.78 | 7,427.23 | 449.16 | -1,125.44 | 14,454,986.40 | 1,740,070.91 | 39.80242281 | -80.64517768 |
| 7,681.00 | 27.11 | 294.90 | 7,511.78 | 466.72 | -1,162.56 | 14,455,003.96 | 1,740,033.79 | 39.80247145 | -80.64530959 |
| 7,776.00 | 28.52 | 295.34 | 7,595.80 | 485.54 | -1,202.69 | 14,455,022.78 | 1,739,993.66 | 39.80252357 | -80.64545222 |
| 7,824.00 | 29.40 | 296.57 | 7,637.80 | 495.72 | -1,223.59 | 14,455,032.96 | 1,739,972.76 | 39.80255174 | -80.64552647 |
| 7,871.00 | 30.89 | 297.18 | 7,678.44 | 506.39 | -1,244.64 | 14,455,043.63 | 1,739,951.71 | 39.80258128 | -80.64560127 |
| 7,965.00 | 33.18 | 297.80 | 7,758.12 | 529.41 | -1,288.86 | 14,455,066.65 | 1,739,907.49 | 39.80264498 | -80.64575841 |
| 8,059.00 | 33.49 | 297.10 | 7,836.66 | 553.22 | -1,334.70 | 14,455,090.46 | 1,739,861.65 | 39.80271087 | -80.64592128 |
| 8,153.00 | 35.11 | 297.54 | 7,914.31 | 577.53 | -1,381.76 | 14,455,114.78 | 1,739,814.59 | 39.80277815 | -80.64608849 |

| | | | |
|------------------|--------------------------------|-------------------------------------|---|
| Company: | Tug Hill Operating LLC | Local Co-ordinate Reference: | Well Fitzgerald 19 HU (slot O) |
| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Original Hole | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Original Hole | Database: | DB_Dec2220_v16 |

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---|-----------------|-------------|---------------------|------------|------------|---------------------|--------------------|-------------|--------------|
| 8,435.00 | 39.38 | 300.26 | 8,138.76 | 660.15 | -1,531.02 | 14,455,197.40 | 1,739,665.33 | 39.80300666 | -80.64661876 |
| 8,813.00 | 41.75 | 300.79 | 8,425.89 | 785.02 | -1,742.74 | 14,455,322.26 | 1,739,453.61 | 39.80335187 | -80.64737083 |
| 8,906.00 | 39.29 | 300.00 | 8,496.59 | 815.60 | -1,794.85 | 14,455,352.84 | 1,739,401.50 | 39.80343641 | -80.64755593 |
| 9,001.00 | 36.39 | 299.38 | 8,571.60 | 844.47 | -1,845.46 | 14,455,381.71 | 1,739,350.89 | 39.80351625 | -80.64773575 |
| 9,095.00 | 34.37 | 296.13 | 8,648.25 | 869.84 | -1,893.59 | 14,455,407.08 | 1,739,302.76 | 39.80358644 | -80.64790675 |
| 9,190.00 | 33.18 | 294.37 | 8,727.21 | 892.38 | -1,941.35 | 14,455,429.62 | 1,739,255.00 | 39.80364885 | -80.64807648 |
| 9,284.00 | 28.61 | 294.55 | 8,807.85 | 912.35 | -1,985.27 | 14,455,449.59 | 1,739,211.08 | 39.80370418 | -80.64823259 |
| 9,379.00 | 26.72 | 297.10 | 8,891.99 | 931.54 | -2,024.98 | 14,455,468.78 | 1,739,171.37 | 39.80375728 | -80.64837370 |
| 9,474.00 | 28.52 | 300.61 | 8,976.17 | 952.82 | -2,063.52 | 14,455,490.06 | 1,739,132.83 | 39.80381614 | -80.64851062 |
| 9,568.00 | 31.73 | 301.49 | 9,057.46 | 977.16 | -2,103.92 | 14,455,514.40 | 1,739,092.43 | 39.80388343 | -80.64865413 |
| 9,662.00 | 34.10 | 301.40 | 9,136.37 | 1,003.81 | -2,147.49 | 14,455,541.05 | 1,739,048.86 | 39.80395707 | -80.64880891 |
| 9,756.00 | 36.17 | 300.96 | 9,213.24 | 1,031.81 | -2,193.78 | 14,455,569.05 | 1,739,002.57 | 39.80403447 | -80.64897331 |
| Survey @ 9756.00 MD 9213.24 TVD | | | | | | | | | |
| 9,822.00 | 36.17 | 300.96 | 9,266.52 | 1,051.85 | -2,227.18 | 14,455,589.09 | 1,738,969.17 | 39.80408986 | -80.64909196 |
| Survey Proj. to 9822.00 MD 9266.52 TVD | | | | | | | | | |

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates | | Comment |
|---------------------|---------------------|-------------------|------------|--|
| | | +N/-S (ft) | +E/-W (ft) | |
| 189.00 | 189.00 | 0.02 | -0.15 | MWD surveys |
| 9,756.00 | 9,213.24 | 1,031.81 | -2,193.78 | Survey @ 9756.00 MD 9213.24 TVD |
| 9,822.00 | 9,266.52 | 1,051.85 | -2,227.18 | Survey Proj. to 9822.00 MD 9266.52 TVD |

| | | | |
|------------------|--------------------------------|-------------------------------------|---|
| Company: | Tug Hill Operating LLC | Local Co-ordinate Reference: | Well Fitzgerald 19 HU (slot O) |
| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Sidetrack 01 | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Sidetrack 01 | Database: | DB_Dec2220_v16 |

| | | | |
|--------------------|--|----------------------|----------------|
| Project | Marshall County, West Virginia | | |
| Map System: | Universal Transverse Mercator (US Survey Feet) | System Datum: | Mean Sea Level |
| Geo Datum: | NAD83 West Virginia - HARN | | |
| Map Zone: | Zone 17N (84 W to 78 W) | | |

| | | | | | |
|------------------------------|------------|---------------------|--------------------|-------------------|--------------|
| Site | Fitzgerald | | | | |
| Site Position: | | Northing: | 14,454,567.73 usft | Latitude: | 39.80126184 |
| From: | Lat/Long | Easting: | 1,741,096.26 usft | Longitude: | -80.64153292 |
| Position Uncertainty: | 0.00 ft | Slot Radius: | 13-3/16 " | | |

| | | | | | | |
|-----------------------------|---------------------------|---------|----------------------------|--------------------|----------------------|--------------|
| Well | Fitzgerald 19 HU (slot O) | | | | | |
| Well Position | +N/-S | 0.00 ft | Northing: | 14,454,537.24 usft | Latitude: | 39.80117700 |
| | +E/-W | 0.00 ft | Easting: | 1,741,196.35 usft | Longitude: | -80.64117700 |
| Position Uncertainty | 0.00 ft | | Wellhead Elevation: | ft | Ground Level: | 1,292.91 ft |
| Grid Convergence: | 0.230 ° | | | | | |

| | | | | | |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore | Sidetrack 01 | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | IGRF2020 | 3/8/2021 | -8.706 | 66.567 | 51,775.55809291 |

| | | | | | |
|--------------------------|------------------------------|-------------------|-------------------|----------------------|----------|
| Design | Surveys Sidetrack 01 | | | | |
| Audit Notes: | | | | | |
| Version: | 1.0 | Phase: | ACTUAL | Tie On Depth: | 6,962.00 |
| Vertical Section: | Depth From (TVD) (ft) | +N/-S (ft) | +E/-W (ft) | Direction (°) | |
| | 0.00 | 0.00 | 0.00 | 170.30 | |

| | | | | | |
|-----------------------|----------------|---------------------------|------------------|--------------------|--|
| Survey Program | Date | 4/9/2021 | | | |
| From (ft) | To (ft) | Survey (Wellbore) | Tool Name | Description | |
| 189.00 | 1,151.00 | MWD surf (Original Hole) | MWD | MWD - Standard | |
| 1,201.00 | 2,855.00 | MWD int (Original Hole) | MWD | MWD - Standard | |
| 2,952.00 | 6,962.00 | MWD (Original Hole) | MWD | MWD - Standard | |
| 7,025.00 | 20,931.00 | MWD ST1 (Sidetrack 01) | MWD | MWD - Standard | |
| 20,965.00 | 20,965.00 | Projection (Sidetrack 01) | 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) | |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 189.00 | 0.09 | 278.37 | 189.00 | 0.02 | -0.15 | -0.05 | 0.05 | 0.05 | 0.00 | 0.00 |
| 204.00 | 0.18 | 261.41 | 204.00 | 0.02 | -0.18 | -0.05 | 0.65 | 0.60 | -113.07 | |
| 234.00 | 0.22 | 289.36 | 234.00 | 0.03 | -0.28 | -0.08 | 0.35 | 0.13 | 93.17 | |
| 264.00 | 0.18 | 295.25 | 264.00 | 0.07 | -0.38 | -0.13 | 0.15 | -0.13 | 19.63 | |
| 299.00 | 0.22 | 295.34 | 299.00 | 0.12 | -0.49 | -0.20 | 0.11 | 0.11 | 0.26 | |



| | | | |
|------------------|--------------------------------|-------------------------------------|---|
| Company: | Tug Hill Operating LLC | Local Co-ordinate Reference: | Well Fitzgerald 19 HU (slot O) |
| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Sidetrack 01 | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Sidetrack 01 | Database: | DB_Dec2220_v16 |

| 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) |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| 329.00 | 0.17 | 302.98 | 329.00 | 0.17 | -0.58 | -0.27 | 0.19 | -0.17 | 25.47 |
| 359.00 | 0.17 | 294.63 | 359.00 | 0.21 | -0.66 | -0.32 | 0.08 | 0.00 | -27.83 |
| 389.00 | 0.21 | 297.07 | 389.00 | 0.26 | -0.75 | -0.38 | 0.14 | 0.13 | 8.13 |
| 418.00 | 0.17 | 255.61 | 418.00 | 0.27 | -0.84 | -0.41 | 0.48 | -0.14 | -142.97 |
| 448.00 | 0.17 | 286.72 | 448.00 | 0.27 | -0.92 | -0.43 | 0.30 | 0.00 | 103.70 |
| 478.00 | 0.17 | 292.34 | 478.00 | 0.30 | -1.01 | -0.47 | 0.06 | 0.00 | 18.73 |
| 508.00 | 0.21 | 302.72 | 508.00 | 0.35 | -1.09 | -0.53 | 0.18 | 0.13 | 34.60 |
| 538.00 | 0.39 | 304.83 | 538.00 | 0.44 | -1.22 | -0.64 | 0.60 | 0.60 | 7.03 |
| 568.00 | 0.35 | 291.65 | 568.00 | 0.53 | -1.39 | -0.76 | 0.31 | -0.13 | -43.93 |
| 598.00 | 0.44 | 272.22 | 598.00 | 0.57 | -1.59 | -0.83 | 0.53 | 0.30 | -64.77 |
| 628.00 | 0.53 | 296.74 | 628.00 | 0.64 | -1.83 | -0.93 | 0.75 | 0.30 | 81.73 |
| 657.00 | 0.40 | 304.65 | 656.99 | 0.75 | -2.03 | -1.09 | 0.50 | -0.45 | 27.28 |
| 688.00 | 0.48 | 290.06 | 687.99 | 0.86 | -2.25 | -1.23 | 0.44 | 0.26 | -47.06 |
| 717.00 | 0.44 | 315.55 | 716.99 | 0.98 | -2.44 | -1.38 | 0.71 | -0.14 | 87.90 |
| 748.00 | 0.35 | 322.23 | 747.99 | 1.14 | -2.58 | -1.56 | 0.33 | -0.29 | 21.55 |
| 778.00 | 0.57 | 293.76 | 777.99 | 1.27 | -2.77 | -1.72 | 1.04 | 0.73 | -94.90 |
| 809.00 | 0.57 | 301.84 | 808.99 | 1.42 | -3.04 | -1.91 | 0.26 | 0.00 | 26.06 |
| 841.00 | 0.39 | 320.29 | 840.99 | 1.58 | -3.25 | -2.11 | 0.73 | -0.56 | 57.66 |
| 872.00 | 0.57 | 318.45 | 871.99 | 1.78 | -3.42 | -2.33 | 0.58 | 0.58 | -5.94 |
| 903.00 | 0.39 | 318.19 | 902.99 | 1.97 | -3.59 | -2.55 | 0.58 | -0.58 | -0.84 |
| 935.00 | 0.44 | 306.94 | 934.99 | 2.13 | -3.76 | -2.73 | 0.30 | 0.16 | -35.16 |
| 964.00 | 0.62 | 318.01 | 963.98 | 2.31 | -3.96 | -2.95 | 0.71 | 0.62 | 38.17 |
| 997.00 | 0.48 | 319.16 | 996.98 | 2.55 | -4.17 | -3.22 | 0.43 | -0.42 | 3.48 |
| 1,029.00 | 0.48 | 316.70 | 1,028.98 | 2.75 | -4.34 | -3.44 | 0.06 | 0.00 | -7.69 |
| 1,061.00 | 0.62 | 309.05 | 1,060.98 | 2.96 | -4.57 | -3.68 | 0.49 | 0.44 | -23.91 |
| 1,092.00 | 0.62 | 319.33 | 1,091.98 | 3.19 | -4.81 | -3.95 | 0.36 | 0.00 | 33.16 |
| 1,124.00 | 0.66 | 296.04 | 1,123.98 | 3.40 | -5.09 | -4.21 | 0.82 | 0.13 | -72.78 |
| 1,151.00 | 0.57 | 322.32 | 1,150.97 | 3.58 | -5.31 | -4.42 | 1.09 | -0.33 | 97.33 |
| 1,201.00 | 0.88 | 304.13 | 1,200.97 | 3.99 | -5.78 | -4.90 | 0.76 | 0.62 | -36.38 |
| 1,218.00 | 1.01 | 299.12 | 1,217.97 | 4.13 | -6.02 | -5.09 | 0.91 | 0.76 | -29.47 |
| 1,249.00 | 0.97 | 273.37 | 1,248.96 | 4.28 | -6.52 | -5.32 | 1.43 | -0.13 | -83.06 |
| 1,281.00 | 1.32 | 271.87 | 1,280.96 | 4.31 | -7.16 | -5.45 | 1.10 | 1.09 | -4.69 |
| 1,312.00 | 1.49 | 263.35 | 1,311.95 | 4.28 | -7.92 | -5.55 | 0.87 | 0.55 | -27.48 |
| 1,344.00 | 1.71 | 246.12 | 1,343.94 | 4.03 | -8.77 | -5.45 | 1.64 | 0.69 | -53.84 |
| 1,375.00 | 2.11 | 241.46 | 1,374.92 | 3.57 | -9.69 | -5.16 | 1.38 | 1.29 | -15.03 |
| 1,407.00 | 2.64 | 240.49 | 1,406.89 | 2.93 | -10.85 | -4.72 | 1.66 | 1.66 | -3.03 |
| 1,438.00 | 3.38 | 238.38 | 1,437.85 | 2.10 | -12.25 | -4.13 | 2.41 | 2.39 | -6.81 |
| 1,470.00 | 3.78 | 234.61 | 1,469.79 | 0.99 | -13.91 | -3.32 | 1.45 | 1.25 | -11.78 |
| 1,501.00 | 4.13 | 234.43 | 1,500.71 | -0.25 | -15.65 | -2.39 | 1.13 | 1.13 | -0.58 |
| 1,533.00 | 4.17 | 230.73 | 1,532.63 | -1.65 | -17.49 | -1.32 | 0.85 | 0.13 | -11.56 |
| 1,564.00 | 4.00 | 232.50 | 1,563.55 | -3.03 | -19.22 | -0.26 | 0.68 | -0.55 | 5.71 |
| 1,627.00 | 3.52 | 238.56 | 1,626.41 | -5.37 | -22.61 | 1.49 | 0.99 | -0.76 | 9.62 |
| 1,721.00 | 3.52 | 241.72 | 1,720.24 | -8.24 | -27.62 | 3.47 | 0.21 | 0.00 | 3.36 |
| 1,816.00 | 4.26 | 235.40 | 1,815.02 | -11.63 | -33.09 | 5.89 | 0.90 | 0.78 | -6.65 |

| | | | |
|------------------|--------------------------------|-------------------------------------|---|
| Company: | Tug Hill Operating LLC | Local Co-ordinate Reference: | Well Fitzgerald 19 HU (slot O) |
| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Sidetrack 01 | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Sidetrack 01 | Database: | DB_Dec2220_v16 |

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) |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| 1,910.00 | 4.22 | 235.04 | 1,908.76 | -15.59 | -38.80 | 8.84 | 0.05 | -0.04 | -0.38 |
| 2,004.00 | 5.01 | 235.13 | 2,002.45 | -19.92 | -45.00 | 12.06 | 0.84 | 0.84 | 0.10 |
| 2,099.00 | 5.14 | 231.62 | 2,097.08 | -24.94 | -51.74 | 15.86 | 0.35 | 0.14 | -3.69 |
| 2,194.00 | 5.10 | 232.94 | 2,191.70 | -30.12 | -58.45 | 19.85 | 0.13 | -0.04 | 1.39 |
| 2,288.00 | 4.75 | 246.03 | 2,285.36 | -34.22 | -65.34 | 22.73 | 1.25 | -0.37 | 13.93 |
| 2,383.00 | 5.71 | 251.22 | 2,379.96 | -37.34 | -73.41 | 24.44 | 1.13 | 1.01 | 5.46 |
| 2,477.00 | 5.76 | 241.11 | 2,473.49 | -41.13 | -81.96 | 26.73 | 1.07 | 0.05 | -10.76 |
| 2,572.00 | 5.27 | 233.46 | 2,568.06 | -46.03 | -89.64 | 30.27 | 0.93 | -0.52 | -8.05 |
| 2,665.00 | 3.91 | 230.47 | 2,660.76 | -50.59 | -95.52 | 33.77 | 1.48 | -1.46 | -3.22 |
| 2,761.00 | 3.65 | 226.70 | 2,756.55 | -54.77 | -100.27 | 37.09 | 0.37 | -0.27 | -3.93 |
| 2,855.00 | 3.74 | 236.54 | 2,850.35 | -58.51 | -105.00 | 39.99 | 0.68 | 0.10 | 10.47 |
| 2,952.00 | 4.26 | 241.72 | 2,947.12 | -61.96 | -110.82 | 42.41 | 0.65 | 0.54 | 5.34 |
| 3,045.00 | 3.74 | 240.32 | 3,039.89 | -65.10 | -116.49 | 44.55 | 0.57 | -0.56 | -1.51 |
| 3,140.00 | 3.91 | 238.20 | 3,134.68 | -68.34 | -121.94 | 46.82 | 0.23 | 0.18 | -2.23 |
| 3,234.00 | 4.31 | 261.68 | 3,228.44 | -70.54 | -128.16 | 47.94 | 1.83 | 0.43 | 24.98 |
| 3,329.00 | 6.02 | 282.42 | 3,323.06 | -69.99 | -136.55 | 45.98 | 2.64 | 1.80 | 21.83 |
| 3,423.00 | 8.13 | 293.49 | 3,416.34 | -66.28 | -147.47 | 40.49 | 2.66 | 2.24 | 11.78 |
| 3,518.00 | 10.63 | 304.21 | 3,510.07 | -58.67 | -160.88 | 30.73 | 3.20 | 2.63 | 11.28 |
| 3,613.00 | 13.58 | 309.22 | 3,602.95 | -46.69 | -176.77 | 16.24 | 3.29 | 3.11 | 5.27 |
| 3,708.00 | 16.30 | 311.77 | 3,694.74 | -30.75 | -195.35 | -2.60 | 2.94 | 2.86 | 2.68 |
| 3,801.00 | 15.82 | 307.47 | 3,784.11 | -14.35 | -215.15 | -22.10 | 1.38 | -0.52 | -4.62 |
| 3,900.00 | 14.06 | 297.80 | 3,879.77 | -0.53 | -236.50 | -39.32 | 3.08 | -1.78 | -9.77 |
| 3,995.00 | 15.29 | 293.05 | 3,971.68 | 9.76 | -258.24 | -53.12 | 1.81 | 1.29 | -5.00 |
| 4,089.00 | 15.95 | 296.13 | 4,062.21 | 20.30 | -281.24 | -67.39 | 1.13 | 0.70 | 3.28 |
| 4,184.00 | 15.42 | 297.10 | 4,153.67 | 31.81 | -304.20 | -82.60 | 0.62 | -0.56 | 1.02 |
| 4,279.00 | 15.16 | 290.42 | 4,245.31 | 41.89 | -327.09 | -96.39 | 1.87 | -0.27 | -7.03 |
| 4,373.00 | 15.91 | 289.89 | 4,335.88 | 50.57 | -350.72 | -108.92 | 0.81 | 0.80 | -0.56 |
| 4,468.00 | 14.68 | 293.23 | 4,427.51 | 59.74 | -374.03 | -121.90 | 1.59 | -1.29 | 3.52 |
| 4,562.00 | 15.03 | 296.57 | 4,518.37 | 69.89 | -395.88 | -135.58 | 0.98 | 0.37 | 3.55 |
| 4,657.00 | 14.81 | 297.62 | 4,610.17 | 81.03 | -417.65 | -150.23 | 0.37 | -0.23 | 1.11 |
| 4,752.00 | 15.25 | 299.91 | 4,701.92 | 92.89 | -439.24 | -165.56 | 0.78 | 0.46 | 2.41 |
| 4,846.00 | 14.99 | 297.27 | 4,792.67 | 104.63 | -460.76 | -180.75 | 0.78 | -0.28 | -2.81 |
| 4,941.00 | 15.73 | 296.74 | 4,884.27 | 116.05 | -483.18 | -195.79 | 0.79 | 0.78 | -0.56 |
| 5,034.00 | 16.79 | 298.94 | 4,973.55 | 128.22 | -506.20 | -211.66 | 1.32 | 1.14 | 2.37 |
| 5,129.00 | 15.56 | 299.29 | 5,064.79 | 141.10 | -529.32 | -228.25 | 1.30 | -1.29 | 0.37 |
| 5,224.00 | 14.02 | 297.36 | 5,156.64 | 152.62 | -550.65 | -243.20 | 1.70 | -1.62 | -2.03 |
| 5,319.00 | 13.40 | 295.69 | 5,248.93 | 162.68 | -570.79 | -256.51 | 0.77 | -0.65 | -1.76 |
| 5,413.00 | 14.81 | 296.92 | 5,340.10 | 172.84 | -591.32 | -269.98 | 1.53 | 1.50 | 1.31 |
| 5,508.00 | 16.35 | 299.82 | 5,431.61 | 184.99 | -613.75 | -285.73 | 1.82 | 1.62 | 3.05 |
| 5,603.00 | 16.22 | 297.54 | 5,522.80 | 197.77 | -637.12 | -302.27 | 0.69 | -0.14 | -2.40 |
| 5,697.00 | 16.57 | 297.71 | 5,612.97 | 210.07 | -660.62 | -318.36 | 0.38 | 0.37 | 0.18 |
| 5,791.00 | 15.21 | 297.10 | 5,703.38 | 221.93 | -683.47 | -333.89 | 1.46 | -1.45 | -0.65 |
| 5,885.00 | 14.72 | 297.27 | 5,794.19 | 233.01 | -705.06 | -348.46 | 0.52 | -0.52 | 0.18 |

| | | | |
|------------------|--------------------------------|-------------------------------------|---|
| Company: | Tug Hill Operating LLC | Local Co-ordinate Reference: | Well Fitzgerald 19 HU (slot O) |
| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Sidetrack 01 | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Sidetrack 01 | Database: | DB_Dec2220_v16 |

| 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) |
|---|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| 5,979.00 | 15.25 | 299.21 | 5,884.89 | 244.52 | -726.47 | -363.40 | 0.78 | 0.56 | 2.06 |
| 6,074.00 | 14.59 | 296.48 | 5,976.79 | 255.95 | -748.08 | -378.31 | 1.01 | -0.69 | -2.87 |
| 6,168.00 | 15.42 | 297.36 | 6,067.59 | 266.97 | -769.78 | -392.83 | 0.92 | 0.88 | 0.94 |
| 6,261.00 | 14.90 | 297.01 | 6,157.35 | 278.09 | -791.41 | -407.43 | 0.57 | -0.56 | -0.38 |
| 6,356.00 | 14.99 | 297.62 | 6,249.14 | 289.33 | -813.18 | -422.18 | 0.19 | 0.09 | 0.64 |
| 6,450.00 | 15.34 | 298.77 | 6,339.86 | 300.95 | -834.85 | -437.28 | 0.49 | 0.37 | 1.22 |
| 6,544.00 | 14.68 | 297.45 | 6,430.66 | 312.42 | -856.32 | -452.21 | 0.79 | -0.70 | -1.40 |
| 6,639.00 | 14.85 | 299.29 | 6,522.52 | 323.93 | -877.62 | -467.14 | 0.53 | 0.18 | 1.94 |
| 6,734.00 | 14.63 | 300.35 | 6,614.39 | 335.95 | -898.59 | -482.52 | 0.37 | -0.23 | 1.12 |
| 6,837.00 | 15.34 | 295.07 | 6,713.89 | 348.29 | -922.16 | -498.66 | 1.49 | 0.69 | -5.13 |
| 6,867.00 | 15.82 | 294.02 | 6,742.79 | 351.64 | -929.48 | -503.19 | 1.86 | 1.60 | -3.50 |
| 6,962.00 | 15.47 | 295.07 | 6,834.27 | 362.28 | -952.79 | -517.61 | 0.47 | -0.37 | 1.11 |
| Tie into original hole @ 6962 MD | | | | | | | | | |
| 7,025.00 | 16.60 | 295.50 | 6,894.82 | 369.71 | -968.52 | -527.58 | 1.80 | 1.79 | 0.68 |
| 7,119.00 | 17.97 | 298.94 | 6,984.58 | 382.51 | -993.33 | -544.38 | 1.82 | 1.46 | 3.66 |
| 7,139.00 | 17.27 | 296.39 | 7,003.64 | 385.32 | -998.69 | -548.05 | 5.21 | -3.50 | -12.75 |
| 7,181.00 | 16.92 | 289.10 | 7,043.79 | 390.10 | -1,010.05 | -554.67 | 5.17 | -0.83 | -17.36 |
| 7,213.00 | 16.35 | 281.98 | 7,074.45 | 392.56 | -1,018.86 | -558.58 | 6.61 | -1.78 | -22.25 |
| 7,307.00 | 16.48 | 282.24 | 7,164.62 | 398.13 | -1,044.83 | -568.45 | 0.16 | 0.14 | 0.28 |
| 7,402.00 | 18.02 | 290.68 | 7,255.36 | 406.18 | -1,071.76 | -580.91 | 3.09 | 1.62 | 8.88 |
| 7,495.00 | 20.39 | 293.49 | 7,343.18 | 417.72 | -1,100.08 | -597.06 | 2.73 | 2.55 | 3.02 |
| 7,589.00 | 20.70 | 293.67 | 7,431.20 | 430.91 | -1,130.31 | -615.16 | 0.34 | 0.33 | 0.19 |
| 7,684.00 | 21.09 | 292.35 | 7,519.95 | 444.15 | -1,161.50 | -633.47 | 0.64 | 0.41 | -1.39 |
| 7,779.00 | 18.63 | 298.94 | 7,609.31 | 458.00 | -1,190.59 | -652.02 | 3.50 | -2.59 | 6.94 |
| 7,873.00 | 18.28 | 304.04 | 7,698.48 | 473.52 | -1,215.95 | -671.58 | 1.76 | -0.37 | 5.43 |
| 7,967.00 | 18.28 | 305.45 | 7,787.73 | 490.32 | -1,240.17 | -692.23 | 0.47 | 0.00 | 1.50 |
| 8,061.00 | 18.94 | 303.86 | 7,876.82 | 507.37 | -1,264.85 | -713.19 | 0.89 | 0.70 | -1.69 |
| 8,154.00 | 21.09 | 303.25 | 7,964.20 | 524.96 | -1,291.38 | -734.99 | 2.32 | 2.31 | -0.66 |
| 8,249.00 | 22.72 | 301.67 | 8,052.34 | 543.96 | -1,321.29 | -758.77 | 1.82 | 1.72 | -1.66 |
| 8,343.00 | 23.82 | 299.64 | 8,138.69 | 562.88 | -1,353.24 | -782.80 | 1.45 | 1.17 | -2.16 |
| 8,437.00 | 22.41 | 298.94 | 8,225.14 | 580.94 | -1,385.42 | -806.02 | 1.53 | -1.50 | -0.74 |
| 8,532.00 | 20.61 | 296.74 | 8,313.52 | 597.23 | -1,416.20 | -827.26 | 2.08 | -1.89 | -2.32 |
| 8,626.00 | 21.75 | 296.30 | 8,401.17 | 612.39 | -1,446.59 | -847.32 | 1.22 | 1.21 | -0.47 |
| 8,721.00 | 20.26 | 295.87 | 8,489.86 | 627.36 | -1,477.17 | -867.24 | 1.58 | -1.57 | -0.45 |
| 8,814.00 | 20.12 | 295.34 | 8,577.14 | 641.23 | -1,506.12 | -885.79 | 0.25 | -0.15 | -0.57 |
| 8,909.00 | 20.35 | 293.40 | 8,666.28 | 654.79 | -1,536.05 | -904.19 | 0.75 | 0.24 | -2.04 |
| 9,003.00 | 18.37 | 296.48 | 8,754.96 | 667.89 | -1,564.31 | -921.86 | 2.37 | -2.11 | 3.28 |
| 9,098.00 | 14.11 | 298.77 | 8,846.15 | 680.14 | -1,587.87 | -937.91 | 4.53 | -4.48 | 2.41 |
| 9,192.00 | 15.42 | 300.79 | 8,937.05 | 692.05 | -1,608.65 | -953.15 | 1.50 | 1.39 | 2.15 |
| 9,286.00 | 18.54 | 303.16 | 9,026.94 | 706.63 | -1,631.90 | -971.43 | 3.40 | 3.32 | 2.52 |
| 9,381.00 | 20.21 | 303.25 | 9,116.55 | 723.89 | -1,658.27 | -992.89 | 1.76 | 1.76 | 0.09 |
| 9,475.00 | 21.27 | 303.07 | 9,204.46 | 742.09 | -1,686.14 | -1,015.53 | 1.13 | 1.13 | -0.19 |
| 9,569.00 | 22.50 | 303.16 | 9,291.69 | 761.23 | -1,715.48 | -1,039.34 | 1.31 | 1.31 | 0.10 |

| | | | |
|------------------|--------------------------------|-------------------------------------|---|
| Company: | Tug Hill Operating LLC | Local Co-ordinate Reference: | Well Fitzgerald 19 HU (slot O) |
| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Sidetrack 01 | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Sidetrack 01 | Database: | DB_Dec2220_v16 |

| 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) |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| 9,663.00 | 22.94 | 304.13 | 9,378.39 | 781.35 | -1,745.70 | -1,064.26 | 0.61 | 0.47 | 1.03 |
| 9,758.00 | 20.04 | 302.11 | 9,466.78 | 800.40 | -1,774.82 | -1,087.94 | 3.15 | -3.05 | -2.13 |
| 9,852.00 | 19.86 | 299.64 | 9,555.14 | 816.85 | -1,802.34 | -1,108.80 | 0.92 | -0.19 | -2.63 |
| 9,947.00 | 20.34 | 299.82 | 9,644.35 | 833.04 | -1,830.69 | -1,129.53 | 0.51 | 0.51 | 0.19 |
| 10,042.00 | 20.39 | 298.59 | 9,733.42 | 849.17 | -1,859.55 | -1,150.29 | 0.45 | 0.05 | -1.29 |
| 10,136.00 | 19.82 | 298.77 | 9,821.69 | 864.68 | -1,887.90 | -1,170.35 | 0.61 | -0.61 | 0.19 |
| 10,230.00 | 18.41 | 300.00 | 9,910.50 | 879.77 | -1,914.72 | -1,189.75 | 1.56 | -1.50 | 1.31 |
| 10,324.00 | 18.68 | 299.47 | 9,999.62 | 894.60 | -1,940.68 | -1,208.74 | 0.34 | 0.29 | -0.56 |
| 10,414.00 | 18.90 | 299.21 | 10,084.83 | 908.80 | -1,965.95 | -1,226.99 | 0.26 | 0.24 | -0.29 |
| 10,508.00 | 18.33 | 295.69 | 10,173.91 | 922.64 | -1,992.56 | -1,245.12 | 1.34 | -0.61 | -3.74 |
| 10,602.00 | 17.67 | 293.14 | 10,263.31 | 934.66 | -2,019.00 | -1,261.41 | 1.09 | -0.70 | -2.71 |
| 10,696.00 | 17.89 | 292.17 | 10,352.82 | 945.71 | -2,045.49 | -1,276.77 | 0.39 | 0.23 | -1.03 |
| 10,791.00 | 17.93 | 291.82 | 10,443.22 | 956.65 | -2,072.58 | -1,292.12 | 0.12 | 0.04 | -0.37 |
| 10,885.00 | 17.89 | 292.88 | 10,532.66 | 967.64 | -2,099.31 | -1,307.46 | 0.35 | -0.04 | 1.13 |
| 10,980.00 | 17.09 | 292.88 | 10,623.27 | 978.74 | -2,125.62 | -1,322.83 | 0.84 | -0.84 | 0.00 |
| 11,080.00 | 19.00 | 295.70 | 10,718.35 | 991.52 | -2,153.83 | -1,340.17 | 2.10 | 1.91 | 2.82 |
| 11,129.00 | 23.29 | 294.20 | 10,764.04 | 998.95 | -2,169.86 | -1,350.20 | 8.82 | 8.76 | -3.06 |
| 11,223.00 | 23.16 | 292.00 | 10,850.42 | 1,013.49 | -2,203.95 | -1,370.28 | 0.93 | -0.14 | -2.34 |
| 11,270.00 | 23.02 | 291.69 | 10,893.66 | 1,020.35 | -2,221.06 | -1,379.92 | 0.39 | -0.30 | -0.66 |
| 11,317.00 | 23.11 | 291.73 | 10,936.90 | 1,027.16 | -2,238.16 | -1,389.52 | 0.19 | 0.19 | 0.09 |
| 11,364.00 | 23.33 | 288.47 | 10,980.10 | 1,033.53 | -2,255.56 | -1,398.72 | 2.77 | 0.47 | -6.94 |
| 11,411.00 | 23.99 | 278.78 | 11,023.16 | 1,037.94 | -2,273.84 | -1,406.14 | 8.38 | 1.40 | -20.62 |
| 11,458.00 | 25.32 | 270.98 | 11,065.89 | 1,039.57 | -2,293.33 | -1,411.04 | 7.47 | 2.83 | -16.60 |
| 11,505.00 | 27.57 | 266.35 | 11,107.97 | 1,039.05 | -2,314.24 | -1,414.05 | 6.49 | 4.79 | -9.85 |
| 11,552.00 | 28.68 | 263.13 | 11,149.42 | 1,037.00 | -2,336.30 | -1,415.75 | 4.00 | 2.36 | -6.85 |
| 11,600.00 | 28.59 | 262.82 | 11,191.55 | 1,034.19 | -2,359.13 | -1,416.82 | 0.36 | -0.19 | -0.65 |
| 11,647.00 | 29.70 | 261.55 | 11,232.60 | 1,031.07 | -2,381.80 | -1,417.57 | 2.70 | 2.36 | -2.70 |
| 11,694.00 | 31.90 | 257.36 | 11,272.98 | 1,026.65 | -2,405.44 | -1,417.18 | 6.54 | 4.68 | -8.91 |
| 11,741.00 | 34.60 | 255.73 | 11,312.28 | 1,020.64 | -2,430.50 | -1,415.48 | 6.05 | 5.74 | -3.47 |
| 11,789.00 | 37.52 | 256.57 | 11,351.08 | 1,013.88 | -2,457.93 | -1,413.45 | 6.17 | 6.08 | 1.75 |
| 11,836.00 | 40.88 | 255.24 | 11,387.49 | 1,006.64 | -2,486.73 | -1,411.16 | 7.37 | 7.15 | -2.83 |
| 11,883.00 | 45.03 | 252.12 | 11,421.89 | 997.61 | -2,517.44 | -1,407.43 | 9.92 | 8.83 | -6.64 |
| 11,930.00 | 48.34 | 247.22 | 11,454.14 | 985.70 | -2,549.47 | -1,401.09 | 10.35 | 7.04 | -10.43 |
| 11,977.00 | 51.79 | 242.46 | 11,484.31 | 970.35 | -2,582.05 | -1,391.45 | 10.68 | 7.34 | -10.13 |
| 12,024.00 | 51.44 | 236.65 | 11,513.51 | 951.70 | -2,613.79 | -1,378.41 | 9.72 | -0.74 | -12.36 |
| 12,072.00 | 50.46 | 231.71 | 11,543.76 | 929.91 | -2,644.01 | -1,362.02 | 8.25 | -2.04 | -10.29 |
| 12,119.00 | 51.13 | 229.51 | 11,573.48 | 906.80 | -2,672.15 | -1,343.98 | 3.90 | 1.43 | -4.68 |
| 12,167.00 | 52.72 | 224.53 | 11,603.09 | 881.04 | -2,699.76 | -1,323.24 | 8.81 | 3.31 | -10.38 |
| 12,214.00 | 54.53 | 220.25 | 11,630.97 | 853.09 | -2,725.25 | -1,299.99 | 8.28 | 3.85 | -9.11 |
| 12,261.00 | 56.16 | 216.24 | 11,657.70 | 822.73 | -2,749.17 | -1,274.09 | 7.83 | 3.47 | -8.53 |
| 12,308.00 | 58.06 | 214.13 | 11,683.22 | 790.48 | -2,771.90 | -1,246.12 | 5.53 | 4.04 | -4.49 |
| 12,356.00 | 59.88 | 211.57 | 11,707.97 | 755.92 | -2,794.20 | -1,215.82 | 5.94 | 3.79 | -5.33 |
| 12,403.00 | 62.26 | 207.61 | 11,730.71 | 720.16 | -2,814.49 | -1,183.98 | 8.94 | 5.06 | -8.43 |
| 12,451.00 | 64.56 | 203.64 | 11,752.20 | 681.46 | -2,833.03 | -1,148.97 | 8.81 | 4.79 | -8.27 |

| | | | |
|------------------|--------------------------------|-------------------------------------|---|
| Company: | Tug Hill Operating LLC | Local Co-ordinate Reference: | Well Fitzgerald 19 HU (slot O) |
| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Sidetrack 01 | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Sidetrack 01 | Database: | DB_Dec2220_v16 |

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) |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| 12,498.00 | 67.04 | 200.03 | 11,771.47 | 641.68 | -2,848.96 | -1,112.43 | 8.77 | 5.28 | -7.68 |
| 12,546.00 | 69.42 | 196.24 | 11,789.28 | 599.32 | -2,862.82 | -1,073.02 | 8.85 | 4.96 | -7.90 |
| 12,593.00 | 72.38 | 192.93 | 11,804.66 | 556.35 | -2,873.99 | -1,032.54 | 9.16 | 6.30 | -7.04 |
| 12,640.00 | 74.68 | 189.94 | 11,817.99 | 512.18 | -2,882.92 | -990.51 | 7.82 | 4.89 | -6.36 |
| 12,687.00 | 76.45 | 186.06 | 11,829.71 | 467.12 | -2,889.24 | -947.15 | 8.84 | 3.77 | -8.26 |
| 12,734.00 | 78.52 | 182.84 | 11,839.89 | 421.38 | -2,892.80 | -902.67 | 8.01 | 4.40 | -6.85 |
| 12,781.00 | 80.20 | 179.40 | 11,848.57 | 375.21 | -2,893.70 | -857.31 | 8.03 | 3.57 | -7.32 |
| 12,829.00 | 81.26 | 175.17 | 11,856.31 | 327.90 | -2,891.45 | -810.30 | 8.97 | 2.21 | -8.81 |
| 12,876.00 | 81.22 | 170.33 | 11,863.47 | 281.83 | -2,885.59 | -763.90 | 10.18 | -0.09 | -10.30 |
| 12,924.00 | 82.10 | 166.76 | 11,870.43 | 235.30 | -2,876.16 | -716.44 | 7.58 | 1.83 | -7.44 |
| 12,971.00 | 84.31 | 163.10 | 11,876.00 | 190.24 | -2,864.02 | -669.99 | 9.05 | 4.70 | -7.79 |
| 13,019.00 | 85.46 | 159.71 | 11,880.28 | 144.94 | -2,848.78 | -622.76 | 7.43 | 2.40 | -7.06 |
| 13,066.00 | 85.42 | 155.21 | 11,884.02 | 101.68 | -2,830.82 | -577.09 | 9.54 | -0.09 | -9.57 |
| 13,113.00 | 85.15 | 153.18 | 11,887.88 | 59.51 | -2,810.44 | -532.09 | 4.34 | -0.57 | -4.32 |
| 13,160.00 | 87.80 | 153.18 | 11,890.77 | 17.65 | -2,789.27 | -487.26 | 5.64 | 5.64 | 0.00 |
| 13,208.00 | 88.73 | 151.95 | 11,892.22 | -24.93 | -2,767.17 | -441.57 | 3.21 | 1.94 | -2.56 |
| 13,255.00 | 89.70 | 149.57 | 11,892.87 | -65.94 | -2,744.21 | -397.28 | 5.47 | 2.06 | -5.06 |
| 13,303.00 | 89.70 | 150.06 | 11,893.12 | -107.43 | -2,720.08 | -352.32 | 1.02 | 0.00 | 1.02 |
| 13,397.00 | 89.79 | 150.94 | 11,893.54 | -189.24 | -2,673.79 | -263.88 | 0.94 | 0.10 | 0.94 |
| 13,491.00 | 89.70 | 150.14 | 11,893.95 | -271.08 | -2,627.56 | -175.42 | 0.86 | -0.10 | -0.85 |
| 13,585.00 | 89.70 | 150.06 | 11,894.45 | -352.57 | -2,580.70 | -87.20 | 0.09 | 0.00 | -0.09 |
| 13,679.00 | 89.70 | 149.79 | 11,894.94 | -433.91 | -2,533.60 | 0.91 | 0.29 | 0.00 | -0.29 |
| 13,773.00 | 89.84 | 149.75 | 11,895.32 | -515.13 | -2,486.27 | 88.94 | 0.15 | 0.15 | -0.04 |
| 13,866.00 | 89.26 | 149.70 | 11,896.05 | -595.44 | -2,439.39 | 176.01 | 0.63 | -0.62 | -0.05 |
| 13,961.00 | 89.22 | 149.79 | 11,897.31 | -677.50 | -2,391.53 | 264.95 | 0.10 | -0.04 | 0.09 |
| 14,056.00 | 89.13 | 150.23 | 11,898.67 | -759.77 | -2,344.05 | 354.04 | 0.47 | -0.09 | 0.46 |
| 14,150.00 | 89.22 | 149.39 | 11,900.03 | -841.01 | -2,296.78 | 442.08 | 0.90 | 0.10 | -0.89 |
| 14,245.00 | 89.22 | 149.57 | 11,901.32 | -922.84 | -2,248.54 | 530.87 | 0.19 | 0.00 | 0.19 |
| 14,340.00 | 89.26 | 150.10 | 11,902.58 | -1,004.97 | -2,200.81 | 619.87 | 0.56 | 0.04 | 0.56 |
| 14,435.00 | 89.26 | 149.57 | 11,903.81 | -1,087.10 | -2,153.08 | 708.86 | 0.56 | 0.00 | -0.56 |
| 14,529.00 | 89.26 | 149.66 | 11,905.02 | -1,168.18 | -2,105.53 | 796.79 | 0.10 | 0.00 | 0.10 |
| 14,623.00 | 89.31 | 149.31 | 11,906.20 | -1,249.15 | -2,057.81 | 884.65 | 0.38 | 0.05 | -0.37 |
| 14,718.00 | 89.22 | 149.44 | 11,907.41 | -1,330.90 | -2,009.42 | 973.38 | 0.17 | -0.09 | 0.14 |
| 14,812.00 | 89.22 | 149.70 | 11,908.69 | -1,411.94 | -1,961.81 | 1,061.28 | 0.28 | 0.00 | 0.28 |
| 14,907.00 | 89.00 | 149.88 | 11,910.17 | -1,494.03 | -1,914.02 | 1,150.25 | 0.30 | -0.23 | 0.19 |
| 15,002.00 | 89.09 | 149.09 | 11,911.75 | -1,575.86 | -1,865.79 | 1,239.03 | 0.84 | 0.09 | -0.83 |
| 15,097.00 | 89.00 | 149.66 | 11,913.34 | -1,657.59 | -1,817.40 | 1,327.75 | 0.61 | -0.09 | 0.60 |
| 15,191.00 | 89.04 | 149.83 | 11,914.94 | -1,738.78 | -1,770.04 | 1,415.76 | 0.19 | 0.04 | 0.18 |
| 15,286.00 | 88.86 | 148.42 | 11,916.69 | -1,820.30 | -1,721.30 | 1,504.32 | 1.50 | -0.19 | -1.48 |
| 15,380.00 | 88.82 | 149.26 | 11,918.59 | -1,900.72 | -1,672.68 | 1,591.79 | 0.89 | -0.04 | 0.89 |
| 15,475.00 | 88.78 | 149.79 | 11,920.58 | -1,982.58 | -1,624.51 | 1,680.59 | 0.56 | -0.04 | 0.56 |
| 15,569.00 | 88.73 | 149.92 | 11,922.62 | -2,063.85 | -1,577.31 | 1,768.65 | 0.15 | -0.05 | 0.14 |
| 15,664.00 | 89.09 | 149.61 | 11,924.43 | -2,145.91 | -1,529.48 | 1,857.59 | 0.50 | 0.38 | -0.33 |

| | | | |
|------------------|--------------------------------|-------------------------------------|---|
| Company: | Tug Hill Operating LLC | Local Co-ordinate Reference: | Well Fitzgerald 19 HU (slot O) |
| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Sidetrack 01 | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Sidetrack 01 | Database: | DB_Dec2220_v16 |

| 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) |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| 15,758.00 | 89.44 | 149.39 | 11,925.63 | -2,226.90 | -1,481.78 | 1,945.46 | 0.44 | 0.37 | -0.23 |
| 15,853.00 | 89.48 | 149.66 | 11,926.53 | -2,308.77 | -1,433.60 | 2,034.28 | 0.29 | 0.04 | 0.28 |
| 15,946.00 | 89.57 | 149.53 | 11,927.30 | -2,388.97 | -1,386.53 | 2,121.26 | 0.17 | 0.10 | -0.14 |
| 16,040.00 | 89.00 | 149.75 | 11,928.47 | -2,470.08 | -1,339.03 | 2,209.21 | 0.65 | -0.61 | 0.23 |
| 16,134.00 | 88.78 | 149.70 | 11,930.29 | -2,551.24 | -1,291.65 | 2,297.20 | 0.24 | -0.23 | -0.05 |
| 16,229.00 | 88.86 | 149.61 | 11,932.25 | -2,633.21 | -1,243.66 | 2,386.08 | 0.13 | 0.08 | -0.09 |
| 16,323.00 | 88.82 | 149.35 | 11,934.15 | -2,714.17 | -1,195.93 | 2,473.92 | 0.28 | -0.04 | -0.28 |
| 16,418.00 | 88.91 | 149.13 | 11,936.03 | -2,795.79 | -1,147.36 | 2,562.56 | 0.25 | 0.09 | -0.23 |
| 16,512.00 | 88.95 | 148.95 | 11,937.79 | -2,876.38 | -1,099.01 | 2,650.14 | 0.20 | 0.04 | -0.19 |
| 16,606.00 | 89.31 | 149.35 | 11,939.22 | -2,957.07 | -1,050.81 | 2,737.80 | 0.57 | 0.38 | 0.43 |
| 16,701.00 | 89.22 | 149.09 | 11,940.44 | -3,038.68 | -1,002.20 | 2,826.43 | 0.29 | -0.09 | -0.27 |
| 16,796.00 | 89.31 | 149.04 | 11,941.65 | -3,120.16 | -953.37 | 2,914.97 | 0.11 | 0.09 | -0.05 |
| 16,890.00 | 89.31 | 149.48 | 11,942.79 | -3,200.95 | -905.32 | 3,002.70 | 0.47 | 0.00 | 0.47 |
| 16,985.00 | 89.26 | 149.04 | 11,943.97 | -3,282.60 | -856.77 | 3,091.36 | 0.47 | -0.05 | -0.46 |
| 17,077.00 | 89.22 | 149.48 | 11,945.19 | -3,361.66 | -809.75 | 3,177.21 | 0.48 | -0.04 | 0.48 |
| 17,172.00 | 89.31 | 149.22 | 11,946.41 | -3,443.38 | -761.32 | 3,265.93 | 0.29 | 0.09 | -0.27 |
| 17,265.00 | 89.35 | 149.09 | 11,947.50 | -3,523.22 | -713.64 | 3,352.66 | 0.15 | 0.04 | -0.14 |
| 17,360.00 | 89.31 | 149.57 | 11,948.61 | -3,604.93 | -665.19 | 3,441.36 | 0.51 | -0.04 | 0.51 |
| 17,454.00 | 89.31 | 149.48 | 11,949.74 | -3,685.94 | -617.52 | 3,529.24 | 0.10 | 0.00 | -0.10 |
| 17,549.00 | 89.09 | 148.87 | 11,951.07 | -3,767.51 | -568.84 | 3,617.84 | 0.68 | -0.23 | -0.64 |
| 17,644.00 | 88.64 | 148.82 | 11,952.95 | -3,848.79 | -519.70 | 3,706.24 | 0.48 | -0.47 | -0.05 |
| 17,739.00 | 88.91 | 150.54 | 11,954.98 | -3,930.78 | -471.76 | 3,795.13 | 1.83 | 0.28 | 1.81 |
| 17,833.00 | 88.95 | 150.01 | 11,956.74 | -4,012.39 | -425.16 | 3,883.43 | 0.57 | 0.04 | -0.56 |
| 17,928.00 | 88.95 | 150.32 | 11,958.48 | -4,094.79 | -377.90 | 3,972.61 | 0.33 | 0.00 | 0.33 |
| 18,022.00 | 88.86 | 149.53 | 11,960.27 | -4,176.12 | -330.80 | 4,060.71 | 0.85 | -0.10 | -0.84 |
| 18,116.00 | 88.73 | 150.10 | 11,962.25 | -4,257.35 | -283.55 | 4,148.74 | 0.62 | -0.14 | 0.61 |
| 18,211.00 | 88.86 | 149.31 | 11,964.25 | -4,339.36 | -235.64 | 4,237.65 | 0.84 | 0.14 | -0.83 |
| 18,305.00 | 89.04 | 149.57 | 11,965.97 | -4,420.29 | -187.86 | 4,325.47 | 0.34 | 0.19 | 0.28 |
| 18,400.00 | 89.04 | 149.92 | 11,967.56 | -4,502.34 | -140.00 | 4,414.41 | 0.37 | 0.00 | 0.37 |
| 18,493.00 | 89.04 | 149.92 | 11,969.12 | -4,582.80 | -93.39 | 4,501.58 | 0.00 | 0.00 | 0.00 |
| 18,588.00 | 89.04 | 149.48 | 11,970.71 | -4,664.81 | -45.47 | 4,590.49 | 0.46 | 0.00 | -0.46 |
| 18,683.00 | 89.09 | 149.79 | 11,972.26 | -4,746.77 | 2.55 | 4,679.36 | 0.33 | 0.05 | 0.33 |
| 18,778.00 | 89.04 | 149.92 | 11,973.81 | -4,828.91 | 50.25 | 4,768.37 | 0.15 | -0.05 | 0.14 |
| 18,872.00 | 89.04 | 149.31 | 11,975.39 | -4,909.99 | 97.79 | 4,856.29 | 0.65 | 0.00 | -0.65 |
| 18,967.00 | 88.91 | 149.57 | 11,977.09 | -4,991.78 | 146.08 | 4,945.05 | 0.31 | -0.14 | 0.27 |
| 19,062.00 | 88.51 | 149.97 | 11,979.23 | -5,073.84 | 193.90 | 5,033.99 | 0.60 | -0.42 | 0.42 |
| 19,156.00 | 88.60 | 149.79 | 11,981.60 | -5,155.12 | 241.06 | 5,122.06 | 0.21 | 0.10 | -0.19 |
| 19,251.00 | 88.60 | 149.35 | 11,983.92 | -5,237.01 | 289.16 | 5,210.88 | 0.46 | 0.00 | -0.46 |
| 19,346.00 | 88.95 | 149.83 | 11,985.95 | -5,318.92 | 337.24 | 5,299.72 | 0.63 | 0.37 | 0.51 |
| 19,439.00 | 89.00 | 149.79 | 11,987.61 | -5,399.29 | 383.99 | 5,386.82 | 0.07 | 0.05 | -0.04 |
| 19,533.00 | 88.95 | 149.57 | 11,989.29 | -5,480.42 | 431.44 | 5,474.78 | 0.24 | -0.05 | -0.23 |
| 19,627.00 | 89.00 | 149.26 | 11,990.97 | -5,561.33 | 479.26 | 5,562.59 | 0.33 | 0.05 | -0.33 |
| 19,722.00 | 88.95 | 149.53 | 11,992.67 | -5,643.09 | 527.62 | 5,651.32 | 0.29 | -0.05 | 0.28 |

| | | | |
|------------------|--------------------------------|-------------------------------------|---|
| Company: | Tug Hill Operating LLC | Local Co-ordinate Reference: | Well Fitzgerald 19 HU (slot O) |
| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Sidetrack 01 | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Sidetrack 01 | Database: | DB_Dec2220_v16 |

| 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) |
|---|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| 19,816.00 | 89.26 | 149.39 | 11,994.14 | -5,724.04 | 575.38 | 5,739.16 | 0.36 | 0.33 | -0.15 |
| 19,910.00 | 89.22 | 150.10 | 11,995.39 | -5,805.22 | 622.74 | 5,827.17 | 0.76 | -0.04 | 0.76 |
| 20,005.00 | 89.22 | 150.01 | 11,996.68 | -5,887.53 | 670.15 | 5,916.29 | 0.09 | 0.00 | -0.09 |
| 20,100.00 | 89.09 | 149.61 | 11,998.08 | -5,969.64 | 717.92 | 6,005.27 | 0.44 | -0.14 | -0.42 |
| 20,194.00 | 88.91 | 150.19 | 11,999.72 | -6,050.95 | 765.06 | 6,093.36 | 0.65 | -0.19 | 0.62 |
| 20,288.00 | 88.86 | 150.98 | 12,001.55 | -6,132.82 | 811.21 | 6,181.83 | 0.84 | -0.05 | 0.84 |
| 20,383.00 | 88.82 | 149.61 | 12,003.48 | -6,215.31 | 858.28 | 6,271.07 | 1.44 | -0.04 | -1.44 |
| 20,478.00 | 88.73 | 149.09 | 12,005.51 | -6,297.02 | 906.70 | 6,359.77 | 0.56 | -0.09 | -0.55 |
| 20,573.00 | 88.73 | 149.92 | 12,007.61 | -6,378.86 | 954.89 | 6,448.56 | 0.87 | 0.00 | 0.87 |
| 20,667.00 | 88.73 | 149.13 | 12,009.70 | -6,459.85 | 1,002.55 | 6,536.42 | 0.84 | 0.00 | -0.84 |
| 20,762.00 | 88.73 | 149.22 | 12,011.80 | -6,541.41 | 1,051.22 | 6,625.02 | 0.09 | 0.00 | 0.09 |
| 20,857.00 | 88.73 | 149.70 | 12,013.91 | -6,623.22 | 1,099.48 | 6,713.78 | 0.51 | 0.00 | 0.51 |
| 20,931.00 | 88.78 | 149.13 | 12,015.52 | -6,686.91 | 1,137.13 | 6,782.90 | 0.77 | 0.07 | -0.77 |
| Survey @ 20931.00 MD 12015.52 TVD | | | | | | | | | |
| 20,965.00 | 88.78 | 149.13 | 12,016.24 | -6,716.08 | 1,154.57 | 6,814.60 | 0.00 | 0.00 | 0.00 |
| Survey Proj. to 20965.00 MD 12016.24 TVD | | | | | | | | | |

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates | | Comment |
|---------------------|---------------------|-------------------|------------|-----------------------------------|
| | | +N/-S (ft) | +E/-W (ft) | |
| 6,962.00 | 6,834.27 | 362.28 | -952.79 | Tie into original hole @ 6962 MD |
| 20,931.00 | 12,015.52 | -6,686.91 | 1,137.13 | Survey @ 20931.00 MD 12015.52 TVD |

| | | | |
|------------------|--------------------------------|-------------------------------------|---|
| Company: | Tug Hill Operating LLC | Local Co-ordinate Reference: | Well Fitzgerald 19 HU (slot O) |
| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Sidetrack 01 | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Sidetrack 01 | Database: | DB_Dec2220_v16 |

| | | | |
|--------------------|--|----------------------|----------------|
| Project | Marshall County, West Virginia | | |
| Map System: | Universal Transverse Mercator (US Survey Feet) | System Datum: | Mean Sea Level |
| Geo Datum: | NAD83 West Virginia - HARN | | |
| Map Zone: | Zone 17N (84 W to 78 W) | | |

| | | | | | |
|------------------------------|------------|---------------------|--------------------|--------------------------|--------------|
| Site | Fitzgerald | | | | |
| Site Position: | | Northing: | 14,454,567.73 usft | Latitude: | 39.80126184 |
| From: | Lat/Long | Easting: | 1,741,096.26 usft | Longitude: | -80.64153292 |
| Position Uncertainty: | 0.00 ft | Slot Radius: | 13-3/16 " | Grid Convergence: | 0.229 ° |

| | | | | | | |
|-----------------------------|---------------------------|---------|----------------------------|--------------------|----------------------|--------------|
| Well | Fitzgerald 19 HU (slot O) | | | | | |
| Well Position | +N/-S | 0.00 ft | Northing: | 14,454,537.24 usft | Latitude: | 39.80117700 |
| | +E/-W | 0.00 ft | Easting: | 1,741,196.35 usft | Longitude: | -80.64117700 |
| Position Uncertainty | | 0.00 ft | Wellhead Elevation: | ft | Ground Level: | 1,292.91 ft |

| | | | | | |
|------------------|-------------------|--------------------|--------------------|------------------|-----------------------|
| Wellbore | Sidetrack 01 | | | | |
| Magnetics | Model Name | Sample Date | Declination | Dip Angle | Field Strength |
| | IGRF2020 | 3/8/2021 | (°) | (°) | (nT) |
| | | | -8.706 | 66.567 | 51,775.55809291 |

| | | | | | |
|--------------------------|-------------------------|---------------|--------------|----------------------|----------|
| Design | Surveys Sidetrack 01 | | | | |
| Audit Notes: | | | | | |
| Version: | 1.0 | Phase: | ACTUAL | Tie On Depth: | 6,962.00 |
| Vertical Section: | Depth From (TVD) | +N/-S | +E/-W | Direction | |
| | (ft) | (ft) | (ft) | (°) | |
| | 0.00 | 0.00 | 0.00 | 170.30 | |

| | | | | | |
|-----------------------|---------------|---------------------------|------------------|--------------------|--|
| Survey Program | Date 4/9/2021 | | | | |
| From | To | Survey (Wellbore) | Tool Name | Description | |
| (ft) | (ft) | | | | |
| 189.00 | 1,151.00 | MWD surf (Original Hole) | MWD | MWD - Standard | |
| 1,201.00 | 2,855.00 | MWD int (Original Hole) | MWD | MWD - Standard | |
| 2,952.00 | 6,962.00 | MWD (Original Hole) | MWD | MWD - Standard | |
| 7,025.00 | 20,931.00 | MWD ST1 (Sidetrack 01) | MWD | MWD - Standard | |
| 20,965.00 | 20,965.00 | Projection (Sidetrack 01) | MWD | MWD - Standard | |

| | | | | | | | | | | |
|-----------------|--------------------|----------------|-----------------|--------------|--------------|-----------------|----------------|-----------------|------------------|--|
| Survey | | | | | | | | | | |
| Measured | Inclination | Azimuth | Vertical | +N/-S | +E/-W | Map | Map | Latitude | Longitude | |
| Depth | (°) | (°) | Depth | (ft) | (ft) | Northing | Easting | | | |
| (ft) | | | (ft) | | | (usft) | (usft) | | | |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14,454,537.24 | 1,741,196.35 | 39.80117700 | -80.64117700 | |
| 189.00 | 0.09 | 278.37 | 189.00 | 0.02 | -0.15 | 14,454,537.26 | 1,741,196.20 | 39.80117706 | -80.64117752 | |
| 204.00 | 0.18 | 261.41 | 204.00 | 0.02 | -0.18 | 14,454,537.26 | 1,741,196.16 | 39.80117706 | -80.64117765 | |
| 234.00 | 0.22 | 289.36 | 234.00 | 0.03 | -0.28 | 14,454,537.27 | 1,741,196.06 | 39.80117709 | -80.64117801 | |
| 264.00 | 0.18 | 295.25 | 264.00 | 0.07 | -0.38 | 14,454,537.31 | 1,741,195.97 | 39.80117720 | -80.64117835 | |
| 299.00 | 0.22 | 295.34 | 299.00 | 0.12 | -0.49 | 14,454,537.37 | 1,741,195.86 | 39.80117735 | -80.64117874 | |
| 329.00 | 0.17 | 302.98 | 329.00 | 0.17 | -0.58 | 14,454,537.41 | 1,741,195.77 | 39.80117748 | -80.64117906 | |
| 359.00 | 0.17 | 294.63 | 359.00 | 0.21 | -0.66 | 14,454,537.46 | 1,741,195.69 | 39.80117760 | -80.64117934 | |

| | | | |
|------------------|--------------------------------|-------------------------------------|---|
| Company: | Tug Hill Operating LLC | Local Co-ordinate Reference: | Well Fitzgerald 19 HU (slot O) |
| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Sidetrack 01 | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Sidetrack 01 | Database: | DB_Dec2220_v16 |

Survey

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---------------------|-----------------|-------------|---------------------|------------|------------|---------------------|--------------------|-------------|--------------|
| 389.00 | 0.21 | 297.07 | 389.00 | 0.26 | -0.75 | 14,454,537.50 | 1,741,195.60 | 39.80117772 | -80.64117966 |
| 418.00 | 0.17 | 255.61 | 418.00 | 0.27 | -0.84 | 14,454,537.51 | 1,741,195.51 | 39.80117776 | -80.64117997 |
| 448.00 | 0.17 | 286.72 | 448.00 | 0.27 | -0.92 | 14,454,537.52 | 1,741,195.42 | 39.80117776 | -80.64118028 |
| 478.00 | 0.17 | 292.34 | 478.00 | 0.30 | -1.01 | 14,454,537.55 | 1,741,195.34 | 39.80117785 | -80.64118057 |
| 508.00 | 0.21 | 302.72 | 508.00 | 0.35 | -1.09 | 14,454,537.59 | 1,741,195.25 | 39.80117798 | -80.64118089 |
| 538.00 | 0.39 | 304.83 | 538.00 | 0.44 | -1.22 | 14,454,537.68 | 1,741,195.12 | 39.80117822 | -80.64118135 |
| 568.00 | 0.35 | 291.65 | 568.00 | 0.53 | -1.39 | 14,454,537.77 | 1,741,194.95 | 39.80117847 | -80.64118195 |
| 598.00 | 0.44 | 272.22 | 598.00 | 0.57 | -1.59 | 14,454,537.81 | 1,741,194.75 | 39.80117858 | -80.64118266 |
| 628.00 | 0.53 | 296.74 | 628.00 | 0.64 | -1.83 | 14,454,537.88 | 1,741,194.52 | 39.80117877 | -80.64118351 |
| 657.00 | 0.40 | 304.65 | 656.99 | 0.75 | -2.03 | 14,454,538.00 | 1,741,194.31 | 39.80117909 | -80.64118423 |
| 688.00 | 0.48 | 290.06 | 687.99 | 0.86 | -2.25 | 14,454,538.10 | 1,741,194.10 | 39.80117939 | -80.64118498 |
| 717.00 | 0.44 | 315.55 | 716.99 | 0.98 | -2.44 | 14,454,538.22 | 1,741,193.91 | 39.80117972 | -80.64118566 |
| 748.00 | 0.35 | 322.23 | 747.99 | 1.14 | -2.58 | 14,454,538.38 | 1,741,193.77 | 39.80118016 | -80.64118616 |
| 778.00 | 0.57 | 293.76 | 777.99 | 1.27 | -2.77 | 14,454,538.52 | 1,741,193.58 | 39.80118053 | -80.64118685 |
| 809.00 | 0.57 | 301.84 | 808.99 | 1.42 | -3.04 | 14,454,538.66 | 1,741,193.30 | 39.80118093 | -80.64118782 |
| 841.00 | 0.39 | 320.29 | 840.99 | 1.58 | -3.25 | 14,454,538.83 | 1,741,193.10 | 39.80118139 | -80.64118854 |
| 872.00 | 0.57 | 318.45 | 871.99 | 1.78 | -3.42 | 14,454,539.02 | 1,741,192.93 | 39.80118193 | -80.64118914 |
| 903.00 | 0.39 | 318.19 | 902.99 | 1.97 | -3.59 | 14,454,539.22 | 1,741,192.76 | 39.80118246 | -80.64118976 |
| 935.00 | 0.44 | 306.94 | 934.99 | 2.13 | -3.76 | 14,454,539.37 | 1,741,192.59 | 39.80118289 | -80.64119036 |
| 964.00 | 0.62 | 318.01 | 963.98 | 2.31 | -3.96 | 14,454,539.56 | 1,741,192.39 | 39.80118340 | -80.64119105 |
| 997.00 | 0.48 | 319.16 | 996.98 | 2.55 | -4.17 | 14,454,539.79 | 1,741,192.18 | 39.80118405 | -80.64119179 |
| 1,029.00 | 0.48 | 316.70 | 1,028.98 | 2.75 | -4.34 | 14,454,539.99 | 1,741,192.00 | 39.80118460 | -80.64119243 |
| 1,061.00 | 0.62 | 309.05 | 1,060.98 | 2.96 | -4.57 | 14,454,540.20 | 1,741,191.78 | 39.80118517 | -80.64119323 |
| 1,092.00 | 0.62 | 319.33 | 1,091.98 | 3.19 | -4.81 | 14,454,540.43 | 1,741,191.54 | 39.80118581 | -80.64119408 |
| 1,124.00 | 0.66 | 296.04 | 1,123.98 | 3.40 | -5.09 | 14,454,540.64 | 1,741,191.26 | 39.80118640 | -80.64119507 |
| 1,151.00 | 0.57 | 322.32 | 1,150.97 | 3.58 | -5.31 | 14,454,540.82 | 1,741,191.04 | 39.80118688 | -80.64119586 |
| 1,201.00 | 0.88 | 304.13 | 1,200.97 | 3.99 | -5.78 | 14,454,541.23 | 1,741,190.57 | 39.80118802 | -80.64119752 |
| 1,218.00 | 1.01 | 299.12 | 1,217.97 | 4.13 | -6.02 | 14,454,541.38 | 1,741,190.33 | 39.80118842 | -80.64119837 |
| 1,249.00 | 0.97 | 273.37 | 1,248.96 | 4.28 | -6.52 | 14,454,541.53 | 1,741,189.83 | 39.80118883 | -80.64120015 |
| 1,281.00 | 1.32 | 271.87 | 1,280.96 | 4.31 | -7.16 | 14,454,541.55 | 1,741,189.19 | 39.80118892 | -80.64120243 |
| 1,312.00 | 1.49 | 263.35 | 1,311.95 | 4.28 | -7.92 | 14,454,541.52 | 1,741,188.43 | 39.80118883 | -80.64120512 |
| 1,344.00 | 1.71 | 246.12 | 1,343.94 | 4.03 | -8.77 | 14,454,541.28 | 1,741,187.58 | 39.80118818 | -80.64120815 |
| 1,375.00 | 2.11 | 241.46 | 1,374.92 | 3.57 | -9.69 | 14,454,540.82 | 1,741,186.66 | 39.80118692 | -80.64121145 |
| 1,407.00 | 2.64 | 240.49 | 1,406.89 | 2.93 | -10.85 | 14,454,540.17 | 1,741,185.50 | 39.80118517 | -80.64121559 |
| 1,438.00 | 3.38 | 238.38 | 1,437.85 | 2.10 | -12.25 | 14,454,539.34 | 1,741,184.10 | 39.80118290 | -80.64122058 |
| 1,470.00 | 3.78 | 234.61 | 1,469.79 | 0.99 | -13.91 | 14,454,538.24 | 1,741,182.43 | 39.80117988 | -80.64122652 |
| 1,501.00 | 4.13 | 234.43 | 1,500.71 | -0.25 | -15.65 | 14,454,536.99 | 1,741,180.69 | 39.80117649 | -80.64123273 |
| 1,533.00 | 4.17 | 230.73 | 1,532.63 | -1.65 | -17.49 | 14,454,535.59 | 1,741,178.86 | 39.80117265 | -80.64123930 |
| 1,564.00 | 4.00 | 232.50 | 1,563.55 | -3.03 | -19.22 | 14,454,534.22 | 1,741,177.13 | 39.80116890 | -80.64124548 |
| 1,627.00 | 3.52 | 238.56 | 1,626.41 | -5.37 | -22.61 | 14,454,531.87 | 1,741,173.73 | 39.80116250 | -80.64125759 |
| 1,721.00 | 3.52 | 241.72 | 1,720.24 | -8.24 | -27.62 | 14,454,529.00 | 1,741,168.73 | 39.80115466 | -80.64127545 |
| 1,816.00 | 4.26 | 235.40 | 1,815.02 | -11.63 | -33.09 | 14,454,525.61 | 1,741,163.26 | 39.80114543 | -80.64129498 |
| 1,910.00 | 4.22 | 235.04 | 1,908.76 | -15.59 | -38.80 | 14,454,521.65 | 1,741,157.55 | 39.80113460 | -80.64131536 |
| 2,004.00 | 5.01 | 235.13 | 2,002.45 | -19.92 | -45.00 | 14,454,517.32 | 1,741,151.35 | 39.80112278 | -80.64133751 |
| 2,099.00 | 5.14 | 231.62 | 2,097.08 | -24.94 | -51.74 | 14,454,512.31 | 1,741,144.61 | 39.80110909 | -80.64136157 |
| 2,194.00 | 5.10 | 232.94 | 2,191.70 | -30.12 | -58.45 | 14,454,507.12 | 1,741,137.90 | 39.80109492 | -80.64138552 |
| 2,288.00 | 4.75 | 246.03 | 2,285.36 | -34.22 | -65.34 | 14,454,503.02 | 1,741,131.01 | 39.80108374 | -80.64141011 |
| 2,383.00 | 5.71 | 251.22 | 2,379.96 | -37.34 | -73.41 | 14,454,499.90 | 1,741,122.94 | 39.80107526 | -80.64143888 |
| 2,477.00 | 5.76 | 241.11 | 2,473.49 | -41.13 | -81.96 | 14,454,496.12 | 1,741,114.38 | 39.80106496 | -80.64146941 |
| 2,572.00 | 5.27 | 233.46 | 2,568.06 | -46.03 | -89.64 | 14,454,491.22 | 1,741,106.70 | 39.80105159 | -80.64149682 |
| 2,665.00 | 3.91 | 230.47 | 2,660.76 | -50.59 | -95.52 | 14,454,486.65 | 1,741,100.83 | 39.80103912 | -80.64151781 |
| 2,761.00 | 3.65 | 226.70 | 2,756.55 | -54.77 | -100.27 | 14,454,482.47 | 1,741,096.08 | 39.80102770 | -80.64153477 |
| 2,855.00 | 3.74 | 236.54 | 2,850.35 | -58.51 | -105.00 | 14,454,478.73 | 1,741,091.34 | 39.80101748 | -80.64155169 |
| 2,952.00 | 4.26 | 241.72 | 2,947.12 | -61.96 | -110.82 | 14,454,475.28 | 1,741,085.53 | 39.80100806 | -80.64157243 |
| 3,045.00 | 3.74 | 240.32 | 3,039.89 | -65.10 | -116.49 | 14,454,472.14 | 1,741,079.85 | 39.80099950 | -80.64159269 |



Survey Report - Geographic



| | | | |
|------------------|--------------------------------|-------------------------------------|---|
| Company: | Tug Hill Operating LLC | Local Co-ordinate Reference: | Well Fitzgerald 19 HU (slot O) |
| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Sidetrack 01 | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Sidetrack 01 | Database: | DB_Dec2220_v16 |

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---|-----------------|-------------|---------------------|------------|------------|---------------------|--------------------|-------------|--------------|
| 3,140.00 | 3.91 | 238.20 | 3,134.68 | -68.34 | -121.94 | 14,454,468.90 | 1,741,074.41 | 39.80099066 | -80.64161212 |
| 3,234.00 | 4.31 | 261.68 | 3,228.44 | -70.54 | -128.16 | 14,454,466.70 | 1,741,068.19 | 39.80098469 | -80.64163429 |
| 3,329.00 | 6.02 | 282.42 | 3,323.06 | -69.99 | -136.55 | 14,454,467.26 | 1,741,059.79 | 39.80098631 | -80.64166419 |
| 3,423.00 | 8.13 | 293.49 | 3,416.34 | -66.28 | -147.47 | 14,454,470.97 | 1,741,048.88 | 39.80099662 | -80.64170298 |
| 3,518.00 | 10.63 | 304.21 | 3,510.07 | -58.67 | -160.88 | 14,454,478.57 | 1,741,035.47 | 39.80101765 | -80.64175062 |
| 3,613.00 | 13.58 | 309.22 | 3,602.95 | -46.69 | -176.77 | 14,454,490.55 | 1,741,019.58 | 39.80105073 | -80.64180703 |
| 3,708.00 | 16.30 | 311.77 | 3,694.74 | -30.75 | -195.35 | 14,454,506.49 | 1,741,000.99 | 39.80109470 | -80.64187298 |
| 3,801.00 | 15.82 | 307.47 | 3,784.11 | -14.35 | -215.15 | 14,454,522.90 | 1,740,981.20 | 39.80113997 | -80.64194322 |
| 3,900.00 | 14.06 | 297.80 | 3,879.77 | -0.53 | -236.50 | 14,454,536.72 | 1,740,959.84 | 39.80117816 | -80.64201905 |
| 3,995.00 | 15.29 | 293.05 | 3,971.68 | 9.76 | -258.24 | 14,454,547.00 | 1,740,938.11 | 39.80120665 | -80.64209629 |
| 4,089.00 | 15.95 | 296.13 | 4,062.21 | 20.30 | -281.24 | 14,454,557.55 | 1,740,915.11 | 39.80123585 | -80.64217803 |
| 4,184.00 | 15.42 | 297.10 | 4,153.67 | 31.81 | -304.20 | 14,454,569.05 | 1,740,892.15 | 39.80126769 | -80.64224999 |
| 4,279.00 | 15.16 | 290.42 | 4,245.31 | 41.89 | -327.09 | 14,454,579.14 | 1,740,869.26 | 39.80129565 | -80.64234097 |
| 4,373.00 | 15.91 | 289.89 | 4,335.88 | 50.57 | -350.72 | 14,454,587.81 | 1,740,845.62 | 39.80131972 | -80.64242499 |
| 4,468.00 | 14.68 | 293.23 | 4,427.51 | 59.74 | -374.03 | 14,454,596.99 | 1,740,822.32 | 39.80134518 | -80.64250784 |
| 4,562.00 | 15.03 | 296.57 | 4,518.37 | 69.89 | -395.88 | 14,454,607.14 | 1,740,800.47 | 39.80137329 | -80.64258548 |
| 4,657.00 | 14.81 | 297.62 | 4,610.17 | 81.03 | -417.65 | 14,454,618.27 | 1,740,778.70 | 39.80140412 | -80.64266285 |
| 4,752.00 | 15.25 | 299.91 | 4,701.92 | 92.89 | -439.24 | 14,454,630.13 | 1,740,757.11 | 39.80143693 | -80.64273955 |
| 4,846.00 | 14.99 | 297.27 | 4,792.67 | 104.63 | -460.76 | 14,454,641.87 | 1,740,735.59 | 39.80146939 | -80.64281601 |
| 4,941.00 | 15.73 | 296.74 | 4,884.27 | 116.05 | -483.18 | 14,454,653.29 | 1,740,713.17 | 39.80150101 | -80.64289567 |
| 5,034.00 | 16.79 | 298.94 | 4,973.55 | 128.22 | -506.20 | 14,454,665.46 | 1,740,690.15 | 39.80153469 | -80.64297744 |
| 5,129.00 | 15.56 | 299.29 | 5,064.79 | 141.10 | -529.32 | 14,454,678.34 | 1,740,667.03 | 39.80157029 | -80.64305958 |
| 5,224.00 | 14.02 | 297.36 | 5,156.64 | 152.82 | -550.65 | 14,454,689.86 | 1,740,645.70 | 39.80160217 | -80.64313537 |
| 5,319.00 | 13.40 | 295.69 | 5,248.93 | 162.68 | -570.79 | 14,454,699.92 | 1,740,625.56 | 39.80163002 | -80.64320694 |
| 5,413.00 | 14.81 | 296.92 | 5,340.10 | 172.84 | -591.32 | 14,454,710.08 | 1,740,605.03 | 39.80165815 | -80.64327988 |
| 5,508.00 | 16.35 | 299.82 | 5,431.61 | 184.99 | -613.75 | 14,454,722.23 | 1,740,582.60 | 39.80169176 | -80.64335957 |
| 5,603.00 | 16.22 | 297.54 | 5,522.80 | 197.77 | -637.12 | 14,454,735.01 | 1,740,559.23 | 39.80172712 | -80.64344258 |
| 5,697.00 | 16.57 | 297.71 | 5,612.97 | 210.07 | -660.62 | 14,454,747.32 | 1,740,535.73 | 39.80176116 | -80.64352610 |
| 5,791.00 | 15.21 | 297.10 | 5,703.38 | 221.93 | -683.47 | 14,454,759.17 | 1,740,512.88 | 39.80179396 | -80.64360727 |
| 5,885.00 | 14.72 | 297.27 | 5,794.19 | 233.01 | -705.06 | 14,454,770.26 | 1,740,491.29 | 39.80182465 | -80.64368399 |
| 5,979.00 | 15.25 | 299.21 | 5,884.99 | 244.52 | -726.47 | 14,454,781.76 | 1,740,469.88 | 39.80185648 | -80.64376004 |
| 6,074.00 | 14.59 | 296.48 | 5,976.79 | 255.95 | -748.08 | 14,454,793.19 | 1,740,448.27 | 39.80188811 | -80.64383684 |
| 6,168.00 | 15.42 | 297.36 | 6,067.59 | 266.97 | -769.78 | 14,454,804.22 | 1,740,426.57 | 39.80191862 | -80.64391393 |
| 6,261.00 | 14.90 | 297.01 | 6,157.35 | 278.09 | -791.41 | 14,454,815.33 | 1,740,404.94 | 39.80194937 | -80.64399080 |
| 6,356.00 | 14.99 | 297.62 | 6,249.14 | 289.33 | -813.18 | 14,454,826.57 | 1,740,383.17 | 39.80198048 | -80.64406814 |
| 6,450.00 | 15.34 | 298.77 | 6,339.86 | 300.95 | -834.85 | 14,454,838.19 | 1,740,361.50 | 39.80201263 | -80.64414513 |
| 6,544.00 | 14.68 | 297.45 | 6,430.66 | 312.42 | -856.32 | 14,454,849.67 | 1,740,340.03 | 39.80204438 | -80.64422141 |
| 6,639.00 | 14.85 | 299.29 | 6,522.52 | 323.93 | -877.62 | 14,454,861.17 | 1,740,318.73 | 39.80207621 | -80.64429708 |
| 6,734.00 | 14.63 | 300.35 | 6,614.39 | 335.95 | -898.59 | 14,454,873.19 | 1,740,297.76 | 39.80210944 | -80.64437158 |
| 6,837.00 | 15.34 | 295.07 | 6,713.89 | 348.29 | -922.16 | 14,454,885.54 | 1,740,274.19 | 39.80214360 | -80.64444531 |
| 6,867.00 | 15.82 | 294.02 | 6,742.79 | 351.64 | -929.48 | 14,454,888.88 | 1,740,266.86 | 39.80215287 | -80.64448136 |
| 6,962.00 | 15.47 | 295.07 | 6,834.27 | 362.28 | -952.79 | 14,454,899.52 | 1,740,243.56 | 39.80218234 | -80.64456419 |
| Tie into original hole @ 6962 MD | | | | | | | | | |
| 7,025.00 | 16.60 | 295.50 | 6,894.82 | 369.71 | -968.52 | 14,454,906.96 | 1,740,227.83 | 39.80220293 | -80.64462010 |
| 7,119.00 | 17.97 | 298.94 | 6,984.58 | 382.51 | -993.33 | 14,454,919.75 | 1,740,203.01 | 39.80223835 | -80.64470826 |
| 7,139.00 | 17.27 | 296.39 | 7,003.64 | 385.32 | -998.69 | 14,454,922.57 | 1,740,197.66 | 39.80224613 | -80.64472730 |
| 7,181.00 | 16.92 | 289.10 | 7,043.79 | 390.10 | -1,010.05 | 14,454,927.34 | 1,740,186.29 | 39.80225936 | -80.64476768 |
| 7,213.00 | 16.35 | 281.98 | 7,074.45 | 392.56 | -1,018.86 | 14,454,929.80 | 1,740,177.49 | 39.80226621 | -80.64479901 |
| 7,307.00 | 16.48 | 282.24 | 7,164.62 | 398.13 | -1,044.83 | 14,454,935.37 | 1,740,151.51 | 39.80228180 | -80.64489140 |
| 7,402.00 | 18.02 | 290.68 | 7,255.36 | 406.18 | -1,071.76 | 14,454,943.42 | 1,740,124.59 | 39.80230419 | -80.64498714 |
| 7,495.00 | 20.39 | 293.49 | 7,343.18 | 417.72 | -1,100.08 | 14,454,954.96 | 1,740,096.27 | 39.80233619 | -80.64508781 |
| 7,589.00 | 20.70 | 293.67 | 7,431.20 | 430.91 | -1,130.31 | 14,454,968.15 | 1,740,066.04 | 39.80237276 | -80.64519527 |
| 7,684.00 | 21.09 | 292.35 | 7,519.95 | 444.15 | -1,161.50 | 14,454,981.39 | 1,740,034.85 | 39.80240946 | -80.64530612 |
| 7,779.00 | 18.63 | 298.94 | 7,609.31 | 458.00 | -1,190.59 | 14,454,995.24 | 1,740,005.76 | 39.80244780 | -80.64540952 |
| 7,873.00 | 18.28 | 304.04 | 7,698.48 | 473.52 | -1,215.95 | 14,455,010.76 | 1,739,980.40 | 39.80249069 | -80.64549959 |

| | | | |
|------------------|--------------------------------|-------------------------------------|---|
| Company: | Tug Hill Operating LLC | Local Co-ordinate Reference: | Well Fitzgerald 19 HU (slot O) |
| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Sidetrack 01 | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Sidetrack 01 | Database: | DB_Dec2220_v16 |

| Survey | | | | | | | | | |
|---------------------|-----------------|-------------|---------------------|------------|------------|---------------------|--------------------|-------------|--------------|
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
| 7,967.00 | 18.28 | 305.45 | 7,787.73 | 490.32 | -1,240.17 | 14,455,027.56 | 1,739,956.17 | 39.80253710 | -80.64558560 |
| 8,061.00 | 18.94 | 303.86 | 7,876.82 | 507.37 | -1,264.85 | 14,455,044.61 | 1,739,931.50 | 39.80258419 | -80.64567323 |
| 8,154.00 | 21.09 | 303.25 | 7,964.20 | 524.96 | -1,291.38 | 14,455,062.20 | 1,739,904.97 | 39.80263278 | -80.64576744 |
| 8,249.00 | 22.72 | 301.67 | 8,052.34 | 543.96 | -1,321.29 | 14,455,081.20 | 1,739,875.06 | 39.80268529 | -80.64587366 |
| 8,343.00 | 23.82 | 299.64 | 8,138.69 | 562.88 | -1,353.24 | 14,455,100.12 | 1,739,843.11 | 39.80273760 | -80.64598715 |
| 8,437.00 | 22.41 | 298.94 | 8,225.14 | 580.94 | -1,385.42 | 14,455,118.18 | 1,739,810.93 | 39.80278754 | -80.64610147 |
| 8,532.00 | 20.61 | 296.74 | 8,313.52 | 597.23 | -1,416.20 | 14,455,134.47 | 1,739,780.15 | 39.80283260 | -80.64621084 |
| 8,626.00 | 21.75 | 296.30 | 8,401.17 | 612.39 | -1,446.59 | 14,455,149.63 | 1,739,749.76 | 39.80287457 | -80.64631883 |
| 8,721.00 | 20.26 | 295.87 | 8,489.86 | 627.36 | -1,477.17 | 14,455,164.60 | 1,739,719.18 | 39.80291603 | -80.64642750 |
| 8,814.00 | 20.12 | 295.34 | 8,577.14 | 641.23 | -1,506.12 | 14,455,178.48 | 1,739,690.23 | 39.80295444 | -80.64653037 |
| 8,909.00 | 20.35 | 293.40 | 8,666.28 | 654.79 | -1,536.05 | 14,455,192.03 | 1,739,660.30 | 39.80299198 | -80.64663673 |
| 9,003.00 | 18.37 | 296.48 | 8,754.96 | 667.89 | -1,564.31 | 14,455,205.13 | 1,739,632.04 | 39.80302826 | -80.64673717 |
| 9,098.00 | 14.11 | 298.77 | 8,846.15 | 680.14 | -1,587.87 | 14,455,217.38 | 1,739,608.48 | 39.80306216 | -80.64682089 |
| 9,192.00 | 15.42 | 300.79 | 8,937.05 | 692.05 | -1,608.65 | 14,455,229.29 | 1,739,587.70 | 39.80309510 | -80.64689471 |
| 9,286.00 | 18.54 | 303.16 | 9,026.94 | 706.63 | -1,631.90 | 14,455,243.87 | 1,739,564.45 | 39.80313538 | -80.64697729 |
| 9,381.00 | 20.21 | 303.25 | 9,116.55 | 723.89 | -1,658.27 | 14,455,261.13 | 1,739,538.08 | 39.80318307 | -80.64707094 |
| 9,475.00 | 21.27 | 303.07 | 9,204.46 | 742.09 | -1,686.14 | 14,455,279.33 | 1,739,510.21 | 39.80323337 | -80.64716990 |
| 9,569.00 | 22.50 | 303.16 | 9,291.69 | 761.23 | -1,715.48 | 14,455,298.48 | 1,739,480.87 | 39.80328625 | -80.64727412 |
| 9,663.00 | 22.94 | 304.13 | 9,378.39 | 781.35 | -1,745.70 | 14,455,318.59 | 1,739,450.65 | 39.80334182 | -80.64738144 |
| 9,758.00 | 20.04 | 302.11 | 9,466.78 | 800.40 | -1,774.82 | 14,455,337.64 | 1,739,421.53 | 39.80339444 | -80.64748485 |
| 9,852.00 | 19.86 | 299.64 | 9,555.14 | 816.85 | -1,802.34 | 14,455,354.09 | 1,739,394.01 | 39.80343993 | -80.64758261 |
| 9,947.00 | 20.34 | 299.82 | 9,644.35 | 833.04 | -1,830.69 | 14,455,370.28 | 1,739,365.66 | 39.80348470 | -80.64768332 |
| 10,042.00 | 20.39 | 298.59 | 9,733.42 | 849.17 | -1,859.55 | 14,455,386.41 | 1,739,336.80 | 39.80352931 | -80.64778584 |
| 10,136.00 | 19.82 | 298.77 | 9,821.69 | 864.68 | -1,887.90 | 14,455,401.92 | 1,739,308.45 | 39.80357220 | -80.64788655 |
| 10,230.00 | 18.41 | 300.00 | 9,910.50 | 879.77 | -1,914.72 | 14,455,417.01 | 1,739,281.63 | 39.80361394 | -80.64798185 |
| 10,324.00 | 18.68 | 299.47 | 9,999.62 | 894.60 | -1,940.68 | 14,455,431.84 | 1,739,255.67 | 39.80365494 | -80.64807408 |
| 10,414.00 | 18.90 | 299.21 | 10,084.83 | 908.80 | -1,965.95 | 14,455,446.04 | 1,739,230.40 | 39.80369422 | -80.64816386 |
| 10,508.00 | 18.33 | 295.69 | 10,173.91 | 922.64 | -1,992.56 | 14,455,459.88 | 1,739,203.79 | 39.80373251 | -80.64825841 |
| 10,602.00 | 17.67 | 293.14 | 10,263.31 | 934.66 | -2,019.00 | 14,455,471.90 | 1,739,177.35 | 39.80376579 | -80.64835237 |
| 10,696.00 | 17.89 | 292.17 | 10,352.82 | 945.71 | -2,045.49 | 14,455,482.95 | 1,739,150.86 | 39.80379643 | -80.64844653 |
| 10,791.00 | 17.93 | 291.82 | 10,443.22 | 956.65 | -2,072.58 | 14,455,493.89 | 1,739,123.77 | 39.80382677 | -80.64854283 |
| 10,885.00 | 17.89 | 292.88 | 10,532.66 | 967.64 | -2,099.31 | 14,455,504.88 | 1,739,097.04 | 39.80385725 | -80.64863787 |
| 10,980.00 | 17.09 | 292.88 | 10,623.27 | 978.74 | -2,125.62 | 14,455,515.98 | 1,739,070.73 | 39.80388801 | -80.64873137 |
| 11,080.00 | 19.00 | 295.70 | 10,718.35 | 991.52 | -2,153.83 | 14,455,528.76 | 1,739,042.52 | 39.80392340 | -80.64883163 |
| 11,129.00 | 23.29 | 294.20 | 10,764.04 | 998.95 | -2,169.86 | 14,455,536.19 | 1,739,026.49 | 39.80394398 | -80.64888860 |
| 11,223.00 | 23.16 | 292.00 | 10,850.42 | 1,013.49 | -2,203.95 | 14,455,550.73 | 1,738,992.40 | 39.80398429 | -80.64900978 |
| 11,270.00 | 23.02 | 291.69 | 10,893.66 | 1,020.35 | -2,221.06 | 14,455,557.59 | 1,738,975.30 | 39.80400331 | -80.64907060 |
| 11,317.00 | 23.11 | 291.73 | 10,936.90 | 1,027.16 | -2,238.16 | 14,455,564.40 | 1,738,958.19 | 39.80402220 | -80.64913142 |
| 11,364.00 | 23.33 | 288.47 | 10,980.10 | 1,033.53 | -2,255.56 | 14,455,570.77 | 1,738,940.79 | 39.80403986 | -80.64919327 |
| 11,411.00 | 23.99 | 278.78 | 11,023.16 | 1,037.94 | -2,273.84 | 14,455,575.18 | 1,738,922.51 | 39.80405216 | -80.64925828 |
| 11,458.00 | 25.32 | 270.98 | 11,065.89 | 1,039.57 | -2,293.33 | 14,455,576.81 | 1,738,903.02 | 39.80405685 | -80.64932768 |
| 11,505.00 | 27.57 | 266.35 | 11,107.97 | 1,039.05 | -2,314.24 | 14,455,576.29 | 1,738,882.11 | 39.80405565 | -80.64940213 |
| 11,552.00 | 28.68 | 263.13 | 11,149.42 | 1,037.00 | -2,336.30 | 14,455,574.25 | 1,738,860.06 | 39.80405028 | -80.64948068 |
| 11,600.00 | 28.59 | 262.82 | 11,191.55 | 1,034.19 | -2,359.13 | 14,455,571.43 | 1,738,837.23 | 39.80404280 | -80.64956201 |
| 11,647.00 | 29.70 | 261.55 | 11,232.60 | 1,031.07 | -2,381.80 | 14,455,568.32 | 1,738,814.55 | 39.80403448 | -80.64964279 |
| 11,694.00 | 31.90 | 257.36 | 11,272.98 | 1,026.65 | -2,405.44 | 14,455,563.89 | 1,738,790.91 | 39.80402257 | -80.64972702 |
| 11,741.00 | 34.60 | 255.73 | 11,312.28 | 1,020.64 | -2,430.50 | 14,455,557.88 | 1,738,765.86 | 39.80400634 | -80.64981632 |
| 11,789.00 | 37.52 | 256.57 | 11,351.08 | 1,013.88 | -2,457.93 | 14,455,551.12 | 1,738,738.42 | 39.80398809 | -80.64991408 |
| 11,836.00 | 40.88 | 255.24 | 11,387.49 | 1,006.64 | -2,486.73 | 14,455,543.88 | 1,738,709.62 | 39.80396850 | -80.65001673 |
| 11,883.00 | 45.03 | 252.12 | 11,421.89 | 997.61 | -2,517.44 | 14,455,534.85 | 1,738,678.91 | 39.80394404 | -80.65012621 |
| 11,930.00 | 48.34 | 247.22 | 11,454.14 | 985.70 | -2,549.47 | 14,455,522.94 | 1,738,646.88 | 39.80391167 | -80.65024042 |
| 11,977.00 | 51.79 | 242.46 | 11,484.31 | 970.35 | -2,582.05 | 14,455,507.59 | 1,738,614.30 | 39.80386988 | -80.65035664 |
| 12,024.00 | 51.44 | 236.65 | 11,513.51 | 951.70 | -2,613.79 | 14,455,488.95 | 1,738,582.56 | 39.80381900 | -80.65046991 |
| 12,072.00 | 50.46 | 231.71 | 11,543.76 | 929.91 | -2,644.01 | 14,455,467.15 | 1,738,552.34 | 39.80375948 | -80.65057780 |
| 12,119.00 | 51.13 | 229.51 | 11,573.48 | 906.80 | -2,672.15 | 14,455,444.04 | 1,738,524.20 | 39.80369631 | -80.65067832 |

| | | | |
|------------------|--------------------------------|-------------------------------------|---|
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| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Sidetrack 01 | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Sidetrack 01 | Database: | DB_Dec2220_v16 |

Survey

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---------------------|-----------------|-------------|---------------------|------------|------------|---------------------|--------------------|-------------|--------------|
| 12,167.00 | 52.72 | 224.53 | 11,603.09 | 881.04 | -2,699.76 | 14,455,418.28 | 1,738,496.59 | 39.80362587 | -80.65077700 |
| 12,214.00 | 54.53 | 220.25 | 11,630.97 | 853.09 | -2,725.25 | 14,455,390.33 | 1,738,471.10 | 39.80354939 | -80.65086814 |
| 12,261.00 | 56.16 | 216.24 | 11,657.70 | 822.73 | -2,749.17 | 14,455,359.97 | 1,738,447.19 | 39.80346627 | -80.65095371 |
| 12,308.00 | 58.06 | 214.13 | 11,683.22 | 790.48 | -2,771.90 | 14,455,327.72 | 1,738,424.45 | 39.80337793 | -80.65103509 |
| 12,356.00 | 59.88 | 211.57 | 11,707.97 | 755.92 | -2,794.20 | 14,455,293.16 | 1,738,402.15 | 39.80328328 | -80.65111497 |
| 12,403.00 | 62.26 | 207.61 | 11,730.71 | 720.16 | -2,814.49 | 14,455,257.40 | 1,738,381.86 | 39.80318527 | -80.65118771 |
| 12,451.00 | 64.56 | 203.64 | 11,752.20 | 681.46 | -2,833.03 | 14,455,218.70 | 1,738,363.32 | 39.80307921 | -80.65125427 |
| 12,498.00 | 67.04 | 200.03 | 11,771.47 | 641.68 | -2,848.96 | 14,455,178.92 | 1,738,347.39 | 39.80297011 | -80.65131154 |
| 12,546.00 | 69.42 | 196.24 | 11,789.28 | 599.32 | -2,862.82 | 14,455,136.56 | 1,738,333.53 | 39.80285395 | -80.65136147 |
| 12,593.00 | 72.38 | 192.93 | 11,804.66 | 556.35 | -2,873.99 | 14,455,093.59 | 1,738,322.36 | 39.80273606 | -80.65140183 |
| 12,640.00 | 74.68 | 189.94 | 11,817.99 | 512.18 | -2,882.92 | 14,455,049.42 | 1,738,313.44 | 39.80261485 | -80.65143423 |
| 12,687.00 | 76.45 | 186.06 | 11,829.71 | 467.12 | -2,889.24 | 14,455,004.36 | 1,738,307.11 | 39.80249117 | -80.65145738 |
| 12,734.00 | 78.52 | 182.84 | 11,839.89 | 421.38 | -2,892.80 | 14,454,958.62 | 1,738,303.56 | 39.80236560 | -80.65147067 |
| 12,781.00 | 80.20 | 179.40 | 11,848.57 | 375.21 | -2,893.70 | 14,454,912.45 | 1,738,302.66 | 39.80223881 | -80.65147451 |
| 12,829.00 | 81.26 | 175.17 | 11,856.31 | 327.90 | -2,891.45 | 14,454,865.14 | 1,738,304.90 | 39.80210887 | -80.65146717 |
| 12,876.00 | 81.22 | 170.33 | 11,863.47 | 281.83 | -2,885.59 | 14,454,819.08 | 1,738,310.76 | 39.80198230 | -80.65144694 |
| 12,924.00 | 82.10 | 166.76 | 11,870.43 | 235.30 | -2,876.16 | 14,454,772.54 | 1,738,332.33 | 39.80185439 | -80.65141401 |
| 12,971.00 | 84.31 | 163.10 | 11,876.00 | 190.24 | -2,864.02 | 14,454,727.48 | 1,738,332.33 | 39.80173054 | -80.65137143 |
| 13,019.00 | 85.46 | 159.71 | 11,880.28 | 144.94 | -2,848.78 | 14,454,682.18 | 1,738,347.57 | 39.80160595 | -80.65131778 |
| 13,066.00 | 85.42 | 155.21 | 11,884.02 | 101.68 | -2,830.82 | 14,454,638.92 | 1,738,365.53 | 39.80148696 | -80.65125446 |
| 13,113.00 | 85.15 | 153.18 | 11,887.88 | 59.51 | -2,810.44 | 14,454,596.75 | 1,738,385.92 | 39.80137094 | -80.65118245 |
| 13,160.00 | 87.80 | 153.18 | 11,890.77 | 17.65 | -2,789.27 | 14,454,554.89 | 1,738,407.08 | 39.80125575 | -80.65110768 |
| 13,208.00 | 88.73 | 151.95 | 11,892.22 | -24.93 | -2,767.17 | 14,454,512.31 | 1,738,429.19 | 39.80113858 | -80.65102956 |
| 13,255.00 | 89.70 | 149.57 | 11,892.87 | -65.94 | -2,744.21 | 14,454,471.31 | 1,738,452.14 | 39.80102572 | -80.65094841 |
| 13,303.00 | 89.70 | 150.06 | 11,893.12 | -107.43 | -2,720.08 | 14,454,429.81 | 1,738,476.27 | 39.80091152 | -80.65086306 |
| 13,397.00 | 89.79 | 150.94 | 11,893.54 | -189.24 | -2,673.79 | 14,454,348.00 | 1,738,522.56 | 39.80068635 | -80.65069940 |
| 13,491.00 | 89.70 | 150.14 | 11,893.95 | -271.08 | -2,627.56 | 14,454,266.16 | 1,738,568.79 | 39.80046109 | -80.65053594 |
| 13,585.00 | 89.70 | 150.06 | 11,894.45 | -352.57 | -2,580.70 | 14,454,184.67 | 1,738,615.65 | 39.80023681 | -80.65037024 |
| 13,679.00 | 89.70 | 149.79 | 11,894.94 | -433.91 | -2,533.60 | 14,454,103.33 | 1,738,662.75 | 39.80001291 | -80.65020366 |
| 13,773.00 | 89.84 | 149.75 | 11,895.32 | -515.13 | -2,486.27 | 14,454,022.11 | 1,738,710.08 | 39.79978937 | -80.65003630 |
| 13,866.00 | 89.26 | 149.70 | 11,896.05 | -595.44 | -2,439.39 | 14,453,941.80 | 1,738,756.96 | 39.79956830 | -80.64987049 |
| 13,961.00 | 89.22 | 149.79 | 11,897.31 | -677.50 | -2,391.53 | 14,453,859.75 | 1,738,804.82 | 39.79934245 | -80.64970123 |
| 14,056.00 | 89.13 | 150.23 | 11,898.67 | -759.77 | -2,344.05 | 14,453,777.47 | 1,738,852.30 | 39.79911601 | -80.64953333 |
| 14,150.00 | 89.22 | 149.39 | 11,900.03 | -841.01 | -2,296.78 | 14,453,696.23 | 1,738,899.57 | 39.79889239 | -80.64936619 |
| 14,245.00 | 89.22 | 149.57 | 11,901.32 | -922.84 | -2,248.54 | 14,453,614.40 | 1,738,947.81 | 39.79866715 | -80.64919558 |
| 14,340.00 | 89.26 | 150.10 | 11,902.58 | -1,004.97 | -2,200.81 | 14,453,532.28 | 1,738,995.54 | 39.79844109 | -80.64902679 |
| 14,435.00 | 89.26 | 149.57 | 11,903.81 | -1,087.10 | -2,153.08 | 14,453,450.15 | 1,739,043.27 | 39.79821503 | -80.64885800 |
| 14,529.00 | 89.26 | 149.66 | 11,905.02 | -1,168.18 | -2,105.53 | 14,453,369.07 | 1,739,090.82 | 39.79799185 | -80.64868987 |
| 14,623.00 | 89.31 | 149.31 | 11,906.20 | -1,249.15 | -2,057.81 | 14,453,288.09 | 1,739,138.54 | 39.79776896 | -80.64852108 |
| 14,718.00 | 89.22 | 149.44 | 11,907.41 | -1,330.90 | -2,009.42 | 14,453,206.35 | 1,739,186.93 | 39.79754396 | -80.64834995 |
| 14,812.00 | 89.22 | 149.70 | 11,908.69 | -1,411.94 | -1,961.81 | 14,453,125.31 | 1,739,234.54 | 39.79732088 | -80.64818160 |
| 14,907.00 | 89.00 | 149.88 | 11,910.17 | -1,494.03 | -1,914.02 | 14,453,043.22 | 1,739,282.33 | 39.79709493 | -80.64801258 |
| 15,002.00 | 89.09 | 149.09 | 11,911.75 | -1,575.86 | -1,865.79 | 14,452,961.39 | 1,739,330.56 | 39.79686968 | -80.64784202 |
| 15,097.00 | 89.00 | 149.66 | 11,913.34 | -1,657.59 | -1,817.40 | 14,452,879.65 | 1,739,378.95 | 39.79664469 | -80.64767090 |
| 15,191.00 | 89.04 | 149.83 | 11,914.94 | -1,738.78 | -1,770.04 | 14,452,798.47 | 1,739,426.31 | 39.79642123 | -80.64750344 |
| 15,286.00 | 88.86 | 148.42 | 11,916.69 | -1,820.30 | -1,721.30 | 14,452,716.95 | 1,739,475.05 | 39.79619682 | -80.64733106 |
| 15,380.00 | 88.82 | 149.26 | 11,918.59 | -1,900.72 | -1,672.68 | 14,452,636.52 | 1,739,523.67 | 39.79597544 | -80.64715907 |
| 15,475.00 | 88.78 | 149.79 | 11,920.58 | -1,982.58 | -1,624.51 | 14,452,554.67 | 1,739,571.84 | 39.79575012 | -80.64698873 |
| 15,569.00 | 88.73 | 149.92 | 11,922.62 | -2,063.85 | -1,577.31 | 14,452,473.40 | 1,739,619.04 | 39.79552643 | -80.64682185 |
| 15,664.00 | 89.09 | 149.61 | 11,924.43 | -2,145.91 | -1,529.48 | 14,452,391.34 | 1,739,666.87 | 39.79530055 | -80.64665273 |
| 15,758.00 | 89.44 | 149.39 | 11,925.63 | -2,226.90 | -1,481.78 | 14,452,310.35 | 1,739,714.57 | 39.79507762 | -80.64648403 |
| 15,853.00 | 89.48 | 149.66 | 11,926.53 | -2,308.77 | -1,433.60 | 14,452,228.48 | 1,739,762.75 | 39.79485226 | -80.64631367 |
| 15,946.00 | 89.57 | 149.53 | 11,927.30 | -2,388.97 | -1,386.53 | 14,452,148.27 | 1,739,809.82 | 39.79463148 | -80.64614723 |
| 16,040.00 | 89.00 | 149.75 | 11,928.47 | -2,470.08 | -1,339.03 | 14,452,067.17 | 1,739,857.32 | 39.79440824 | -80.64597925 |
| 16,134.00 | 88.78 | 149.70 | 11,930.29 | -2,551.24 | -1,291.65 | 14,451,986.01 | 1,739,904.70 | 39.79418483 | -80.64581171 |

| | | | |
|------------------|--------------------------------|-------------------------------------|---|
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| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
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| Wellbore: | Sidetrack 01 | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Sidetrack 01 | Database: | DB_Dec2220_v16 |

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---|-----------------|-------------|---------------------|------------|------------|---------------------|--------------------|-------------|--------------|
| 16,229.00 | 88.86 | 149.61 | 11,932.25 | -2,633.21 | -1,243.66 | 14,451,904.04 | 1,739,952.69 | 39.79395921 | -80.64564204 |
| 16,323.00 | 88.82 | 149.35 | 11,934.15 | -2,714.17 | -1,195.93 | 14,451,823.08 | 1,740,000.41 | 39.79373635 | -80.64547327 |
| 16,418.00 | 88.91 | 149.13 | 11,936.03 | -2,795.79 | -1,147.36 | 14,451,741.46 | 1,740,048.99 | 39.79351168 | -80.64530149 |
| 16,512.00 | 88.95 | 148.95 | 11,937.79 | -2,876.38 | -1,099.01 | 14,451,660.87 | 1,740,097.34 | 39.79328983 | -80.64513050 |
| 16,606.00 | 89.31 | 149.35 | 11,939.22 | -2,957.07 | -1,050.81 | 14,451,580.18 | 1,740,145.54 | 39.79306771 | -80.64496006 |
| 16,701.00 | 89.22 | 149.09 | 11,940.44 | -3,038.68 | -1,002.20 | 14,451,498.56 | 1,740,194.15 | 39.79284305 | -80.64478816 |
| 16,796.00 | 89.31 | 149.04 | 11,941.65 | -3,120.16 | -953.37 | 14,451,417.09 | 1,740,242.98 | 39.79261876 | -80.64461547 |
| 16,890.00 | 89.31 | 149.48 | 11,942.79 | -3,200.95 | -905.32 | 14,451,336.30 | 1,740,291.02 | 39.79239637 | -80.64444558 |
| 16,985.00 | 89.26 | 149.04 | 11,943.97 | -3,282.60 | -856.77 | 14,451,254.65 | 1,740,339.58 | 39.79217163 | -80.64427388 |
| 17,077.00 | 89.22 | 149.48 | 11,945.19 | -3,361.66 | -809.75 | 14,451,175.59 | 1,740,386.60 | 39.79195398 | -80.64410761 |
| 17,172.00 | 89.31 | 149.22 | 11,946.41 | -3,443.38 | -761.32 | 14,451,093.87 | 1,740,435.03 | 39.79172902 | -80.64393637 |
| 17,265.00 | 89.35 | 149.09 | 11,947.50 | -3,523.22 | -713.64 | 14,451,014.03 | 1,740,482.71 | 39.79150924 | -80.64376777 |
| 17,360.00 | 89.31 | 149.57 | 11,948.61 | -3,604.93 | -665.19 | 14,450,932.32 | 1,740,531.16 | 39.79128433 | -80.64359643 |
| 17,454.00 | 89.31 | 149.48 | 11,949.74 | -3,685.94 | -617.52 | 14,450,851.31 | 1,740,578.83 | 39.79106134 | -80.64342788 |
| 17,549.00 | 89.09 | 148.87 | 11,951.07 | -3,767.51 | -568.84 | 14,450,769.74 | 1,740,627.51 | 39.79083680 | -80.64325576 |
| 17,644.00 | 88.64 | 148.82 | 11,952.95 | -3,848.79 | -519.70 | 14,450,688.46 | 1,740,676.64 | 39.79061304 | -80.64308199 |
| 17,739.00 | 88.91 | 150.54 | 11,954.98 | -3,930.78 | -471.76 | 14,450,606.48 | 1,740,724.59 | 39.79038737 | -80.64291247 |
| 17,833.00 | 88.95 | 150.01 | 11,956.74 | -4,012.39 | -425.16 | 14,450,524.86 | 1,740,771.19 | 39.79016272 | -80.64274774 |
| 17,928.00 | 88.95 | 150.32 | 11,958.48 | -4,094.79 | -377.90 | 14,450,442.46 | 1,740,818.45 | 39.78993592 | -80.64258069 |
| 18,022.00 | 88.86 | 149.53 | 11,960.27 | -4,176.12 | -330.80 | 14,450,361.14 | 1,740,865.54 | 39.78971206 | -80.64241419 |
| 18,116.00 | 88.73 | 150.10 | 11,962.25 | -4,257.35 | -283.55 | 14,450,279.90 | 1,740,912.79 | 39.78948845 | -80.64224714 |
| 18,211.00 | 88.86 | 149.31 | 11,964.25 | -4,339.36 | -235.64 | 14,450,197.89 | 1,740,960.71 | 39.78926271 | -80.64207775 |
| 18,305.00 | 89.04 | 149.57 | 11,965.97 | -4,420.29 | -187.86 | 14,450,116.96 | 1,741,008.49 | 39.78903993 | -80.64190880 |
| 18,400.00 | 89.04 | 149.92 | 11,967.56 | -4,502.34 | -140.00 | 14,450,034.91 | 1,741,056.35 | 39.78881408 | -80.64173960 |
| 18,493.00 | 89.04 | 149.92 | 11,969.12 | -4,582.80 | -93.39 | 14,449,954.45 | 1,741,102.96 | 39.78859260 | -80.64157484 |
| 18,588.00 | 89.04 | 149.48 | 11,970.71 | -4,664.81 | -45.47 | 14,449,872.44 | 1,741,150.88 | 39.78836685 | -80.64140541 |
| 18,683.00 | 89.09 | 149.79 | 11,972.26 | -4,746.77 | 2.55 | 14,449,790.48 | 1,741,198.90 | 39.78814125 | -80.64123565 |
| 18,778.00 | 89.04 | 149.92 | 11,973.81 | -4,828.91 | 50.25 | 14,449,708.34 | 1,741,246.60 | 39.78791514 | -80.64106702 |
| 18,872.00 | 89.04 | 149.31 | 11,975.39 | -4,909.99 | 97.79 | 14,449,627.26 | 1,741,294.14 | 39.78769196 | -80.64089895 |
| 18,967.00 | 88.91 | 149.57 | 11,977.09 | -4,991.78 | 146.08 | 14,449,545.47 | 1,741,342.43 | 39.78746681 | -80.64072821 |
| 19,062.00 | 88.51 | 149.97 | 11,979.23 | -5,073.84 | 193.90 | 14,449,463.41 | 1,741,390.25 | 39.78724093 | -80.64055917 |
| 19,156.00 | 88.60 | 149.79 | 11,981.60 | -5,155.12 | 241.06 | 14,449,382.13 | 1,741,437.40 | 39.78701719 | -80.64039247 |
| 19,251.00 | 88.60 | 149.35 | 11,983.92 | -5,237.01 | 289.16 | 14,449,300.24 | 1,741,485.50 | 39.78679177 | -80.64022242 |
| 19,346.00 | 88.95 | 149.83 | 11,985.95 | -5,318.92 | 337.24 | 14,449,218.33 | 1,741,533.58 | 39.78656630 | -80.64005245 |
| 19,439.00 | 89.00 | 149.79 | 11,987.61 | -5,399.29 | 383.99 | 14,449,137.96 | 1,741,580.34 | 39.78634506 | -80.63988716 |
| 19,533.00 | 88.95 | 149.57 | 11,989.29 | -5,480.42 | 431.44 | 14,449,056.83 | 1,741,627.79 | 39.78612173 | -80.63971943 |
| 19,627.00 | 89.00 | 149.26 | 11,990.97 | -5,561.33 | 479.26 | 14,448,975.92 | 1,741,675.61 | 39.78589901 | -80.63955036 |
| 19,722.00 | 88.95 | 149.53 | 11,992.67 | -5,643.09 | 527.62 | 14,448,894.17 | 1,741,723.97 | 39.78567396 | -80.63937940 |
| 19,816.00 | 89.26 | 149.39 | 11,994.14 | -5,724.04 | 575.38 | 14,448,813.22 | 1,741,771.72 | 39.78545112 | -80.63921056 |
| 19,910.00 | 89.22 | 150.10 | 11,995.39 | -5,805.22 | 622.74 | 14,448,732.03 | 1,741,819.08 | 39.78522764 | -80.63904315 |
| 20,005.00 | 89.22 | 150.01 | 11,996.68 | -5,887.53 | 670.15 | 14,448,649.72 | 1,741,866.50 | 39.78500107 | -80.63887555 |
| 20,100.00 | 89.09 | 149.61 | 11,998.08 | -5,969.64 | 717.92 | 14,448,567.61 | 1,741,914.27 | 39.78477506 | -80.63870670 |
| 20,194.00 | 88.91 | 150.19 | 11,999.72 | -6,050.95 | 765.06 | 14,448,486.30 | 1,741,961.40 | 39.78455123 | -80.63854009 |
| 20,288.00 | 88.86 | 150.98 | 12,001.55 | -6,132.82 | 811.21 | 14,448,404.44 | 1,742,007.56 | 39.78432590 | -80.63837697 |
| 20,383.00 | 88.82 | 149.61 | 12,003.48 | -6,215.31 | 858.28 | 14,448,321.94 | 1,742,054.62 | 39.78409882 | -80.63821062 |
| 20,478.00 | 88.73 | 149.09 | 12,005.51 | -6,297.02 | 906.70 | 14,448,240.23 | 1,742,103.04 | 39.78387389 | -80.63803945 |
| 20,573.00 | 88.73 | 149.92 | 12,007.61 | -6,378.86 | 954.89 | 14,448,158.39 | 1,742,151.24 | 39.78364861 | -80.63786907 |
| 20,667.00 | 88.73 | 149.13 | 12,009.70 | -6,459.85 | 1,002.55 | 14,448,077.40 | 1,742,198.90 | 39.78342565 | -80.63770059 |
| 20,762.00 | 88.73 | 149.22 | 12,011.80 | -6,541.41 | 1,051.22 | 14,447,995.84 | 1,742,247.57 | 39.78320113 | -80.63752853 |
| 20,857.00 | 88.73 | 149.70 | 12,013.91 | -6,623.22 | 1,099.48 | 14,447,914.04 | 1,742,295.83 | 39.78297595 | -80.63735793 |
| 20,931.00 | 88.78 | 149.13 | 12,015.52 | -6,686.91 | 1,137.13 | 14,447,850.35 | 1,742,333.47 | 39.78280062 | -80.63722486 |
| Survey @ 20931.00 MD 12015.52 TVD | | | | | | | | | |
| 20,965.00 | 88.78 | 149.13 | 12,016.24 | -6,716.08 | 1,154.57 | 14,447,821.17 | 1,742,350.91 | 39.78272030 | -80.63716320 |
| Survey Proj. to 20965.00 MD 12016.24 TVD | | | | | | | | | |

| | | | |
|------------------|--------------------------------|-------------------------------------|---|
| Company: | Tug Hill Operating LLC | Local Co-ordinate Reference: | Well Fitzgerald 19 HU (slot O) |
| Project: | Marshall County, West Virginia | TVD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Site: | Fitzgerald | MD Reference: | RKB=1292.91+26 @ 1318.91ft (Nabors B28) |
| Well: | Fitzgerald 19 HU (slot O) | North Reference: | Grid |
| Wellbore: | Sidetrack 01 | Survey Calculation Method: | Minimum Curvature |
| Design: | Surveys Sidetrack 01 | Database: | DB_Dec2220_v16 |

| Design Annotations | | | | |
|---------------------|---------------------|-------------------|------------|--|
| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates | | Comment |
| | | +N/-S (ft) | +E/-W (ft) | |
| 6,962.00 | 6,834.27 | 362.28 | -952.79 | Tie into original hole @ 6962 MD |
| 20,931.00 | 12,015.52 | -6,686.91 | 1,137.13 | Survey @ 20931.00 MD 12015.52 TVD |
| 20,965.00 | 12,016.24 | -6,716.08 | 1,154.57 | Survey Proj. to 20965.00 MD 12016.24 TVD |