McVAY DRILLING COMPANY
P.O. Box 2450
Hobbs, New Mexico 88241
(575) 397-3311
FAX: 39-DRILL

Well Name and Num: Tyrell Fee #2H
Location: Sec 14, T24S, R33E
Operator: COG
Drilling Contractor: McVay Drilling Company

The undersigned certifies that he is an authorized representative of the drilling contractor who drilled the above described well and that he has conducted deviation tests and obtained the following results:

Degrees @	Depth	Degrees @	Depth	Degrees @	Depth	Degrees @	Depth
0.50	281	0.60	6043	91.30	11939		
0.50	494	0.50	6420	90.80	12128		
0.10	772	0.40	6797	89.20	12599		
0.40	1051	0.40	7174	88.70	13071		
1.10	1337	0.50	7363	87.30	13354		
0.10	1682	0.80	7740	90.30	13637		
1.20	2060	1.10	8117				
0.30	2437	1.50	8485				
1.70	2815	1.70	8673				
1.10	3193	7.90	8892				
0.50	3570	45.20	9222				
0.30	3948	73.40	9458				
0.30	4325	91.00	9863				
0.70	4703	88.50	10240				
1.00	5245	89.20	10712				
0.40	5571	89.70	11089				
0.70	5571	88.50	11467				

By: _____

Subscribed and sworn to before me this 23rd day of November, 2015

_____
Notary Public, Lea County, New Mexico

OFFICIAL SEAL
TINA FLEMENS
Notary Public
State of New Mexico
My Comm. Expires 8-16-17

APR 05 2016

VES SURVEY INTERNATIONAL

November 16, 2015

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

Attn: Kanicia Castillo

RE: **Tyrell Fee No 002H**

Please find enclosed a copy of the survey from 0' to 8750' ran on the above referenced well.

Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
§
COUNTY OF NUECES §

This instrument was acknowledged before me on the 16 day of December 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: COG Operating (Concho)
Lease/Well: Tyrell Fee No/002H

Rig Name: McVay 8
State/County: New Mexico/Lea
VS-Azi: 175.58 Degrees
Latitude: 32.22421, Longitude: -103.53733
Grid North = True North -0.42 degs (NAD 27)
Grid Correction Applied = -0.42 degs

Depth Reference : RKB = 26 Foot

DRILLOG HA GYRO SURVEY CALCULATIONS
Filename: tyrell fee 2h_gyro survey.ut
Minimum Curvature Method
Report Date/Time: 11/16/2015 / 12:50

VES Survey International
West Texas
(432) 563-5444
Surveyor: Gene Heiss
Tyrell Fee No 002H / API 30-025-42789

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	****
100.00	0.20	327.81	100.00	0.15	-0.09	-0.15	0.17	327.81	0.20
200.00	0.49	309.19	200.00	0.56	-0.51	-0.60	0.76	317.57	0.30
300.00	0.39	287.68	300.00	0.93	-1.17	-1.02	1.49	308.67	0.19
400.00	0.47	291.65	399.99	1.19	-1.87	-1.33	2.22	302.40	0.09
500.00	0.39	295.54	499.99	1.48	-2.56	-1.68	2.96	300.13	0.09
600.00	0.28	294.37	599.99	1.73	-3.09	-1.97	3.54	299.29	0.10
700.00	0.23	305.86	699.99	1.95	-3.48	-2.22	3.99	299.32	0.07
800.00	0.29	287.64	799.99	2.15	-3.89	-2.44	4.44	298.96	0.10
900.00	0.32	307.55	899.98	2.40	-4.35	-2.73	4.97	298.87	0.11
1000.00	0.36	312.25	999.98	2.78	-4.81	-3.14	5.55	300.06	0.05
1100.00	0.98	274.44	1099.98	3.06	-5.90	-3.50	6.64	297.43	0.73
1200.00	0.66	276.03	1199.97	3.19	-7.32	-3.74	7.99	293.51	0.32
1300.00	0.61	278.03	1299.96	3.32	-8.43	-3.96	9.06	291.51	0.05
1400.00	0.83	288.13	1399.95	3.62	-9.65	-4.36	10.31	290.58	0.25
1500.00	0.78	294.92	1499.94	4.14	-10.96	-4.97	11.72	290.68	0.11
1600.00	0.66	268.51	1599.93	4.41	-12.15	-5.33	12.93	289.94	0.35

VES Survey Date: 11/11/2015

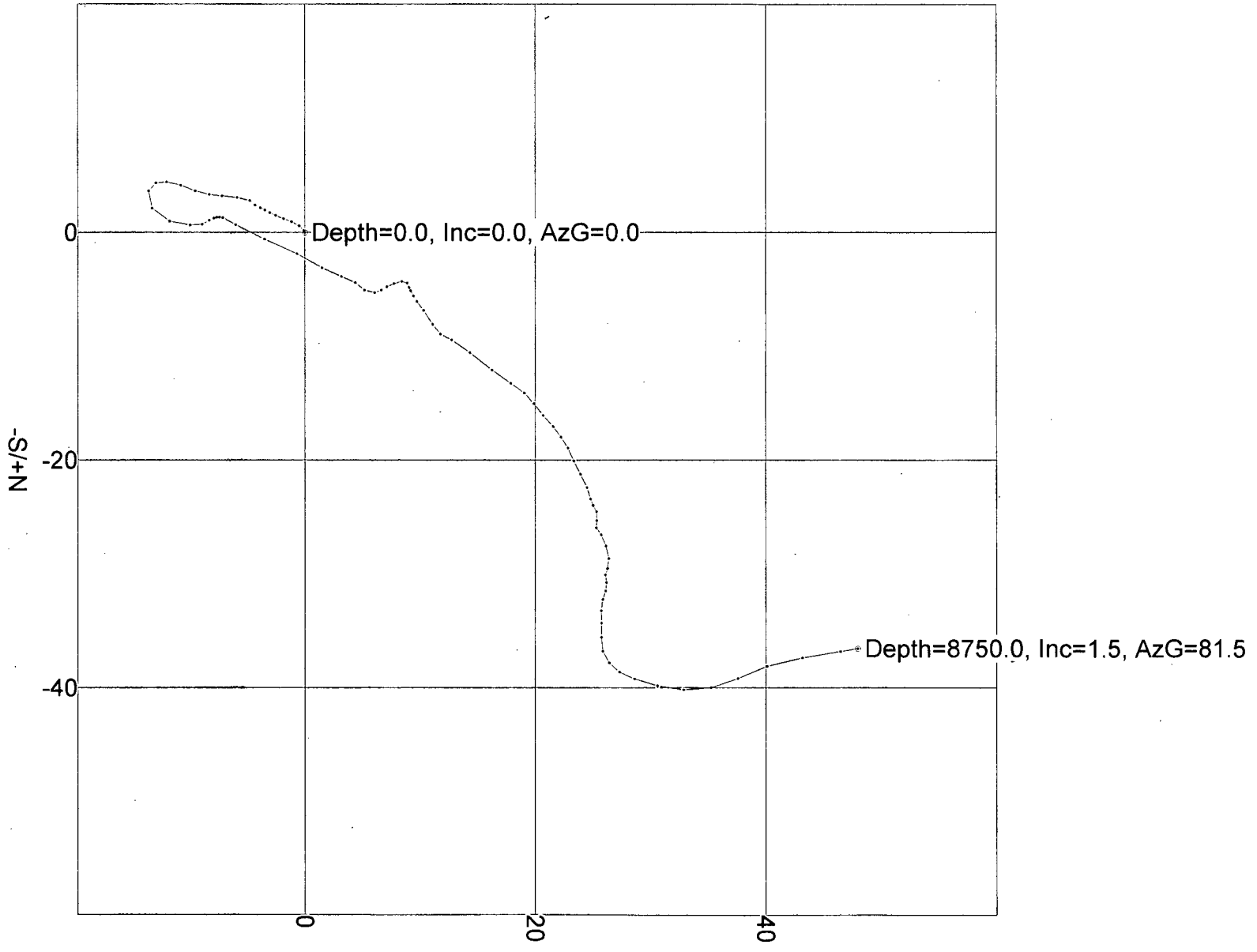
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1700.00	0.48	259.59	1699.93	4.32	-13.14	-5.32	13.83	288.19	0.19
1800.00	0.74	196.20	1799.92	3.62	-13.73	-4.67	14.20	284.77	0.68
1900.00	1.16	153.08	1899.91	2.10	-13.46	-3.13	13.62	278.86	0.80
2000.00	1.31	101.41	1999.89	0.97	-11.88	-1.88	11.92	274.67	1.09
2100.00	0.78	99.17	2099.87	0.63	-10.08	-1.41	10.10	273.60	0.54
2200.00	0.45	61.99	2199.87	0.71	-9.07	-1.41	9.10	274.48	0.50
2300.00	0.38	62.14	2299.87	1.05	-8.43	-1.70	8.50	277.09	0.07
2400.00	0.17	72.04	2399.86	1.25	-8.00	-1.86	8.10	278.86	0.22
2500.00	0.12	80.43	2499.86	1.31	-7.76	-1.90	7.87	279.58	0.05
2600.00	0.14	91.18	2599.86	1.32	-7.53	-1.90	7.65	279.97	0.03
2700.00	0.19	103.55	2699.86	1.28	-7.25	-1.84	7.36	280.04	0.06
2800.00	1.37	118.45	2799.85	0.68	-6.04	-1.14	6.08	276.39	1.18
2900.00	1.88	115.35	2899.81	-0.59	-3.51	0.32	3.56	260.41	0.52
3000.00	1.68	113.59	2999.76	-1.88	-0.69	1.82	2.00	200.07	0.20
3100.00	1.20	127.86	3099.73	-3.11	1.48	3.22	3.45	154.50	0.60
3200.00	0.99	98.60	3199.71	-3.88	3.17	4.12	5.01	140.79	0.59
3300.00	0.60	140.61	3299.71	-4.42	4.36	4.74	6.21	135.39	0.68
3400.00	0.62	119.14	3399.70	-5.09	5.16	5.47	7.25	134.57	0.23
3500.00	0.48	81.23	3499.70	-5.29	6.05	5.74	8.04	131.15	0.38
3600.00	0.26	53.74	3599.69	-5.09	6.64	5.59	8.37	127.46	0.28
3700.00	0.38	56.48	3699.69	-4.78	7.10	5.31	8.56	123.93	0.12
3800.00	0.41	76.20	3799.69	-4.51	7.72	5.09	8.94	120.28	0.14
3900.00	0.41	69.42	3899.69	-4.30	8.41	4.93	9.44	117.08	0.05
4000.00	0.35	154.86	3999.69	-4.45	8.87	5.12	9.93	116.64	0.52
4100.00	0.14	159.45	4099.68	-4.85	9.05	5.53	10.26	118.18	0.21
4200.00	0.23	149.91	4199.68	-5.14	9.19	5.83	10.53	119.20	0.10
4300.00	0.36	154.45	4299.68	-5.59	9.43	6.30	10.96	120.68	0.13
4400.00	0.29	140.27	4399.68	-6.07	9.72	6.80	11.46	121.96	0.10
4500.00	0.83	145.04	4499.68	-6.85	10.30	7.63	12.37	123.64	0.54
4600.00	0.84	149.05	4599.67	-8.08	11.09	8.91	13.72	126.06	0.06
4700.00	0.43	126.54	4699.66	-8.93	11.77	9.81	14.78	127.19	0.47
4800.00	0.82	113.57	4799.65	-9.44	12.73	10.40	15.85	126.56	0.41
4900.00	1.44	131.97	4899.63	-10.57	14.32	11.64	17.80	126.43	0.71
5000.00	1.37	125.02	4999.60	-12.09	16.23	13.31	20.24	126.69	0.18
5100.00	0.94	125.98	5099.58	-13.26	17.87	14.60	22.25	126.57	0.43
5200.00	0.71	126.23	5199.57	-14.11	19.04	15.54	23.70	126.54	0.23
5300.00	0.75	150.23	5299.56	-15.05	19.87	16.53	24.92	127.14	0.31
5400.00	0.77	133.24	5399.56	-16.08	20.68	17.62	26.20	127.86	0.23
5500.00	0.71	144.48	5499.55	-17.05	21.54	18.65	27.47	128.36	0.16

VES Survey Date: 11/11/2015

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
5600.00	0.63	143.78	5599.54	-17.99	22.22	19.65	28.59	129.00	0.09
5700.00	0.66	151.17	5699.53	-18.94	22.82	20.64	29.66	129.69	0.09
5800.00	0.78	160.04	5799.53	-20.09	23.33	21.82	30.79	130.72	0.16
5900.00	0.72	147.20	5899.52	-21.25	23.90	23.03	31.98	131.64	0.18
6000.00	0.79	161.03	5999.51	-22.43	24.47	24.25	33.19	132.51	0.19
6100.00	0.39	165.44	6099.50	-23.40	24.78	25.24	34.08	133.37	0.40
6200.00	0.33	154.13	6199.50	-23.99	24.99	25.84	34.64	133.83	0.09
6300.00	0.38	147.68	6299.50	-24.53	25.29	26.40	35.23	134.12	0.07
6400.00	0.60	197.40	6399.50	-25.30	25.31	27.18	35.79	134.99	0.46
6500.00	0.23	142.38	6499.49	-25.96	25.27	27.83	36.23	135.76	0.50
6600.00	0.62	146.53	6599.49	-26.57	25.69	28.47	36.96	135.95	0.40
6700.00	0.62	167.35	6699.49	-27.55	26.11	29.48	37.96	136.53	0.23
6800.00	0.65	167.42	6799.48	-28.64	26.36	30.59	38.92	137.38	0.03
6900.00	0.46	217.10	6899.48	-29.52	26.24	31.45	39.49	138.36	0.50
7000.00	0.28	167.62	6999.47	-30.08	26.05	31.99	39.79	139.10	0.35
7100.00	0.51	174.28	7099.47	-30.76	26.15	32.68	40.37	139.63	0.23
7200.00	0.35	202.98	7199.47	-31.48	26.07	33.39	40.87	140.36	0.26
7300.00	0.55	194.12	7299.46	-32.22	25.84	34.12	41.30	141.28	0.21
7400.00	0.60	180.96	7399.46	-33.21	25.71	35.09	42.00	142.25	0.14
7500.00	0.64	177.88	7499.45	-34.29	25.72	36.17	42.87	143.13	0.05
7600.00	0.79	181.78	7599.45	-35.54	25.72	37.42	43.87	144.11	0.16
7700.00	0.65	166.42	7699.44	-36.79	25.84	38.67	44.96	144.92	0.24
7800.00	0.72	138.17	7799.43	-37.81	26.39	39.73	46.11	145.09	0.34
7900.00	0.67	126.21	7899.42	-38.62	27.27	40.61	47.28	144.77	0.15
8000.00	1.02	106.91	7999.41	-39.22	28.60	41.31	48.54	143.91	0.45
8100.00	1.36	106.85	8099.39	-39.83	30.58	42.07	50.21	142.48	0.33
8200.00	1.31	91.29	8199.36	-40.20	32.86	42.61	51.92	140.74	0.36
8300.00	1.45	80.07	8299.34	-40.00	35.25	42.60	53.31	138.62	0.30
8400.00	1.43	61.16	8399.31	-39.18	37.59	41.96	54.30	136.19	0.47
8500.00	1.73	71.43	8499.27	-38.10	40.11	41.08	55.32	133.52	0.41
8600.00	1.91	81.08	8599.22	-37.36	43.19	40.58	57.11	130.86	0.36
8700.00	1.95	79.72	8699.16	-36.80	46.52	40.27	59.31	128.35	0.06
8750.00	1.49	81.53	8749.14	-36.55	48.00	40.14	60.33	127.29	0.91

VES Survey Date: 11/11/2015

VES Survey International
West Texas
(432) 563-5444
Surveyor: Gene Heiss
Tyrell Fee No 002H / API 30-025-42789



VES Survey Date: 11/11/2015

VES SURVEY INTERNATIONAL

I Gene Heiss certify that I am employed by Vaughn Energy Services. That I did on the day(s) of 11/11/15 through 11/11/15 conduct or supervise the taking of a Rate Gyro survey from a depth of 0 feet to a depth of 8750 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 Tyrell Fee Well # 2H API # 30-025-42789 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

Gene Heiss
Service Technician
Vaughn Energy Services

CONCHO

COG Operating, LLC

Lea County, NM
Sec 14 T24-S R33-E
Tyrell Fee #2H

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

20 November, 2015

RDC
The DIRECTIONAL DRILLING COMPANY

Company:	COG Operating, LLC	**Local Co-ordinate Reference:**	Well Tyrell Fee #2H
Project:	Lea County, NM	**TVD Reference:**	WELL @ 3634.0usft (McVay 8 RKB 26' + GL 3608')
Site:	Sec 14 T24-S R33-E	**MD Reference:**	WELL @ 3634.0usft (McVay 8 RKB 26' + GL 3608')
Well:	Tyrell Fee #2H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Wellbore #1	**Database:**	Compass

Project Lea County, NM

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 Sec 14 T24-S R33-E

Site Position:		**Northing:**	446,199.90 usft	**Latitude:**	32° 13' 27.170 N
From:	Map	**Easting:**	746,158.90 usft	**Longitude:**	103° 32' 14.376 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.42 °

Well Tyrell Fee #2H

Well Position	**+N/-S**	0.0 usft	**Northing:**	446,199.90 usft	**Latitude:**	32° 13' 27.170 N
	+E/-W	0.0 usft	**Easting:**	746,158.90 usft	**Longitude:**	103° 32' 14.376 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	0.0 usft	**Ground Level:**	3,608.0 usft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/20/2015	7.12	60.09	48,111

Design Wellbore #1

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	175.58

Survey Program **Date** 11/17/2015

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	8,750.0	GYRO (Wellbore #1)	Good_gyro	Good Gyro
8,798.0	13,810.0	MWD (Wellbore #1)	MWD default	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
0.0	0.00	0.00	0.0	0.0	0.0	446,199.90	746,158.90	32° 13' 27.170 N	103° 32' 14.376 W
100.0	0.20	327.81	100.0	0.1	-0.1	446,200.05	746,158.80	32° 13' 27.172 N	103° 32' 14.377 W
200.0	0.49	309.19	200.0	0.6	-0.5	446,200.47	746,158.38	32° 13' 27.176 N	103° 32' 14.382 W
300.0	0.39	287.68	300.0	0.9	-1.2	446,200.84	746,157.72	32° 13' 27.180 N	103° 32' 14.390 W
400.0	0.47	291.65	400.0	1.2	-1.9	446,201.09	746,157.02	32° 13' 27.182 N	103° 32' 14.398 W
500.0	0.39	295.54	500.0	1.5	-2.6	446,201.39	746,156.33	32° 13' 27.185 N	103° 32' 14.406 W
600.0	0.28	294.37	600.0	1.7	-3.1	446,201.64	746,155.80	32° 13' 27.188 N	103° 32' 14.412 W
700.0	0.23	305.86	700.0	2.0	-3.5	446,201.86	746,155.41	32° 13' 27.190 N	103° 32' 14.417 W
800.0	0.29	287.64	800.0	2.2	-3.9	446,202.05	746,155.01	32° 13' 27.192 N	103° 32' 14.421 W

Company:	COG Operating, LLC	**Local Co-ordinate Reference:**	Well Tyrell Fee #2H
Project:	Lea County, NM	**TVD Reference:**	WELL @ 3634.0usft (McVay 8 RKB 26' + GL 3608')
Site:	Sec 14 T24-S R33-E	**MD Reference:**	WELL @ 3634.0usft (McVay 8 RKB 26' + GL 3608')
Well:	Tyrell Fee #2H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Wellbore #1	**Database:**	Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
900.0	0.32	307.55	900.0	2.4	-4.3	446,202.30	746,154.55	32° 13' 27.194 N	103° 32' 14.427 W
1,000.0	0.36	312.25	1,000.0	2.8	-4.8	446,202.68	746,154.09	32° 13' 27.198 N	103° 32' 14.432 W
1,100.0	0.98	274.44	1,100.0	3.1	-5.9	446,202.96	746,153.01	32° 13' 27.201 N	103° 32' 14.445 W
1,200.0	0.66	276.03	1,200.0	3.2	-7.3	446,203.08	746,151.58	32° 13' 27.202 N	103° 32' 14.461 W
1,300.0	0.61	278.03	1,300.0	3.3	-8.4	446,203.22	746,150.48	32° 13' 27.204 N	103° 32' 14.474 W
1,400.0	0.83	288.13	1,400.0	3.6	-9.6	446,203.52	746,149.27	32° 13' 27.207 N	103° 32' 14.488 W
1,500.0	0.78	294.92	1,499.9	4.1	-10.9	446,204.03	746,147.96	32° 13' 27.212 N	103° 32' 14.503 W
1,600.0	0.66	268.51	1,599.9	4.4	-12.1	446,204.30	746,146.77	32° 13' 27.215 N	103° 32' 14.517 W
1,700.0	0.48	259.59	1,699.9	4.3	-13.1	446,204.21	746,145.78	32° 13' 27.214 N	103° 32' 14.529 W
1,800.0	0.74	196.20	1,799.9	3.6	-13.7	446,203.52	746,145.19	32° 13' 27.207 N	103° 32' 14.536 W
1,900.0	1.16	153.08	1,899.9	2.1	-13.4	446,201.99	746,145.47	32° 13' 27.192 N	103° 32' 14.533 W
2,000.0	1.31	101.41	1,999.9	1.0	-11.8	446,200.87	746,147.05	32° 13' 27.181 N	103° 32' 14.514 W
2,100.0	0.78	99.17	2,099.9	0.6	-10.1	446,200.53	746,148.84	32° 13' 27.177 N	103° 32' 14.493 W
2,200.0	0.45	61.99	2,199.9	0.7	-9.0	446,200.61	746,149.86	32° 13' 27.178 N	103° 32' 14.482 W
2,300.0	0.38	62.14	2,299.9	1.0	-8.4	446,200.95	746,150.50	32° 13' 27.181 N	103° 32' 14.474 W
2,400.0	0.17	72.04	2,399.9	1.2	-8.0	446,201.15	746,150.93	32° 13' 27.183 N	103° 32' 14.469 W
2,500.0	0.12	80.43	2,499.9	1.3	-7.7	446,201.21	746,151.18	32° 13' 27.184 N	103° 32' 14.466 W
2,600.0	0.14	91.18	2,599.9	1.3	-7.5	446,201.22	746,151.40	32° 13' 27.184 N	103° 32' 14.464 W
2,700.0	0.19	103.55	2,699.9	1.3	-7.2	446,201.18	746,151.69	32° 13' 27.184 N	103° 32' 14.460 W
2,800.0	1.37	118.45	2,799.9	0.7	-6.0	446,200.58	746,152.90	32° 13' 27.177 N	103° 32' 14.446 W
2,900.0	1.88	115.35	2,899.8	-0.6	-3.5	446,199.30	746,155.43	32° 13' 27.165 N	103° 32' 14.417 W
3,000.0	1.68	113.59	2,999.8	-1.9	-0.6	446,198.01	746,158.26	32° 13' 27.152 N	103° 32' 14.384 W
3,100.0	1.20	127.86	3,099.7	-3.1	1.5	446,196.79	746,160.43	32° 13' 27.139 N	103° 32' 14.359 W
3,200.0	0.99	98.60	3,199.7	-3.9	3.2	446,196.01	746,162.11	32° 13' 27.132 N	103° 32' 14.339 W
3,300.0	0.60	140.61	3,299.7	-4.4	4.4	446,195.48	746,163.29	32° 13' 27.126 N	103° 32' 14.326 W
3,400.0	0.62	119.14	3,399.7	-5.1	5.2	446,194.81	746,164.10	32° 13' 27.120 N	103° 32' 14.316 W
3,500.0	0.48	81.23	3,499.7	-5.3	6.1	446,194.61	746,164.99	32° 13' 27.118 N	103° 32' 14.306 W
3,600.0	0.26	53.74	3,599.7	-5.1	6.7	446,194.81	746,165.58	32° 13' 27.120 N	103° 32' 14.299 W
3,700.0	0.38	56.48	3,699.7	-4.8	7.1	446,195.13	746,166.04	32° 13' 27.123 N	103° 32' 14.294 W
3,800.0	0.41	76.20	3,799.7	-4.5	7.8	446,195.40	746,166.67	32° 13' 27.125 N	103° 32' 14.286 W
3,900.0	0.41	69.42	3,899.7	-4.3	8.5	446,195.61	746,167.35	32° 13' 27.127 N	103° 32' 14.278 W
4,000.0	0.35	154.86	3,999.7	-4.4	8.9	446,195.46	746,167.81	32° 13' 27.126 N	103° 32' 14.273 W
4,100.0	0.14	159.45	4,099.7	-4.8	9.1	446,195.06	746,167.99	32° 13' 27.122 N	103° 32' 14.271 W
4,200.0	0.23	149.91	4,199.7	-5.1	9.2	446,194.78	746,168.13	32° 13' 27.119 N	103° 32' 14.269 W
4,300.0	0.36	154.45	4,299.7	-5.6	9.5	446,194.32	746,168.37	32° 13' 27.114 N	103° 32' 14.267 W
4,400.0	0.29	140.27	4,399.7	-6.1	9.8	446,193.84	746,168.66	32° 13' 27.110 N	103° 32' 14.263 W
4,500.0	0.83	145.04	4,499.7	-6.8	10.3	446,193.05	746,169.24	32° 13' 27.102 N	103° 32' 14.257 W
4,600.0	0.84	149.05	4,599.7	-8.1	11.1	446,191.83	746,170.03	32° 13' 27.090 N	103° 32' 14.247 W
4,700.0	0.43	126.54	4,699.7	-8.9	11.8	446,190.98	746,170.71	32° 13' 27.081 N	103° 32' 14.240 W
4,800.0	0.82	113.57	4,799.7	-9.4	12.8	446,190.47	746,171.67	32° 13' 27.076 N	103° 32' 14.229 W
4,900.0	1.44	131.97	4,899.6	-10.6	14.4	446,189.34	746,173.26	32° 13' 27.065 N	103° 32' 14.210 W
5,000.0	1.37	125.02	4,999.6	-12.1	16.3	446,187.82	746,175.17	32° 13' 27.050 N	103° 32' 14.188 W
5,100.0	0.94	125.98	5,099.6	-13.3	17.9	446,186.65	746,176.81	32° 13' 27.038 N	103° 32' 14.169 W
5,200.0	0.71	126.23	5,199.6	-14.1	19.1	446,185.80	746,177.98	32° 13' 27.029 N	103° 32' 14.156 W
5,300.0	0.75	150.23	5,299.6	-15.0	19.9	446,184.87	746,178.80	32° 13' 27.020 N	103° 32' 14.146 W
5,400.0	0.77	133.24	5,399.6	-16.1	20.7	446,183.84	746,179.62	32° 13' 27.010 N	103° 32' 14.137 W
5,500.0	0.71	144.48	5,499.5	-17.0	21.6	446,182.87	746,180.47	32° 13' 27.000 N	103° 32' 14.127 W
5,600.0	0.63	143.78	5,599.5	-18.0	22.3	446,181.93	746,181.15	32° 13' 26.991 N	103° 32' 14.119 W
5,700.0	0.66	151.17	5,699.5	-18.9	22.9	446,180.98	746,181.75	32° 13' 26.981 N	103° 32' 14.112 W
5,800.0	0.78	160.04	5,799.5	-20.1	23.4	446,179.83	746,182.26	32° 13' 26.970 N	103° 32' 14.106 W
5,900.0	0.72	147.20	5,899.5	-21.2	23.9	446,178.67	746,182.84	32° 13' 26.958 N	103° 32' 14.100 W
6,000.0	0.79	161.03	5,999.5	-22.4	24.5	446,177.49	746,183.40	32° 13' 26.947 N	103° 32' 14.093 W
6,100.0	0.39	165.44	6,099.5	-23.4	24.8	446,176.50	746,183.71	32° 13' 26.937 N	103° 32' 14.090 W

Company:	COG Operating, LLC	**Local Co-ordinate Reference:**	Well Tyrell Fee #2H
Project:	Lea County, NM	**TVD Reference:**	WELL @ 3634.0usft (McVay 8 RKB 26' + GL 3608')
Site:	Sec 14 T24-S R33-E	**MD Reference:**	WELL @ 3634.0usft (McVay 8 RKB 26' + GL 3608')
Well:	Tyrell Fee #2H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Wellbore #1	**Database:**	Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,200.0	0.33	154.13	6,199.5	-24.0	25.0	446,175.92	746,183.92	32° 13' 26.931 N	103° 32' 14.087 W
6,300.0	0.38	147.68	6,299.5	-24.5	25.3	446,175.38	746,184.22	32° 13' 26.926 N	103° 32' 14.084 W
6,400.0	0.60	197.40	6,399.5	-25.3	25.3	446,174.60	746,184.25	32° 13' 26.918 N	103° 32' 14.084 W
6,500.0	0.23	142.38	6,499.5	-26.0	25.3	446,173.94	746,184.21	32° 13' 26.912 N	103° 32' 14.084 W
6,600.0	0.62	146.53	6,599.5	-26.6	25.7	446,173.33	746,184.63	32° 13' 26.906 N	103° 32' 14.079 W
6,700.0	0.62	167.35	6,699.5	-27.6	26.2	446,172.35	746,185.05	32° 13' 26.896 N	103° 32' 14.074 W
6,800.0	0.65	167.42	6,799.5	-28.6	26.4	446,171.27	746,185.29	32° 13' 26.885 N	103° 32' 14.072 W
6,900.0	0.46	217.10	6,899.5	-29.5	26.3	446,170.39	746,185.17	32° 13' 26.876 N	103° 32' 14.073 W
7,000.0	0.28	167.62	6,999.5	-30.1	26.1	446,169.83	746,184.98	32° 13' 26.871 N	103° 32' 14.075 W
7,100.0	0.51	174.28	7,099.5	-30.7	26.2	446,169.15	746,185.08	32° 13' 26.864 N	103° 32' 14.074 W
7,200.0	0.35	202.98	7,199.5	-31.5	26.1	446,168.43	746,185.00	32° 13' 26.857 N	103° 32' 14.075 W
7,300.0	0.55	194.12	7,299.5	-32.2	25.9	446,167.68	746,184.77	32° 13' 26.850 N	103° 32' 14.078 W
7,400.0	0.60	180.96	7,399.5	-33.2	25.7	446,166.69	746,184.64	32° 13' 26.840 N	103° 32' 14.080 W
7,500.0	0.64	177.88	7,499.5	-34.3	25.8	446,165.61	746,184.65	32° 13' 26.829 N	103° 32' 14.080 W
7,600.0	0.79	181.78	7,599.4	-35.5	25.8	446,164.36	746,184.65	32° 13' 26.817 N	103° 32' 14.080 W
7,700.0	0.65	166.42	7,699.4	-36.8	25.9	446,163.12	746,184.77	32° 13' 26.805 N	103° 32' 14.078 W
7,800.0	0.72	138.17	7,799.4	-37.8	26.4	446,162.10	746,185.32	32° 13' 26.794 N	103° 32' 14.072 W
7,900.0	0.67	126.21	7,899.4	-38.6	27.3	446,161.29	746,186.21	32° 13' 26.786 N	103° 32' 14.062 W
8,000.0	1.02	106.91	7,999.4	-39.2	28.6	446,160.69	746,187.53	32° 13' 26.780 N	103° 32' 14.046 W
8,100.0	1.36	106.85	8,099.4	-39.8	30.6	446,160.08	746,189.52	32° 13' 26.774 N	103° 32' 14.023 W
8,200.0	1.31	91.29	8,199.4	-40.2	32.9	446,159.71	746,191.80	32° 13' 26.770 N	103° 32' 13.997 W
8,300.0	1.45	80.07	8,299.3	-40.0	35.3	446,159.91	746,194.19	32° 13' 26.772 N	103° 32' 13.969 W
8,400.0	1.43	61.16	8,399.3	-39.2	37.6	446,160.73	746,196.53	32° 13' 26.780 N	103° 32' 13.942 W
8,500.0	1.73	71.43	8,499.3	-38.1	40.2	446,161.81	746,199.05	32° 13' 26.790 N	103° 32' 13.912 W
8,600.0	1.91	81.08	8,599.2	-37.4	43.2	446,162.55	746,202.13	32° 13' 26.798 N	103° 32' 13.876 W
8,700.0	1.95	79.72	8,699.2	-36.8	46.6	446,163.11	746,205.45	32° 13' 26.803 N	103° 32' 13.838 W
8,750.0	1.49	81.53	8,749.1	-36.5	48.0	446,163.36	746,206.93	32° 13' 26.805 N	103° 32' 13.820 W
Tie Into Gyro @ 8750' MD / 8749' TVD									
8,798.0	1.60	71.40	8,797.1	-36.2	49.3	446,163.66	746,208.18	32° 13' 26.808 N	103° 32' 13.806 W
8,845.0	2.50	154.40	8,844.1	-37.0	50.3	446,162.95	746,209.24	32° 13' 26.801 N	103° 32' 13.794 W
8,892.0	7.90	186.30	8,890.9	-41.1	50.4	446,158.81	746,209.33	32° 13' 26.760 N	103° 32' 13.793 W
8,939.0	14.10	185.30	8,937.0	-50.0	49.6	446,149.89	746,208.45	32° 13' 26.672 N	103° 32' 13.804 W
8,986.0	19.20	188.40	8,982.0	-63.4	47.9	446,136.53	746,206.79	32° 13' 26.540 N	103° 32' 13.824 W
9,033.0	23.40	190.20	9,025.8	-80.2	45.1	446,119.70	746,204.01	32° 13' 26.373 N	103° 32' 13.858 W
9,081.0	29.40	186.70	9,068.8	-101.3	42.0	446,098.59	746,200.94	32° 13' 26.165 N	103° 32' 13.896 W
9,128.0	35.70	182.80	9,108.4	-126.5	40.0	446,073.41	746,198.92	32° 13' 25.916 N	103° 32' 13.921 W
9,150.0	38.17	181.26	9,126.0	-139.7	39.6	446,060.20	746,198.46	32° 13' 25.785 N	103° 32' 13.928 W
Crossed 330' Hardline @ 9150' MD / 9126' TVD									
9,175.0	41.00	179.70	9,145.2	-155.6	39.4	446,044.27	746,198.33	32° 13' 25.627 N	103° 32' 13.931 W
9,222.0	45.20	178.30	9,179.5	-187.7	40.0	446,012.17	746,198.91	32° 13' 25.310 N	103° 32' 13.927 W
9,269.0	50.50	177.90	9,211.1	-222.5	41.2	445,977.36	746,200.07	32° 13' 24.965 N	103° 32' 13.916 W
9,316.0	57.20	177.60	9,238.8	-260.4	42.7	445,939.46	746,201.56	32° 13' 24.590 N	103° 32' 13.902 W
9,364.0	62.60	176.90	9,262.8	-301.9	44.7	445,898.00	746,203.56	32° 13' 24.180 N	103° 32' 13.883 W
9,411.0	67.20	176.50	9,282.8	-344.4	47.1	445,855.52	746,206.01	32° 13' 23.759 N	103° 32' 13.858 W
9,458.0	73.40	176.10	9,298.6	-388.5	50.0	445,811.38	746,208.87	32° 13' 23.322 N	103° 32' 13.828 W
9,486.0	77.40	176.50	9,305.7	-415.6	51.7	445,784.35	746,210.62	32° 13' 23.055 N	103° 32' 13.810 W
9,533.0	82.50	176.50	9,313.9	-461.7	54.5	445,738.17	746,213.44	32° 13' 22.597 N	103° 32' 13.781 W
9,580.0	87.10	176.10	9,318.1	-508.4	57.6	445,691.47	746,216.46	32° 13' 22.135 N	103° 32' 13.750 W
9,675.0	88.90	176.50	9,321.4	-603.2	63.7	445,596.73	746,222.59	32° 13' 21.197 N	103° 32' 13.687 W
9,769.0	91.10	176.50	9,321.4	-697.0	69.4	445,502.92	746,228.33	32° 13' 20.268 N	103° 32' 13.628 W
9,863.0	91.00	174.40	9,319.7	-790.7	76.9	445,409.23	746,235.78	32° 13' 19.341 N	103° 32' 13.550 W
9,957.0	89.20	174.00	9,319.6	-884.2	86.4	445,315.72	746,245.28	32° 13' 18.415 N	103° 32' 13.447 W
10,052.0	90.30	173.70	9,320.0	-978.6	96.6	445,221.27	746,255.46	32° 13' 17.479 N	103° 32' 13.337 W

Company:	COG Operating, LLC	**Local Co-ordinate Reference:**	Well Tyrell Fee #2H
Project:	Lea County, NM	**TVD Reference:**	WELL @ 3634.0usft (McVay 8 RKB 26' + GL 3608')
Site:	Sec 14 T24-S R33-E	**MD Reference:**	WELL @ 3634.0usft (McVay 8 RKB 26' + GL 3608')
Well:	Tyrell Fee #2H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Wellbore #1	**Database:**	Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,146.0	88.90	175.10	9,320.6	-1,072.2	105.7	445,127.72	746,264.63	32° 13' 16.553 N	103° 32' 13.238 W
10,240.0	88.50	175.40	9,322.8	-1,165.8	113.5	445,034.07	746,272.41	32° 13' 15.626 N	103° 32' 13.156 W
10,335.0	87.30	175.40	9,326.2	-1,260.5	121.1	444,939.44	746,280.03	32° 13' 14.689 N	103° 32' 13.075 W
10,429.0	86.90	175.10	9,331.0	-1,354.0	128.9	444,845.88	746,287.80	32° 13' 13.762 N	103° 32' 12.993 W
10,523.0	87.60	175.10	9,335.5	-1,447.6	136.9	444,752.34	746,295.82	32° 13' 12.836 N	103° 32' 12.907 W
10,618.0	88.30	174.70	9,338.9	-1,542.1	145.4	444,657.77	746,304.26	32° 13' 11.900 N	103° 32' 12.817 W
10,712.0	89.20	174.70	9,341.0	-1,635.7	154.0	444,564.20	746,312.94	32° 13' 10.973 N	103° 32' 12.724 W
10,806.0	90.60	174.40	9,341.1	-1,729.3	163.0	444,470.63	746,321.87	32° 13' 10.047 N	103° 32' 12.629 W
10,901.0	89.70	175.80	9,340.9	-1,823.9	171.1	444,375.98	746,329.98	32° 13' 9.109 N	103° 32' 12.542 W
10,995.0	88.20	177.20	9,342.6	-1,917.7	176.8	444,282.17	746,335.72	32° 13' 8.181 N	103° 32' 12.484 W
11,089.0	89.70	177.60	9,344.3	-2,011.6	181.1	444,188.29	746,339.98	32° 13' 7.251 N	103° 32' 12.442 W
11,184.0	88.50	177.90	9,345.8	-2,106.5	184.8	444,093.38	746,343.71	32° 13' 6.312 N	103° 32' 12.407 W
11,278.0	86.90	176.90	9,349.6	-2,200.3	189.1	443,999.55	746,347.97	32° 13' 5.383 N	103° 32' 12.365 W
11,373.0	87.40	176.90	9,354.3	-2,295.1	194.2	443,904.81	746,353.10	32° 13' 4.445 N	103° 32' 12.314 W
11,467.0	88.50	176.50	9,357.7	-2,388.9	199.6	443,811.03	746,358.51	32° 13' 3.517 N	103° 32' 12.259 W
11,561.0	89.60	176.90	9,359.2	-2,482.7	205.0	443,717.20	746,363.92	32° 13' 2.588 N	103° 32' 12.204 W
11,656.0	91.10	176.50	9,358.6	-2,577.5	210.5	443,622.36	746,369.39	32° 13' 1.649 N	103° 32' 12.149 W
11,750.0	89.40	176.50	9,358.2	-2,671.4	216.2	443,528.54	746,375.13	32° 13' 0.720 N	103° 32' 12.090 W
11,844.0	89.70	176.90	9,359.0	-2,765.2	221.6	443,434.70	746,380.54	32° 12' 59.791 N	103° 32' 12.035 W
11,939.0	91.30	176.50	9,358.1	-2,860.0	227.1	443,339.86	746,386.01	32° 12' 58.852 N	103° 32' 11.980 W
12,033.0	89.20	175.40	9,357.7	-2,953.8	233.7	443,246.10	746,392.65	32° 12' 57.924 N	103° 32' 11.910 W
12,128.0	90.80	175.10	9,357.7	-3,048.5	241.6	443,151.43	746,400.51	32° 12' 56.987 N	103° 32' 11.827 W
12,222.0	92.40	175.10	9,355.1	-3,142.1	249.6	443,057.82	746,408.54	32° 12' 56.060 N	103° 32' 11.742 W
12,316.0	90.30	174.70	9,352.9	-3,235.7	258.0	442,964.22	746,416.89	32° 12' 55.133 N	103° 32' 11.653 W
12,411.0	89.00	175.10	9,353.5	-3,330.3	266.4	442,869.60	746,425.34	32° 12' 54.196 N	103° 32' 11.562 W
12,505.0	88.30	174.40	9,355.7	-3,423.9	275.0	442,776.02	746,433.93	32° 12' 53.269 N	103° 32' 11.470 W
12,599.0	89.20	174.40	9,357.7	-3,517.4	284.2	442,682.49	746,443.10	32° 12' 52.343 N	103° 32' 11.372 W
12,694.0	90.30	174.40	9,358.2	-3,612.0	293.5	442,587.95	746,452.37	32° 12' 51.407 N	103° 32' 11.272 W
12,788.0	90.80	175.40	9,357.3	-3,705.6	301.8	442,494.33	746,460.73	32° 12' 50.480 N	103° 32' 11.183 W
12,883.0	89.90	176.90	9,356.7	-3,800.4	308.2	442,399.55	746,467.11	32° 12' 49.542 N	103° 32' 11.117 W
12,977.0	90.80	177.20	9,356.1	-3,894.2	313.0	442,305.67	746,471.95	32° 12' 48.612 N	103° 32' 11.069 W
13,071.0	88.70	175.80	9,356.5	-3,988.0	318.8	442,211.86	746,477.68	32° 12' 47.684 N	103° 32' 11.010 W
13,166.0	89.70	175.80	9,357.8	-4,082.8	325.7	442,117.12	746,484.64	32° 12' 46.746 N	103° 32' 10.937 W
13,260.0	90.80	175.40	9,357.4	-4,176.5	333.0	442,023.40	746,491.85	32° 12' 45.818 N	103° 32' 10.861 W
13,354.0	87.30	175.40	9,359.0	-4,270.2	340.5	441,929.73	746,499.39	32° 12' 44.890 N	103° 32' 10.782 W
13,449.0	90.10	176.50	9,361.1	-4,364.9	347.2	441,835.01	746,506.10	32° 12' 43.952 N	103° 32' 10.712 W
13,543.0	90.80	176.10	9,360.4	-4,458.7	353.3	441,741.21	746,512.16	32° 12' 43.024 N	103° 32' 10.649 W
13,637.0	90.30	176.10	9,359.5	-4,552.5	359.7	441,647.43	746,518.55	32° 12' 42.095 N	103° 32' 10.583 W
13,810.0	90.30	176.10	9,358.6	-4,725.1	371.4	441,474.83	746,530.32	32° 12' 40.387 N	103° 32' 10.461 W
TD @ 13810' MD / 9359' TVD									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
8,750.0	8,749.1	-36.5	48.0	Tie Into Gyro @ 8750' MD / 8749' TVD
9,150.0	9,126.0	-139.7	39.6	Crossed 330' Hardline @ 9150' MD / 9126' TVD
13,810.0	9,358.6	-4,725.1	371.4	TD @ 13810' MD / 9359' TVD

Company Name: COG Operating, LLC
Tyrell Fee #2H
Lea County, NM
Rig: McVay 8 RKB 26' + GL 3608'
Created By: Sam Hays
Date: 11/23/2015

Tyrell Fee #2H
Lea County, NM
Q150784 & WT-150677
Target Change #2

CONCHO

DDC
The DIRECTIONAL DRILLING COMPANY

G
T M

Azimuths to Grid North

Correction: 6.69°

Magnetic Field
Strength: 48111.2snT
Dip Angle: 60.09°
Date: 10/20/2015
Model: IGRF2015

PROJECT DETAILS: Lea County, NM

Geodetic System:	US State Plane 1927 (Exact solution)
Datum:	NAD 1927 (NADCON CONUS)
Ellipsoid:	Clarke 1866
Zone:	New Mexico East 3001
System Datum:	Mean Sea Level

WELL DETAILS: Tyrell Fee #2H

Ground Level: 3608.0

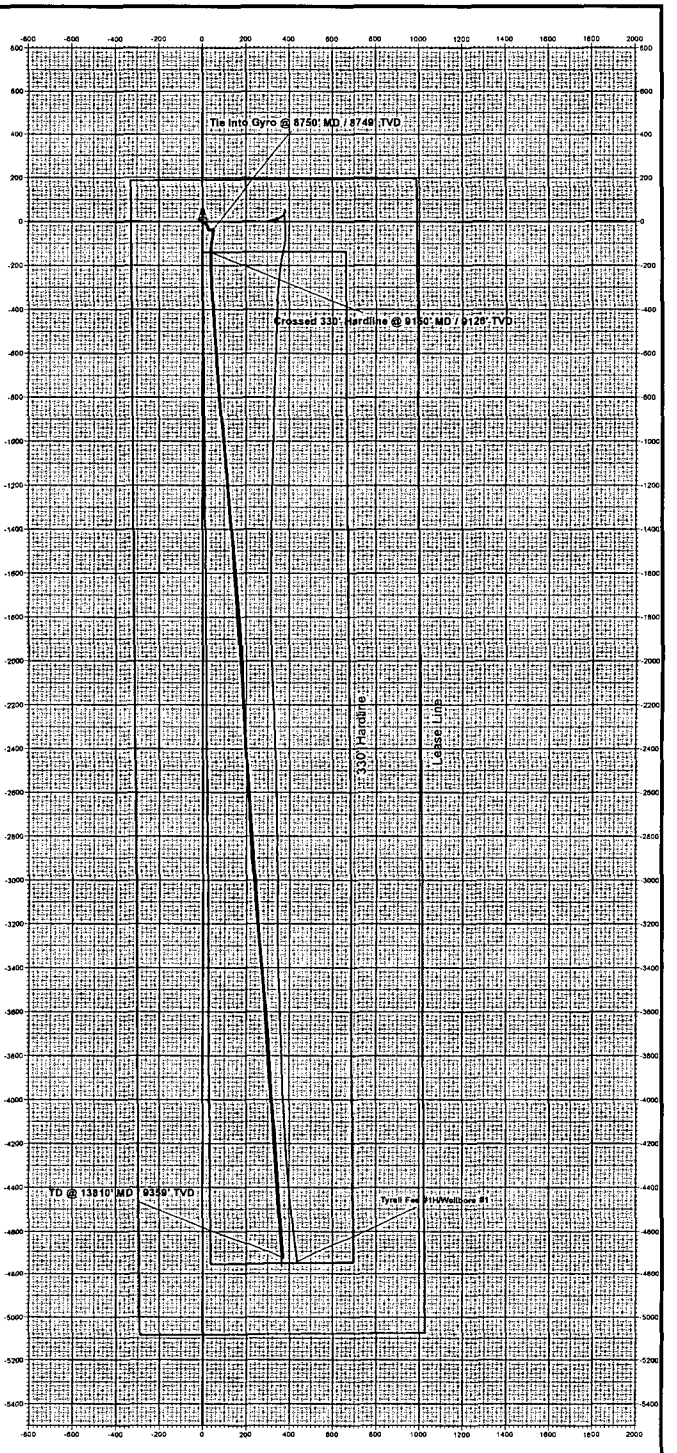
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	448199.90	748158.9032° 13' 27.170 N	103° 32' 14.378 W	

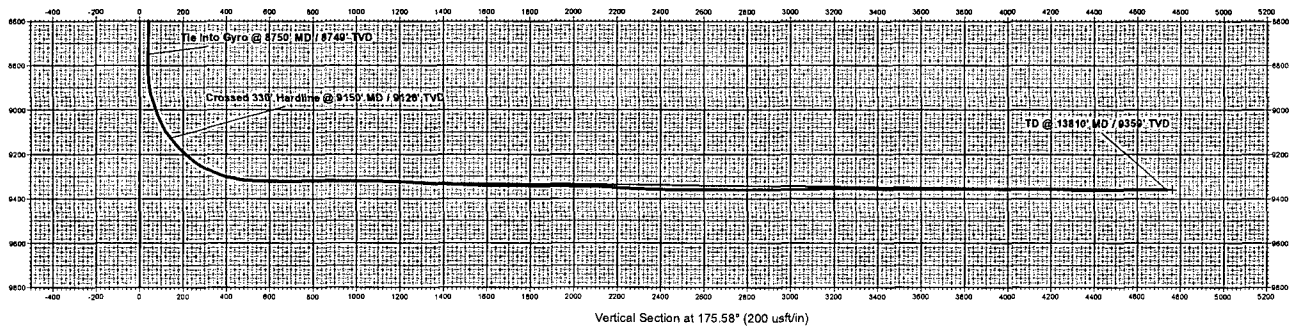
DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL - Tyrell Fee #2H TC#1 - plan hits target center	9359.0	-4750.7	388.9	441449.20	748525.80	32° 12' 40.133 N	103° 32' 10.516 W

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Departure	Annotation
8750.0	1.49	81.53	8749.1	-38.5	48.0	40.1	106.1	Tie Into Gyro @ 8750' MD / 8749' TVD
9150.0	38.17	161.28	9126.0	-139.7	39.8	142.3	213.1	Crossed 330' Hardline @ 9150' MD / 9126' TVD
13810.0	90.30	176.10	9358.8	-4725.1	371.4	4739.6	4810.8	TD @ 13810' MD / 9359' TVD





Vertical Section at 175.58° (200 usft/in)