

Results of Directional Survey

API number:	30-025-42209		
OGRID:		Operator:	COG OPERATING LLC
		Property:	LUSK DEEP UNIT A # 27H

surface	ULSTR:	L	18	T 19S	R 32E
				1980 FSL	190 FWL

BH Loc	ULSTR:	I	18	T 19S	R 32E
13685.00 MD		9268.5	TVD	2202 FSL	341 FEL

Top Perf/OH	ULSTR:	L	18	T 19S	R 32E
9473 MD		9228.2	TVD	2066 FSL	760 FWL

Bot Perf/OH	ULSTR:	I	18	T 19S	R 32E
13592 MD		9266.9	TVD	2199 FSL	460 FEL

	MD	N/S	E/W	VD
	9444.00	603780.60	660636.58	9222.00
TOP PERFS/OH	9473.00	603783.17	660664.81	9228.17
	9475.00	603783.35	660666.76	9228.60
	13495.00	603920.53	664678.02	9265.20
BOT PERFS/OH	13592.00	603924.08	664774.94	9266.88
	13685.00	603927.49	664867.87	9268.50

NEXT TO LAST	13495.00	603920.53	664678.02	9265.20
LAST READING	13685.00	603927.49	664867.87	9268.50
TD	13685.00	603927.49	664867.87	9268.50

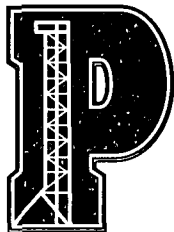
Surface Loc	603696.00	Northing	660099.70	Easting
	1980	FS	190	FW
Projected BHL	603927.49	Northing	664867.87	Easting
Location of				
Top Perfs/OH	603783.17	Northing	660664.81	Easting
Bot Perfs/OH	603924.08	Northing	664774.94	Easting

SUMMARY of Subsurface Locations

Surface Loc	L-18-19S-32E	1980	FS	190	FW	Vert. Depth
Top Perfs/OH	L-18-19S-32E	2066	FS	760	FW	9228.17 SW
Bot Perfs/OH	I-18-19S-32E	2199	FS	460	FE	9266.88 SE
Projected TD	I-18-19S-32E	2202	FS	341	FE	9268.50 SE

NE	607007.20	Northing	665198.60	Easting	NAD 27
NE/NW					

FEB 17 2015



PATRIOT DRILLING, LLC

OPERATOR: COG Operating, LLC
WELL/LEASE: Lusk Deep Unit A #27H
COUNTY: Lea Co., New Mexico
Sec. 18, T 19S, R 32E

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FEB 05 2015

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STATE OF NEW MEXICO
DEVIATION REPORT

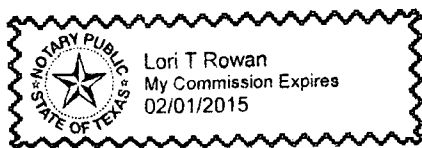
<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
328	1/2	4,625	1
885	1/2	5,098	1 3/4
1,169	3/4	5,444	3
1,455	1 1/4	5,910	1 3/4
1,740	3 1/2	6,357	1
2,151	1 3/4	6,800	3/4
2,532	1 1/2	7,235	1
2,816	2	7,525	3/4
3,292	3 1/2	7,845	1 1/4
3,862	1/2	8,215	1 1/2
4,339	1	8,501	1/2

Patriot Drilling, LLC

M. Leroy Peterson, Executive Vice-President

The foregoing instrument was acknowledged before me on this 2nd day of December, 2014 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling, LLC.

My Commission Expires: 02/01/2015



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



November 20, 2014

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

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Attn: Kanicia Castillo

RE: Lusk Deep Unit A 27H

Please find enclosed a copy of the survey from 0.00' to 8645.00' ran on the above referenced well.

Sincerely,

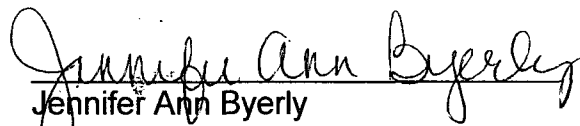

Deb Salge
Operations

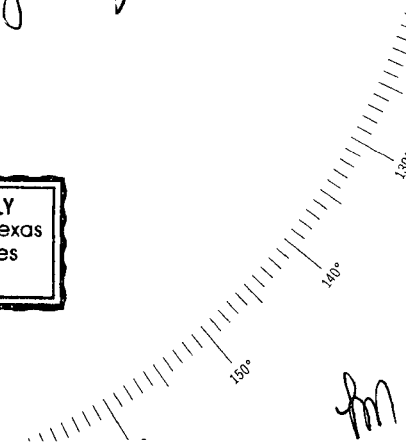
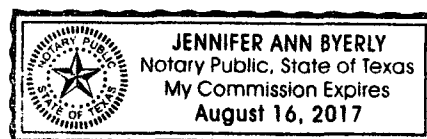
STATE OF TEXAS §

§

COUNTY OF NUECES §

This instrument was acknowledged before me on the 20 day of November, A.D., 2014, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: COG Operating, LLC (Concho)

Lease/Well: Lusk Deep Unit A/27H

Location: S: 18 T: 19S R: 32E

Rig Name: Patriot #6

State/County: New Mexico/Lea

Latitude: 32.66, Longitude: -103.81

GRID North is 0.28 Degrees East of True North

VS-Azi: 0.00 Degrees



Depth Reference : (RKB) 17 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut

Minimum Curvature Method

Report Date/Time: 11/20/2014 / 14:55

VES Survey International

West Texas

(432) 563-5444

Surveyor: Neil Bates

Lusk Deep Unit A 27H / API 30-025-42209

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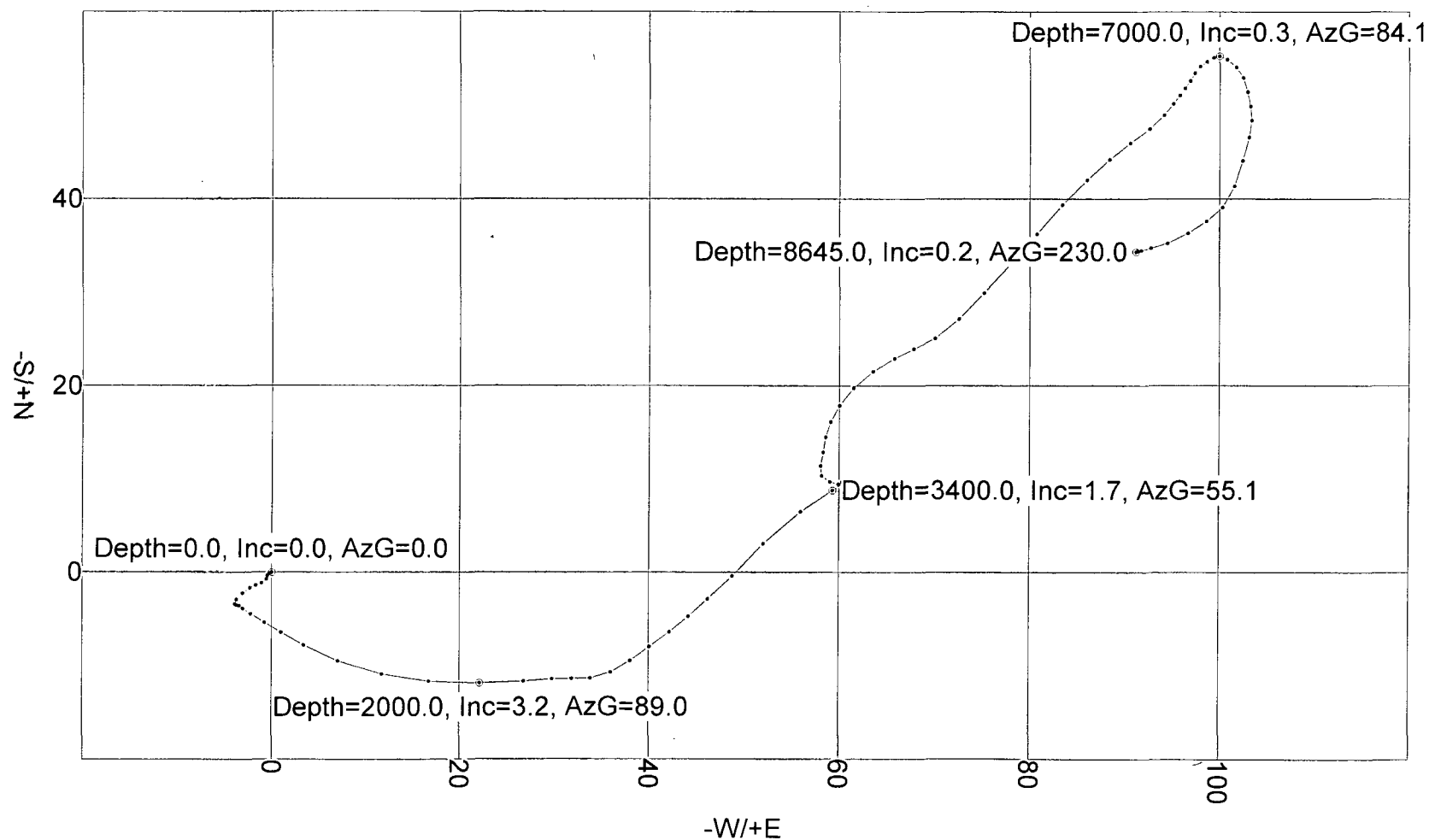
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.36	244.87	100.00	-0.13	-0.28	-0.13	0.31	244.87	0.36
200.00	0.14	142.17	200.00	-0.36	-0.49	-0.36	0.61	233.46	0.41
300.00	0.36	212.19	300.00	-0.73	-0.58	-0.73	0.93	218.64	0.34
400.00	0.41	245.30	400.00	-1.14	-1.08	-1.14	1.57	223.25	0.23
500.00	0.35	251.44	499.99	-1.39	-1.69	-1.39	2.19	230.57	0.08
600.00	0.43	244.07	599.99	-1.65	-2.32	-1.65	2.85	234.51	0.09
700.00	0.67	228.11	699.99	-2.21	-3.09	-2.21	3.80	234.46	0.29
800.00	0.44	215.32	799.98	-2.91	-3.75	-2.91	4.75	232.15	0.26
900.00	0.20	161.92	899.98	-3.40	-3.92	-3.40	5.18	229.08	0.36
1000.00	0.13	60.22	999.98	-3.51	-3.76	-3.51	5.14	227.00	0.27
1100.00	0.26	122.59	1099.98	-3.57	-3.47	-3.57	4.98	224.19	0.23
1200.00	0.32	129.45	1199.98	-3.87	-3.07	-3.87	4.93	218.43	0.07
1300.00	0.83	123.73	1299.97	-4.44	-2.25	-4.44	4.98	206.86	0.52
1400.00	1.15	121.57	1399.96	-5.37	-0.79	-5.37	5.43	188.38	0.32
1500.00	1.20	119.80	1499.94	-6.42	0.98	-6.42	6.49	171.36	0.06
1600.00	1.98	119.37	1599.90	-7.79	3.39	-7.79	8.49	156.48	0.77
1700.00	2.68	111.31	1699.81	-9.48	7.07	-9.48	11.83	143.30	0.77
1800.00	2.91	102.50	1799.70	-10.88	11.72	-10.88	15.99	132.86	0.49

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	2.97	95.57	1899.56	-11.68	16.78	-11.68	20.44	124.84	0.36
2000.00	3.24	89.00	1999.42	-11.88	22.17	-11.88	25.16	118.18	0.45
2100.00	2.10	85.24	2099.31	-11.68	26.82	-11.68	29.26	113.53	1.15
2200.00	1.34	85.66	2199.26	-11.44	29.82	-11.44	31.94	110.99	0.76
2300.00	1.07	94.40	2299.24	-11.42	31.92	-11.42	33.90	109.69	0.32
2400.00	1.19	82.84	2399.22	-11.36	33.89	-11.36	35.74	108.54	0.26
2500.00	1.40	65.18	2499.20	-10.72	36.02	-10.72	37.59	106.58	0.45
2600.00	1.36	52.05	2599.17	-9.48	38.07	-9.48	39.23	103.99	0.32
2700.00	1.51	53.53	2699.14	-7.97	40.06	-7.97	40.85	101.25	0.16
2800.00	1.49	52.80	2799.10	-6.40	42.16	-6.40	42.64	98.63	0.03
2900.00	1.49	46.79	2899.07	-4.72	44.14	-4.72	44.39	96.11	0.16
3000.00	1.66	46.80	2999.03	-2.84	46.15	-2.84	46.24	93.52	0.17
3100.00	2.43	46.28	3098.97	-0.38	48.74	-0.38	48.74	90.44	0.77
3200.00	3.05	41.63	3198.85	3.08	52.04	3.08	52.13	86.62	0.65
3300.00	2.98	56.07	3298.71	6.51	55.96	6.51	56.34	83.36	0.76
3400.00	1.65	55.14	3398.63	8.79	59.31	8.79	59.96	81.57	1.33
3500.00	0.22	54.06	3498.61	9.73	60.65	9.73	61.42	80.89	1.44
3600.00	0.13	254.38	3598.61	9.81	60.69	9.81	61.48	80.82	0.35
3700.00	0.14	299.28	3698.61	9.84	60.47	9.84	61.26	80.76	0.11
3800.00	0.28	193.35	3798.61	9.66	60.30	9.66	61.07	80.90	0.35
3900.00	0.35	275.49	3898.61	9.45	59.94	9.45	60.68	81.04	0.42
4000.00	0.73	292.30	3998.61	9.72	59.04	9.72	59.84	80.65	0.41
4100.00	0.57	324.43	4098.60	10.37	58.16	10.37	59.08	79.89	0.39
4200.00	0.76	14.52	4198.59	11.42	58.04	11.42	59.15	78.87	0.59
4300.00	0.95	7.37	4298.58	12.88	58.31	12.88	59.72	77.54	0.22
4400.00	0.94	11.46	4398.57	14.50	58.58	14.50	60.35	76.09	0.07
4500.00	1.03	23.34	4498.56	16.13	59.10	16.13	61.26	74.73	0.22
4600.00	1.23	32.05	4598.54	17.87	60.03	17.87	62.63	73.42	0.27
4700.00	1.53	43.16	4698.51	19.76	61.51	19.76	64.61	72.19	0.40
4800.00	1.61	55.87	4798.47	21.52	63.59	21.52	67.13	71.30	0.36
4900.00	1.41	60.49	4898.44	22.91	65.82	22.91	69.69	70.81	0.23
5000.00	1.20	67.03	4998.41	23.92	67.85	23.92	71.95	70.58	0.26
5100.00	1.65	60.22	5098.38	25.05	70.06	25.05	74.41	70.33	0.49
5200.00	2.14	42.55	5198.32	27.14	72.58	27.14	77.48	69.50	0.75
5300.00	2.23	43.08	5298.25	29.93	75.16	29.93	80.90	68.29	0.09
5400.00	2.48	42.67	5398.17	32.94	77.95	32.94	84.63	67.10	0.25
5500.00	2.48	37.90	5498.07	36.23	80.75	36.23	88.50	65.83	0.21
5600.00	2.21	42.66	5597.99	39.36	83.38	39.36	92.20	64.73	0.34
5700.00	2.02	45.73	5697.92	42.01	85.95	42.01	95.67	63.95	0.22

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	1.71	49.05	5797.87	44.22	88.34	44.22	98.79	63.41	0.33
5900.00	1.53	54.21	5897.83	45.98	90.56	45.98	101.56	63.08	0.23
6000.00	1.38	53.08	5997.80	47.48	92.60	47.48	104.07	62.85	0.15
6100.00	1.07	38.23	6097.77	48.94	94.15	48.94	106.11	62.53	0.44
6200.00	0.72	38.66	6197.76	50.17	95.12	50.17	107.54	62.19	0.35
6300.00	0.56	35.93	6297.75	51.06	95.80	51.06	108.56	61.94	0.17
6400.00	0.54	36.89	6397.75	51.83	96.37	51.83	109.42	61.73	0.02
6500.00	0.55	33.42	6497.75	52.60	96.91	52.60	110.27	61.51	0.04
6600.00	0.57	24.79	6597.74	53.46	97.39	53.46	111.09	61.24	0.09
6700.00	0.49	54.96	6697.74	54.15	97.95	54.15	111.92	61.06	0.28
6800.00	0.55	54.98	6797.73	54.67	98.69	54.67	112.82	61.01	0.05
6900.00	0.40	65.98	6897.73	55.09	99.40	55.09	113.65	61.00	0.17
7000.00	0.33	84.05	6997.73	55.26	100.01	55.26	114.26	61.08	0.14
7100.00	0.74	128.30	7097.72	54.89	100.80	54.89	114.78	61.43	0.56
7200.00	0.68	136.05	7197.72	54.06	101.73	54.06	115.20	62.01	0.11
7300.00	0.87	155.00	7297.71	52.95	102.46	52.95	115.33	62.67	0.32
7400.00	0.96	169.95	7397.69	51.43	102.93	51.43	115.06	63.45	0.26
7500.00	0.85	167.35	7497.68	49.88	103.23	49.88	114.65	64.21	0.13
7600.00	0.87	183.36	7597.67	48.41	103.35	48.41	114.13	64.90	0.24
7700.00	1.25	190.90	7697.65	46.58	103.10	46.58	113.13	65.69	0.41
7800.00	1.71	198.88	7797.62	44.09	102.41	44.09	111.50	66.71	0.50
7900.00	1.56	195.06	7897.58	41.36	101.57	41.36	109.67	67.84	0.19
8000.00	1.49	223.01	7997.54	39.10	100.33	39.10	107.68	68.71	0.74
8100.00	1.11	235.31	8097.52	37.60	98.65	37.60	105.58	69.14	0.47
8200.00	1.57	237.54	8197.49	36.31	96.70	36.31	103.29	69.42	0.47
8300.00	1.22	251.49	8297.46	35.24	94.54	35.24	100.89	69.56	0.49
8400.00	0.89	257.85	8397.44	34.74	92.77	34.74	99.06	69.47	0.35
8500.00	0.33	252.41	8497.44	34.49	91.74	34.49	98.01	69.40	0.56
8600.00	0.16	270.26	8597.44	34.41	91.33	34.41	97.60	69.36	0.18
8645.00	0.22	230.00	8642.44	34.35	91.20	34.35	97.46	69.36	0.32



VES Survey International
West Texas
(432) 563-5444
Surveyor: Neil Bates
Lusk Deep Unit A 27H / API 30-025-42209





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FEB 05 2015

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COG Operating LLC

Lea County, NM
Lusk Deep Unit A
#27H

OH

Survey: MWD #1

Survey Report - Geographic

16 November, 2014

jm



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #27H
Project:	Lea County, NM	TVD Reference:	WELL @ 3602.6usft (Original Well Elev)
Site:	Lusk Deep Unit A	MD Reference:	WELL @ 3602.6usft (Original Well Elev)
Well:	#27H	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	Lusk Deep Unit A		
Site Position:		Northing:	603,696.00 usft
From:	Map	Easting:	660,099.70 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 39' 30.900 N
		Longitude:	103° 48' 47.247 W
		Grid Convergence:	0.28 °

Well	#27H		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 39' 30.900 N
		Longitude:	103° 48' 47.247 W
		Ground Level:	3,584.6 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	10/22/2014	7.32
			Dip Angle
			(°)
			60.46
			Field Strength
			(nT)
			48,515

Design	OH		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			87.52

Survey Program	Date 11/16/2014		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.0	8,645.0	GYRO (OH)	NS-GYRO-SS
8,683.0	13,685.0	MWD #1 (OH)	MWD
			Description
			NS Gyro single shots
			MWD - Standard

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Map	Map	Latitude	Longitude
Depth	(°)	(°)	Depth	(usft)	(usft)	Northing	Easting		
(usft)			(usft)			(usft)	(usft)		
8,645.0	0.22	230.31	8,642.4	33.9	91.4	603,729.85	660,191.08	32° 39' 31.230 N	103° 48' 46.177 W
Lusk Deep Unit A 13									
8,683.0	0.20	332.40	8,680.4	33.9	91.3	603,729.87	660,190.99	32° 39' 31.231 N	103° 48' 46.178 W
8,714.0	1.10	8.60	8,711.4	34.2	91.3	603,730.21	660,191.01	32° 39' 31.234 N	103° 48' 46.178 W
8,746.0	4.00	63.30	8,743.4	35.0	92.3	603,731.01	660,192.05	32° 39' 31.242 N	103° 48' 46.165 W
8,778.0	7.70	76.80	8,775.2	36.0	95.4	603,732.00	660,195.14	32° 39' 31.252 N	103° 48' 46.129 W
8,809.0	12.30	75.40	8,805.8	37.3	100.7	603,733.31	660,200.36	32° 39' 31.264 N	103° 48' 46.068 W
8,841.0	17.70	75.10	8,836.7	39.4	108.7	603,735.42	660,208.36	32° 39' 31.285 N	103° 48' 45.974 W
8,873.0	22.00	77.00	8,866.7	42.0	119.2	603,738.02	660,218.91	32° 39' 31.310 N	103° 48' 45.851 W
8,905.0	25.10	79.30	8,896.1	44.6	131.7	603,740.63	660,231.42	32° 39' 31.335 N	103° 48' 45.704 W
8,937.0	28.60	81.20	8,924.6	47.1	146.0	603,743.07	660,245.67	32° 39' 31.359 N	103° 48' 45.537 W



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #27H
Project:	Lea County, NM	TVD Reference:	WELL @ 3602.6usft (Original Well Elev)
Site:	Lusk Deep Unit A	MD Reference:	WELL @ 3602.6usft (Original Well Elev)
Well:	#27H	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
8,968.0	32.00	83.00	8,951.4	49.2	161.5	603,745.20	660,261.16	32° 39' 31.379 N	103° 48' 45.356 W
9,000.0	34.50	84.00	8,978.1	51.2	178.9	603,747.18	660,278.59	32° 39' 31.398 N	103° 48' 45.152 W
9,032.0	37.30	84.70	9,004.1	53.0	197.6	603,749.03	660,297.26	32° 39' 31.415 N	103° 48' 44.934 W
9,063.0	40.90	84.40	9,028.1	54.9	217.0	603,750.89	660,316.72	32° 39' 31.432 N	103° 48' 44.706 W
9,095.0	45.00	83.90	9,051.5	57.1	238.7	603,753.11	660,338.40	32° 39' 31.453 N	103° 48' 44.452 W
9,127.0	47.70	84.00	9,073.6	59.5	261.7	603,755.55	660,361.43	32° 39' 31.476 N	103° 48' 44.183 W
9,159.0	50.00	84.40	9,094.7	62.0	285.7	603,757.98	660,385.40	32° 39' 31.499 N	103° 48' 43.902 W
9,190.0	53.10	85.30	9,113.9	64.2	309.9	603,760.16	660,409.57	32° 39' 31.520 N	103° 48' 43.619 W
9,222.0	56.50	85.60	9,132.4	66.2	335.9	603,762.23	660,435.64	32° 39' 31.539 N	103° 48' 43.314 W
9,254.0	59.00	85.30	9,149.5	68.4	362.9	603,764.38	660,462.61	32° 39' 31.559 N	103° 48' 42.999 W
9,285.0	61.10	85.30	9,164.9	70.6	389.7	603,766.58	660,489.38	32° 39' 31.579 N	103° 48' 42.685 W
9,317.0	63.90	84.70	9,179.7	73.1	417.9	603,769.06	660,517.65	32° 39' 31.602 N	103° 48' 42.355 W
9,349.0	67.80	84.20	9,192.8	75.9	447.0	603,771.88	660,546.71	32° 39' 31.629 N	103° 48' 42.015 W
9,380.0	70.50	84.20	9,203.8	78.8	475.8	603,774.81	660,575.53	32° 39' 31.657 N	103° 48' 41.677 W
9,412.0	73.40	84.70	9,213.8	81.7	506.1	603,777.75	660,605.81	32° 39' 31.684 N	103° 48' 41.323 W
9,444.0	76.60	84.70	9,222.0	84.6	536.9	603,780.60	660,636.58	32° 39' 31.711 N	103° 48' 40.963 W
9,475.0	79.10	84.90	9,228.6	87.3	567.1	603,783.35	660,666.76	32° 39' 31.737 N	103° 48' 40.610 W
9,507.0	80.80	85.10	9,234.1	90.1	598.4	603,786.10	660,698.15	32° 39' 31.762 N	103° 48' 40.242 W
9,538.0	82.40	84.60	9,238.7	92.8	629.0	603,788.85	660,728.69	32° 39' 31.788 N	103° 48' 39.885 W
9,570.0	84.60	83.30	9,242.3	96.2	660.6	603,792.20	660,760.30	32° 39' 31.820 N	103° 48' 39.515 W
9,601.0	87.00	82.60	9,244.6	100.0	691.3	603,796.00	660,790.99	32° 39' 31.856 N	103° 48' 39.156 W
9,629.0	88.90	84.00	9,245.6	103.3	719.1	603,799.26	660,818.77	32° 39' 31.887 N	103° 48' 38.831 W
9,692.0	89.40	84.00	9,246.5	109.8	781.7	603,805.84	660,881.42	32° 39' 31.949 N	103° 48' 38.097 W
9,787.0	87.80	83.70	9,248.8	120.0	876.1	603,816.02	660,975.84	32° 39' 32.045 N	103° 48' 36.992 W
9,882.0	87.50	83.70	9,252.7	130.4	970.5	603,826.43	661,070.19	32° 39' 32.143 N	103° 48' 35.888 W
9,977.0	89.20	83.70	9,255.5	140.9	1,064.9	603,836.85	661,164.57	32° 39' 32.242 N	103° 48' 34.784 W
10,072.0	89.50	83.70	9,256.5	151.3	1,159.3	603,847.28	661,258.99	32° 39' 32.340 N	103° 48' 33.679 W
10,167.0	90.00	83.30	9,256.9	162.0	1,253.7	603,858.03	661,353.38	32° 39' 32.442 N	103° 48' 32.574 W
10,262.0	90.80	84.00	9,256.3	172.5	1,348.1	603,868.54	661,447.80	32° 39' 32.542 N	103° 48' 31.469 W
10,357.0	90.70	84.40	9,255.0	182.1	1,442.6	603,878.14	661,542.30	32° 39' 32.632 N	103° 48' 30.363 W
10,452.0	90.00	84.70	9,254.5	191.2	1,537.2	603,887.16	661,636.87	32° 39' 32.717 N	103° 48' 29.256 W
10,547.0	90.60	84.70	9,254.0	199.9	1,631.8	603,895.94	661,731.46	32° 39' 32.799 N	103° 48' 28.149 W
10,642.0	89.00	86.80	9,254.3	207.0	1,726.5	603,902.98	661,826.19	32° 39' 32.864 N	103° 48' 27.041 W
10,737.0	89.10	87.50	9,255.9	211.7	1,821.4	603,907.70	661,921.06	32° 39' 32.906 N	103° 48' 25.931 W
10,832.0	89.60	87.90	9,256.9	215.5	1,916.3	603,911.51	662,015.98	32° 39' 32.939 N	103° 48' 24.820 W
10,927.0	90.50	87.90	9,256.9	219.0	2,011.2	603,914.99	662,110.91	32° 39' 32.969 N	103° 48' 23.710 W
11,022.0	88.60	87.90	9,257.6	222.5	2,106.1	603,918.47	662,205.84	32° 39' 32.999 N	103° 48' 22.599 W
11,118.0	88.40	89.30	9,260.1	224.8	2,202.1	603,920.82	662,301.78	32° 39' 33.017 N	103° 48' 21.477 W
11,213.0	89.00	89.30	9,262.3	226.0	2,297.0	603,921.98	662,396.75	32° 39' 33.024 N	103° 48' 20.366 W
11,308.0	89.60	90.70	9,263.4	226.0	2,392.0	603,921.98	662,491.74	32° 39' 33.019 N	103° 48' 19.255 W
11,403.0	92.20	90.40	9,261.9	225.1	2,487.0	603,921.07	662,586.71	32° 39' 33.005 N	103° 48' 18.144 W
11,498.0	90.70	89.70	9,259.5	225.0	2,582.0	603,920.98	662,681.68	32° 39' 33.000 N	103° 48' 17.033 W
11,593.0	91.40	89.30	9,257.8	225.8	2,677.0	603,921.81	662,776.66	32° 39' 33.003 N	103° 48' 15.922 W
11,688.0	90.80	89.00	9,256.0	227.2	2,771.9	603,923.22	662,871.63	32° 39' 33.013 N	103° 48' 14.811 W
11,783.0	91.40	89.30	9,254.2	228.6	2,866.9	603,924.63	662,966.60	32° 39' 33.022 N	103° 48' 13.700 W
11,877.0	91.50	91.10	9,251.8	228.3	2,960.9	603,924.30	663,060.57	32° 39' 33.014 N	103° 48' 12.601 W
11,972.0	90.00	90.40	9,250.5	227.1	3,055.8	603,923.06	663,155.55	32° 39' 32.997 N	103° 48' 11.490 W
12,068.0	91.10	89.70	9,249.6	227.0	3,151.8	603,922.98	663,251.54	32° 39' 32.992 N	103° 48' 10.367 W
12,163.0	89.90	89.70	9,248.8	227.5	3,246.8	603,923.47	663,346.53	32° 39' 32.992 N	103° 48' 9.256 W
12,257.0	90.80	88.30	9,248.2	229.1	3,340.8	603,925.11	663,440.51	32° 39' 33.003 N	103° 48' 8.157 W
12,352.0	89.60	89.70	9,247.9	230.8	3,435.8	603,926.77	663,535.49	32° 39' 33.015 N	103° 48' 7.046 W
12,448.0	90.10	91.10	9,248.1	230.1	3,531.8	603,926.10	663,631.49	32° 39' 33.004 N	103° 48' 5.923 W
12,542.0	90.80	90.40	9,247.4	228.9	3,625.8	603,924.87	663,725.48	32° 39' 32.987 N	103° 48' 4.823 W
12,637.0	89.50	90.40	9,247.1	228.2	3,720.8	603,924.21	663,820.47	32° 39' 32.976 N	103° 48' 3.712 W
12,732.0	88.80	91.10	9,248.5	227.0	3,815.7	603,922.96	663,915.45	32° 39' 32.959 N	103° 48' 2.601 W



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #27H
Project:	Lea County, NM	TVD Reference:	WELL @ 3602.6usft (Original Well Elev)
Site:	Lusk Deep Unit A	MD Reference:	WELL @ 3602.6usft (Original Well Elev)
Well:	#27H	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
12,827.0	89.00	90.70	9,250.4	225.5	3,910.7	603,921.47	664,010.42	32° 39' 32.939 N	103° 48' 1.491 W
12,922.0	91.00	90.40	9,250.4	224.6	4,005.7	603,920.56	664,105.41	32° 39' 32.925 N	103° 48' 0.380 W
13,018.0	89.60	90.40	9,249.9	223.9	4,101.7	603,919.89	664,201.41	32° 39' 32.914 N	103° 47' 59.257 W
13,113.0	89.80	90.40	9,250.4	223.2	4,196.7	603,919.23	664,296.40	32° 39' 32.903 N	103° 47' 58.146 W
13,208.0	86.90	91.10	9,253.1	222.0	4,291.6	603,917.98	664,391.35	32° 39' 32.886 N	103° 47' 57.035 W
13,303.0	86.90	90.00	9,258.2	221.1	4,386.5	603,917.07	664,486.20	32° 39' 32.872 N	103° 47' 55.926 W
13,398.0	87.90	89.00	9,262.5	221.9	4,481.4	603,917.90	664,581.10	32° 39' 32.875 N	103° 47' 54.816 W
13,495.0	89.00	87.90	9,265.2	224.5	4,578.3	603,920.53	664,678.02	32° 39' 32.896 N	103° 47' 53.682 W
13,685.0	89.00	87.90	9,268.5	231.5	4,768.2	603,927.49	664,867.87	32° 39' 32.956 N	103° 47' 51.461 W
PBHL(LDU#27)									

Checked By: _____ Approved By: _____ Date: _____