

PATRIOT DRILLING, LLC

OPERATOR: COG Operating, LLC
WELL/LEASE: Crapshoot 13 Federal # 1 H
COUNTY: Eddy County New Mexico
Sec. 24, T20S, R29E

**STATE OF NEW MEXICO
DEVIATION REPORT**

3001543158

<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
288	1	3,451	1 1/4
528	1	3,863	1/2
992	2 1/4	4,721	3/4
1,467	1	5,190	1
1,593	1 1/2	5,960	2 1/4
1,896	1	6,135	1 3/4
2,310	2 1/2	6,609	1/4
2,771	2 1/4	7,082	1/2
3,026	2	7,518	1/2

NM OIL CONSERVATION
ARTESIA DISTRICT

NOV 25 2015

RECEIVED

Patriot Drilling, LLC


M. Leroy Peterson, Executive Vice-
President

The foregoing instrument was acknowledged before me on this 29th day of June, 2015 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling, LLC.

My Commission Expires: 02/01/2019




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



June 24, 2015

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

NM OIL CONSERVATION
ARTESIA DISTRICT

NOV 25 2015

RECEIVED

Attn: Kanicia Castillo

RE: **Crapshoot 13 Federal Com 002H**

Please find enclosed a copy of the survey from 0' to 7793' ran on the above referenced well.

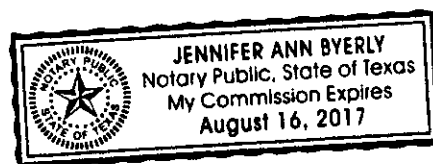
Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 24 day of June,
A.D., 2015, by Keith Havelka.

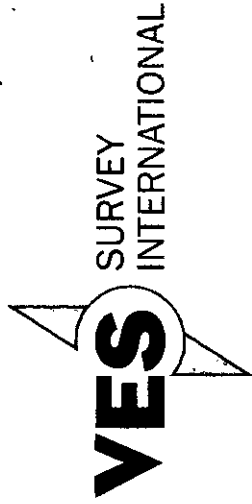

Jennifer Ann Byerly
Notary Public, State of Texas





Company: Concho

Lease/Well: Crapshoot 13 Federal Com/002H



Rig Name: Patriot 6

State/County: New Mexico/Eddy

VS-Azi: 0.00 Degrees

Latitude: 32.56538, Longitude: -104.02312

Grid Convergence Applied = -0.17 degs (NAD 27)

Grid North = True North -0.17 degs

Depth Reference : RKB = 18 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut

Minimum Curvature Method

Report Date/Time: 6/24/2015 / 13:57

VES Survey International
Midland, Texas

432-563-5444

Surveyor: Adam Askew

Crapshoot 13 Federal Com 002H / API 30-015-43158

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	1.02	267.03	99.99	-0.05	-0.89	-0.05	0.89	267.03	1.02
200.00	1.60	295.83	199.97	0.51	-3.03	0.51	3.07	279.64	0.86
300.00	2.71	306.77	299.90	2.54	-6.18	2.54	6.68	292.33	1.19
400.00	2.65	304.03	399.79	5.25	-9.99	5.25	11.29	297.72	0.14
500.00	1.18	288.27	499.73	6.87	-12.89	6.87	14.60	298.05	1.54
600.00	0.40	285.49	599.72	7.28	-14.20	7.28	15.96	297.15	0.79
700.00	0.39	220.21	699.72	7.12	-14.76	7.12	16.38	295.75	0.42
800.00	0.75	106.06	799.71	6.68	-14.34	6.68	15.82	294.97	0.98
900.00	1.56	75.21	899.69	6.84	-12.40	6.84	14.16	298.90	0.99
1000.00	1.64	80.37	999.66	7.43	-9.67	7.43	12.20	307.52	0.17
1100.00	1.68	82.16	1099.61	7.87	-6.81	7.87	10.41	319.12	0.07
1200.00	1.31	84.10	1199.58	8.19	-4.22	8.19	9.21	332.73	0.37
1300.00	0.94	35.15	1299.56	8.97	-2.61	8.97	9.34	343.78	0.99
1400.00	0.92	0.31	1399.55	10.45	-2.13	10.45	10.66	348.45	0.56
1500.00	1.01	331.56	1499.54	12.03	-2.55	12.03	12.29	348.03	0.49
1600.00	1.25	307.66	1599.52	13.47	-3.83	13.47	14.00	344.11	0.52

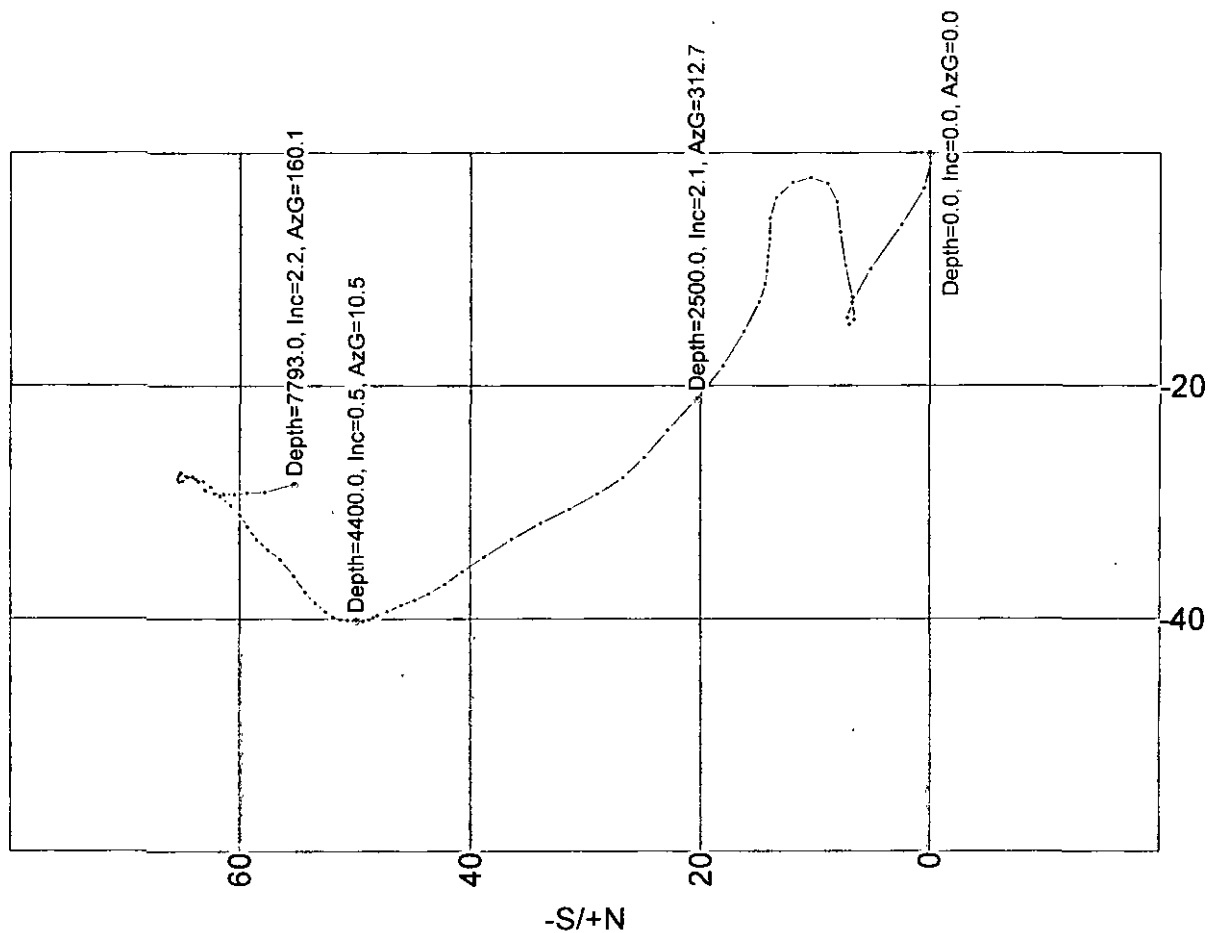
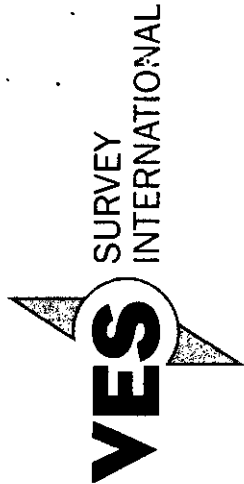
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1700.00	1.06	263.27	1699.50	14.03	-5.61	14.03	15.11	338.19	0.89
1800.00	1.01	278.69	1799.48	14.05	-7.40	14.05	15.88	332.21	0.28
1900.00	0.70	270.36	1899.47	14.19	-8.89	14.19	16.74	327.94	0.34
2000.00	0.76	278.86	1999.46	14.29	-10.15	14.29	17.53	324.63	0.12
2100.00	0.56	274.27	2099.46	14.43	-11.29	14.43	18.32	321.98	0.20
2200.00	1.35	294.62	2199.44	14.96	-12.84	14.96	19.71	319.36	0.85
2300.00	1.91	299.93	2299.40	16.28	-15.35	16.28	22.38	316.68	0.58
2400.00	2.07	303.74	2399.34	18.11	-18.29	18.11	25.74	314.71	0.21
2500.00	2.13	312.73	2499.27	20.37	-21.16	20.37	29.37	313.92	0.34
2600.00	2.04	312.20	2599.21	22.83	-23.85	22.83	33.01	313.76	0.09
2700.00	1.46	310.94	2699.16	24.86	-26.13	24.86	36.07	313.58	0.59
2800.00	1.49	323.17	2799.13	26.74	-27.87	26.74	38.62	313.81	0.32
2900.00	1.53	331.42	2899.09	28.95	-29.28	28.95	41.18	314.67	0.22
3000.00	1.65	332.59	2999.06	31.40	-30.58	31.40	43.83	315.75	0.12
3100.00	1.54	335.97	3099.02	33.90	-31.79	33.90	46.48	316.84	0.14
3200.00	1.75	326.18	3198.98	36.40	-33.19	36.40	49.26	317.64	0.35
3300.00	1.48	330.16	3298.94	38.79	-34.69	38.79	52.04	318.20	0.29
3400.00	1.15	321.76	3398.91	40.70	-35.95	40.70	54.31	318.55	0.38
3500.00	0.97	327.49	3498.89	42.20	-37.02	42.20	56.14	318.74	0.21
3600.00	0.87	331.69	3598.88	43.58	-37.84	43.58	57.71	319.03	0.12
3700.00	0.69	341.36	3698.87	44.82	-38.39	44.82	59.01	319.42	0.22
3800.00	0.76	335.19	3798.86	45.99	-38.86	45.99	60.21	319.80	0.10
3900.00	0.74	339.70	3898.85	47.20	-39.36	47.20	61.46	320.17	0.06
4000.00	0.31	335.63	3998.85	48.05	-39.70	48.05	62.33	320.44	0.43
4100.00	0.14	330.10	4098.85	48.41	-39.87	48.41	62.71	320.52	0.18
4200.00	0.36	332.92	4198.85	48.79	-40.08	48.79	63.14	320.60	0.23
4300.00	0.25	1.41	4298.85	49.30	-40.22	49.30	63.62	320.79	0.19
4400.00	0.46	10.55	4398.84	49.91	-40.14	49.91	64.05	321.20	0.21
4500.00	0.39	351.67	4498.84	50.64	-40.11	50.64	64.60	321.62	0.15
4600.00	0.38	17.83	4598.84	51.29	-40.06	51.29	65.08	322.01	0.17
4700.00	0.38	23.93	4698.84	51.92	-39.82	51.92	65.43	322.51	0.04
4800.00	0.56	42.34	4798.83	52.58	-39.36	52.58	65.68	323.18	0.23
4900.00	0.75	38.48	4898.83	53.46	-38.62	53.46	65.95	324.15	0.20
5000.00	0.73	52.96	4998.82	54.35	-37.71	54.35	66.15	325.25	0.19
5100.00	1.22	57.41	5098.80	55.31	-36.30	55.31	66.16	326.73	0.50
5200.00	0.85	41.37	5198.79	56.44	-34.91	56.44	66.37	328.26	0.47
5300.00	0.76	33.42	5298.78	57.55	-34.06	57.55	66.87	329.38	0.14
5400.00	0.78	51.91	5398.77	58.52	-33.16	58.52	67.26	330.46	0.25
5500.00	0.75	56.02	5498.76	59.31	-32.07	59.31	67.42	331.59	0.06

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
5500.00	0.64	57.33	5598.75	59.97	-31.06	59.97	67.54	332.62	0.12
5700.00	0.67	35.35	5698.75	60.75	-30.26	60.75	67.87	333.52	0.25
5800.00	0.74	45.82	5798.74	61.68	-29.45	61.68	68.35	334.47	0.15
5900.00	0.58	40.56	5898.73	62.51	-28.66	62.51	68.77	335.37	0.18
6000.00	0.31	34.40	5998.73	63.12	-28.18	63.12	69.12	335.94	0.28
6100.00	0.56	5.47	6098.73	63.83	-27.98	63.83	69.69	336.33	0.32
6200.00	0.46	33.25	6198.72	64.64	-27.72	64.64	70.33	336.79	0.26
6300.00	0.15	46.18	6298.72	65.06	-27.41	65.06	70.60	337.16	0.31
6400.00	0.15	262.95	6398.72	65.14	-27.44	65.14	70.68	337.16	0.28
6500.00	0.19	328.19	6498.72	65.26	-27.65	65.26	70.88	337.04	0.18
6600.00	0.21	267.67	6598.72	65.39	-27.92	65.39	71.10	336.88	0.20
6700.00	0.17	212.17	6698.72	65.26	-28.19	65.26	71.09	336.64	0.18
6800.00	0.27	143.82	6798.72	64.94	-28.13	64.94	70.77	336.58	0.26
6900.00	0.34	138.43	6898.72	64.53	-27.79	64.53	70.26	336.70	0.07
7000.00	0.34	211.23	6998.72	64.06	-27.75	64.06	69.81	336.58	0.40
7100.00	0.42	234.28	7098.71	63.59	-28.20	63.59	69.56	336.08	0.17
7200.00	0.68	229.23	7198.71	62.99	-28.95	62.99	69.32	335.32	0.27
7300.00	0.51	160.46	7298.70	62.17	-29.25	62.17	68.71	334.80	0.69
7400.00	0.50	203.03	7398.70	61.35	-29.27	61.35	67.98	334.49	0.37
7500.00	0.62	162.70	7498.70	60.44	-29.29	60.44	67.16	334.15	0.40
7600.00	0.67	182.98	7598.69	59.34	-29.16	59.34	66.11	333.83	0.23
7700.00	1.09	174.74	7698.68	57.80	-29.10	57.80	64.71	333.28	0.44
7793.00	2.23	160.08	7791.64	55.21	-28.40	55.21	62.09	332.78	1.30



VES Survey International
Midland, Texas
432-563-5444

Surveyor: Adam Askew
Crapsheet 13 Federal Com 002H / API 30-015-43158



-W/+E

VES Survey Date: 6/19/2015



COG Operating LLC.

Eddy County, NM

Crapshoot 13 Federal Com

#2H

OH

Survey: MWD #1

Survey Report - Geographic

26 June, 2015



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC.	Local Co-ordinate Reference:	Well #2H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3337.7usft (Original Well Elev)
Site:	Crapshoot 13 Federal Com	MD Reference:	WELL @ 3337.7usft (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	Eddy 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	Crapshoot 13 Federal Com		
Site Position:		Northing:	569,535.60 usft
From:	Map	Easting:	595,569.30 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 33' 55.360 N
		Longitude:	104° 1' 23.240 W
		Grid Convergence:	0.17 °

Well	#2H		
Well Position	+N/-S	0.0 usft	Northing: 569,535.60 usft
	+E/-W	0.0 usft	Easting: 595,569.30 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 33' 55.360 N
		Longitude:	104° 1' 23.240 W
		Ground Level:	3,319.7 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2010	6/1/2015	7.33
			Dip Angle (°)
			60.33
			Field Strength (nT)
			48,377

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)
	0.0	0.0	0.0
			Direction (°)
			350.79

Survey Program	Date 6/26/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
100.0	13,550.0	MWD #1 (OH)	MWD
			Description
			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	569,535.60	595,569.30	32° 33' 55.360 N	104° 1' 23.240 W
100.0	1.02	267.03	100.0	0.0	-0.9	569,535.56	595,568.41	32° 33' 55.359 N	104° 1' 23.250 W
200.0	1.60	295.83	200.0	0.5	-3.0	569,536.12	595,566.27	32° 33' 55.365 N	104° 1' 23.275 W
300.0	2.71	306.77	299.9	2.5	-6.2	569,538.14	595,563.12	32° 33' 55.385 N	104° 1' 23.312 W
400.0	2.65	304.03	399.8	5.2	-10.0	569,540.85	595,559.31	32° 33' 55.412 N	104° 1' 23.356 W
500.0	1.18	288.27	499.7	6.9	-12.9	569,542.47	595,556.42	32° 33' 55.428 N	104° 1' 23.390 W
600.0	0.40	285.49	599.7	7.3	-14.2	569,542.88	595,555.10	32° 33' 55.432 N	104° 1' 23.405 W
700.0	0.39	220.21	699.7	7.1	-14.8	569,542.72	595,554.54	32° 33' 55.431 N	104° 1' 23.412 W
800.0	0.75	106.06	799.7	6.7	-14.3	569,542.28	595,554.95	32° 33' 55.426 N	104° 1' 23.407 W
900.0	1.56	75.21	899.7	6.8	-12.4	569,542.44	595,556.90	32° 33' 55.428 N	104° 1' 23.384 W
1,000.0	1.64	80.37	999.7	7.4	-9.7	569,543.03	595,559.63	32° 33' 55.434 N	104° 1' 23.352 W
1,100.0	1.68	82.16	1,099.6	7.9	-6.8	569,543.47	595,562.49	32° 33' 55.438 N	104° 1' 23.319 W



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC.	Local Co-ordinate Reference:	Well #2H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3337.7usft (Original Well Elev)
Site:	Crapshoot 13 Federal Com	MD Reference:	WELL @ 3337.7usft (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	
1,200.0	1.31	84.10	1,199.6	8.2	-4.2	569,543.79	595,565.08	32° 33' 55.441 N	104° 1' 23.289 W	
1,300.0	0.94	35.15	1,299.6	9.0	-2.6	569,544.57	595,566.69	32° 33' 55.449 N	104° 1' 23.270 W	
1,400.0	0.92	0.31	1,399.5	10.4	-2.1	569,546.05	595,567.16	32° 33' 55.463 N	104° 1' 23.264 W	
1,500.0	1.01	331.56	1,499.5	12.0	-2.6	569,547.63	595,566.75	32° 33' 55.479 N	104° 1' 23.269 W	
1,600.0	1.25	307.66	1,599.5	13.5	-3.8	569,549.07	595,565.47	32° 33' 55.493 N	104° 1' 23.284 W	
1,700.0	1.06	263.27	1,699.5	14.0	-5.6	569,549.63	595,563.68	32° 33' 55.499 N	104° 1' 23.305 W	
1,800.0	1.01	278.69	1,799.5	14.0	-7.4	569,549.65	595,561.89	32° 33' 55.499 N	104° 1' 23.326 W	
1,900.0	0.70	270.36	1,899.5	14.2	-8.9	569,549.79	595,560.41	32° 33' 55.500 N	104° 1' 23.343 W	
2,000.0	0.76	278.86	1,999.5	14.3	-10.2	569,549.89	595,559.15	32° 33' 55.501 N	104° 1' 23.358 W	
2,100.0	0.56	274.27	2,099.5	14.4	-11.3	569,550.03	595,558.00	32° 33' 55.503 N	104° 1' 23.371 W	
2,200.0	1.35	294.62	2,199.4	15.0	-12.9	569,550.56	595,556.44	32° 33' 55.508 N	104° 1' 23.389 W	
2,300.0	1.91	299.93	2,299.4	16.3	-15.4	569,551.88	595,553.93	32° 33' 55.521 N	104° 1' 23.419 W	
2,400.0	2.07	303.74	2,399.3	18.1	-18.3	569,553.72	595,550.98	32° 33' 55.540 N	104° 1' 23.453 W	
2,500.0	2.13	312.73	2,499.3	20.4	-21.2	569,555.98	595,548.12	32° 33' 55.562 N	104° 1' 23.486 W	
2,600.0	2.04	312.20	2,599.2	22.8	-23.9	569,558.44	595,545.43	32° 33' 55.586 N	104° 1' 23.518 W	
2,700.0	1.46	310.94	2,699.2	24.9	-26.2	569,560.47	595,543.15	32° 33' 55.607 N	104° 1' 23.544 W	
2,800.0	1.49	323.17	2,799.1	26.7	-27.9	569,562.34	595,541.41	32° 33' 55.625 N	104° 1' 23.565 W	
2,900.0	1.53	331.42	2,899.1	29.0	-29.3	569,564.55	595,539.99	32° 33' 55.647 N	104° 1' 23.581 W	
3,000.0	1.65	332.59	2,999.1	31.4	-30.6	569,567.01	595,538.69	32° 33' 55.671 N	104° 1' 23.596 W	
3,100.0	1.54	335.97	3,099.0	33.9	-31.8	569,569.51	595,537.48	32° 33' 55.696 N	104° 1' 23.610 W	
3,200.0	1.75	326.18	3,199.0	36.4	-33.2	569,572.01	595,536.08	32° 33' 55.721 N	104° 1' 23.626 W	
3,300.0	1.48	330.16	3,298.9	38.8	-34.7	569,574.40	595,534.59	32° 33' 55.745 N	104° 1' 23.644 W	
3,400.0	1.15	321.76	3,398.9	40.7	-36.0	569,576.30	595,533.33	32° 33' 55.764 N	104° 1' 23.659 W	
3,500.0	0.97	327.49	3,498.9	42.2	-37.1	569,577.81	595,532.25	32° 33' 55.778 N	104° 1' 23.671 W	
3,600.0	0.87	331.69	3,598.9	43.6	-37.9	569,579.19	595,531.44	32° 33' 55.792 N	104° 1' 23.681 W	
3,700.0	0.69	341.36	3,698.9	44.8	-38.4	569,580.43	595,530.88	32° 33' 55.804 N	104° 1' 23.687 W	
3,800.0	0.76	335.19	3,798.9	46.0	-38.9	569,581.60	595,530.41	32° 33' 55.816 N	104° 1' 23.692 W	
3,900.0	0.74	339.70	3,898.9	47.2	-39.4	569,582.81	595,529.91	32° 33' 55.828 N	104° 1' 23.698 W	
4,000.0	0.31	335.63	3,998.8	48.1	-39.7	569,583.66	595,529.58	32° 33' 55.836 N	104° 1' 23.702 W	
4,100.0	0.14	330.10	4,098.8	48.4	-39.9	569,584.01	595,529.40	32° 33' 55.840 N	104° 1' 23.704 W	
4,200.0	0.36	332.92	4,198.8	48.8	-40.1	569,584.40	595,529.20	32° 33' 55.844 N	104° 1' 23.706 W	
4,300.0	0.25	1.41	4,298.8	49.3	-40.2	569,584.89	595,529.06	32° 33' 55.849 N	104° 1' 23.708 W	
4,400.0	0.46	10.55	4,398.8	49.9	-40.2	569,585.51	595,529.14	32° 33' 55.855 N	104° 1' 23.707 W	
4,500.0	0.39	351.67	4,498.8	50.6	-40.1	569,586.24	595,529.16	32° 33' 55.862 N	104° 1' 23.707 W	
4,600.0	0.38	17.83	4,598.8	51.3	-40.1	569,586.89	595,529.22	32° 33' 55.868 N	104° 1' 23.706 W	
4,700.0	0.38	23.93	4,698.8	51.9	-39.9	569,587.51	595,529.45	32° 33' 55.875 N	104° 1' 23.703 W	
4,800.0	0.56	42.34	4,798.8	52.6	-39.4	569,588.17	595,529.92	32° 33' 55.881 N	104° 1' 23.698 W	
4,900.0	0.75	38.48	4,898.8	53.4	-38.7	569,589.05	595,530.65	32° 33' 55.890 N	104° 1' 23.689 W	
5,000.0	0.73	52.96	4,998.8	54.3	-37.7	569,589.94	595,531.57	32° 33' 55.899 N	104° 1' 23.679 W	
5,100.0	1.22	57.41	5,098.8	55.3	-36.3	569,590.90	595,532.97	32° 33' 55.908 N	104° 1' 23.662 W	
5,200.0	0.85	41.37	5,198.8	56.4	-34.9	569,592.03	595,534.36	32° 33' 55.919 N	104° 1' 23.646 W	
5,300.0	0.76	33.42	5,298.8	57.5	-34.1	569,593.14	595,535.22	32° 33' 55.930 N	104° 1' 23.636 W	
5,400.0	0.78	51.91	5,398.8	58.5	-33.2	569,594.11	595,536.12	32° 33' 55.940 N	104° 1' 23.625 W	
5,500.0	0.75	56.02	5,498.8	59.3	-32.1	569,594.90	595,537.20	32° 33' 55.947 N	104° 1' 23.613 W	
5,600.0	0.64	57.33	5,598.8	60.0	-31.1	569,595.57	595,538.21	32° 33' 55.954 N	104° 1' 23.601 W	
5,700.0	0.67	35.35	5,698.7	60.7	-30.3	569,596.35	595,539.02	32° 33' 55.962 N	104° 1' 23.591 W	
5,800.0	0.74	45.82	5,798.7	61.7	-29.5	569,597.27	595,539.82	32° 33' 55.971 N	104° 1' 23.582 W	
5,900.0	0.58	40.56	5,898.7	62.5	-28.7	569,598.11	595,540.61	32° 33' 55.979 N	104° 1' 23.573 W	
6,000.0	0.31	34.40	5,998.7	63.1	-28.2	569,598.72	595,541.09	32° 33' 55.985 N	104° 1' 23.567 W	
6,100.0	0.56	5.47	6,098.7	63.8	-28.0	569,599.42	595,541.29	32° 33' 55.992 N	104° 1' 23.565 W	
6,200.0	0.46	33.25	6,198.7	64.6	-27.7	569,600.25	595,541.56	32° 33' 56.000 N	104° 1' 23.562 W	
6,300.0	0.15	46.18	6,298.7	65.1	-27.4	569,600.67	595,541.87	32° 33' 56.004 N	104° 1' 23.558 W	
6,400.0	0.15	262.95	6,398.7	65.1	-27.5	569,600.75	595,541.84	32° 33' 56.005 N	104° 1' 23.558 W	
6,500.0	0.19	328.19	6,498.7	65.3	-27.7	569,600.87	595,541.62	32° 33' 56.006 N	104° 1' 23.561 W	
6,600.0	0.21	267.67	6,598.7	65.4	-28.0	569,601.01	595,541.35	32° 33' 56.008 N	104° 1' 23.564 W	



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC.	Local Co-ordinate Reference:	Well #2H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3337.7usft (Original Well Elev)
Site:	Crapshoot 13 Federal Corn	MD Reference:	WELL @ 3337.7usft (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
6,700.0	0.17	212.17	6,698.7	65.3	-28.2	569,600.87	595,541.09	32° 33' 56.006 N	104° 1' 23.567 W
6,800.0	0.27	143.82	6,798.7	65.0	-28.2	569,600.56	595,541.15	32° 33' 56.003 N	104° 1' 23.566 W
6,900.0	0.34	138.43	6,898.7	64.5	-27.8	569,600.15	595,541.48	32° 33' 55.999 N	104° 1' 23.562 W
7,000.0	0.34	211.23	6,998.7	64.1	-27.8	569,599.67	595,541.53	32° 33' 55.995 N	104° 1' 23.562 W
7,100.0	0.42	234.28	7,098.7	63.6	-28.2	569,599.20	595,541.08	32° 33' 55.990 N	104° 1' 23.567 W
7,200.0	0.68	229.23	7,198.7	63.0	-29.0	569,598.60	595,540.33	32° 33' 55.984 N	104° 1' 23.576 W
7,300.0	0.51	160.46	7,298.7	62.2	-29.3	569,597.79	595,540.03	32° 33' 55.976 N	104° 1' 23.579 W
7,400.0	0.50	203.03	7,398.7	61.4	-29.3	569,596.97	595,540.01	32° 33' 55.968 N	104° 1' 23.580 W
7,500.0	0.62	162.70	7,498.7	60.5	-29.3	569,596.05	595,540.00	32° 33' 55.959 N	104° 1' 23.580 W
7,600.0	0.67	182.98	7,598.7	59.4	-29.2	569,594.95	595,540.13	32° 33' 55.948 N	104° 1' 23.578 W
7,700.0	1.09	174.74	7,698.7	57.8	-29.1	569,593.42	595,540.18	32° 33' 55.933 N	104° 1' 23.578 W
7,793.0	2.23	160.08	7,791.6	55.2	-28.4	569,590.84	595,540.88	32° 33' 55.907 N	104° 1' 23.570 W
7,826.0	2.70	134.10	7,824.6	54.1	-27.6	569,589.70	595,541.66	32° 33' 55.896 N	104° 1' 23.561 W
7,858.0	1.90	115.00	7,856.6	53.3	-26.6	569,588.95	595,542.68	32° 33' 55.888 N	104° 1' 23.549 W
7,889.0	2.80	332.50	7,887.6	53.8	-26.5	569,589.40	595,542.80	32° 33' 55.893 N	104° 1' 23.547 W
7,921.0	7.60	316.10	7,919.4	56.0	-28.3	569,591.62	595,540.97	32° 33' 55.915 N	104° 1' 23.569 W
7,953.0	11.50	329.50	7,951.0	60.3	-31.4	569,595.90	595,537.88	32° 33' 55.957 N	104° 1' 23.605 W
7,984.0	14.60	334.90	7,981.2	66.5	-34.7	569,602.10	595,534.65	32° 33' 56.019 N	104° 1' 23.642 W
8,016.0	17.70	334.40	8,011.9	74.5	-38.5	569,610.14	595,530.84	32° 33' 56.098 N	104° 1' 23.686 W
8,048.0	22.10	330.40	8,042.0	84.2	-43.5	569,619.77	595,525.76	32° 33' 56.194 N	104° 1' 23.745 W
8,079.0	26.90	326.80	8,070.2	95.1	-50.3	569,630.71	595,519.04	32° 33' 56.302 N	104° 1' 23.824 W
8,111.0	30.90	323.50	8,098.2	107.8	-59.1	569,643.38	595,510.18	32° 33' 56.428 N	104° 1' 23.927 W
8,142.0	34.20	320.80	8,124.3	120.9	-69.4	569,656.54	595,499.94	32° 33' 56.558 N	104° 1' 24.046 W
8,174.0	37.10	317.20	8,150.3	135.0	-81.6	569,670.59	595,487.69	32° 33' 56.698 N	104° 1' 24.189 W
8,206.0	40.70	313.90	8,175.2	149.3	-95.7	569,684.91	595,473.61	32° 33' 56.840 N	104° 1' 24.353 W
8,237.0	44.30	311.40	8,198.1	163.5	-111.1	569,699.09	595,458.20	32° 33' 56.981 N	104° 1' 24.532 W
8,269.0	46.00	310.90	8,220.7	178.4	-128.2	569,714.01	595,441.12	32° 33' 57.129 N	104° 1' 24.731 W
8,301.0	48.50	310.80	8,242.4	193.8	-146.0	569,729.38	595,423.34	32° 33' 57.282 N	104° 1' 24.938 W
8,332.0	52.00	312.10	8,262.2	209.6	-163.8	569,745.16	595,405.49	32° 33' 57.438 N	104° 1' 25.147 W
8,364.0	56.00	313.00	8,281.0	227.1	-182.9	569,762.67	595,386.42	32° 33' 57.612 N	104° 1' 25.369 W
8,396.0	59.60	312.50	8,298.1	245.4	-202.8	569,781.04	595,366.54	32° 33' 57.794 N	104° 1' 25.600 W
8,427.0	62.90	311.60	8,313.0	263.6	-222.9	569,799.24	595,346.36	32° 33' 57.975 N	104° 1' 25.836 W
8,459.0	66.30	310.30	8,326.7	282.6	-244.8	569,818.18	595,324.53	32° 33' 58.163 N	104° 1' 26.090 W
8,491.0	69.50	309.40	8,338.7	301.6	-267.5	569,837.17	595,301.77	32° 33' 58.352 N	104° 1' 26.355 W
8,522.0	72.20	309.30	8,348.9	320.1	-290.2	569,855.74	595,279.12	32° 33' 58.536 N	104° 1' 26.619 W
8,552.0	75.10	307.30	8,357.3	338.0	-312.8	569,873.58	595,256.53	32° 33' 58.713 N	104° 1' 26.883 W
8,584.0	78.10	308.30	8,364.8	357.1	-337.4	569,892.65	595,231.94	32° 33' 58.903 N	104° 1' 27.170 W
8,615.0	79.80	308.50	8,370.7	375.9	-361.2	569,911.55	595,208.10	32° 33' 59.090 N	104° 1' 27.448 W
8,647.0	80.40	308.80	8,376.2	395.6	-385.8	569,931.24	595,183.48	32° 33' 59.286 N	104° 1' 27.735 W
8,678.0	81.20	310.50	8,381.2	415.2	-409.4	569,950.77	595,159.92	32° 33' 59.480 N	104° 1' 28.009 W
8,710.0	81.20	312.30	8,386.1	436.1	-433.1	569,971.68	595,136.20	32° 33' 59.687 N	104° 1' 28.286 W
8,742.0	81.70	314.30	8,390.8	457.8	-456.1	569,993.38	595,113.17	32° 33' 59.903 N	104° 1' 28.554 W
8,773.0	82.20	315.30	8,395.2	479.4	-477.9	570,015.01	595,091.39	32° 34' 0.118 N	104° 1' 28.808 W
8,805.0	83.80	316.40	8,399.1	502.2	-500.0	570,037.80	595,069.27	32° 34' 0.344 N	104° 1' 29.065 W
8,837.0	85.20	317.80	8,402.1	525.5	-521.7	570,061.13	595,047.59	32° 34' 0.575 N	104° 1' 29.318 W
8,869.0	85.90	319.60	8,404.6	549.5	-542.8	570,085.10	595,026.53	32° 34' 0.813 N	104° 1' 29.563 W
8,900.0	85.50	321.90	8,406.9	573.4	-562.3	570,109.03	595,006.98	32° 34' 1.050 N	104° 1' 29.791 W
8,932.0	85.90	323.40	8,409.3	598.8	-581.7	570,134.40	594,987.62	32° 34' 1.302 N	104° 1' 30.016 W
8,964.0	87.30	324.80	8,411.2	624.7	-600.4	570,160.27	594,968.89	32° 34' 1.559 N	104° 1' 30.234 W
8,995.0	88.90	326.20	8,412.3	650.2	-618.0	570,185.81	594,951.34	32° 34' 1.812 N	104° 1' 30.439 W
9,027.0	89.70	328.40	8,412.6	677.1	-635.2	570,212.73	594,934.05	32° 34' 2.079 N	104° 1' 30.640 W
9,059.0	89.80	330.30	8,412.8	704.7	-651.6	570,240.26	594,917.74	32° 34' 2.352 N	104° 1' 30.829 W
9,090.0	89.80	332.00	8,412.9	731.8	-666.5	570,267.41	594,902.78	32° 34' 2.621 N	104° 1' 31.003 W
9,122.0	89.80	333.90	8,413.0	760.3	-681.1	570,295.91	594,888.23	32° 34' 2.903 N	104° 1' 31.172 W
9,154.0	89.60	335.70	8,413.2	789.3	-694.7	570,324.86	594,874.61	32° 34' 3.190 N	104° 1' 31.330 W



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC.	Local Co-ordinate Reference:	Well #2H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3337.7usft (Original Well Elev)
Site:	Crapshoot 13 Federal Com	MD Reference:	WELL @ 3337.7usft (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
9,185.0	89.40	337.80	8,413.4	817.7	-706.9	570,353.34	594,862.37	32° 34' 3.472 N	104° 1' 31.472 W
9,217.0	89.70	339.60	8,413.7	847.5	-718.6	570,383.15	594,850.75	32° 34' 3.767 N	104° 1' 31.607 W
9,248.0	89.80	341.30	8,413.8	876.8	-728.9	570,412.36	594,840.38	32° 34' 4.057 N	104° 1' 31.728 W
9,312.0	89.80	344.80	8,414.1	938.0	-747.6	570,473.57	594,821.72	32° 34' 4.863 N	104° 1' 31.943 W
9,375.0	90.80	347.20	8,413.7	999.1	-762.8	570,534.70	594,806.48	32° 34' 5.268 N	104° 1' 32.119 W
9,439.0	90.80	349.20	8,412.8	1,061.7	-775.9	570,597.33	594,793.40	32° 34' 5.889 N	104° 1' 32.270 W
9,534.0	90.10	351.40	8,412.1	1,155.4	-791.9	570,690.97	594,777.39	32° 34' 6.816 N	104° 1' 32.454 W
9,629.0	90.70	353.00	8,411.4	1,249.5	-804.8	570,785.08	594,764.50	32° 34' 7.747 N	104° 1' 32.602 W
9,755.0	89.80	354.90	8,411.1	1,374.8	-818.1	570,910.37	594,751.22	32° 34' 8.988 N	104° 1' 32.753 W
9,850.0	91.70	354.90	8,410.0	1,469.4	-826.5	571,004.98	594,742.78	32° 34' 9.924 N	104° 1' 32.848 W
9,977.0	89.20	355.70	8,409.0	1,595.9	-836.9	571,131.54	594,732.37	32° 34' 11.177 N	104° 1' 32.965 W
10,104.0	87.70	358.20	8,412.5	1,722.7	-843.7	571,258.30	594,725.62	32° 34' 12.431 N	104° 1' 33.040 W
10,199.0	89.20	358.30	8,415.0	1,817.6	-846.6	571,353.22	594,722.72	32° 34' 13.371 N	104° 1' 33.071 W
10,294.0	90.50	358.30	8,415.3	1,912.6	-849.4	571,448.18	594,719.90	32° 34' 14.310 N	104° 1' 33.100 W
10,389.0	90.60	359.90	8,414.4	2,007.6	-850.9	571,543.16	594,718.41	32° 34' 15.250 N	104° 1' 33.115 W
10,484.0	89.70	0.50	8,414.1	2,102.6	-850.6	571,638.16	594,718.74	32° 34' 16.190 N	104° 1' 33.108 W
10,579.0	89.20	0.00	8,415.0	2,197.5	-850.2	571,733.15	594,719.15	32° 34' 17.130 N	104° 1' 33.100 W
10,674.0	90.80	359.80	8,415.0	2,292.5	-850.3	571,828.15	594,718.99	32° 34' 18.070 N	104° 1' 33.098 W
10,769.0	89.90	359.60	8,414.4	2,387.5	-850.8	571,923.14	594,718.49	32° 34' 19.011 N	104° 1' 33.101 W
10,864.0	88.90	0.00	8,415.4	2,482.5	-851.1	572,018.13	594,718.16	32° 34' 19.951 N	104° 1' 33.102 W
10,959.0	90.20	359.90	8,416.2	2,577.5	-851.2	572,113.13	594,718.07	32° 34' 20.891 N	104° 1' 33.099 W
11,054.0	91.80	359.30	8,414.5	2,672.5	-851.9	572,208.11	594,717.41	32° 34' 21.831 N	104° 1' 33.104 W
11,149.0	90.50	0.60	8,412.6	2,767.5	-852.0	572,303.09	594,717.33	32° 34' 22.770 N	104° 1' 33.102 W
11,243.0	89.80	1.00	8,412.4	2,861.5	-850.7	572,397.08	594,718.64	32° 34' 23.700 N	104° 1' 33.083 W
11,338.0	91.40	0.60	8,411.4	2,956.5	-849.3	572,492.06	594,719.97	32° 34' 24.640 N	104° 1' 33.064 W
11,465.0	89.10	0.20	8,410.8	3,083.4	-848.4	572,619.05	594,720.85	32° 34' 25.897 N	104° 1' 33.050 W
11,560.0	90.80	0.30	8,410.9	3,178.4	-848.0	572,714.04	594,721.27	32° 34' 26.837 N	104° 1' 33.042 W
11,687.0	89.50	0.20	8,410.6	3,305.4	-847.5	572,841.04	594,721.82	32° 34' 28.094 N	104° 1' 33.031 W
11,782.0	90.80	0.20	8,410.3	3,400.4	-847.1	572,936.03	594,722.15	32° 34' 29.034 N	104° 1' 33.024 W
11,908.0	86.90	0.70	8,412.9	3,526.4	-846.2	573,061.98	594,723.14	32° 34' 30.280 N	104° 1' 33.008 W
12,003.0	88.20	0.60	8,416.9	3,621.3	-845.1	573,156.88	594,724.22	32° 34' 31.219 N	104° 1' 32.992 W
12,098.0	89.40	0.80	8,418.9	3,716.3	-843.9	573,251.85	594,725.38	32° 34' 32.159 N	104° 1' 32.975 W
12,193.0	91.00	0.40	8,418.6	3,811.2	-842.9	573,346.85	594,726.37	32° 34' 33.099 N	104° 1' 32.961 W
12,288.0	90.00	0.40	8,417.7	3,906.2	-842.3	573,441.84	594,727.04	32° 34' 34.039 N	104° 1' 32.950 W
12,351.0	90.60	0.60	8,417.4	3,969.2	-841.7	573,504.83	594,727.59	32° 34' 34.662 N	104° 1' 32.941 W
12,446.0	89.80	0.60	8,417.1	4,064.2	-840.7	573,599.83	594,728.58	32° 34' 35.602 N	104° 1' 32.926 W
12,541.0	91.80	1.00	8,415.8	4,159.2	-839.4	573,694.80	594,729.91	32° 34' 36.542 N	104° 1' 32.908 W
12,668.0	89.90	1.20	8,413.9	4,286.2	-837.0	573,821.76	594,732.35	32° 34' 37.798 N	104° 1' 32.875 W
12,763.0	89.50	0.90	8,414.4	4,381.1	-835.2	573,916.74	594,734.09	32° 34' 38.738 N	104° 1' 32.851 W
12,858.0	88.90	359.90	8,415.7	4,476.1	-834.6	574,011.73	594,734.75	32° 34' 39.678 N	104° 1' 32.840 W
12,953.0	90.40	359.70	8,416.3	4,571.1	-834.9	574,106.73	594,734.42	32° 34' 40.618 N	104° 1' 32.841 W
13,048.0	90.00	359.10	8,415.9	4,666.1	-835.9	574,201.72	594,733.42	32° 34' 41.558 N	104° 1' 32.849 W
13,143.0	88.80	359.90	8,416.9	4,761.1	-836.7	574,296.71	594,732.59	32° 34' 42.498 N	104° 1' 32.856 W
13,238.0	90.40	0.30	8,417.6	4,856.1	-836.5	574,391.70	594,732.76	32° 34' 43.438 N	104° 1' 32.851 W
13,364.0	90.00	0.80	8,417.2	4,982.1	-835.3	574,517.69	594,733.97	32° 34' 44.685 N	104° 1' 32.832 W
13,550.0	90.00	0.80	8,417.2	5,168.1	-832.7	574,703.68	594,736.57	32° 34' 46.525 N	104° 1' 32.796 W
PBHL(CSFC#2H)									

Checked By: _____ Approved By: _____ Date: _____