

Results of Directional Survey

API number:	30-025-42000		
OGRID:		Operator:	COG PRODUCTION, LLC
		Property:	CABO BLANCO STATE # 3H

surface

ULSTR:	A	05	T 24S	R 33E
			490 FNL	1265 FEL

BH Loc

ULSTR:	P	05	T 24S	R 33E
15461 MD	11311.7	TVD	328 FSL	1262 FEL
4942 FNL				

5270

	MD	N/S	E/W	VD
	11310.00	-307.40	-3.70	11162.60
TOP PERFS/OH	11342.00	-337.90	-4.10	11142.10
	11342.00	-337.90	-4.10	11142.10
	15277.00	-4268.30	7.50	11305.30
BOT PERFS/OH	15280.00	-4271.30	7.45	11305.40
	15372.00	-4363.20	5.80	11308.40

NEXT TO LAST	15372.00	-4363.20	5.80	11308.40
LAST READING	15461.00	-4452.10	3.50	11311.70
TD	15461.00	-4452.10	3.50	11311.70

Surface Location	490	FN	1265	FE
Projected BHL	4942	FN	1262	FE
Location of				
Top Perfs/OH	828	FN	1269	FE
Bottom Perfs/OH	4761	FN	1258	FE

SUMMARY of Subsurface Locations

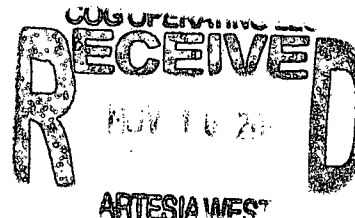
Surface Location	A-05-24S-33E	490	FN	1265	FE	Vert. Depth
Top Perfs/OH	A-05-24S-33E	828	FN	1269	FE	11142.10
Bottom Perfs/OH	P-05-24S-33E	4761	FN	1258	FE	11305.40
Projected TD	P-05-24S-33E	4942	FN	1262	FE	11311.70

FEB 03 2015

**McVAY DRILLING COMPANY**

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

Well Name and Num: Cabo Blanco State #3H
Location: Sec 5, 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:

<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>
1.10	283	0.80	6671	80.60	11406
1.00	568	0.40	7084	87.40	11525
0.40	846	0.90	7496	87.60	11946
0.80	1314	0.90	7907	87.30	12422
0.70	1550	0.90	8152	88.50	12613
0.60	1797	0.80	8689	88.70	13088
0.30	2051	0.80	8922	86.90	13564
0.20	2399	1.10	9132	88.00	13659
0.50	3161	0.70	9416	86.70	14135
0.90	3541	0.90	9792	88.70	14610
1.00	3921	2.30	10033	89.90	14896
1.10	4300	2.50	10252	87.90	15372
1.40	4775	1.40	10740		
2.40	4996	7.00	10803		
0.90	5438	46.60	11088		
0.70	5809	56.70	11183		
0.40	6189	62.90	11247		

HOBBSCOCD

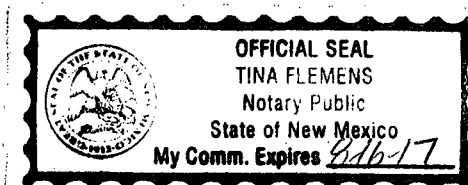
JAN 26 2015

RECEIVED

By: Hector Cruz

Subscribed and sworn to before me this 6th day of November, 2014

Tina Flemens
Notary Public, Lea County, New Mexico



jm



October 31, 2014

HOBBSOCD

JAN 26 2015

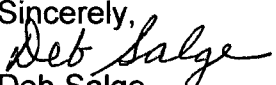
RECEIVED

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

Attn: Kanicia Castillo

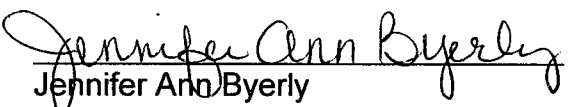
RE: Cabo Blanco State No. 003H

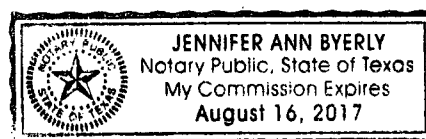
Please find enclosed a copy of the survey from 0.00' to 10675.00' ran on the above referenced well.

Sincerely,

Deb Salge
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 31 day of October, A.D., 2014, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: Cog Operating, LLC (Concho)
Lease/Well: Cabo Blanco State /No. 003H
Location: S5 - 24/S - 33/E
Rig Name: McVay #8
State/County: New Mexico/Lea
Latitude: 32.25, Longitude: -103.59
GRID North is 0.40 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB = 18 FT

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 10/31/2014 / 14:28

VES Survey International
West Texas
(432) 563-5444
Surveyor: Cody Johnson
Cabo Blanco State No. 003H / API 30-025-42000

HOBBSD
JAN 26 2015
RECEIVED

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	0.37	265.33	100.00	-0.03	-0.32	-0.03	0.32	265.33	0.37
200.00	0.60	257.15	200.00	-0.17	-1.15	-0.17	1.17	261.65	0.24
300.00	0.84	267.99	299.99	-0.31	-2.40	-0.31	2.42	262.60	0.28
400.00	1.17	280.37	399.97	-0.15	-4.14	-0.15	4.15	267.88	0.39
500.00	1.10	262.15	499.95	-0.10	-6.10	-0.10	6.10	269.06	0.37
600.00	0.94	283.12	599.94	-0.04	-7.84	-0.04	7.84	269.67	0.40
700.00	0.77	267.10	699.93	0.11	-9.31	0.11	9.31	270.66	0.29
800.00	0.32	268.38	799.92	0.06	-10.27	0.06	10.27	270.36	0.45
900.00	0.39	298.95	899.92	0.22	-10.85	0.22	10.85	271.17	0.20
1000.00	0.23	340.35	999.92	0.57	-11.21	0.57	11.23	272.93	0.27
1100.00	0.30	77.72	1099.92	0.81	-11.03	0.81	11.06	274.23	0.39
1200.00	0.47	125.48	1199.92	0.63	-10.44	0.63	10.46	273.46	0.35
1300.00	0.56	107.53	1299.91	0.25	-9.64	0.25	9.64	271.46	0.19
1400.00	0.61	82.11	1399.91	0.17	-8.64	0.17	8.64	271.13	0.26
1500.00	0.43	67.32	1499.90	0.39	-7.76	0.39	7.77	272.87	0.22
1600.00	0.85	56.27	1599.90	0.95	-6.80	0.95	6.87	277.92	0.44
1700.00	0.36	13.37	1699.89	1.66	-6.11	1.66	6.33	285.22	0.64
1800.00	0.35	18.51	1799.89	2.26	-5.94	2.26	6.36	290.78	0.03

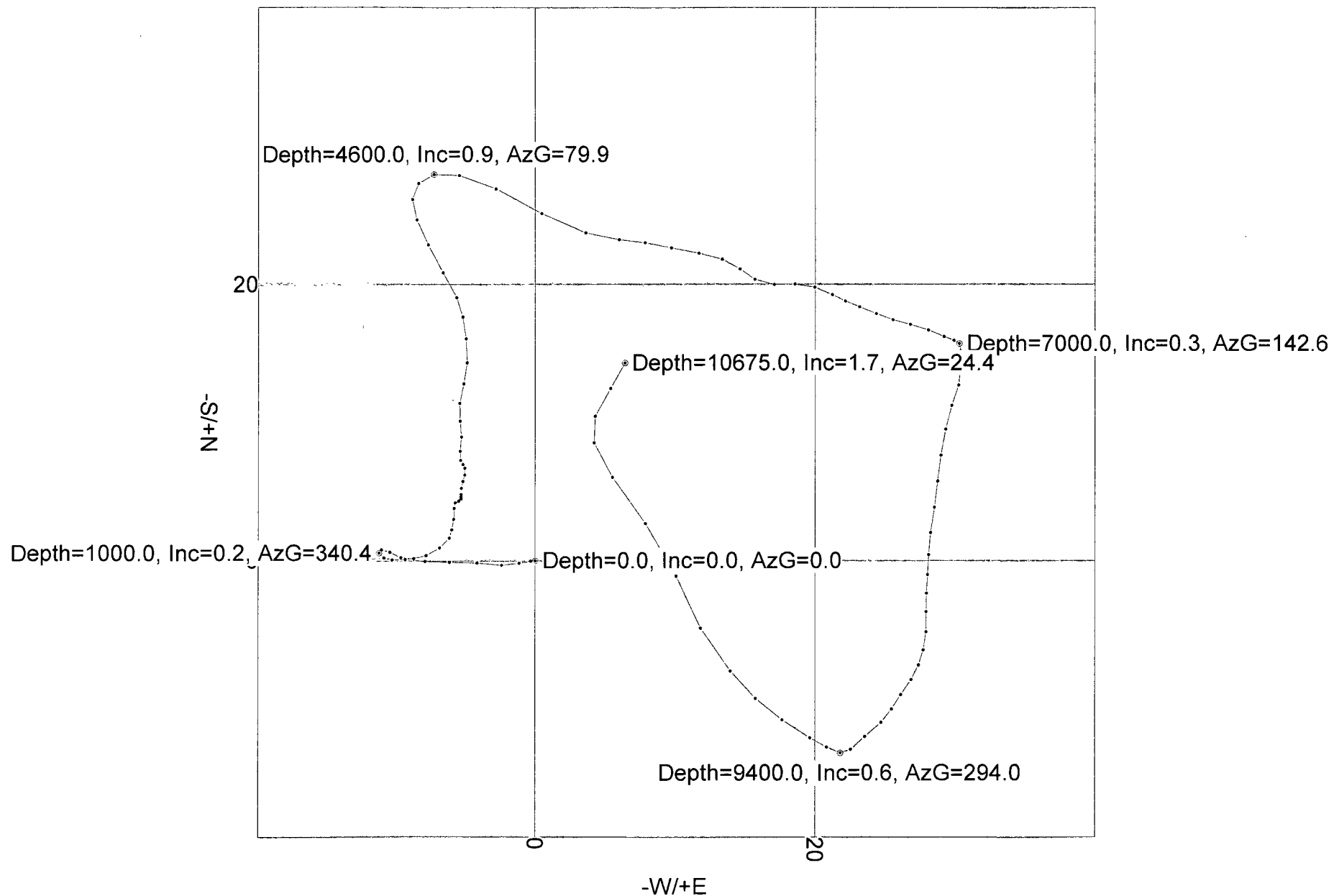
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.54	4.80	1899.89	3.02	-5.81	3.02	6.54	297.45	0.22
2000.00	0.37	359.38	1999.88	3.81	-5.77	3.81	6.92	303.46	0.18
2100.00	0.12	44.55	2099.88	4.21	-5.70	4.21	7.09	306.48	0.30
2200.00	0.21	77.32	2199.88	4.33	-5.45	4.33	6.96	308.48	0.12
2300.00	0.13	355.91	2299.88	4.48	-5.28	4.48	6.93	310.35	0.23
2400.00	0.04	7.74	2399.88	4.63	-5.28	4.63	7.03	311.26	0.09
2500.00	0.15	358.40	2499.88	4.80	-5.28	4.80	7.14	312.27	0.11
2600.00	0.38	5.16	2599.88	5.26	-5.25	5.26	7.44	315.03	0.23
2700.00	0.20	25.17	2699.88	5.75	-5.15	5.75	7.72	318.13	0.20
2800.00	0.36	9.68	2799.88	6.22	-5.02	6.22	7.99	321.07	0.18
2900.00	0.19	347.19	2899.88	6.69	-5.01	6.69	8.36	323.21	0.20
3000.00	0.18	320.23	2999.88	6.98	-5.14	6.98	8.67	323.60	0.09
3100.00	0.23	336.33	3099.87	7.28	-5.33	7.28	9.02	323.82	0.07
3200.00	0.55	7.40	3199.87	7.94	-5.34	7.94	9.57	326.06	0.37
3300.00	0.63	3.12	3299.87	8.96	-5.25	8.96	10.39	329.63	0.09
3400.00	0.70	347.88	3399.86	10.11	-5.35	10.11	11.44	332.11	0.19
3500.00	0.81	8.93	3499.85	11.40	-5.37	11.40	12.60	334.79	0.30
3600.00	0.84	13.99	3599.84	12.81	-5.08	12.81	13.78	338.36	0.08
3700.00	0.93	3.75	3699.83	14.33	-4.85	14.33	15.13	341.29	0.18
3800.00	1.08	351.92	3799.81	16.07	-4.93	16.07	16.81	342.94	0.25
3900.00	0.74	351.14	3899.80	17.63	-5.16	17.63	18.37	343.68	0.34
4000.00	0.96	336.18	3999.79	19.04	-5.60	19.04	19.84	343.61	0.31
4100.00	1.39	329.15	4099.77	20.84	-6.56	20.84	21.85	342.53	0.46
4200.00	1.23	335.54	4199.74	22.86	-7.63	22.86	24.10	341.55	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	0.94	88.90	5799.38	19.97	17.08	19.97	26.28	40.53	0.56
5900.00	0.74	87.68	5899.37	20.01	18.54	20.01	27.28	42.82	0.20
6000.00	0.91	109.80	5999.36	19.77	19.94	19.77	28.08	45.25	0.36
6100.00	0.66	117.56	6099.35	19.23	21.21	19.23	28.63	47.80	0.27
6200.00	0.54	113.99	6199.34	18.77	22.15	18.77	29.03	49.71	0.13
6300.00	0.75	111.13	6299.34	18.35	23.18	18.35	29.57	51.64	0.21
6400.00	0.73	113.17	6399.33	17.86	24.38	17.86	30.22	53.77	0.03
6500.00	0.72	106.96	6499.32	17.43	25.57	17.43	30.95	55.73	0.08
6600.00	0.76	103.67	6599.31	17.08	26.83	17.08	31.80	57.51	0.06
6700.00	0.79	111.05	6699.30	16.68	28.11	16.68	32.69	59.32	0.10
6800.00	0.61	115.13	6799.29	16.21	29.24	16.21	33.43	61.00	0.19
6900.00	0.27	103.38	6899.29	15.93	29.95	15.93	33.92	62.00	0.34
7000.00	0.26	142.60	6999.29	15.69	30.32	15.69	34.14	62.63	0.18
7100.00	0.41	184.27	7099.29	15.16	30.43	15.16	33.99	63.51	0.27
7200.00	0.45	183.70	7199.29	14.41	30.37	14.41	33.62	64.62	0.05
7300.00	0.37	173.03	7299.28	13.69	30.39	13.69	33.33	65.74	0.11
7400.00	0.80	191.80	7399.28	12.69	30.29	12.69	32.84	67.26	0.46
7500.00	1.00	204.16	7499.27	11.22	29.79	11.22	31.83	69.37	0.28
7600.00	1.06	185.00	7599.25	9.50	29.35	9.50	30.85	72.06	0.35
7700.00	1.13	194.93	7699.23	7.63	29.02	7.63	30.00	75.27	0.20
7800.00	1.07	178.55	7799.21	5.75	28.78	5.75	29.35	78.71	0.32
7900.00	1.14	194.59	7899.20	3.85	28.56	3.85	28.82	82.32	0.32
8000.00	0.99	181.57	7999.18	2.03	28.28	2.03	28.36	85.90	0.28
8100.00	0.85	187.56	8099.17	0.43	28.16				

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	1.81	302.10	9699.01	-11.56	17.66	-11.56	21.11	123.20	0.91
9800.00	1.05	321.77	9798.98	-10.00	15.76	-10.00	18.66	122.39	0.89
9900.00	2.02	316.33	9898.94	-8.00	13.98	-8.00	16.11	119.80	0.97
10000.00	2.34	333.87	9998.87	-4.90	11.86	-4.90	12.84	112.44	0.74
10100.00	2.42	336.57	10098.78	-1.13	10.12	-1.13	10.19	96.36	0.14
10200.00	2.67	323.90	10198.69	2.69	7.91	2.69	8.36	71.19	0.61
10300.00	2.03	325.29	10298.60	6.03	5.53	6.03	8.18	42.53	0.64
10400.00	1.25	343.56	10398.56	8.53	4.22	8.53	9.51	26.31	0.93
10500.00	1.10	23.05	10498.54	10.46	4.29	10.46	11.30	22.29	0.80
10600.00	1.53	33.79	10598.51	12.45	5.41	12.45	13.58	23.46	0.49
10675.00	1.71	24.40	10673.48	14.30	6.42	14.30	15.68	24.19	0.42



VES Survey International
West Texas
(432) 563-5444
Surveyor: Cody Johnson
Cabo Blanco State No. 003H / API 30-025-42000



VES Survey Date: 10/22/2014



COG Production LLC

Lea County, NM

Cabo Blanco State

#3H

OH

Survey: MWD #1

Survey Report - Geographic

30 October, 2014



Wellplanning
Survey Report - Geographic

Company:	COG Production LLC	Local Co-ordinate Reference:	Well #3H
Project:	Lea County, NM	TVD Reference:	WELL @ 3694.4usft (Original Well Elev)
Site:	Cabo Blanco State	MD Reference:	WELL @ 3694.4usft (Original Well Elev)
Well:	#3H	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	Cabo Blanco State		
Site Position:		Northing:	456,423.00 usft
From:	Map	Easting:	730,914.90 usft
Position Uncertainty:	3.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 15' 9.416 N
		Longitude:	103° 35' 10.996 W
		Grid Convergence:	0.40 °

Well	#3H		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 15' 8.847 N
		Longitude:	103° 35' 21.888 W
		Ground Level:	3,668.4 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	10/23/2014	7.18
			Dip Angle
			(°)
			60.13
			Field Strength
			(nT)
			48,294

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
			(°)
			180.23

Survey Program	Date 10/30/2014		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.0	10,675.0	GYRO (OH)	MWD
10,708.0	15,461.0	MWD #1 (OH)	MWD
			Description
			MWD - Standard
			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)		
10,675.0	1.71	24.40	10,673.5	14.3	6.4	456,373.29	729,986.37	32° 15' 8.988 N	103° 35' 21.812 W
10,708.0	1								



Wellplanning
Survey Report - Geographic

Company:	COG Production LLC	Local Co-ordinate Reference:	Well #3H
Project:	Lea County, NM	TVD Reference:	WELL @ 3694.4usft (Original Well Elev)
Site:	Cabo Blanco State	MD Reference:	WELL @ 3694.4usft (Original Well Elev)
Well:	#3H	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
11,025.0	39.80	181.20	11,001.0	-76.8	2.7	456,282.21	729,982.70	32° 15' 8.087 N	103° 35' 21.862 W
11,057.0	44.30	180.80	11,024.7	-98.2	2.3	456,260.79	729,982.33	32° 15' 7.875 N	103° 35' 21.868 W
11,088.0	46.60	180.80	11,046.5	-120.3	2.0	456,238.70	729,982.02	32° 15' 7.657 N	103° 35' 21.874 W
11,120.0	49.10	181.90	11,067.9	-144.0	1.5	456,214.98	729,981.46	32° 15' 7.422 N	103° 35' 21.882 W
11,152.0	53.50	182.90	11,087.9	-169.0	0.4	456,190.04	729,980.41	32° 15' 7.175 N	103° 35' 21.896 W
11,183.0	56.70	182.20	11,105.7	-194.4	-0.7	456,164.64	729,979.28	32° 15' 6.924 N	103° 35' 21.912 W
11,215.0	58.90	181.90	11,122.7	-221.4	-1.7	456,137.58	729,978.31	32° 15' 6.656 N	103° 35' 21.925 W
11,247.0	62.60	181.20	11,138.4	-249.3	-2.4	456,109.68	729,977.56	32° 15' 6.380 N	103° 35' 21.936 W
11,279.0	67.70	181.20	11,151.8	-278.3	-3.0	456,080.66	729,976.95	32° 15' 6.093 N	103° 35' 21.945 W
11,310.0	71.40	181.20	11,162.6	-307.4	-3.7	456,051.62	729,976.35	32° 15' 5.806 N	103° 35' 21.955 W
11,342.0	74.30	180.50	11,172.1	-337.9	-4.1	456,021.05	729,975.89	32° 15' 5.503 N	103° 35' 21.963 W
11,374.0	78.50	180.10	11,179.6	-369.0	-4.3	455,989.96	729,975.73	32° 15' 5.196 N	103° 35' 21.967 W
11,406.0	80.60	179.40	11,185.4	-400.5	-4.1	455,958.49	729,975.87	32° 15' 4.884 N	103° 35' 21.968 W
11,437.0	82.00	179.10	11,190.1	-431.2	-3.7	455,927.85	729,976.27	32° 15' 4.581 N	103° 35' 21.966 W
11,470.0	84.50	179.40	11,194.0	-463.9	-3.3	455,895.08	729,976.70	32° 1	



Wellplanning
Survey Report - Geographic

Company:	COG Production LLC	Local Co-ordinate Reference:	Well #3H
Project:	Lea County, NM	TVD Reference:	WELL @ 3694.4usft (Original Well Elev)
Site:	Cabo Blanco State	MD Reference:	WELL @ 3694.4usft (Original Well Elev)
Well:	#3H	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
15,087.0	87.90	180.80	11,299.0	-4,078.4	9.5	452,280.63	729,989.54	32° 14' 28.489 N	103° 35' 22.105 W
15,182.0	88.10	180.60	11,302.3	-4,173.3	8.4	452,185.69	729,988.38	32° 14' 27.550 N	103° 35' 22.126 W
15,277.0	88.30	180.50	11,305.3	-4,268.3	7.5	452,090.74	729,987.47	32° 14' 26.610 N	103° 35' 22.145 W
15,372.0	87.90	181.50	11,308.4	-4,363.2	5.8	451,995.81	729,985.82	32° 14' 25.671 N	103° 35' 22.172 W
15,461.0	87.90	181.50	11,311.7	-4,452.1	3.5	451,906.90	729,983.49	32° 14' 24.791 N	103° 35' 22.206 W
PBHL(CBS#3)									

Checked By: _____	Approved By: _____	Date: _____
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