VES SURVEY INTERNATIONAL

September 25, 2015

Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

Attn: Kanicia Castillo

RE: **Queso State No 006H**

Please find enclosed a copy of the survey from 0' to 8800' ran on the above referenced well.

Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
§
COUNTY OF NUECES §

This instrument was acknowledged before me on the 25 day of September A.D., 2015, by Keith Havelka.

Jennifer Ann Byerly
Notary Public, State of Texas

JENNIFER ANN BYERLY
Notary Public, State of Texas
My Commission Expires
August 16, 2017

**VES Survey International**
P.O. Box 261021, Corpus Christi, Texas 78426
T (361) 767-0602 F (361) 767-0612
www.vessurvey.com

Company: Concho
Lease/Well: Queso State No/006H
Location: P-36-28S-32E- P-373-S-280-E-LEA
Rig Name: Patriot 2
State/County: New Mexico/Lea
VS-Azi: 0.00 Degrees
Latitude: 32.25532, Longitude: -103.62064
Grid North = True North -0.38 degs

RKB : 20 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS
Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 9/25/2015 / 15:14

VES Survey International
Fort Worth Tx
Surveyor: Jason Wilson
( 817 ) 718-1320
Queso State No 006H / API 30-025-42741

| Measured Depth FT | Incl Angle Deg | Drift Direction Deg | TVD FT | +N/-S FT | +E/-W FT | Vertical Section FT | Closure Distance FT | Closure Direction Deg | Dogleg Severity Deg/100 |
|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | **** |
| 50.00 | 0.49 | 301.97 | 50.00 | 0.11 | -0.18 | 0.11 | 0.21 | 301.97 | 0.98 |
| 100.00 | 0.69 | 257.54 | 100.00 | 0.16 | -0.66 | 0.16 | 0.68 | 283.87 | 0.96 |
| 200.00 | 0.62 | 273.07 | 199.99 | 0.06 | -1.78 | 0.06 | 1.79 | 271.98 | 0.19 |
| 300.00 | 0.50 | 279.73 | 299.99 | 0.16 | -2.75 | 0.16 | 2.76 | 273.41 | 0.14 |
| 400.00 | 0.43 | 285.38 | 399.98 | 0.34 | -3.54 | 0.34 | 3.56 | 275.44 | 0.08 |
| 500.00 | 0.54 | 251.59 | 499.98 | 0.29 | -4.35 | 0.29 | 4.36 | 273.80 | 0.30 |
| 600.00 | 0.47 | 270.92 | 599.98 | 0.15 | -5.21 | 0.15 | 5.21 | 271.62 | 0.18 |
| 700.00 | 0.42 | 259.75 | 699.97 | 0.09 | -5.98 | 0.09 | 5.98 | 270.85 | 0.10 |
| 800.00 | 0.17 | 211.70 | 799.97 | -0.10 | -6.41 | -0.10 | 6.41 | 269.09 | 0.33 |
| 900.00 | 0.49 | 335.74 | 899.97 | 0.16 | -6.67 | 0.16 | 6.67 | 271.40 | 0.60 |
| 1000.00 | 0.86 | 48.16 | 999.96 | 1.05 | -6.28 | 1.05 | 6.37 | 279.51 | 0.85 |
| 1100.00 | 0.89 | 2.44 | 1099.95 | 2.33 | -5.69 | 2.33 | 6.15 | 292.29 | 0.68 |
| 1200.00 | 0.82 | 356.17 | 1199.94 | 3.83 | -5.71 | 3.83 | 6.87 | 303.86 | 0.12 |
| 1300.00 | 0.72 | 6.87 | 1299.93 | 5.17 | -5.68 | 5.17 | 7.68 | 312.32 | 0.18 |
| 1400.00 | 0.91 | 42.96 | 1399.92 | 6.37 | -5.06 | 6.37 | 8.14 | 321.54 | 0.53 |
| 1500.00 | 1.28 | 35.97 | 1499.91 | 7.86 | -3.87 | 7.86 | 8.76 | 333.78 | 0.39 |
| 1600.00 | 0.98 | 24.77 | 1599.89 | 9.53 | -2.86 | 9.53 | 9.95 | 343.33 | 0.37 |
| 1700.00 | 1.22 | 354.84 | 1699.87 | 11.38 | -2.59 | 11.38 | 11.67 | 347.15 | 0.62 |


VES Survey Date: 9/23/2015

| Measured Depth FT | Incl Angle Deg | Drift Direction Deg | TVD FT | +N/-S FT | +E/-W FT | Vertical Section FT | Closure Distance FT | Closure Direction Deg | Dogleg Severity Deg/100 |
|---|---|---|---|---|---|---|---|---|---|
| 1800.00 | 1.19 | 349.49 | 1799.85 | 13.46 | -2.88 | 13.46 | 13.76 | 347.93 | 0.12 |
| 1900.00 | 1.10 | 327.45 | 1899.83 | 15.29 | -3.58 | 15.29 | 15.70 | 346.80 | 0.45 |
| 2000.00 | 0.18 | 281.52 | 1999.82 | 16.13 | -4.26 | 16.13 | 16.68 | 345.21 | 0.98 |
| 2100.00 | 0.12 | 263.23 | 2099.82 | 16.15 | -4.52 | 16.15 | 16.77 | 344.37 | 0.08 |
| 2200.00 | 0.26 | 274.99 | 2199.82 | 16.16 | -4.84 | 16.16 | 16.87 | 343.32 | 0.14 |
| 2300.00 | 0.38 | 298.57 | 2299.82 | 16.34 | -5.36 | 16.34 | 17.19 | 341.85 | 0.18 |
| 2400.00 | 0.34 | 14.79 | 2399.82 | 16.78 | -5.57 | 16.78 | 17.68 | 341.63 | 0.44 |
| 2500.00 | 0.37 | 357.81 | 2499.81 | 17.39 | -5.51 | 17.39 | 18.24 | 342.42 | 0.11 |
| 2600.00 | 0.44 | 288.34 | 2599.81 | 17.83 | -5.89 | 17.83 | 18.78 | 341.73 | 0.47 |
| 2700.00 | 0.35 | 289.47 | 2699.81 | 18.06 | -6.54 | 18.06 | 19.20 | 340.10 | 0.09 |
| 2800.00 | 0.42 | 299.07 | 2799.81 | 18.34 | -7.15 | 18.34 | 19.68 | 338.71 | 0.10 |
| 2900.00 | 0.57 | 301.10 | 2899.80 | 18.77 | -7.90 | 18.77 | 20.37 | 337.19 | 0.15 |
| 3000.00 | 0.63 | 329.31 | 2999.80 | 19.51 | -8.60 | 19.51 | 21.32 | 336.20 | 0.30 |
| 3100.00 | 0.70 | 82.86 | 3099.79 | 20.06 | -8.28 | 20.06 | 21.70 | 337.57 | 1.12 |
| 3200.00 | 2.27 | 81.47 | 3199.76 | 20.43 | -5.71 | 20.43 | 21.21 | 344.38 | 1.57 |
| 3300.00 | 2.46 | 89.07 | 3299.67 | 20.76 | -1.61 | 20.76 | 20.82 | 355.57 | 0.36 |
| 3400.00 | 2.57 | 82.82 | 3399.58 | 21.07 | 2.76 | 21.07 | 21.25 | 7.47 | 0.30 |
| 3500.00 | 2.49 | 85.72 | 3499.48 | 21.51 | 7.15 | 21.51 | 22.67 | 18.39 | 0.15 |
| 3600.00 | 2.30 | 80.11 | 3599.39 | 22.02 | 11.29 | 22.02 | 24.75 | 27.15 | 0.30 |
| 3700.00 | 2.31 | 79.37 | 3699.31 | 22.74 | 15.25 | 22.74 | 27.38 | 33.85 | 0.03 |
| 3800.00 | 2.35 | 84.34 | 3799.23 | 23.31 | 19.27 | 23.31 | 30.24 | 39.58 | 0.21 |
| 3900.00 | 2.42 | 81.78 | 3899.14 | 23.81 | 23.41 | 23.81 | 33.39 | 44.51 | 0.13 |
| 4000.00 | 2.65 | 86.05 | 3999.04 | 24.27 | 27.80 | 24.27 | 36.91 | 48.87 | 0.30 |
| 4100.00 | 2.63 | 86.29 | 4098.94 | 24.58 | 32.39 | 24.58 | 40.66 | 52.81 | 0.03 |
| 4200.00 | 2.68 | 85.88 | 4198.83 | 24.90 | 37.01 | 24.90 | 44.60 | 56.07 | 0.05 |
| 4300.00 | 2.89 | 88.66 | 4298.71 | 25.12 | 41.85 | 25.12 | 48.81 | 59.02 | 0.25 |
| 4400.00 | 3.27 | 89.42 | 4398.57 | 25.21 | 47.22 | 25.21 | 53.53 | 61.90 | 0.39 |
| 4500.00 | 3.41 | 91.78 | 4498.40 | 25.15 | 53.05 | 25.15 | 58.71 | 64.64 | 0.19 |
| 4600.00 | 3.44 | 96.92 | 4598.22 | 24.70 | 59.00 | 24.70 | 63.96 | 67.29 | 0.31 |
| 4700.00 | 3.87 | 110.39 | 4698.02 | 23.16 | 65.14 | 23.16 | 69.13 | 70.43 | 0.96 |
| 4800.00 | 3.81 | 111.68 | 4797.79 | 20.75 | 71.39 | 20.75 | 74.35 | 73.79 | 0.11 |
| 4900.00 | 3.71 | 119.12 | 4897.58 | 17.95 | 77.30 | 17.95 | 79.36 | 76.92 | 0.50 |
| 5000.00 | 3.49 | 114.12 | 4997.38 | 15.14 | 82.90 | 15.14 | 84.27 | 79.65 | 0.38 |
| 5100.00 | 3.13 | 119.09 | 5097.22 | 12.56 | 88.07 | 12.56 | 88.96 | 81.88 | 0.46 |
| 5200.00 | 1.81 | 135.23 | 5197.12 | 10.11 | 91.57 | 10.11 | 92.13 | 83.70 | 1.48 |
| 5300.00 | 1.21 | 119.08 | 5297.09 | 8.47 | 93.61 | 8.47 | 93.99 | 84.83 | 0.73 |
| 5400.00 | 1.13 | 117.30 | 5397.07 | 7.51 | 95.41 | 7.51 | 95.70 | 85.50 | 0.09 |
| 5500.00 | 0.85 | 134.74 | 5497.05 | 6.53 | 96.81 | 6.53 | 97.03 | 86.14 | 0.41 |
| 5600.00 | 0.80 | 137.71 | 5597.04 | 5.49 | 97.81 | 5.49 | 97.96 | 86.79 | 0.06 |

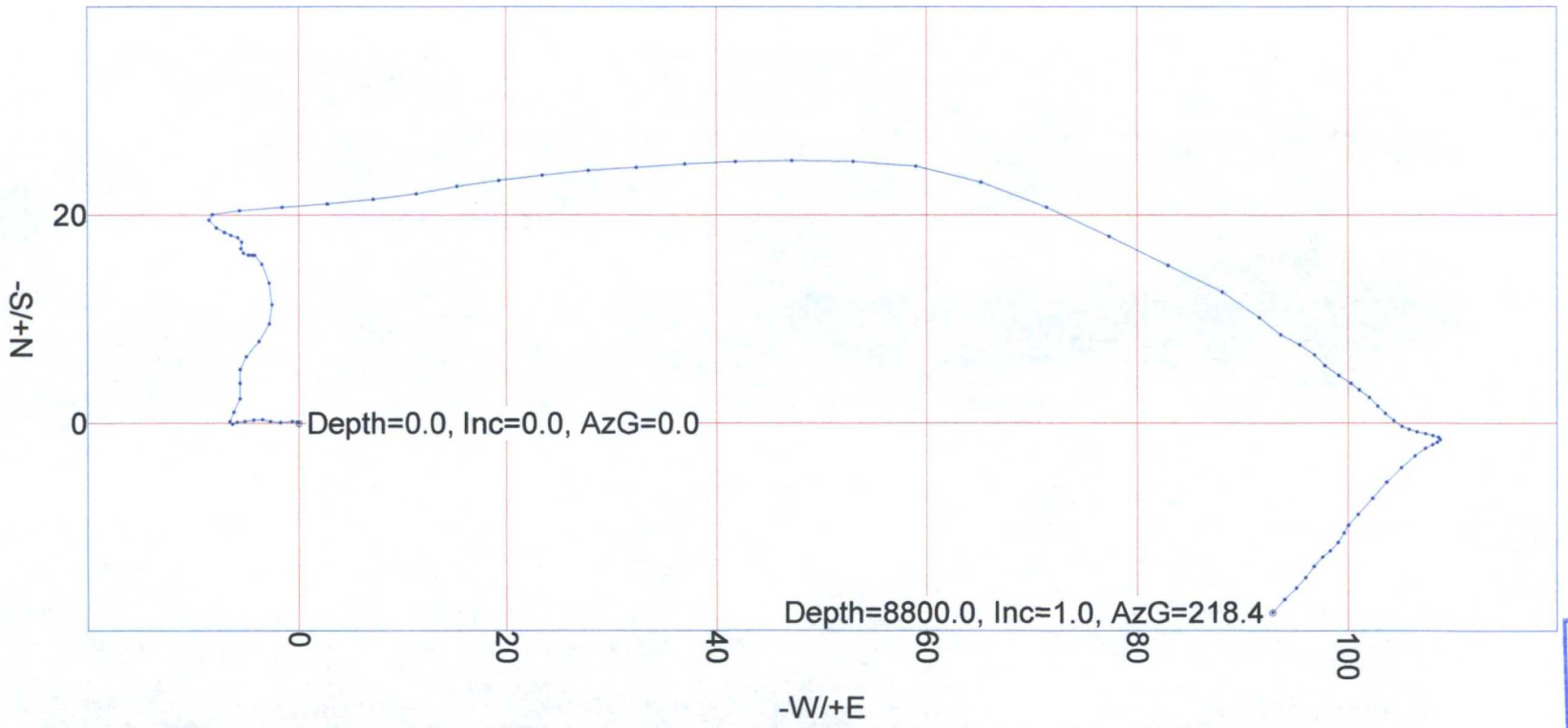


VES Survey Date: 9/23/2015

| Measured Depth FT | Incl Angle Deg | Drift Direction Deg | TVD FT | +N/-S FT | +E/-W FT | Vertical Section FT | Closure Distance FT | Closure Direction Deg | Dogleg Severity Deg/100 |
|---|---|---|---|---|---|---|---|---|---|
| 5700.00 | 1.09 | 115.08 | 5697.03 | 4.57 | 99.14 | 4.57 | 99.25 | 87.36 | 0.47 |
| 5800.00 | 0.52 | 140.63 | 5797.02 | 3.82 | 100.29 | 3.82 | 100.36 | 87.82 | 0.66 |
| 5900.00 | 0.63 | 121.16 | 5897.01 | 3.18 | 101.05 | 3.18 | 101.10 | 88.20 | 0.22 |
| 6000.00 | 0.80 | 130.08 | 5997.00 | 2.44 | 102.06 | 2.44 | 102.09 | 88.63 | 0.20 |
| 6100.00 | 0.50 | 146.30 | 6097.00 | 1.63 | 102.84 | 1.63 | 102.85 | 89.09 | 0.35 |
| 6200.00 | 0.66 | 123.92 | 6196.99 | 0.94 | 103.56 | 0.94 | 103.56 | 89.48 | 0.28 |
| 6300.00 | 0.56 | 138.85 | 6296.99 | 0.25 | 104.36 | 0.25 | 104.36 | 89.86 | 0.19 |
| 6400.00 | 0.57 | 113.94 | 6396.98 | -0.32 | 105.14 | -0.32 | 105.14 | 90.18 | 0.24 |
| 6500.00 | 0.30 | 108.85 | 6496.98 | -0.61 | 105.85 | -0.61 | 105.85 | 90.33 | 0.27 |
| 6600.00 | 0.56 | 105.10 | 6596.98 | -0.82 | 106.57 | -0.82 | 106.57 | 90.44 | 0.26 |
| 6700.00 | 0.43 | 101.20 | 6696.97 | -1.02 | 107.40 | -1.02 | 107.41 | 90.55 | 0.13 |
| 6800.00 | 0.38 | 109.40 | 6796.97 | -1.20 | 108.08 | -1.20 | 108.09 | 90.64 | 0.08 |
| 6900.00 | 0.28 | 102.74 | 6896.97 | -1.37 | 108.62 | -1.37 | 108.63 | 90.72 | 0.11 |
| 7000.00 | 0.21 | 209.55 | 6996.97 | -1.58 | 108.77 | -1.58 | 108.78 | 90.83 | 0.39 |
| 7100.00 | 0.22 | 238.15 | 7096.97 | -1.85 | 108.51 | -1.85 | 108.53 | 90.97 | 0.11 |
| 7200.00 | 0.35 | 246.70 | 7196.97 | -2.07 | 108.07 | -2.07 | 108.09 | 91.10 | 0.13 |
| 7300.00 | 0.54 | 240.04 | 7296.96 | -2.42 | 107.38 | -2.42 | 107.41 | 91.29 | 0.21 |
| 7400.00 | 0.86 | 230.52 | 7396.96 | -3.14 | 106.39 | -3.14 | 106.43 | 91.69 | 0.34 |
| 7500.00 | 1.10 | 227.50 | 7496.94 | -4.27 | 105.10 | -4.27 | 105.19 | 92.32 | 0.25 |
| 7600.00 | 1.18 | 221.85 | 7596.92 | -5.68 | 103.71 | -5.68 | 103.86 | 93.14 | 0.14 |
| 7700.00 | 1.20 | 220.29 | 7696.90 | -7.24 | 102.34 | -7.24 | 102.60 | 94.05 | 0.04 |
| 7800.00 | 1.15 | 223.30 | 7796.88 | -8.77 | 100.98 | -8.77 | 101.36 | 94.96 | 0.08 |
| 7900.00 | 0.49 | 218.45 | 7896.87 | -9.84 | 100.02 | -9.84 | 100.51 | 95.62 | 0.67 |
| 8000.00 | 0.47 | 201.55 | 7996.86 | -10.55 | 99.61 | -10.55 | 100.17 | 96.05 | 0.14 |
| 8100.00 | 0.76 | 215.42 | 8096.86 | -11.48 | 99.07 | -11.48 | 99.73 | 96.61 | 0.33 |
| 8200.00 | 0.52 | 235.53 | 8196.85 | -12.28 | 98.31 | -12.28 | 99.08 | 97.12 | 0.33 |
| 8300.00 | 0.59 | 225.60 | 8296.85 | -12.89 | 97.57 | -12.89 | 98.42 | 97.53 | 0.12 |
| 8400.00 | 0.80 | 219.42 | 8396.84 | -13.79 | 96.76 | -13.79 | 97.74 | 98.11 | 0.22 |
| 8500.00 | 0.72 | 213.97 | 8496.83 | -14.85 | 95.97 | -14.85 | 97.11 | 98.79 | 0.10 |
| 8600.00 | 0.85 | 226.91 | 8596.82 | -15.88 | 95.08 | -15.88 | 96.39 | 99.48 | 0.22 |
| 8700.00 | 0.95 | 225.03 | 8696.81 | -16.97 | 93.95 | -16.97 | 95.47 | 100.24 | 0.11 |
| 8800.00 | 0.98 | 218.42 | 8796.80 | -18.23 | 92.83 | -18.23 | 94.60 | 101.11 | 0.12 |


VES Survey Date: 9/23/2015

VES Survey International
Fort Worth Tx
Surveyor: Jason Wilson
( 817 ) 718-1320
Queso State No 006H / API 30-025-42741






VES Survey Date: 9/23/2015

VES SURVEY INTERNATIONAL

I Jason Wilson certify that I am employed by Vaughn Energy Services. That I did on the day(s) of 09/24/15 through 09/24/15 conduct or supervise the taking of a Ha Gyro survey from a depth of 0 feet to a depth of 8800 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Vaughn Energy Services, that I am authorized and qualified to make this report; that this survey was conducted at the request of Concho for the Queso State Well # 006H API # 30-025-42741 in Lea County / Parish New Mexico ; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Vaughn Energy Services

Jason Wilson
Service Technician
Vaughn Energy Services

CONCHO

# COG Operating LLC

**Lea County, NM (NAD27 NME)**
**Queso State**
**#6H**

**OH**

**Survey: MWD #1**

# Survey Report - Geographic

**02 October, 2015**

| | | | |
|---|---|---|---|
| **Company:** | COG Operating LLC | **Local Co-ordinate Reference:** | Well #6H |
| **Project:** | Lea County, NM (NAD27 NME) | **TVD Reference:** | WELL @ 3659.0usft (20' KB) |
| **Site:** | Queso State | **MD Reference:** | WELL @ 3659.0usft (20' KB) |
| **Well:** | #6H | **North Reference:** | Grid |
| **Wellbore:** | OH | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | OH | **Database:** | EDM 5000.1 Single User Db |

**Project** Lea County, NM (NAD27 NME)

| | | | |
|---|---|---|---|
| **Map System:** | US State Plane 1927 (Exact solution) | **System Datum:** | Mean Sea Level |
| **Geo Datum:** | NAD 1927 (NADCON CONUS) | | |
| **Map Zone:** | New Mexico East 3001 | | |

**Site** Queso State

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 457,175.20 usft | **Latitude:** | 32° 15' 17.563 N |
| **From:** | Map | **Easting:** | 720,457.30 usft | **Longitude:** | 103° 37' 12.709 W |
| **Position Uncertainty:** | 5.0 usft | **Slot Radius:** | 13-3/16 " | **Grid Convergence:** | 0.38 ° |

**Well** #6H

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 0.0 usft | **Northing:** | 457,175.20 usft | **Latitude:** | 32° 15' 17.563 N |
| | **+E/-W** | 0.0 usft | **Easting:** | 720,457.30 usft | **Longitude:** | 103° 37' 12.709 W |
| **Position Uncertainty** | | 0.0 usft | **Wellhead Elevation:** | usft | **Ground Level:** | 3,639.0 usft |

**Wellbore** OH

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF2010 | 9/15/2015 | 7.09 | 60.10 | 48,203 |

**Design** OH

**Audit Notes:**

| | | | | | |
|---|---|---|---|---|---|
| **Version:** | 1.0 | **Phase:** | ACTUAL | **Tie On Depth:** | 0.0 |

| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft) | +E/-W (usft) | Direction (°) |
|---|---|---|---|---|
| | 0.0 | 0.0 | 0.0 | 358.45 |

**Survey Program** **Date** 10/2/2015

| From (usft) | To (usft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 50.0 | 8,800.0 | GYRO (OH) | CB-GYRO-MS | Camera based gyro multishot |
| 8,922.0 | 13,945.0 | MWD #1 (OH) | MWD | MWD - Standard |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| 8,800.0 | 0.98 | 218.42 | 8,796.8 | -18.2 | 92.8 | 457,156.98 | 720,550.14 | 32° 15' 17.377 N | 103° 37' 11.629 W |
| 8,922.0 | 1.10 | 234.10 | 8,918.8 | -19.7 | 91.2 | 457,155.47 | 720,548.54 | 32° 15' 17.362 N | 103° 37' 11.648 W |
| 8,954.0 | 1.00 | 241.60 | 8,950.8 | -20.0 | 90.7 | 457,155.16 | 720,548.05 | 32° 15' 17.359 N | 103° 37' 11.653 W |
| 8,986.0 | 1.00 | 276.90 | 8,982.8 | -20.1 | 90.2 | 457,155.06 | 720,547.52 | 32° 15' 17.358 N | 103° 37' 11.659 W |
| 9,017.0 | 1.30 | 317.30 | 9,013.8 | -19.8 | 89.7 | 457,155.35 | 720,547.02 | 32° 15' 17.361 N | 103° 37' 11.665 W |
| 9,049.0 | 2.20 | 343.00 | 9,045.7 | -19.0 | 89.3 | 457,156.21 | 720,546.59 | 32° 15' 17.370 N | 103° 37' 11.670 W |
| 9,081.0 | 3.00 | 355.50 | 9,077.7 | -17.6 | 89.0 | 457,157.63 | 720,546.34 | 32° 15' 17.384 N | 103° 37' 11.673 W |
| 9,113.0 | 3.50 | 355.40 | 9,109.7 | -15.8 | 88.9 | 457,159.44 | 720,546.20 | 32° 15' 17.401 N | 103° 37' 11.674 W |
| 9,145.0 | 5.10 | 352.30 | 9,141.6 | -13.4 | 88.6 | 457,161.82 | 720,545.93 | 32° 15' 17.425 N | 103° 37' 11.677 W |
| 9,176.0 | 10.70 | 354.70 | 9,172.3 | -9.1 | 88.2 | 457,166.06 | 720,545.48 | 32° 15' 17.467 N | 103° 37' 11.682 W |
| 9,208.0 | 16.00 | 351.20 | 9,203.4 | -1.8 | 87.2 | 457,173.38 | 720,544.53 | 32° 15' 17.540 N | 103° 37' 11.693 W |

| | | | |
|---|---|---|---|
| **Company:** | COG Operating LLC | **Local Co-ordinate Reference:** | Well #6H |
| **Project:** | Lea County, NM (NAD27 NME) | **TVD Reference:** | WELL @ 3659.0usft (20' KB) |
| **Site:** | Queso State | **MD Reference:** | WELL @ 3659.0usft (20' KB) |
| **Well:** | #6H | **North Reference:** | Grid |
| **Wellbore:** | OH | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | OH | **Database:** | EDM 5000.1 Single User Db |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| 9,240.0 | 21.70 | 350.60 | 9,233.7 | 8.4 | 85.6 | 457,183.58 | 720,542.89 | 32° 15' 17.641 N | 103° 37' 11.711 W |
| 9,272.0 | 27.00 | 350.40 | 9,262.8 | 21.4 | 83.4 | 457,196.59 | 720,540.71 | 32° 15' 17.769 N | 103° 37' 11.736 W |
| 9,304.0 | 31.80 | 350.60 | 9,290.7 | 36.9 | 80.8 | 457,212.08 | 720,538.12 | 32° 15' 17.923 N | 103° 37' 11.764 W |
| 9,335.0 | 36.00 | 350.60 | 9,316.4 | 53.9 | 78.0 | 457,229.13 | 720,535.30 | 32° 15' 18.092 N | 103° 37' 11.796 W |
| 9,367.0 | 39.70 | 350.70 | 9,341.7 | 73.3 | 74.8 | 457,248.50 | 720,532.11 | 32° 15' 18.284 N | 103° 37' 11.832 W |
| 9,399.0 | 43.90 | 350.40 | 9,365.5 | 94.3 | 71.3 | 457,269.54 | 720,528.60 | 32° 15' 18.492 N | 103° 37' 11.871 W |
| 9,430.0 | 48.30 | 349.60 | 9,387.0 | 116.3 | 67.4 | 457,291.53 | 720,524.72 | 32° 15' 18.710 N | 103° 37' 11.914 W |
| 9,462.0 | 52.40 | 348.10 | 9,407.4 | 140.5 | 62.7 | 457,315.69 | 720,519.95 | 32° 15' 18.949 N | 103° 37' 11.968 W |
| 9,490.0 | 55.60 | 347.80 | 9,423.9 | 162.6 | 57.9 | 457,337.84 | 720,515.22 | 32° 15' 19.169 N | 103° 37' 12.021 W |
| 9,525.0 | 58.60 | 348.00 | 9,442.9 | 191.4 | 51.8 | 457,366.57 | 720,509.06 | 32° 15' 19.454 N | 103° 37' 12.091 W |
| 9,557.0 | 61.10 | 347.50 | 9,459.0 | 218.4 | 45.9 | 457,393.61 | 720,503.19 | 32° 15' 19.722 N | 103° 37' 12.157 W |
| 9,589.0 | 63.90 | 347.10 | 9,473.7 | 246.1 | 39.7 | 457,421.30 | 720,496.95 | 32° 15' 19.996 N | 103° 37' 12.228 W |
| 9,620.0 | 67.70 | 346.70 | 9,486.4 | 273.6 | 33.2 | 457,448.83 | 720,490.54 | 32° 15' 20.269 N | 103° 37' 12.300 W |
| 9,652.0 | 71.60 | 346.40 | 9,497.6 | 302.8 | 26.3 | 457,478.01 | 720,483.56 | 32° 15' 20.558 N | 103° 37' 12.379 W |
| 9,684.0 | 75.80 | 345.60 | 9,506.5 | 332.6 | 18.8 | 457,507.80 | 720,476.13 | 32° 15' 20.853 N | 103° 37' 12.463 W |
| 9,716.0 | 77.00 | 345.90 | 9,514.1 | 362.7 | 11.2 | 457,537.95 | 720,468.47 | 32° 15' 21.152 N | 103° 37' 12.550 W |
| 9,747.0 | 77.50 | 346.40 | 9,520.9 | 392.1 | 3.9 | 457,567.30 | 720,461.24 | 32° 15' 21.443 N | 103° 37' 12.632 W |
| 9,779.0 | 78.00 | 348.00 | 9,527.7 | 422.6 | -3.0 | 457,597.80 | 720,454.31 | 32° 15' 21.745 N | 103° 37' 12.711 W |
| 9,810.0 | 79.50 | 347.70 | 9,533.7 | 452.3 | -9.4 | 457,627.52 | 720,447.91 | 32° 15' 22.040 N | 103° 37' 12.783 W |
| 9,842.0 | 84.00 | 346.20 | 9,538.3 | 483.2 | -16.5 | 457,658.36 | 720,440.76 | 32° 15' 22.346 N | 103° 37' 12.864 W |
| 9,875.0 | 89.60 | 345.20 | 9,540.2 | 515.1 | -24.7 | 457,690.28 | 720,432.62 | 32° 15' 22.662 N | 103° 37' 12.956 W |
| 9,906.0 | 93.60 | 346.40 | 9,539.3 | 545.1 | -32.3 | 457,720.31 | 720,425.02 | 32° 15' 22.960 N | 103° 37' 13.042 W |
| 9,970.0 | 94.10 | 349.20 | 9,535.0 | 607.5 | -45.8 | 457,782.72 | 720,411.53 | 32° 15' 23.578 N | 103° 37' 13.194 W |
| 10,065.0 | 92.60 | 347.80 | 9,529.5 | 700.4 | -64.7 | 457,875.64 | 720,392.62 | 32° 15' 24.499 N | 103° 37' 13.407 W |
| 10,160.0 | 91.60 | 348.50 | 9,526.0 | 793.4 | -84.2 | 457,968.56 | 720,373.13 | 32° 15' 25.420 N | 103° 37' 13.627 W |
| 10,256.0 | 91.00 | 350.60 | 9,523.8 | 887.7 | -101.6 | 458,062.93 | 720,355.72 | 32° 15' 26.355 N | 103° 37' 13.823 W |
| 10,351.0 | 90.70 | 353.60 | 9,522.4 | 981.8 | -114.6 | 458,157.01 | 720,342.67 | 32° 15' 27.286 N | 103° 37' 13.967 W |
| 10,446.0 | 89.00 | 356.10 | 9,522.6 | 1,076.4 | -123.2 | 458,251.62 | 720,334.14 | 32° 15' 28.223 N | 103° 37' 14.059 W |
| 10,541.0 | 89.80 | 357.60 | 9,523.6 | 1,171.3 | -128.4 | 458,346.46 | 720,328.92 | 32° 15' 29.162 N | 103° 37' 14.113 W |
| 10,636.0 | 91.00 | 1.00 | 9,523.0 | 1,266.2 | -129.5 | 458,441.44 | 720,327.76 | 32° 15' 30.102 N | 103° 37' 14.119 W |
| 10,732.0 | 91.90 | 1.80 | 9,520.5 | 1,362.2 | -127.2 | 458,537.38 | 720,330.10 | 32° 15' 31.051 N | 103° 37' 14.084 W |
| 10,827.0 | 91.90 | 1.20 | 9,517.4 | 1,457.1 | -124.7 | 458,632.29 | 720,332.59 | 32° 15' 31.990 N | 103° 37' 14.048 W |
| 10,922.0 | 93.60 | 1.20 | 9,512.8 | 1,552.0 | -122.7 | 458,727.16 | 720,334.58 | 32° 15' 32.929 N | 103° 37' 14.018 W |
| 11,017.0 | 92.50 | 0.70 | 9,507.8 | 1,646.8 | -121.1 | 458,822.01 | 720,336.15 | 32° 15' 33.867 N | 103° 37' 13.992 W |
| 11,113.0 | 90.60 | 1.70 | 9,505.2 | 1,742.7 | -119.1 | 458,917.95 | 720,338.16 | 32° 15' 34.817 N | 103° 37' 13.961 W |
| 11,208.0 | 89.00 | 1.10 | 9,505.5 | 1,837.7 | -116.8 | 459,012.92 | 720,340.48 | 32° 15' 35.756 N | 103° 37' 13.927 W |
| 11,303.0 | 89.50 | 0.90 | 9,506.8 | 1,932.7 | -115.2 | 459,107.89 | 720,342.14 | 32° 15' 36.696 N | 103° 37' 13.900 W |
| 11,398.0 | 90.30 | 0.90 | 9,506.9 | 2,027.7 | -113.7 | 459,202.88 | 720,343.63 | 32° 15' 37.636 N | 103° 37' 13.875 W |
| 11,493.0 | 90.90 | 0.90 | 9,505.9 | 2,122.7 | -112.2 | 459,297.86 | 720,345.12 | 32° 15' 38.576 N | 103° 37' 13.851 W |
| 11,588.0 | 91.50 | 0.70 | 9,503.9 | 2,217.6 | -110.8 | 459,392.83 | 720,346.45 | 32° 15' 39.515 N | 103° 37' 13.828 W |
| 11,683.0 | 89.10 | 0.40 | 9,503.4 | 2,312.6 | -109.9 | 459,487.82 | 720,347.36 | 32° 15' 40.455 N | 103° 37' 13.810 W |
| 11,779.0 | 89.30 | 0.10 | 9,504.8 | 2,408.6 | -109.5 | 459,583.81 | 720,347.78 | 32° 15' 41.405 N | 103° 37' 13.798 W |
| 11,874.0 | 90.00 | 0.10 | 9,505.4 | 2,503.6 | -109.4 | 459,678.81 | 720,347.94 | 32° 15' 42.345 N | 103° 37' 13.788 W |
| 11,969.0 | 91.40 | 1.70 | 9,504.2 | 2,598.6 | -107.9 | 459,773.78 | 720,349.44 | 32° 15' 43.285 N | 103° 37' 13.764 W |
| 12,064.0 | 92.50 | 1.30 | 9,501.0 | 2,693.5 | -105.4 | 459,868.69 | 720,351.92 | 32° 15' 44.224 N | 103° 37' 13.727 W |
| 12,159.0 | 92.70 | 0.90 | 9,496.7 | 2,788.4 | -103.6 | 459,963.58 | 720,353.74 | 32° 15' 45.163 N | 103° 37' 13.699 W |
| 12,254.0 | 89.60 | 0.10 | 9,494.8 | 2,883.3 | -102.7 | 460,058.54 | 720,354.57 | 32° 15' 46.102 N | 103° 37' 13.682 W |
| 12,349.0 | 89.50 | 359.90 | 9,495.5 | 2,978.3 | -102.7 | 460,153.54 | 720,354.57 | 32° 15' 47.042 N | 103° 37' 13.674 W |
| 12,444.0 | 92.00 | 359.80 | 9,494.3 | 3,073.3 | -103.0 | 460,248.52 | 720,354.32 | 32° 15' 47.982 N | 103° 37' 13.670 W |
| 12,539.0 | 92.80 | 359.70 | 9,490.3 | 3,168.2 | -103.4 | 460,343.44 | 720,353.91 | 32° 15' 48.922 N | 103° 37' 13.667 W |
| 12,634.0 | 93.20 | 359.60 | 9,485.3 | 3,263.1 | -104.0 | 460,438.31 | 720,353.33 | 32° 15' 49.860 N | 103° 37' 13.667 W |
| 12,729.0 | 91.50 | 359.40 | 9,481.4 | 3,358.0 | -104.8 | 460,533.22 | 720,352.50 | 32° 15' 50.800 N | 103° 37' 13.669 W |
| 12,824.0 | 91.30 | 358.80 | 9,479.1 | 3,453.0 | -106.3 | 460,628.18 | 720,351.01 | 32° 15' 51.739 N | 103° 37' 13.679 W |
| 12,920.0 | 92.40 | 358.70 | 9,476.0 | 3,548.9 | -108.4 | 460,724.10 | 720,348.92 | 32° 15' 52.689 N | 103° 37' 13.696 W |
| 13,015.0 | 91.20 | 358.70 | 9,473.0 | 3,643.8 | -110.5 | 460,819.03 | 720,346.76 | 32° 15' 53.628 N | 103° 37' 13.714 W |

| | | | |
|---|---|---|---|
| **Company:** | COG Operating LLC | **Local Co-ordinate Reference:** | Well #6H |
| **Project:** | Lea County, NM (NAD27 NME) | **TVD Reference:** | WELL @ 3659.0usft (20' KB) |
| **Site:** | Queso State | **MD Reference:** | WELL @ 3659.0usft (20' KB) |
| **Well:** | #6H | **North Reference:** | Grid |
| **Wellbore:** | OH | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | OH | **Database:** | EDM 5000.1 Single User Db |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| 13,110.0 | 89.50 | 356.90 | 9,472.4 | 3,738.8 | -114.2 | 460,913.95 | 720,343.12 | 32° 15' 54.568 N | 103° 37' 13.749 W |
| 13,205.0 | 90.40 | 358.40 | 9,472.5 | 3,833.7 | -118.1 | 461,008.87 | 720,339.22 | 32° 15' 55.507 N | 103° 37' 13.787 W |
| 13,300.0 | 90.40 | 358.00 | 9,471.8 | 3,928.6 | -121.1 | 461,103.82 | 720,336.24 | 32° 15' 56.447 N | 103° 37' 13.814 W |
| 13,395.0 | 92.30 | 358.40 | 9,469.6 | 4,023.5 | -124.0 | 461,198.74 | 720,333.25 | 32° 15' 57.387 N | 103° 37' 13.842 W |
| 13,490.0 | 93.90 | 358.20 | 9,464.5 | 4,118.4 | -126.9 | 461,293.56 | 720,330.44 | 32° 15' 58.325 N | 103° 37' 13.867 W |
| 13,584.0 | 92.90 | 359.10 | 9,458.9 | 4,212.2 | -129.1 | 461,387.36 | 720,328.23 | 32° 15' 59.253 N | 103° 37' 13.886 W |
| 13,680.0 | 90.20 | 359.20 | 9,456.3 | 4,308.1 | -130.5 | 461,483.31 | 720,326.81 | 32° 16' 0.203 N | 103° 37' 13.895 W |
| 13,775.0 | 93.90 | 0.40 | 9,452.9 | 4,403.0 | -130.8 | 461,578.23 | 720,326.47 | 32° 16' 1.142 N | 103° 37' 13.891 W |
| 13,945.0 | 93.90 | 0.40 | 9,441.3 | 4,572.6 | -129.6 | 461,747.83 | 720,327.66 | 32° 16' 2.821 N | 103° 37' 13.864 W |
| **PBHL (QS#6H)** | | | | | | | | | |

Checked By: _____ Approved By: _____ Date: _____

PATRIOT DRILLING, LLC



OPERATOR: COG Operating, LLC
WELL/LEASE: Queso State 6H
COUNTY: Lea Co., New Mexico
Sec. 36, T 23S, R 32E

**STATE OF NEW MEXICO**
**DEVIATION REPORT**

| Depth | Deviation | Depth | Deviation |
|---|---|---|---|
| 436 | 1/2 | 5,479 | 1 1/4 |
| 738 | 1/2 | 6,138 | 3/4 |
| 1,196 | 3/4 | 6,520 | 1/2 |
| 1,662 | 1 1/2 | 6,901 | 1/4 |
| 2,043 | 1/4 | 7,472 | 1 |
| 2,421 | 1/2 | 7,853 | 3/4 |
| 2,990 | 3/4 | 8,233 | 3/4 |
| 3,363 | 2 1/2 | 8,613 | 1 |
| 3,840 | 2 1/2 | 8,804 | 1 |
| 4,220 | 3 | | |
| 4,411 | 3 1/2 | | |
| 4,976 | 3 3/4 | | |

**Patriot Drilling, LLC**

M. Leroy Peterson, Executive Vice-President

The foregoing instrument was acknowledged before me on this 12th day of October, 2015 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling, LLC.

My Commission Expires: 02/01/2019

LORI TERESA ROWAN
Notary Public, State of Texas
My Commission Expires
February 01, 2019

Lori T. Rowan
Notary Public for Ector Co., Texas

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