

**McVAY DRILLING COMPANY**

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

30-025-42061

HOBBS OCD

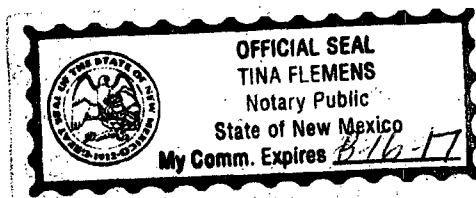
JUN 26 2015

RECEIVED

Well Name and Num: Grey Hawk State #2H
Location: Sec 31, T21S, R34E
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:

<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>
1.90	259	0.70	5903	2.80	10399
0.07	493	0.80	6328	31.20	10684
0.03	800	0.70	6582	56.14	10940
0.50	1086	1.10	6995	78.00	11031
0.50	1399	1.20	7345	87.30	11284
0.50	1786	1.30	7724	90.00	11667
0.40	1975	1.10	8169	92.00	11952
0.30	2385	0.90	8584	88.00	12142
1.50	2829	0.60	8977	92.00	12527
2.00	3301	2.00	9376	88.70	12907
2.50	3490	0.60	9471	89.30	13382
1.30	3963	1.10	9852	90.10	13853
1.20	4435	2.00	10264	92.30	14229
1.60	4609	2.30	10429	88.10	14703
1.70	4987	25.50	10759	90.80	15082
1.10	5174	33.10	10812	94.30	15385
0.80	5507	44.40	10876		

By: Matt O'ConnorSubscribed and sworn to before me this 4th day of March, 2015Tina Flemens
Notary Public, Lea County, New Mexico

JUL 27 2015

AM



February 20, 2015

HOBBS OCD

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

JUN 26 2015

RECEIVED

Attn: Kanicia Castillo

RE: Grey Hawk State 2H

Please find enclosed a copy of the survey from 0' to 10,340' ran on the above referenced well.

Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §

§

COUNTY OF NUECES §

This instrument was acknowledged before me on the 20 day of Feb.,
A.D., 2015, by Keith Havelka.

A handwritten signature in cursive script that reads "Jennifer Ann Byerly".

Jennifer Ann Byerly
Notary Public, State of Texas



Company: Cog Operating LLC
Lease/Well: Grey Hawk State/2H

Rig Name: Mcvay 7
State/County: New Mexico /Lea
Latitude: 32.43, Longitude: -103.51
GRID North is 0.44 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : 17 FT

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: grey hawk state 2h -de_01.ut

Minimum Curvature Method

Report Date/Time: 2/20/2015 / 15:39

VES Survey International

(432) 563-5444

West Texas

Surveyor: Javier Estrada

Grey Hawk State 2H / API 30-025-42061

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	0.65	217.48	100.00	-0.45	-0.34	-0.45	0.56	217.48	0.65
200.00	0.72	200.47	199.99	-1.49	-0.91	-1.49	1.74	211.39	0.22
300.00	0.78	225.89	299.98	-2.55	-1.61	-2.55	3.02	212.34	0.33
400.00	0.62	242.84	399.98	-3.27	-2.58	-3.27	4.16	218.31	0.26
500.00	0.77	259.77	499.97	-3.63	-3.72	-3.63	5.20	225.70	0.25
600.00	0.58	277.13	599.96	-3.69	-4.89	-3.69	6.12	232.94	0.28
700.00	0.43	277.86	699.96	-3.58	-5.76	-3.58	6.78	238.17	0.15
800.00	0.41	272.16	799.95	-3.51	-6.50	-3.51	7.38	241.61	0.05
900.00	0.35	278.47	899.95	-3.45	-7.16	-3.45	7.95	244.27	0.08
1000.00	0.41	251.59	999.95	-3.52	-7.80	-3.52	8.56	245.72	0.18
1100.00	0.34	260.23	1099.95	-3.68	-8.43	-3.68	9.20	246.41	0.09
1200.00	0.34	254.02	1199.95	-3.81	-9.00	-3.81	9.78	247.05	0.04
1300.00	0.26	204.91	1299.94	-4.10	-9.38	-4.10	10.24	246.39	0.26
1400.00	0.12	163.96	1399.94	-4.41	-9.45	-4.41	10.43	244.99	0.19
1500.00	0.05	204.25	1499.94	-4.55	-9.44	-4.55	10.48	244.25	0.09
1600.00	0.14	214.80	1599.94	-4.69	-9.53	-4.69	10.62	243.77	0.08
1700.00	0.16	216.10	1699.94	-4.91	-9.68	-4.91	10.85	243.11	0.03
1800.00	0.16	206.34	1799.94	-5.15	-9.83	-5.15	11.09	242.35	0.03

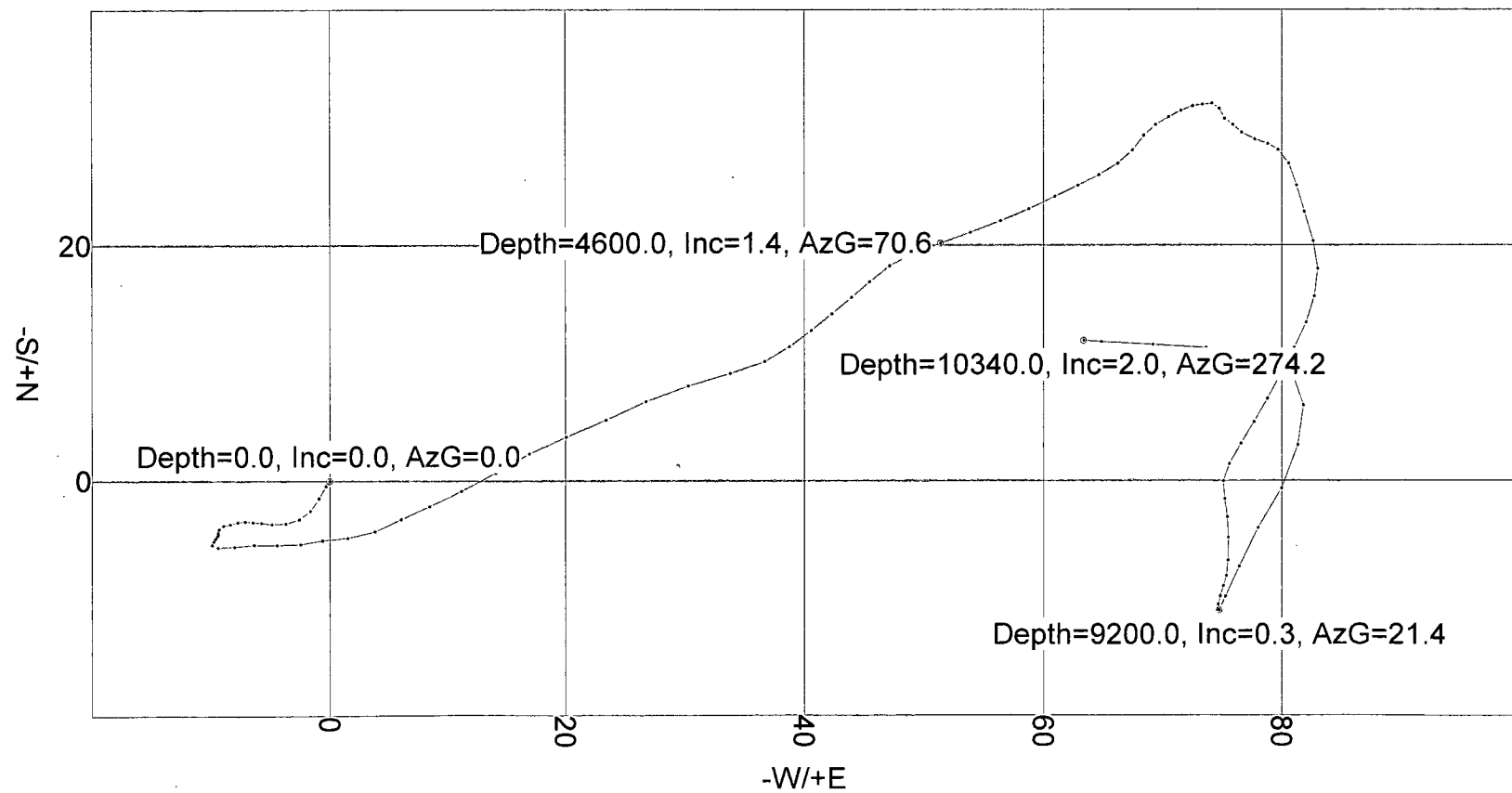
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.22	204.13	1899.94	-5.44	-9.96	-5.44	11.35	241.35	0.06
2000.00	0.66	93.74	1999.94	-5.65	-9.47	-5.65	11.03	239.15	0.76
2100.00	0.97	84.09	2099.93	-5.60	-8.05	-5.60	9.81	235.16	0.34
2200.00	0.93	84.39	2199.92	-5.44	-6.40	-5.44	8.40	229.65	0.04
2300.00	1.32	94.93	2299.90	-5.46	-4.44	-5.46	7.04	219.15	0.44
2400.00	0.98	78.51	2399.88	-5.39	-2.46	-5.39	5.92	204.51	0.48
2500.00	1.17	82.00	2499.86	-5.08	-0.61	-5.08	5.11	186.87	0.20
2600.00	1.27	85.63	2599.84	-4.85	1.50	-4.85	5.08	162.78	0.13
2700.00	1.45	69.10	2699.81	-4.31	3.79	-4.31	5.74	138.66	0.43
2800.00	1.39	61.31	2799.78	-3.28	6.04	-3.28	6.88	118.47	0.20
2900.00	1.66	69.28	2899.74	-2.18	8.46	-2.18	8.74	104.47	0.34
3000.00	1.88	61.19	2999.70	-0.88	11.25	-0.88	11.28	94.49	0.33
3100.00	1.86	61.20	3099.64	0.69	14.10	0.69	14.12	87.21	0.02
3200.00	1.88	59.99	3199.59	2.29	16.94	2.29	17.10	82.31	0.05
3300.00	2.09	70.35	3299.53	3.72	20.08	3.72	20.42	79.51	0.41
3400.00	2.07	62.96	3399.46	5.15	23.40	5.15	23.97	77.58	0.27
3500.00	2.14	66.65	3499.40	6.72	26.73	6.72	27.56	75.90	0.15
3600.00	2.18	71.96	3599.33	8.04	30.25	8.04	31.30	75.11	0.20
3700.00	2.06	74.85	3699.26	9.10	33.79	9.10	34.99	74.92	0.16
3800.00	1.46	64.52	3799.21	10.12	36.67	10.12	38.04	74.57	0.68
3900.00	1.36	53.18	3899.18	11.37	38.76	11.37	40.39	73.65	0.30
4000.00	1.24	51.79	3999.15	12.75	40.56	12.75	42.51	72.55	0.12
4100.00	1.34	50.68	4099.13	14.16	42.31	14.16	44.62	71.49	0.11
4200.00	1.14	49.36	4199.11	15.56	43.98	15.56	46.65	70.52	0.20
4300.00	1.21	49.07	4299.08	16.89	45.53	16.89	48.56	69.64	0.06
4400.00	1.25	53.45	4399.06	18.23	47.20	18.23	50.60	68.88	0.10
4500.00	1.34	68.05	4499.04	19.32	49.16	19.32	52.82	68.55	0.34
4600.00	1.45	70.61	4599.01	20.17	51.43	20.17	55.25	68.58	0.12
4700.00	1.58	68.80	4698.97	21.09	53.91	21.09	57.89	68.63	0.14
4800.00	1.53	68.32	4798.94	22.08	56.43	22.08	60.60	68.63	0.05
4900.00	1.41	65.48	4898.90	23.08	58.79	23.08	63.16	68.56	0.14
5000.00	1.35	62.05	4998.87	24.15	60.95	24.15	65.56	68.39	0.10
5100.00	1.12	66.29	5098.85	25.09	62.89	25.09	67.71	68.25	0.25
5200.00	1.11	59.06	5198.83	25.98	64.61	25.98	69.64	68.09	0.14
5300.00	1.04	57.93	5298.81	26.96	66.21	26.96	71.49	67.84	0.07
5400.00	0.91	37.12	5398.80	28.08	67.46	28.08	73.07	67.40	0.37
5500.00	0.87	38.06	5498.79	29.31	68.41	29.31	74.42	66.81	0.05
5600.00	0.74	57.91	5598.78	30.25	69.42	30.25	75.72	66.46	0.30
5700.00	0.70	60.81	5698.77	30.89	70.50	30.89	76.97	66.34	0.05

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
5800.00	0.67	62.78	5798.76	31.45	71.55	31.45	78.16	66.27	0.04
5900.00	0.54	74.84	5898.76	31.84	72.52	31.84	79.21	66.30	0.18
6000.00	0.43	88.04	5998.75	31.98	73.35	31.98	80.02	66.44	0.16
6100.00	0.49	81.65	6098.75	32.05	74.15	32.05	80.78	66.62	0.08
6200.00	0.64	157.52	6198.75	31.60	74.78	31.60	81.18	67.10	0.71
6300.00	0.44	143.79	6298.74	30.77	75.22	30.77	81.27	67.75	0.24
6400.00	0.58	112.81	6398.74	30.26	75.91	30.26	81.72	68.26	0.30
6500.00	0.63	151.38	6498.73	29.59	76.64	29.59	82.15	68.89	0.40
6600.00	0.97	95.82	6598.72	29.02	77.74	29.02	82.98	69.53	0.80
6700.00	0.46	138.01	6698.72	28.63	78.85	28.63	83.89	70.04	0.70
6800.00	0.70	109.93	6798.71	28.12	79.69	28.12	84.51	70.56	0.36
6900.00	1.16	160.85	6898.70	26.96	80.59	26.96	84.98	71.50	0.90
7000.00	1.09	160.79	6998.68	25.11	81.24	25.11	85.03	72.82	0.07
7100.00	1.60	165.69	7098.65	22.86	81.90	22.86	85.03	74.40	0.52
7200.00	1.39	160.60	7198.62	20.36	82.64	20.36	85.11	76.16	0.25
7300.00	1.39	181.57	7298.59	18.01	83.01	18.01	84.94	77.76	0.51
7400.00	1.34	191.89	7398.56	15.65	82.74	15.65	84.21	79.29	0.25
7500.00	1.32	202.89	7498.54	13.44	82.05	13.44	83.14	80.70	0.26
7600.00	1.44	205.58	7598.51	11.24	81.06	11.24	81.83	82.10	0.13
7700.00	1.37	208.88	7698.48	9.06	79.94	9.06	80.45	83.53	0.11
7800.00	1.37	207.87	7798.45	6.96	78.80	6.96	79.11	84.95	0.02
7900.00	1.25	211.71	7898.42	4.97	77.67	4.97	77.83	86.34	0.14
8000.00	1.18	209.14	7998.40	3.15	76.59	3.15	76.66	87.65	0.09
8100.00	1.09	210.07	8098.38	1.42	75.61	1.42	75.63	88.92	0.09
8200.00	0.74	183.44	8198.37	-0.05	75.10	-0.05	75.10	90.04	0.54
8300.00	1.01	169.75	8298.36	-1.56	75.22	-1.56	75.23	91.19	0.34
8400.00	0.76	174.57	8398.34	-3.09	75.44	-3.09	75.50	92.35	0.27
8500.00	1.26	179.13	8498.33	-4.85	75.52	-4.85	75.67	93.68	0.51
8600.00	0.98	182.82	8598.31	-6.81	75.49	-6.81	75.80	95.15	0.29
8700.00	0.52	190.45	8698.30	-8.11	75.36	-8.11	75.80	96.14	0.47
8800.00	0.52	199.67	8798.30	-8.98	75.13	-8.98	75.67	96.82	0.08
8900.00	0.55	196.62	8898.29	-9.87	74.84	-9.87	75.49	97.51	0.05
9000.00	0.28	185.63	8998.29	-10.58	74.68	-10.58	75.42	98.06	0.28
9100.00	0.28	178.02	9098.29	-11.07	74.66	-11.07	75.48	98.43	0.04
9200.00	0.29	21.44	9198.29	-11.08	74.77	-11.08	75.58	98.43	0.56
9300.00	1.20	24.54	9298.28	-9.89	75.29	-9.89	75.94	97.48	0.90
9400.00	2.03	23.71	9398.24	-7.32	76.44	-7.32	76.79	95.47	0.83
9500.00	2.17	27.64	9498.17	-4.03	78.02	-4.03	78.13	92.96	0.20
9600.00	2.31	32.34	9598.09	-0.65	79.98	-0.65	79.98	90.47	0.23

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
9700.00	2.27	8.48	9698.02	3.01	81.35	3.01	81.41	87.88	0.95
9800.00	1.62	7.28	9797.96	6.38	81.82	6.38	82.07	85.54	0.65
9900.00	1.68	315.77	9897.92	8.84	80.98	8.84	81.46	83.77	1.44
10000.00	2.51	285.74	9997.86	10.49	77.84	10.49	78.55	82.33	1.35
10100.00	2.39	275.27	10097.77	11.27	73.66	11.27	74.52	81.30	0.46
10200.00	2.75	271.85	10197.66	11.54	69.19	11.54	70.15	80.53	0.40
10300.00	2.26	274.97	10297.57	11.79	64.83	11.79	65.89	79.69	0.52
10340.00	2.01	274.18	10337.54	11.91	63.35	11.91	64.46	79.35	0.63



VES Survey International
(432) 563-5444
West Texas
Surveyor: Javier Estrada
Grey Hawk State 2H / API 30-025-42061





COG Operating LLC

**Lea County, NM
Grey Hawk State
#2H**

OH

Survey: MWD #2 ST01

Survey Report - Geographic

01 March, 2015



Wellplanning

Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H
Project:	Lea County, NM	TVD Reference:	WELL @ 3647.6usft (Original Well Elev)
Site:	Grey Hawk State	MD Reference:	WELL @ 3647.6usft (Original Well Elev)
Well:	#2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

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		Grey Hawk State			
Site Position:		Northing:	520,577.50 usft	Latitude:	32° 25' 42.354 N
From:	Map	Easting:	756,780.50 usft	Longitude:	103° 30' 4.012 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.45 °

Well	#2H					
Well Position	+N/-S	0.0 usft	Northing:	520,555.50 usft	Latitude:	32° 25' 42.289 N
	+E/-W	0.0 usft	Easting:	754,801.10 usft	Longitude:	103° 30' 27.107 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,630.6 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/31/2015	7.12	60.29	48,381

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	0.07	

Survey Program	Date 3/1/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	10,340.0	GYRO (OH)	NS-GYRO-SS	NS Gyro single shots
10,429.0	10,876.0	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
10,340.0	2.01	274.18	10,337.5	12.0	63.4	520,567.46	754,864.52	32° 25' 42.402 N	103° 30' 26.366 W
10,398.0	2.80	329.50	10,395.5	13.3	61.7	520,568.75	754,862.78	32° 25' 42.415 N	103° 30' 26.386 W
10,430.0	5.30	356.40	10,427.4	15.4	61.2	520,570.90	754,862.29	32° 25' 42.436 N	103° 30' 26.392 W
10,461.0	8.70	4.20	10,458.2	19.2	61.3	520,574.67	754,862.38	32° 25' 42.474 N	103° 30' 26.390 W
10,493.0	12.80	3.90	10,489.6	25.1	61.7	520,580.62	754,862.79	32° 25' 42.532 N	103° 30' 26.385 W
10,525.0	16.80	3.40	10,520.5	33.3	62.2	520,588.78	754,863.31	32° 25' 42.613 N	103° 30' 26.378 W
10,557.0	20.40	5.40	10,550.9	43.4	63.0	520,598.95	754,864.11	32° 25' 42.714 N	103° 30' 26.368 W
10,589.0	23.60	8.80	10,580.5	55.3	64.5	520,610.84	754,865.61	32° 25' 42.831 N	103° 30' 26.349 W
10,621.0	26.10	8.60	10,609.6	68.6	66.6	520,624.13	754,867.65	32° 25' 42.963 N	103° 30' 26.324 W
10,652.0	28.60	12.00	10,637.1	82.6	69.1	520,638.13	754,870.21	32° 25' 43.101 N	103° 30' 26.293 W
10,684.0	31.20	10.10	10,664.8	98.3	72.2	520,653.79	754,873.26	32° 25' 43.256 N	103° 30' 26.256 W



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H
Project:	Lea County, NM	TVD Reference:	WELL @ 3647.6usft (Original Well Elev)
Site:	Grey Hawk State	MD Reference:	WELL @ 3647.6usft (Original Well Elev)
Well:	#2H	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
10,716.0	34.20	8.00	10,691.8	115.4	74.9	520,670.86	754,875.96	32° 25' 43.424 N	103° 30' 26.223 W
10,748.0	36.90	6.20	10,717.8	133.8	77.2	520,689.32	754,878.25	32° 25' 43.607 N	103° 30' 26.195 W
10,780.0	40.00	4.70	10,742.9	153.6	79.0	520,709.12	754,880.13	32° 25' 43.803 N	103° 30' 26.171 W
10,812.0	42.90	4.00	10,766.8	174.7	80.6	520,730.24	754,881.74	32° 25' 44.012 N	103° 30' 26.151 W
10,844.0	46.10	3.30	10,789.7	197.1	82.1	520,752.62	754,883.16	32° 25' 44.233 N	103° 30' 26.132 W
10,876.0	49.40	2.60	10,811.2	220.8	83.3	520,776.28	754,884.37	32° 25' 44.467 N	103° 30' 26.116 W
10,908.0	53.20	2.30	10,831.2	245.7	84.3	520,801.22	754,885.44	32° 25' 44.714 N	103° 30' 26.101 W
10,940.0	56.40	1.80	10,849.6	271.8	85.3	520,827.35	754,886.37	32° 25' 44.972 N	103° 30' 26.088 W
10,971.0	59.90	2.00	10,866.0	298.2	86.2	520,853.66	754,887.25	32° 25' 45.232 N	103° 30' 26.075 W
11,003.0	63.60	1.70	10,881.1	326.3	87.1	520,881.83	754,888.16	32° 25' 45.511 N	103° 30' 26.062 W
11,035.0	66.90	0.30	10,894.5	355.4	87.6	520,910.88	754,888.66	32° 25' 45.798 N	103° 30' 26.053 W
11,067.0	70.20	359.00	10,906.2	385.2	87.4	520,940.66	754,888.47	32° 25' 46.093 N	103° 30' 26.053 W
11,099.0	74.10	358.10	10,916.0	415.6	86.6	520,971.11	754,887.70	32° 25' 46.394 N	103° 30' 26.059 W
11,131.0	78.00	358.00	10,923.7	446.6	85.5	521,002.14	754,886.64	32° 25' 46.702 N	103° 30' 26.069 W
11,159.0	81.70	357.60	10,928.7	474.2	84.5	521,029.67	754,885.58	32° 25' 46.974 N	103° 30' 26.079 W
11,189.0	83.70	358.20	10,932.5	503.9	83.4	521,059.41	754,884.49	32° 25' 47.268 N	103° 30' 26.089 W
11,221.0	85.30	358.40	10,935.6	535.7	82.5	521,091.25	754,883.55	32° 25' 47.584 N	103° 30' 26.097 W
11,252.0	86.00	358.60	10,937.9	566.6	81.6	521,122.15	754,882.74	32° 25' 47.889 N	103° 30' 26.103 W
11,284.0	87.30	358.50	10,939.8	598.6	80.8	521,154.08	754,881.93	32° 25' 48.205 N	103° 30' 26.110 W
11,316.0	88.60	358.20	10,940.9	630.5	79.9	521,186.05	754,881.01	32° 25' 48.522 N	103° 30' 26.118 W
11,348.0	90.20	358.90	10,941.3	662.5	79.1	521,218.03	754,880.20	32° 25' 48.838 N	103° 30' 26.124 W
11,380.0	91.40	358.90	10,940.8	694.5	78.5	521,250.02	754,879.59	32° 25' 49.155 N	103° 30' 26.129 W
11,476.0	92.30	358.60	10,937.7	790.4	76.4	521,345.95	754,877.49	32° 25' 50.104 N	103° 30' 26.144 W
11,572.0	91.50	357.40	10,934.5	886.3	73.0	521,441.84	754,874.15	32° 25' 51.053 N	103° 30' 26.175 W
11,667.0	90.00	357.00	10,933.3	981.2	68.4	521,536.71	754,869.51	32° 25' 51.992 N	103° 30' 26.220 W
11,763.0	90.70	356.00	10,932.7	1,077.0	62.5	521,632.53	754,863.64	32° 25' 52.941 N	103° 30' 26.280 W
11,856.0	92.50	355.40	10,930.1	1,169.7	55.6	521,725.23	754,856.67	32° 25' 53.859 N	103° 30' 26.353 W
11,952.0	92.00	355.40	10,926.3	1,265.3	47.9	521,820.84	754,848.98	32° 25' 54.806 N	103° 30' 26.434 W
12,048.0	89.80	356.30	10,924.8	1,361.1	40.9	521,916.57	754,842.04	32° 25' 55.753 N	103° 30' 26.507 W
12,143.0	88.00	358.20	10,926.6	1,455.9	36.4	522,011.44	754,837.48	32° 25' 56.692 N	103° 30' 26.551 W
12,239.0	89.10	359.30	10,929.1	1,551.9	34.3	522,107.38	754,835.39	32° 25' 57.642 N	103° 30' 26.567 W
12,335.0	90.80	1.30	10,929.2	1,647.9	34.8	522,203.37	754,835.89	32° 25' 58.592 N	103° 30' 26.553 W
12,431.0	93.10	0.20	10,925.9	1,743.8	36.0	522,299.30	754,837.14	32° 25' 59.541 N	103° 30' 26.529 W
12,527.0	92.00	358.50	10,921.6	1,839.7	35.0	522,395.19	754,836.06	32° 26' 0.490 N	103° 30' 26.533 W
12,622.0	88.70	358.10	10,921.0	1,934.6	32.1	522,490.14	754,833.24	32° 26' 1.429 N	103° 30' 26.558 W
12,718.0	87.20	0.30	10,924.5	2,030.6	30.8	522,586.06	754,831.90	32° 26' 2.379 N	103° 30' 26.565 W
12,812.0	88.00	359.20	10,928.4	2,124.5	30.4	522,679.97	754,831.49	32° 26' 3.308 N	103° 30' 26.561 W
12,907.0	88.70	0.40	10,931.1	2,219.4	30.1	522,774.93	754,831.16	32° 26' 4.248 N	103° 30' 26.556 W
13,001.0	90.20	359.20	10,932.1	2,313.4	29.7	522,868.92	754,830.83	32° 26' 5.178 N	103° 30' 26.552 W
13,097.0	91.10	0.90	10,931.0	2,409.4	29.8	522,964.91	754,830.91	32° 26' 6.127 N	103° 30' 26.542 W
13,192.0	93.20	359.90	10,927.4	2,504.3	30.5	523,059.83	754,831.58	32° 26' 7.067 N	103° 30' 26.526 W
13,287.0	91.50	359.30	10,923.5	2,599.2	29.8	523,154.75	754,830.91	32° 26' 8.006 N	103° 30' 26.525 W
13,382.0	89.30	359.00	10,922.8	2,694.2	28.4	523,249.73	754,829.50	32° 26' 8.946 N	103° 30' 26.533 W
13,476.0	90.40	358.20	10,923.1	2,788.2	26.1	523,343.70	754,827.21	32° 26' 9.876 N	103° 30' 26.551 W
13,570.0	91.80	357.70	10,921.3	2,882.1	22.7	523,437.62	754,823.84	32° 26' 10.805 N	103° 30' 26.582 W
13,664.0	89.50	358.00	10,920.2	2,976.0	19.2	523,531.54	754,820.32	32° 26' 11.735 N	103° 30' 26.614 W
13,758.0	89.30	1.40	10,921.2	3,070.0	18.7	523,625.52	754,819.83	32° 26' 12.665 N	103° 30' 26.612 W
13,853.0	90.10	1.20	10,921.7	3,165.0	20.9	523,720.49	754,821.98	32° 26' 13.605 N	103° 30' 26.578 W
13,947.0	91.10	0.40	10,920.7	3,259.0	22.2	523,814.48	754,823.29	32° 26' 14.535 N	103° 30' 26.554 W
14,040.0	89.50	0.40	10,920.2	3,352.0	22.8	523,907.47	754,823.94	32° 26' 15.455 N	103° 30' 26.538 W
14,134.0	90.50	359.10	10,920.2	3,446.0	22.4	524,001.47	754,823.53	32° 26' 16.385 N	103° 30' 26.534 W
14,229.0	92.30	357.20	10,917.9	3,540.9	19.4	524,096.38	754,820.47	32° 26' 17.324 N	103° 30' 26.562 W
14,325.0	92.30	355.40	10,914.1	3,636.6	13.2	524,192.10	754,814.28	32° 26' 18.272 N	103° 30' 26.625 W
14,420.0	90.70	355.80	10,911.6	3,731.3	5.9	524,286.78	754,806.99	32° 26' 19.209 N	103° 30' 26.702 W
14,514.0	89.30	357.50	10,911.6	3,825.1	0.4	524,380.62	754,801.50	32° 26' 20.138 N	103° 30' 26.757 W



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H
Project:	Lea County, NM	TVD Reference:	WELL @ 3647.6usft (Original Well Elev)
Site:	Grey Hawk State	MD Reference:	WELL @ 3647.6usft (Original Well Elev)
Well:	#2H	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
14,608.0	88.40	359.00	10,913.5	3,919.0	-2.5	524,474.55	754,798.63	32° 26' 21.068 N	103° 30' 26.782 W
14,703.0	88.10	0.90	10,916.4	4,014.0	-2.5	524,569.50	754,798.55	32° 26' 22.007 N	103° 30' 26.775 W
14,798.0	89.20	359.90	10,918.6	4,109.0	-1.9	524,664.47	754,799.21	32° 26' 22.947 N	103° 30' 26.758 W
14,892.0	89.60	1.80	10,919.6	4,202.9	-0.5	524,758.45	754,800.60	32° 26' 23.877 N	103° 30' 26.734 W
14,987.0	90.50	0.90	10,919.5	4,297.9	1.7	524,853.42	754,802.84	32° 26' 24.816 N	103° 30' 26.699 W
15,082.0	90.80	359.20	10,918.4	4,392.9	1.8	524,948.41	754,802.93	32° 26' 25.756 N	103° 30' 26.689 W
15,177.0	89.80	359.70	10,917.9	4,487.9	0.9	525,043.41	754,802.01	32° 26' 26.696 N	103° 30' 26.692 W
15,271.0	91.80	357.70	10,916.6	4,581.9	-1.2	525,137.36	754,799.88	32° 26' 27.626 N	103° 30' 26.708 W
15,385.0	94.30	354.90	10,910.5	4,695.4	-8.6	525,250.94	754,792.54	32° 26' 28.751 N	103° 30' 26.783 W
15,433.0	94.30	354.90	10,906.9	4,743.1	-12.8	525,298.62	754,788.29	32° 26' 29.223 N	103° 30' 26.829 W
PBHL(GH#2H)									

Checked By:	Approved By:	Date:
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