Results of Directional Survey

API number:	30-025-40733			
OGRID:		Operator:	COG OPERATING LLC	
		Property:	SOPAPILLA STATE	# 1H

surface	ULSTR:	M	02	T	23S	R	33E
				190	FSL	380	FWL

BH Loc	ULSTR:	D	02	T	23S	R	33E
15596	MD	11117.5	TVD	378	FNL	343	FWL
				4922	FSL		

Top Perf/OH	ULSTR:	M	02	T	23S	R	33E
11243	MD	11083.4	TVD	575	FSL	331	FWL

Bot Perf/OH	ULSTR:	D	02	T	23S	R	33E
15510	MD	11116.9	TVD	444	FNL	344	FWL
				4836	FSL		

	MD	N/S	E/W	VD
	11219	361.90	-52.30	11077
TOP PERFS/OH	**11243**	384.90	-49.40	11083.40
	11243	384.90	-49.40	11083.40
	15451	4587.20	-35.10	11116.40
BOT PERFS/OH	**15510**	4646.20	-35.65	11116.89
	15548	4684.20	-36.00	11117.20

NEXT TO LAST	15548	4684.20	-36.00	11117.20
LAST READING	15596	4732.20	-36.70	11117.50
TD	**15596**	4732.20	-36.70	11117.50

Surface Location	190	FS	380	FW
Projected BHL	4922	FS	343	FW
Location of				
Top Perfs/OH	575	FS	331	FW
Bottom Perfs/OH	4836	FS	344	FW

SUMMARY of Subsurface Locations

Surface Location	M-02-23S-33E	190	FS	380	FW	Vert. Depth
Top Perfs/OH	M-02-23S-33E	575	FS	331	FW	11083.40
Bottom Perfs/OH	D-02-23S-33E	4836	FS	344	FW	11116.89
Projected TD	D-02-23S-33E	4922	FS	343	FW	11117.50

MAR 25 2013

VES
VAUGHN ENERGY SERVICES
A GYRO TECHNOLOGIES INC. COMPANY

PO Box 261021
Corpus Christi, Texas 78426
(361) 767-0602 • (800) 606-GYRO • Fax (361) 767-0612

December 3, 2012

HOBBS OCD

MAR 2 0 2013

RECEIVED

COG Operating LLC (Concho)
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

Attn: Kanica Castillo

SUR: M-02-23s-33e, 190/S & 380/W
BHL: D-02-23s-33e, 4922/S & 343/W
API # 30-025-40733

RE: **Sopapilla State No. 001H**

Please find enclosed a copy of the survey from 0.00' to 10160.00' ran on the above referenced well.

If I can be of any further service please do not hesitate to call me at 800-606-4976.

STATE OF TEXAS §
§
COUNTY OF NUECES §

This instrument was acknowledged before me on the 6th day of December A.D., 2012, by Keith Havelka.

LAURA BALLEW
Notary Public, State of Texas
My Commission Expires
January 28, 2014

Laura Ballew
Notary Public, State of Texas

Sincerely,

Keith Havelka
Operations

Company: COG Operating LLC (Concho)
Lease/Well: Sopapilla State / No. 001H
Location: SEC2 T23S R33E
Rig Name: Basic 46
State/County: New Mexico / Lea
Latitude: 32.33, Longitude: -103.55
GRID North is 0.42 Degrees East of True North
VS-Azi: 359.52 Degrees

Depth Reference : RKB = 22'

DRILLOG HA GYRO SURVEY CALCULATIONS
Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 12/3/2012 / 14:37

Vaughn Energy Services
Gardendale, Texas
(432) 563-5444
Surveyor: Colby Ware

Sopapilla State No. 001H / API 30-025-40733

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W 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	****
100.00	0.92	96.61	100.00	-0.09	0.80	0.81	96.61	0.92
200.00	1.18	103.94	199.98	-0.43	2.60	2.64	99.46	0.28
300.00	1.36	106.77	299.95	-1.02	4.73	4.84	102.20	0.20
400.00	1.57	109.61	399.92	-1.83	7.16	7.39	104.30	0.22
500.00	1.00	111.31	499.90	-2.60	9.26	9.62	105.69	0.57
600.00	0.43	93.02	599.89	-2.94	10.44	10.85	105.71	0.61
700.00	0.57	86.21	699.88	-2.92	11.32	11.69	104.49	0.16
800.00	0.72	69.40	799.88	-2.67	12.41	12.69	102.14	0.24
900.00	1.37	62.97	899.86	-1.90	14.06	14.19	97.71	0.66
1000.00	2.02	86.54	999.82	-1.25	16.89	16.93	94.24	0.94
1100.00	1.26	93.53	1099.78	-1.21	19.75	19.78	93.52	0.78
1200.00	0.51	60.52	1199.76	-1.06	21.23	21.26	92.87	0.88
1300.00	0.44	16.50	1299.76	-0.48	21.73	21.73	91.25	0.36
1400.00	0.38	312.48	1399.76	0.12	21.59	21.60	89.69	0.44
1500.00	0.69	309.54	1499.75	0.72	20.89	20.90	88.01	0.31
1600.00	0.98	306.59	1599.74	1.62	19.74	19.80	85.32	0.29
1700.00	1.25	294.19	1699.72	2.57	18.06	18.24	81.89	0.36
1800.00	1.51	281.78	1799.70	3.29	15.78	16.11	78.23	0.40

VES Survey Date: 11/26/2012

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	1.76	279.69	1899.65	3.81	12.97	13.52	73.61	0.26
2000.00	2.03	277.59	1999.60	4.31	9.70	10.62	66.06	0.28
2100.00	1.72	272.21	2099.55	4.60	6.45	7.92	54.50	0.36
2200.00	1.41	266.84	2199.51	4.59	3.72	5.91	39.01	0.34
2300.00	1.43	273.36	2299.48	4.59	1.24	4.76	15.12	0.16
2400.00	1.45	299.89	2399.45	5.30	-1.10	5.41	348.22	0.66
2500.00	1.47	339.42	2499.42	7.13	-2.65	7.61	339.58	0.99
2600.00	1.49	16.94	2599.39	9.57	-2.73	9.95	344.10	0.95
2700.00	2.12	38.47	2699.34	12.26	-1.20	12.32	354.41	0.91
2800.00	2.74	45.99	2799.25	15.37	1.67	15.46	6.20	0.70
2900.00	1.93	54.39	2899.16	18.02	4.76	18.64	14.81	0.88
3000.00	1.12	62.80	2999.13	19.45	7.01	20.67	19.82	0.84
3100.00	1.11	82.66	3099.11	20.02	8.84	21.89	23.84	0.39
3200.00	1.10	102.52	3199.09	19.94	10.75	22.65	28.33	0.38
3300.00	1.74	104.29	3299.06	19.35	13.15	23.40	34.20	0.64
3400.00	2.40	106.05	3398.99	18.40	16.64	24.80	42.12	0.66
3500.00	2.62	112.48	3498.90	16.95	20.76	26.80	50.78	0.36
3600.00	2.75	132.90	3598.79	14.44	24.63	28.55	59.62	0.96
3700.00	1.89	139.97	3698.71	11.55	27.45	29.78	67.18	0.91
3800.00	0.93	150.04	3798.68	9.58	28.91	30.46	71.66	0.99
3900.00	1.34	170.23	3898.66	7.73	29.51	30.51	75.32	0.57
4000.00	1.75	189.41	3998.62	5.08	29.46	29.89	80.22	0.66
4100.00	1.88	168.86	4098.57	1.96	29.53	29.59	86.20	0.66
4200.00	2.01	148.31	4198.52	-1.14	30.77	30.79	92.13	0.71
4300.00	1.66	129.22	4298.46	-3.55	32.81	33.00	96.18	0.70
4400.00	1.27	110.14	4398.43	-4.85	34.97	35.31	97.90	0.62
4500.00	1.41	119.41	4498.41	-5.83	37.08	37.53	98.94	0.26
4600.00	1.55	128.68	4598.37	-7.28	39.20	39.87	100.52	0.28
4700.00	2.01	116.41	4698.32	-8.90	41.82	42.76	102.02	0.60
4800.00	2.48	104.14	4798.25	-10.21	45.49	46.63	102.65	0.67
4900.00	1.91	93.71	4898.17	-10.85	49.26	50.44	102.42	0.69
5000.00	1.35	83.27	4998.13	-10.82	52.09	53.21	101.73	0.64
5100.00	1.42	78.11	5098.10	-10.42	54.48	55.47	100.83	0.14
5200.00	1.51	72.96	5198.07	-9.78	56.95	57.78	99.75	0.16
5300.00	1.75	71.64	5298.03	-8.92	59.66	60.32	98.50	0.24
5400.00	1.95	70.33	5397.98	-7.86	62.71	63.20	97.15	0.20
5500.00	1.83	70.76	5497.92	-6.76	65.82	66.17	95.87	0.12
5600.00	1.73	71.18	5597.88	-5.75	68.76	69.00	94.78	0.10
5700.00	1.69	68.66	5697.83	-4.73	71.56	71.72	93.78	0.09

VES Survey Date: 11/26/2012

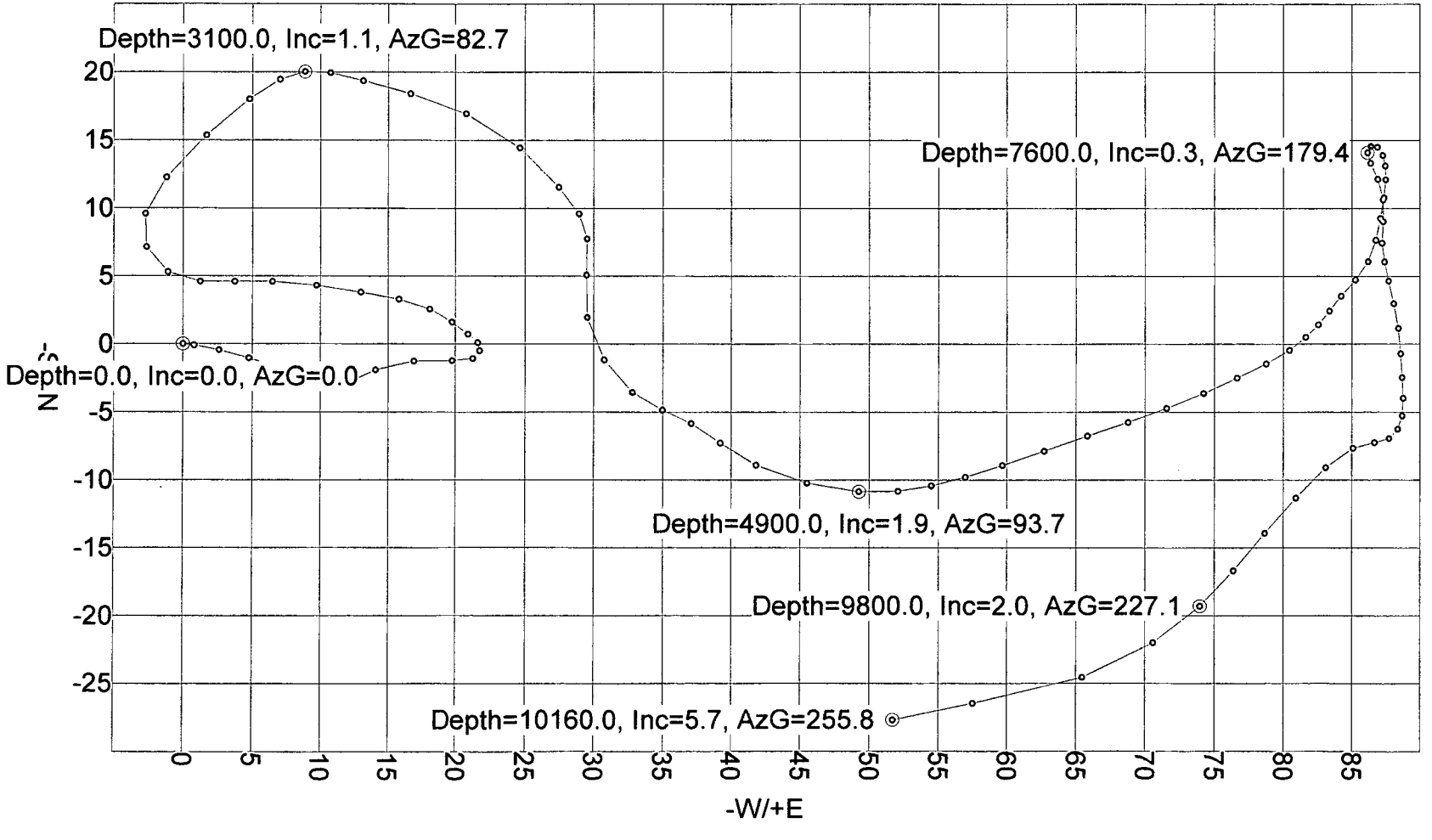
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	1.62	66.15	5797.79	-3.62	74.22	74.31	92.79	0.10
5900.00	1.44	64.34	5897.75	-2.51	76.64	76.68	91.87	0.18
6000.00	1.26	62.54	5997.73	-1.45	78.75	78.77	91.06	0.18
6100.00	1.01	54.96	6097.71	-0.44	80.45	80.45	90.31	0.30
6200.00	0.75	47.38	6197.70	0.50	81.65	81.65	89.65	0.28
6300.00	0.75	41.63	6297.69	1.43	82.56	82.57	89.01	0.07
6400.00	0.74	35.89	6397.68	2.44	83.37	83.41	88.32	0.07
6500.00	0.86	39.27	6497.67	3.55	84.23	84.30	87.59	0.13
6600.00	0.94	42.65	6597.66	4.74	85.26	85.39	86.82	0.09
6700.00	0.96	26.64	6697.64	6.09	86.19	86.40	85.96	0.27
6800.00	0.97	12.64	6797.63	7.66	86.75	87.09	84.95	0.24
6900.00	0.90	10.79	6897.62	9.26	87.08	87.57	83.93	0.07
7000.00	0.86	8.95	6997.60	10.77	87.35	88.01	82.97	0.05
7100.00	0.68	1.41	7097.59	12.10	87.48	88.31	82.12	0.21
7200.00	0.49	353.87	7197.59	13.12	87.45	88.43	81.47	0.20
7300.00	0.44	336.09	7297.59	13.90	87.25	88.35	80.95	0.15
7400.00	0.39	318.31	7397.58	14.50	86.87	88.07	80.52	0.14
7500.00	0.36	233.84	7497.58	14.57	86.39	87.61	80.43	0.50
7600.00	0.33	179.36	7597.58	14.09	86.14	87.28	80.71	0.32
7700.00	0.60	153.81	7697.58	13.33	86.37	87.40	81.23	0.34
7800.00	0.88	158.25	7797.57	12.15	86.89	87.74	82.04	0.28
7900.00	0.92	172.68	7897.56	10.64	87.28	87.92	83.05	0.23
8000.00	0.96	187.11	7997.54	9.02	87.28	87.74	84.10	0.24
8100.00	0.85	177.52	8097.53	7.45	87.20	87.52	85.12	0.18
8200.00	0.75	167.93	8197.52	6.07	87.37	87.58	86.03	0.17
8300.00	0.91	167.15	8297.51	4.66	87.69	87.81	86.96	0.17
8400.00	1.06	166.38	8397.50	2.99	88.08	88.13	88.06	0.15
8500.00	1.07	172.40	8497.48	1.17	88.42	88.43	89.24	0.11
8600.00	1.08	176.43	8597.46	-0.69	88.60	88.60	90.45	0.08
8700.00	0.94	176.80	8697.45	-2.45	88.71	88.74	91.58	0.14
8800.00	0.82	177.17	8797.43	-3.99	88.79	88.88	92.57	0.12
8900.00	0.67	191.93	8897.43	-5.28	88.70	88.86	93.40	0.24
9000.00	0.52	206.69	8997.42	-6.26	88.38	88.60	94.05	0.21
9100.00	0.61	237.82	9097.42	-6.95	87.72	88.00	94.53	0.32
9200.00	0.70	268.96	9197.41	-7.24	86.66	86.96	94.78	0.36
9300.00	1.19	247.28	9297.40	-7.66	85.09	85.44	95.14	0.60
9400.00	1.69	225.59	9397.36	-9.09	83.08	83.58	96.24	0.73
9500.00	1.87	222.81	9497.32	-11.32	80.92	81.71	97.96	0.20
9600.00	2.07	220.02	9597.26	-13.89	78.65	79.87	100.02	0.22

VES Survey Date: 11/26/2012

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
9700.00	2.05	218.56	9697.19	-16.67	76.38	78.18	102.31	0.05
9800.00	2.04	227.09	9797.13	-19.29	73.95	76.43	104.62	0.31
9900.00	2.90	233.97	9897.04	-21.99	70.60	73.95	107.30	0.91
10000.00	3.77	250.85	9996.87	-24.56	65.45	69.90	110.57	1.30
10100.00	5.63	260.33	10096.53	-26.46	57.51	63.30	114.71	2.01
10160.00	5.70	255.77	10156.24	-27.69	51.72	58.66	118.17	0.76

VES Survey Date: 11/26/2012

Vaughn Energy Services
Gardendale, Texas
(432) 563-5444
Surveyor: Colby Ware
Sopapilla State No. 001H / API 30-025-40733



VES Survey Date: 11/26/2012

CRESCENT DIRECTIONAL DRILLING

January 2, 2013

STATE OF NEW MEXICO

COUNTY OF LEA

I, Ricky Neagle, certify that; I am employed by Crescent Directional Drilling, L.P.; that on the day(s) of November 10, 2012-December 31, 2012 we conducted and or supervised the taking of a MWD survey for Sopapilla State #1H from a depth of 10160 feet to a depth of 15596 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Crescent Directional Drilling Services, L.P.; that I am authorized and qualified to make this report; that this survey was conducted at the request of Concho; that I reviewed this report and find it conforms to the principles and procedures as set forth by Crescent Directional.

Ricky Neagle
Coordinator of MWD Operations
Crescent Directional Drilling, L.P.

Carrie Reed 1-7-13
NOTARY DATE

NOTARY PUBLIC STATE OF TEXAS
CARRIE REED
My Commission Expires
October 4, 2015

Crescent Directional Drilling L.P.
2040 Aldine Western Rd Houston, TX 77038
Phone (281) 668-9500 Fax (281) 668-9539

CRESCENT DIRECTIONAL DRILLING

COG Operating LLC

Lea County, NM
Sopapilla State
#1H

ST2

SUR: M-02-23s-33e, 190/S & 380/W
BHL: D-02-23s-33e, 4922/S & 343/W
API # 30-025-40733

Design: ST2

Survey Report - Geographic

30 December, 2012

CONCHO

CONCHO

COG Operating LLC
Project: Lea County, NM
Site: Sopapilla State
Well: #1H
Wellbore: ST2
Plan: ST2 Plan #2 (#1H/ST2)

WELL DETAILS: #1H

Ground Elevation:: 3561.0
RKB Elevation: WELL @ 3583.0usft (Basic #46 - 22' KB)
Rig Name: Basic #46 - 22' KB

Surface Hole Location

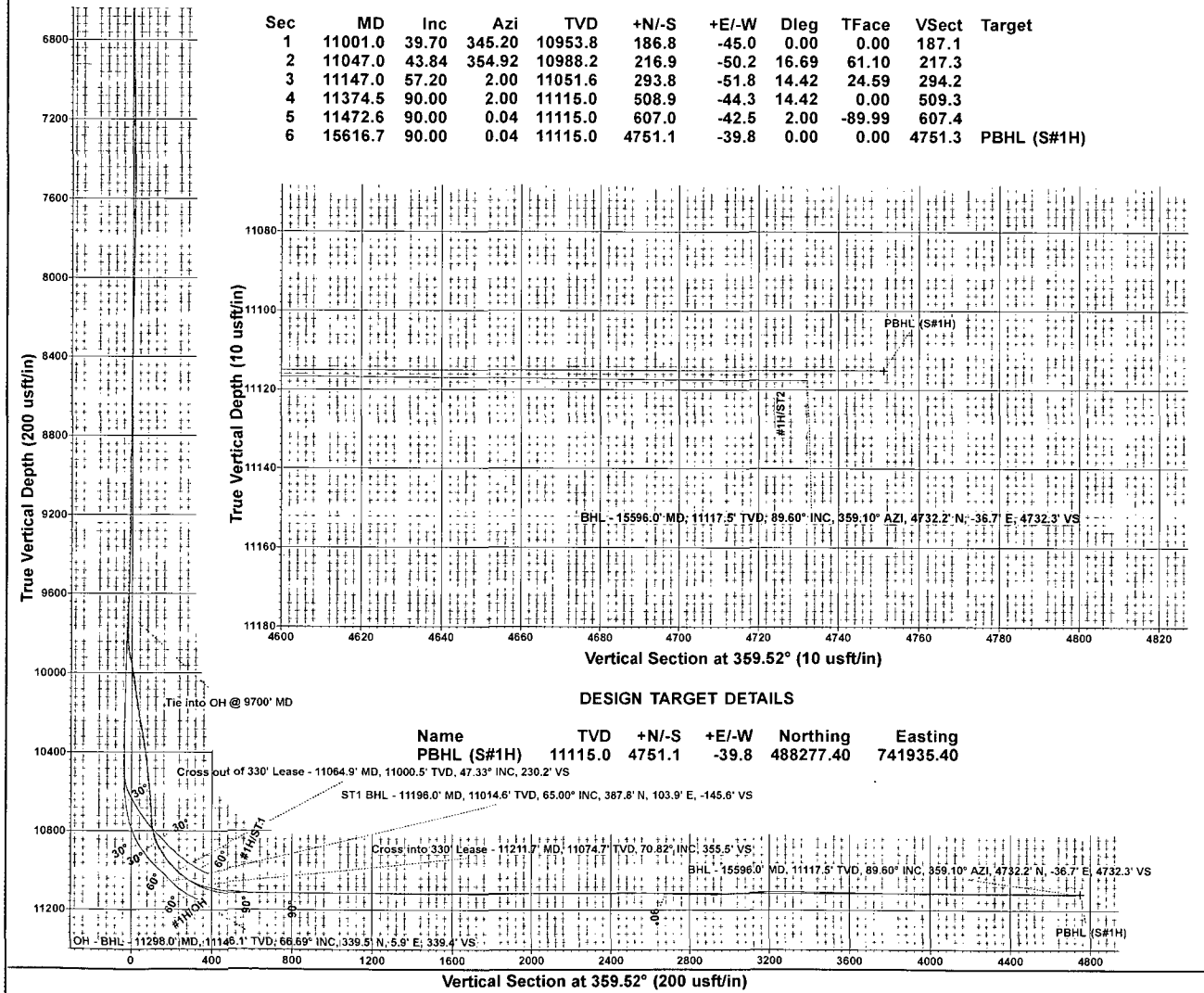
Northing	Easting	Latittude	Longitude
483526.30	741975.20	32° 19' 36.833 N	103° 32' 59.904 W

Azimuths to Grid North
True North: -0.42°
Magnetic North: 6.98°

Magnetic Field
Strength: 48530.6snT
Dip Angle: 60.25°
Date: 12/11/2012
Model: IGRF2010

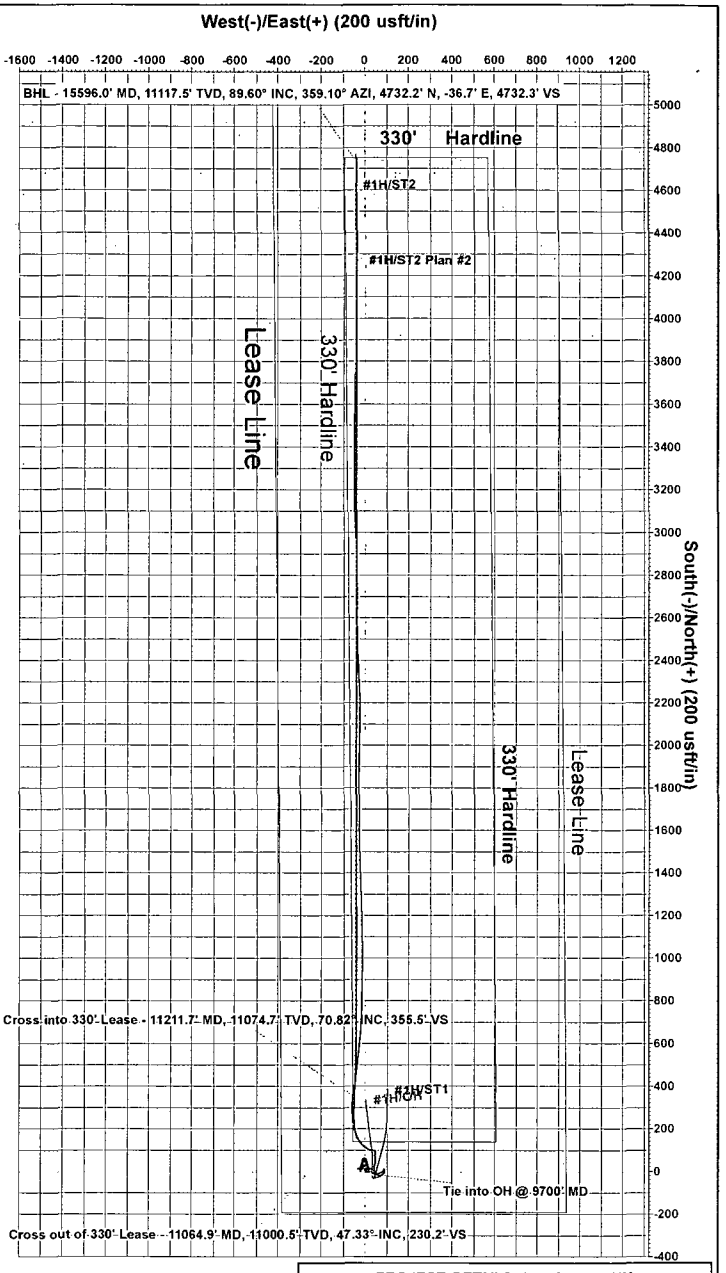
Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	11001.0	39.70	345.20	10953.8	186.8	-45.0	0.00	0.00	187.1	
2	11047.0	43.84	354.92	10988.2	216.9	-50.2	16.69	61.10	217.3	
3	11147.0	57.20	2.00	11051.6	293.8	-51.8	14.42	24.59	294.2	
4	11374.5	90.00	2.00	11115.0	508.9	-44.3	14.42	0.00	509.3	
5	11472.6	90.00	0.04	11115.0	607.0	-42.5	2.00	-89.99	607.4	
6	15616.7	90.00	0.04	11115.0	4751.1	-39.8	0.00	0.00	4751.3	PBHL (S#1H)



DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
PBHL (S#1H)	11115.0	4751.1	-39.8	488277.40	741935.40



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
Local North: Grid

CRESCENT DIRECTIONAL DRILLING

Crescent Directional Drilling
7715 West Industrial Ave. Midland, Tx 79706
Phone: 432-618-1135

Plan: ST2 Plan #2 (#1H/ST2)
Created By: Matt Higgins Date: 23:19, December 30 2012

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #1H
Project:	Lea County, NM	**TVD Reference:**	WELL @ 3583.0usft (Basic #46 - 22' KB)
Site:	Sopapilla State	**MD Reference:**	WELL @ 3583.0usft (Basic #46 - 22' KB)
Well:	#1H	**North Reference:**	Grid
Wellbore:	ST2	**Survey Calculation Method:**	Minimum Curvature
Design:	ST2	**Database:**	Houston R5000 Database

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	Sopapilla State				
Site Position:		**Northing:**	483,526.30 usft	**Latitude:**	32° 19' 36.833 N
From:	Map	**Easting:**	741,975.20 usft	**Longitude:**	103° 32' 59.904 W
Position Uncertainty:	2.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.42 °

Well	#1H					
Well Position	**+N/-S**	0.0 usft	**Northing:**	483,526.30 usft	**Latitude:**	32° 19' 36.833 N
	+E/-W	0.0 usft	**Easting:**	741,975.20 usft	**Longitude:**	103° 32' 59.904 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,561.0 usft

Wellbore	ST2				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2010	12/11/2012	7.40	60.25	48,531

Design	ST2					
Audit Notes:						
Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**		9,700.0
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**		
	0.0	0.0	0.0	359.52		

Survey Program **Date** 12/30/2012

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	9,700.0	Survey #1 - VES1 (OH)	CB-GYRO-MS	Camera based gyro multishot
9,760.0	15,548.0	Survey #4 - MWD3 (ST2)	MWD	MWD - Standard
15,596.0	15,596.0	Survey #5 - PTB (ST2)	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
0.0	0.00	0.00	0.0	0.0	0.0	483,526.30	741,975.20	32° 19' 36.833 N	103° 32' 59.904 W
100.0	0.92	96.61	100.0	-0.1	0.8	483,526.21	741,975.99	32° 19' 36.832 N	103° 32' 59.895 W
200.0	1.18	103.94	200.0	-0.4	2.6	483,525.87	741,977.79	32° 19' 36.829 N	103° 32' 59.874 W
300.0	1.36	106.77	300.0	-1.0	4.7	483,525.28	741,979.93	32° 19' 36.823 N	103° 32' 59.849 W
400.0	1.57	109.61	399.9	-1.8	7.2	483,524.48	741,982.35	32° 19' 36.815 N	103° 32' 59.821 W
500.0	1.00	111.31	499.9	-2.6	9.3	483,523.70	741,984.46	32° 19' 36.807 N	103° 32' 59.796 W
600.0	0.43	93.02	599.9	-2.9	10.4	483,523.36	741,985.64	32° 19' 36.803 N	103° 32' 59.783 W
700.0	0.57	86.21	699.9	-2.9	11.3	483,523.37	741,986.52	32° 19' 36.803 N	103° 32' 59.772 W
800.0	0.72	69.40	799.9	-2.7	12.4	483,523.63	741,987.60	32° 19' 36.806 N	103° 32' 59.760 W
900.0	1.37	62.97	899.9	-1.9	14.1	483,524.39	741,989.25	32° 19' 36.813 N	103° 32' 59.740 W

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #1H
Project:	Lea County, NM	**TVD Reference:**	WELL @ 3583.0usft (Basic #46 - 22' KB)
Site:	Sopapilla State	**MD Reference:**	WELL @ 3583.0usft (Basic #46 - 22' KB)
Well:	#1H	**North Reference:**	Grid
Wellbore:	ST2	**Survey Calculation Method:**	Minimum Curvature
Design:	ST2	**Database:**	Houston R5000 Database

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,000.0	2.02	86.54	999.8	-1.3	16.9	483,525.04	741,992.08	32° 19' 36.820 N	103° 32' 59.707 W
1,100.0	1.26	93.53	1,099.8	-1.2	19.7	483,525.08	741,994.93	32° 19' 36.820 N	103° 32' 59.674 W
1,200.0	0.51	60.52	1,199.8	-1.1	21.2	483,525.23	741,996.42	32° 19' 36.821 N	103° 32' 59.657 W
1,300.0	0.44	16.50	1,299.8	-0.5	21.7	483,525.82	741,996.91	32° 19' 36.827 N	103° 32' 59.651 W
1,400.0	0.38	312.48	1,399.8	0.1	21.6	483,526.41	741,996.78	32° 19' 36.833 N	103° 32' 59.652 W
1,500.0	0.69	309.54	1,499.8	0.7	20.9	483,527.02	741,996.07	32° 19' 36.839 N	103° 32' 59.661 W
1,600.0	0.98	306.59	1,599.7	1.6	19.7	483,527.91	741,994.92	32° 19' 36.848 N	103° 32' 59.674 W
1,700.0	1.25	294.19	1,699.7	2.6	18.0	483,528.87	741,993.24	32° 19' 36.857 N	103° 32' 59.694 W
1,800.0	1.51	281.78	1,799.7	3.3	15.8	483,529.58	741,990.95	32° 19' 36.865 N	103° 32' 59.720 W
1,900.0	1.76	279.69	1,899.7	3.8	13.0	483,530.11	741,988.15	32° 19' 36.870 N	103° 32' 59.753 W
2,000.0	2.03	277.59	1,999.6	4.3	9.7	483,530.60	741,984.88	32° 19' 36.875 N	103° 32' 59.791 W
2,100.0	1.72	272.21	2,099.5	4.6	6.4	483,530.90	741,981.62	32° 19' 36.878 N	103° 32' 59.829 W
2,200.0	1.41	266.84	2,199.5	4.6	3.7	483,530.89	741,978.90	32° 19' 36.878 N	103° 32' 59.861 W
2,300.0	1.43	273.36	2,299.5	4.6	1.2	483,530.89	741,976.42	32° 19' 36.879 N	103° 32' 59.889 W
2,400.0	1.45	299.89	2,399.4	5.3	-1.1	483,531.60	741,974.08	32° 19' 36.886 N	103° 32' 59.917 W
2,500.0	1.47	339.42	2,499.4	7.1	-2.7	483,533.43	741,972.53	32° 19' 36.904 N	103° 32' 59.934 W
2,600.0	1.49	16.94	2,599.4	9.6	-2.7	483,535.87	741,972.46	32° 19' 36.928 N	103° 32' 59.935 W
2,700.0	2.12	38.47	2,699.3	12.3	-1.2	483,538.56	741,973.99	32° 19' 36.955 N	103° 32' 59.917 W
2,800.0	2.74	45.99	2,799.2	15.4	1.7	483,541.67	741,976.86	32° 19' 36.985 N	103° 32' 59.883 W
2,900.0	1.93	54.39	2,899.2	18.0	4.8	483,544.31	741,979.95	32° 19' 37.011 N	103° 32' 59.847 W
3,000.0	1.12	62.80	2,999.1	19.4	7.0	483,545.74	741,982.19	32° 19' 37.025 N	103° 32' 59.821 W
3,100.0	1.11	82.66	3,099.1	20.0	8.8	483,546.31	741,984.02	32° 19' 37.031 N	103° 32' 59.800 W
3,200.0	1.10	102.52	3,199.1	19.9	10.7	483,546.23	741,985.91	32° 19' 37.030 N	103° 32' 59.777 W
3,300.0	1.74	104.29	3,299.1	19.3	13.1	483,545.64	741,988.32	32° 19' 37.024 N	103° 32' 59.749 W
3,400.0	2.40	106.05	3,399.0	18.4	16.6	483,544.69	741,991.81	32° 19' 37.014 N	103° 32' 59.709 W
3,500.0	2.62	112.48	3,498.9	16.9	20.7	483,543.24	741,995.93	32° 19' 36.999 N	103° 32' 59.661 W
3,600.0	2.75	132.90	3,598.8	14.4	24.6	483,540.73	741,999.80	32° 19' 36.974 N	103° 32' 59.616 W
3,700.0	1.89	139.97	3,698.7	11.5	27.4	483,537.83	742,002.62	32° 19' 36.945 N	103° 32' 59.583 W
3,800.0	0.93	150.04	3,798.7	9.6	28.9	483,535.87	742,004.08	32° 19' 36.926 N	103° 32' 59.567 W
3,900.0	1.34	170.23	3,898.7	7.7	29.5	483,534.01	742,004.69	32° 19' 36.907 N	103° 32' 59.560 W
4,000.0	1.75	189.41	3,998.6	5.1	29.4	483,531.35	742,004.64	32° 19' 36.881 N	103° 32' 59.561 W
4,100.0	1.88	168.86	4,098.6	1.9	29.5	483,528.24	742,004.70	32° 19' 36.850 N	103° 32' 59.560 W
4,200.0	2.01	148.31	4,198.5	-1.2	30.7	483,525.14	742,005.94	32° 19' 36.819 N	103° 32' 59.546 W
4,300.0	1.66	129.22	4,298.5	-3.6	32.8	483,522.73	742,007.98	32° 19' 36.795 N	103° 32' 59.522 W
4,400.0	1.27	110.14	4,398.4	-4.9	34.9	483,521.43	742,010.15	32° 19' 36.782 N	103° 32' 59.497 W
4,500.0	1.41	119.41	4,498.4	-5.9	37.1	483,520.45	742,012.26	32° 19' 36.773 N	103° 32' 59.473 W
4,600.0	1.55	128.68	4,598.4	-7.3	39.2	483,519.00	742,014.39	32° 19' 36.758 N	103° 32' 59.448 W
4,700.0	2.01	116.41	4,698.3	-8.9	41.8	483,517.37	742,017.01	32° 19' 36.742 N	103° 32' 59.417 W
4,800.0	2.48	104.14	4,798.2	-10.2	45.5	483,516.06	742,020.68	32° 19' 36.729 N	103° 32' 59.375 W
4,900.0	1.91	93.71	4,898.2	-10.9	49.2	483,515.43	742,024.44	32° 19' 36.722 N	103° 32' 59.331 W
5,000.0	1.35	83.27	4,998.1	-10.8	52.1	483,515.46	742,027.28	32° 19' 36.722 N	103° 32' 59.298 W
5,100.0	1.42	78.11	5,098.1	-10.5	54.5	483,515.85	742,029.66	32° 19' 36.726 N	103° 32' 59.270 W
5,200.0	1.51	72.96	5,198.1	-9.8	56.9	483,516.49	742,032.13	32° 19' 36.732 N	103° 32' 59.241 W
5,300.0	1.75	71.64	5,298.0	-8.9	59.6	483,517.36	742,034.84	32° 19' 36.740 N	103° 32' 59.210 W
5,400.0	1.95	70.33	5,398.0	-7.9	62.7	483,518.41	742,037.89	32° 19' 36.751 N	103° 32' 59.174 W
5,500.0	1.83	70.76	5,497.9	-6.8	65.8	483,519.51	742,041.00	32° 19' 36.761 N	103° 32' 59.138 W
5,600.0	1.73	71.18	5,597.9	-5.8	68.7	483,520.52	742,043.94	32° 19' 36.771 N	103° 32' 59.103 W
5,700.0	1.69	68.66	5,697.8	-4.8	71.5	483,521.55	742,046.74	32° 19' 36.781 N	103° 32' 59.071 W
5,800.0	1.62	66.15	5,797.8	-3.6	74.2	483,522.66	742,049.40	32° 19' 36.792 N	103° 32' 59.040 W
5,900.0	1.44	64.34	5,897.8	-2.5	76.6	483,523.77	742,051.83	32° 19' 36.803 N	103° 32' 59.011 W
6,000.0	1.26	62.54	5,997.7	-1.5	78.7	483,524.82	742,053.94	32° 19' 36.813 N	103° 32' 58.987 W
6,100.0	1.01	54.96	6,097.7	-0.5	80.4	483,525.84	742,055.64	32° 19' 36.823 N	103° 32' 58.967 W
6,200.0	0.75	47.38	6,197.7	0.5	81.6	483,526.78	742,056.84	32° 19' 36.832 N	103° 32' 58.953 W
6,300.0	0.75	41.63	6,297.7	1.4	82.6	483,527.72	742,057.76	32° 19' 36.841 N	103° 32' 58.942 W
6,400.0	0.74	35.89	6,397.7	2.4	83.4	483,528.73	742,058.57	32° 19' 36.851 N	103° 32' 58.932 W

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #1H
Project:	Lea County, NM	**TVD Reference:**	WELL @ 3583.0usft (Basic #46 - 22' KB)
Site:	Sopapilla State	**MD Reference:**	WELL @ 3583.0usft (Basic #46 - 22' KB)
Well:	#1H	**North Reference:**	Grid
Wellbore:	ST2	**Survey Calculation Method:**	Minimum Curvature
Design:	ST2	**Database:**	Houston R5000 Database

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,500.0	0.86	39.27	6,497.7	3.5	84.2	483,529.83	742,059.42	32° 19' 36.862 N	103° 32' 58.922 W
6,600.0	0.94	42.65	6,597.7	4.7	85.3	483,531.02	742,060.45	32° 19' 36.874 N	103° 32' 58.910 W
6,700.0	0.96	26.64	6,697.6	6.1	86.2	483,532.37	742,061.38	32° 19' 36.887 N	103° 32' 58.899 W
6,800.0	0.97	12.64	6,797.6	7.6	86.7	483,533.94	742,061.95	32° 19' 36.903 N	103° 32' 58.892 W
6,900.0	0.90	10.79	6,897.6	9.2	87.1	483,535.54	742,062.28	32° 19' 36.918 N	103° 32' 58.888 W
7,000.0	0.86	8.95	6,997.6	10.8	87.3	483,537.06	742,062.54	32° 19' 36.933 N	103° 32' 58.885 W
7,100.0	0.68	1.41	7,097.6	12.1	87.5	483,538.39	742,062.67	32° 19' 36.946 N	103° 32' 58.884 W
7,200.0	0.49	353.87	7,197.6	13.1	87.4	483,539.41	742,062.64	32° 19' 36.957 N	103° 32' 58.884 W
7,300.0	0.44	336.09	7,297.6	13.9	87.2	483,540.18	742,062.44	32° 19' 36.964 N	103° 32' 58.886 W
7,400.0	0.39	318.31	7,397.6	14.5	86.9	483,540.79	742,062.06	32° 19' 36.970 N	103° 32' 58.891 W
7,500.0	0.36	233.84	7,497.6	14.6	86.4	483,540.86	742,061.58	32° 19' 36.971 N	103° 32' 58.896 W
7,600.0	0.33	179.36	7,597.6	14.1	86.1	483,540.38	742,061.33	32° 19' 36.966 N	103° 32' 58.899 W
7,700.0	0.60	153.81	7,697.6	13.3	86.4	483,539.63	742,061.56	32° 19' 36.959 N	103° 32' 58.896 W
7,800.0	0.88	158.25	7,797.6	12.1	86.9	483,538.44	742,062.08	32° 19' 36.947 N	103° 32' 58.891 W
7,900.0	0.92	172.68	7,897.6	10.6	87.3	483,536.93	742,062.46	32° 19' 36.932 N	103° 32' 58.886 W
8,000.0	0.96	187.11	7,997.5	9.0	87.3	483,535.31	742,062.46	32° 19' 36.916 N	103° 32' 58.886 W
8,100.0	0.85	177.52	8,097.5	7.4	87.2	483,533.73	742,062.39	32° 19' 36.900 N	103° 32' 58.887 W
8,200.0	0.75	167.93	8,197.5	6.1	87.4	483,532.35	742,062.56	32° 19' 36.887 N	103° 32' 58.885 W
8,300.0	0.91	167.15	8,297.5	4.6	87.7	483,530.94	742,062.87	32° 19' 36.873 N	103° 32' 58.882 W
8,400.0	1.06	166.38	8,397.5	3.0	88.1	483,529.27	742,063.27	32° 19' 36.856 N	103° 32' 58.877 W
8,500.0	1.07	172.40	8,497.5	1.1	88.4	483,527.44	742,063.61	32° 19' 36.838 N	103° 32' 58.874 W
8,600.0	1.08	176.43	8,597.5	-0.7	88.6	483,525.58	742,063.79	32° 19' 36.820 N	103° 32' 58.872 W
8,700.0	0.94	176.80	8,697.4	-2.5	88.7	483,523.82	742,063.90	32° 19' 36.802 N	103° 32' 58.871 W
8,800.0	0.82	177.17	8,797.4	-4.0	88.8	483,522.28	742,063.98	32° 19' 36.787 N	103° 32' 58.870 W
8,900.0	0.67	191.93	8,897.4	-5.3	88.7	483,521.00	742,063.89	32° 19' 36.774 N	103° 32' 58.871 W
9,000.0	0.52	206.69	8,997.4	-6.3	88.4	483,520.02	742,063.57	32° 19' 36.765 N	103° 32' 58.875 W
9,100.0	0.61	237.82	9,097.4	-7.0	87.7	483,519.33	742,062.91	32° 19' 36.758 N	103° 32' 58.882 W
9,200.0	0.70	268.96	9,197.4	-7.3	86.7	483,519.03	742,061.85	32° 19' 36.755 N	103° 32' 58.895 W
9,300.0	1.19	247.28	9,297.4	-7.7	85.1	483,518.62	742,060.28	32° 19' 36.751 N	103° 32' 58.913 W
9,400.0	1.69	225.59	9,397.4	-9.1	83.1	483,517.19	742,058.27	32° 19' 36.737 N	103° 32' 58.937 W
9,500.0	1.87	222.81	9,497.3	-11.3	80.9	483,514.96	742,056.11	32° 19' 36.715 N	103° 32' 58.962 W
9,600.0	2.07	220.02	9,597.3	-13.9	78.6	483,512.38	742,053.84	32° 19' 36.690 N	103° 32' 58.989 W
9,700.0	2.05	218.56	9,697.2	-16.7	76.4	483,509.60	742,051.56	32° 19' 36.662 N	103° 32' 59.015 W
Tie into OH @ 9700' MD									
9,760.0	8.00	271.70	9,757.0	-17.4	71.5	483,508.88	742,046.71	32° 19' 36.656 N	103° 32' 59.072 W
9,791.0	10.30	271.90	9,787.6	-17.3	66.6	483,509.04	742,041.79	32° 19' 36.658 N	103° 32' 59.129 W
9,822.0	10.70	279.70	9,818.0	-16.7	61.0	483,509.62	742,036.18	32° 19' 36.664 N	103° 32' 59.195 W
9,852.0	10.70	291.80	9,847.5	-15.2	55.7	483,511.12	742,030.85	32° 19' 36.679 N	103° 32' 59.257 W
9,883.0	9.90	310.40	9,878.0	-12.4	51.0	483,513.92	742,026.15	32° 19' 36.707 N	103° 32' 59.311 W
9,914.0	10.60	326.60	9,908.5	-8.3	47.4	483,518.02	742,022.55	32° 19' 36.748 N	103° 32' 59.353 W
9,945.0	11.80	340.10	9,939.0	-2.9	44.7	483,523.39	742,019.90	32° 19' 36.801 N	103° 32' 59.383 W
9,976.0	12.00	338.90	9,969.3	3.1	42.5	483,529.37	742,017.66	32° 19' 36.861 N	103° 32' 59.409 W
10,006.0	10.90	346.80	9,998.7	8.7	40.7	483,535.04	742,015.89	32° 19' 36.917 N	103° 32' 59.429 W
10,037.0	9.10	358.20	10,029.2	14.0	39.9	483,540.35	742,015.14	32° 19' 36.969 N	103° 32' 59.437 W
10,068.0	7.40	17.90	10,059.9	18.4	40.5	483,544.70	742,015.68	32° 19' 37.012 N	103° 32' 59.431 W
10,098.0	7.30	20.70	10,089.7	22.0	41.7	483,548.32	742,016.95	32° 19' 37.048 N	103° 32' 59.416 W
10,130.0	7.20	17.20	10,121.4	25.8	43.1	483,552.14	742,018.26	32° 19' 37.086 N	103° 32' 59.400 W
10,161.0	9.00	9.30	10,152.1	30.1	44.0	483,556.39	742,019.22	32° 19' 37.128 N	103° 32' 59.388 W
10,192.0	9.50	10.00	10,182.7	35.0	44.9	483,561.30	742,020.06	32° 19' 37.176 N	103° 32' 59.378 W
10,223.0	9.30	11.10	10,213.3	40.0	45.8	483,566.28	742,020.99	32° 19' 37.225 N	103° 32' 59.367 W
10,255.0	9.00	9.10	10,244.9	45.0	46.7	483,571.29	742,021.88	32° 19' 37.275 N	103° 32' 59.356 W
10,285.0	10.60	359.60	10,274.4	50.1	47.0	483,576.36	742,022.23	32° 19' 37.325 N	103° 32' 59.352 W
10,317.0	10.60	357.20	10,305.9	55.9	46.9	483,582.25	742,022.07	32° 19' 37.383 N	103° 32' 59.353 W
10,347.0	9.80	357.50	10,335.4	61.3	46.6	483,587.55	742,021.82	32° 19' 37.436 N	103° 32' 59.355 W
10,377.0	8.80	351.40	10,365.0	66.1	46.2	483,592.37	742,021.37	32° 19' 37.484 N	103° 32' 59.360 W

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #1H
Project:	Lea County, NM	**TVD Reference:**	WELL @ 3583.0usft (Basic #46 - 22' KB)
Site:	Sopapilla State	**MD Reference:**	WELL @ 3583.0usft (Basic #46 - 22' KB)
Well:	#1H	**North Reference:**	Grid
Wellbore:	ST2	**Survey Calculation Method:**	Minimum Curvature
Design:	ST2	**Database:**	Houston R5000 Database

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,408.0	8.50	348.40	10,395.7	70.7	45.4	483,596.96	742,020.55	32° 19' 37.529 N	103° 32' 59.369 W
10,440.0	6.90	4.20	10,427.4	74.9	45.0	483,601.20	742,020.22	32° 19' 37.571 N	103° 32' 59.373 W
10,471.0	6.80	10.20	10,458.2	78.6	45.5	483,604.86	742,020.68	32° 19' 37.607 N	103° 32' 59.367 W
10,502.0	6.30	6.50	10,489.0	82.1	46.0	483,608.36	742,021.20	32° 19' 37.642 N	103° 32' 59.361 W
10,534.0	6.10	5.60	10,520.8	85.5	46.4	483,611.79	742,021.56	32° 19' 37.676 N	103° 32' 59.356 W
10,565.0	6.00	5.60	10,551.6	88.7	46.7	483,615.04	742,021.88	32° 19' 37.708 N	103° 32' 59.352 W
10,596.0	6.10	3.50	10,582.4	92.0	46.9	483,618.30	742,022.14	32° 19' 37.740 N	103° 32' 59.349 W
10,627.0	4.80	353.70	10,613.3	94.9	46.9	483,621.23	742,022.10	32° 19' 37.769 N	103° 32' 59.349 W
10,658.0	6.60	308.00	10,644.1	97.3	45.4	483,623.62	742,020.55	32° 19' 37.793 N	103° 32' 59.367 W
10,689.0	10.70	293.70	10,674.8	99.6	41.3	483,625.88	742,016.51	32° 19' 37.816 N	103° 32' 59.414 W
10,720.0	13.40	279.10	10,705.1	101.3	35.1	483,627.60	742,010.32	32° 19' 37.833 N	103° 32' 59.486 W
10,752.0	14.20	273.30	10,736.2	102.1	27.5	483,628.41	742,002.74	32° 19' 37.842 N	103° 32' 59.574 W
10,783.0	17.90	293.00	10,766.0	104.2	19.4	483,630.50	741,994.55	32° 19' 37.863 N	103° 32' 59.670 W
10,814.0	22.20	300.60	10,795.1	109.0	9.9	483,635.34	741,985.12	32° 19' 37.911 N	103° 32' 59.779 W
10,845.0	26.40	306.70	10,823.4	116.1	-0.6	483,642.45	741,974.55	32° 19' 37.983 N	103° 32' 59.902 W
10,876.0	29.70	314.80	10,850.7	125.7	-11.6	483,651.98	741,963.57	32° 19' 38.078 N	103° 33' 0.029 W
10,908.0	31.70	323.30	10,878.3	138.0	-22.3	483,664.32	741,952.91	32° 19' 38.201 N	103° 33' 0.152 W
10,939.0	34.30	331.30	10,904.3	152.2	-31.4	483,678.52	741,943.84	32° 19' 38.342 N	103° 33' 0.256 W
10,971.0	37.00	338.40	10,930.3	169.1	-39.2	483,695.39	741,935.96	32° 19' 38.509 N	103° 33' 0.347 W
11,001.0	39.70	345.20	10,953.8	186.8	-45.0	483,713.06	741,930.19	32° 19' 38.684 N	103° 33' 0.413 W
11,032.0	42.60	351.60	10,977.2	206.7	-49.1	483,733.02	741,926.12	32° 19' 38.882 N	103° 33' 0.458 W
11,063.0	47.00	354.20	10,999.2	228.4	-51.8	483,754.69	741,923.44	32° 19' 39.097 N	103° 33' 0.488 W
11,064.9	47.33	354.30	11,000.5	229.8	-51.9	483,756.08	741,923.30	32° 19' 39.111 N	103° 33' 0.489 W
Cross out of 330' Lease - 11064.9' MD, 11000.5' TVD, 47.33° INC, 230.2' VS									
11,095.0	52.60	355.80	11,019.8	252.7	-53.9	483,779.03	741,921.33	32° 19' 39.338 N	103° 33' 0.510 W
11,125.0	57.40	357.70	11,037.0	277.3	-55.2	483,803.56	741,919.95	32° 19' 39.581 N	103° 33' 0.524 W
11,157.0	62.70	0.50	11,053.0	305.0	-55.7	483,831.27	741,919.53	32° 19' 39.855 N	103° 33' 0.527 W
11,188.0	67.00	3.20	11,066.2	333.0	-54.7	483,859.30	741,920.45	32° 19' 40.132 N	103° 33' 0.514 W
11,211.7	70.82	5.59	11,074.7	355.0	-53.0	483,881.34	741,922.15	32° 19' 40.350 N	103° 33' 0.492 W
Cross into 330' Lease - 11211.7' MD, 11074.7' TVD, 70.82° INC, 355.5' VS									
11,219.0	72.00	6.30	11,077.0	361.9	-52.3	483,888.23	741,922.86	32° 19' 40.418 N	103° 33' 0.483 W
11,243.0	77.20	8.10	11,083.4	384.9	-49.4	483,911.17	741,925.77	32° 19' 40.645 N	103° 33' 0.447 W
11,275.0	78.40	7.70	11,090.1	415.9	-45.1	483,942.15	741,930.07	32° 19' 40.951 N	103° 33' 0.395 W
11,305.0	79.50	8.40	11,095.9	445.0	-41.0	483,971.31	741,934.19	32° 19' 41.240 N	103° 33' 0.344 W
11,337.0	81.10	6.00	11,101.3	476.3	-37.1	484,002.60	741,938.14	32° 19' 41.549 N	103° 33' 0.295 W
11,368.0	83.50	6.50	11,105.4	506.8	-33.7	484,033.13	741,941.49	32° 19' 41.851 N	103° 33' 0.254 W
11,399.0	85.70	6.00	11,108.4	537.5	-30.4	484,063.81	741,944.84	32° 19' 42.154 N	103° 33' 0.212 W
11,431.0	87.10	4.90	11,110.4	569.3	-27.3	484,095.60	741,947.88	32° 19' 42.469 N	103° 33' 0.174 W
11,462.0	88.10	6.50	11,111.7	600.1	-24.2	484,126.42	741,950.95	32° 19' 42.773 N	103° 33' 0.135 W
11,523.0	88.70	4.60	11,113.4	660.8	-18.3	484,187.11	741,956.85	32° 19' 43.373 N	103° 33' 0.062 W
11,616.0	89.80	1.40	11,114.6	753.7	-13.5	484,279.96	741,961.72	32° 19' 44.292 N	103° 32' 59.997 W
11,707.0	90.00	0.70	11,114.7	844.6	-11.8	484,370.94	741,963.38	32° 19' 45.192 N	103° 32' 59.970 W
11,800.0	90.50	0.50	11,114.3	937.6	-10.8	484,463.93	741,964.36	32° 19' 46.112 N	103° 32' 59.950 W
11,894.0	90.10	359.80	11,113.8	1,031.6	-10.6	484,557.93	741,964.60	32° 19' 47.042 N	103° 32' 59.940 W
11,989.0	90.50	358.20	11,113.4	1,126.6	-12.3	484,652.91	741,962.95	32° 19' 47.982 N	103° 32' 59.951 W
12,083.0	88.80	358.90	11,113.9	1,220.6	-14.6	484,746.88	741,960.57	32° 19' 48.912 N	103° 32' 59.970 W
12,178.0	88.70	357.70	11,116.0	1,315.5	-17.4	484,841.81	741,957.75	32° 19' 49.852 N	103° 32' 59.995 W
12,270.0	89.50	359.10	11,117.4	1,407.5	-20.0	484,933.76	741,955.18	32° 19' 50.762 N	103° 33' 0.017 W
12,366.0	90.70	357.70	11,117.3	1,503.4	-22.7	485,029.72	741,952.50	32° 19' 51.712 N	103° 33' 0.040 W
12,460.0	90.60	358.40	11,116.2	1,597.4	-25.9	485,123.66	741,949.30	32° 19' 52.641 N	103° 33' 0.070 W
12,552.0	89.40	359.60	11,116.2	1,689.3	-27.5	485,215.64	741,947.70	32° 19' 53.552 N	103° 33' 0.081 W
12,645.0	89.60	359.80	11,117.0	1,782.3	-28.0	485,308.64	741,947.21	32° 19' 54.472 N	103° 33' 0.078 W
12,739.0	90.70	1.70	11,116.8	1,876.3	-26.8	485,402.62	741,948.44	32° 19' 55.402 N	103° 33' 0.056 W
12,832.0	91.70	0.90	11,114.8	1,969.3	-24.6	485,495.57	741,950.55	32° 19' 56.321 N	103° 33' 0.023 W
12,926.0	90.60	0.50	11,112.9	2,063.2	-23.5	485,589.55	741,951.70	32° 19' 57.251 N	103° 33' 0.002 W

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #1H
Project:	Lea County, NM	**TVD Reference:**	WELL @ 3583.0usft (Basic #46 - 22' KB)
Site:	Sopapilla State	**MD Reference:**	WELL @ 3583.0usft (Basic #46 - 22' KB)
Well:	#1H	**North Reference:**	Grid
Wellbore:	ST2	**Survey Calculation Method:**	Minimum Curvature
Design:	ST2	**Database:**	Houston R5000 Database

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
13,020.0	90.60	0.30	11,112.0	2,157.2	-22.8	485,683.54	741,952.35	32° 19' 58.181 N	103° 32' 59.986 W
13,113.0	89.50	358.60	11,111.9	2,250.2	-23.7	485,776.53	741,951.46	32° 19' 59.102 N	103° 32' 59.989 W
13,206.0	90.90	356.80	11,111.6	2,343.1	-27.5	485,869.45	741,947.73	32° 20' 0.021 N	103° 33' 0.024 W
13,302.0	90.20	358.60	11,110.6	2,439.1	-31.3	485,965.36	741,943.88	32° 20' 0.971 N	103° 33' 0.061 W
13,394.0	89.60	358.10	11,110.8	2,531.0	-34.0	486,057.32	741,941.23	32° 20' 1.881 N	103° 33' 0.084 W
13,486.0	87.60	359.10	11,113.0	2,623.0	-36.2	486,149.26	741,938.98	32° 20' 2.791 N	103° 33' 0.103 W
13,580.0	88.20	0.30	11,116.5	2,716.9	-36.7	486,243.20	741,938.49	32° 20' 3.720 N	103° 33' 0.100 W
13,675.0	89.20	359.50	11,118.6	2,811.9	-36.9	486,338.17	741,938.32	32° 20' 4.660 N	103° 33' 0.094 W
13,768.0	90.70	358.20	11,118.7	2,904.8	-38.7	486,431.15	741,936.46	32° 20' 5.580 N	103° 33' 0.108 W
13,862.0	92.50	357.70	11,116.1	2,998.7	-42.1	486,525.05	741,933.10	32° 20' 6.510 N	103° 33' 0.139 W
13,925.0	94.40	358.40	11,112.3	3,061.6	-44.2	486,587.89	741,930.96	32° 20' 7.132 N	103° 33' 0.159 W
13,986.0	94.00	359.60	11,107.8	3,122.4	-45.3	486,648.72	741,929.90	32° 20' 7.734 N	103° 33' 0.166 W
14,050.0	90.80	0.00	11,105.2	3,186.4	-45.5	486,712.65	741,929.67	32° 20' 8.366 N	103° 33' 0.163 W
14,140.0	89.90	0.30	11,104.6	3,276.3	-45.3	486,802.65	741,929.91	32° 20' 9.257 N	103° 33' 0.153 W
14,235.0	89.30	0.20	11,105.3	3,371.3	-44.9	486,897.65	741,930.32	32° 20' 10.197 N	103° 33' 0.140 W
14,329.0	89.10	0.70	11,106.6	3,465.3	-44.1	486,991.63	741,931.06	32° 20' 11.127 N	103° 33' 0.123 W
14,420.0	89.20	0.20	11,107.9	3,556.3	-43.4	487,082.62	741,931.78	32° 20' 12.027 N	103° 33' 0.107 W
14,514.0	88.40	1.20	11,109.9	3,650.3	-42.3	487,176.59	741,932.92	32° 20' 12.957 N	103° 33' 0.086 W
14,608.0	88.80	1.00	11,112.2	3,744.2	-40.5	487,270.54	741,934.73	32° 20' 13.886 N	103° 33' 0.057 W
14,703.0	89.20	0.70	11,113.9	3,839.2	-39.1	487,365.52	741,936.14	32° 20' 14.826 N	103° 33' 0.032 W
14,798.0	89.30	0.20	11,115.1	3,934.2	-38.3	487,460.51	741,936.88	32° 20' 15.766 N	103° 33' 0.015 W
14,891.0	89.50	0.20	11,116.1	4,027.2	-38.0	487,553.50	741,937.21	32° 20' 16.686 N	103° 33' 0.004 W
14,984.0	90.50	0.20	11,116.1	4,120.2	-37.7	487,646.50	741,937.53	32° 20' 17.606 N	103° 32' 59.992 W
15,078.0	89.90	0.70	11,115.7	4,214.2	-36.9	487,740.50	741,938.27	32° 20' 18.537 N	103° 32' 59.975 W
15,171.0	90.00	0.70	11,115.8	4,307.2	-35.8	487,833.49	741,939.41	32° 20' 19.457 N	103° 32' 59.954 W
15,265.0	89.90	0.20	11,115.9	4,401.2	-35.1	487,927.49	741,940.14	32° 20' 20.387 N	103° 32' 59.937 W
15,358.0	90.00	0.00	11,116.0	4,494.2	-34.9	488,020.49	741,940.31	32° 20' 21.307 N	103° 32' 59.928 W
15,451.0	89.50	359.80	11,116.4	4,587.2	-35.1	488,113.48	741,940.14	32° 20' 22.227 N	103° 32' 59.922 W
15,548.0	89.60	359.10	11,117.2	4,684.2	-36.0	488,210.48	741,939.21	32° 20' 23.187 N	103° 32' 59.924 W
15,596.0	89.60	359.10	11,117.5	4,732.2	-36.7	488,258.47	741,938.46	32° 20' 23.662 N	103° 32' 59.929 W

BHL - 15596.0' MD, 11117.5' TVD, 89.60° INC, 359.10° AZI, 4732.2' N, -36.7' E, 4732.3' VS

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
9,700.0	9,697.2	-16.7	76.4	Tie into OH @ 9700' MD
11,064.9	11,000.5	229.8	-51.9	Cross out of 330' Lease - 11064.9' MD, 11000.5' TVD, 47.33° INC, 230.2' VS
11,211.7	11,074.7	355.0	-53.0	Cross into 330' Lease - 11211.7' MD, 11074.7' TVD, 70.82° INC, 355.5' VS
15,596.0	11,117.5	4,732.2	-36.7	BHL - 15596.0' MD, 11117.5' TVD, 89.60° INC, 359.10° AZI, 4732.2' N, -36.7' E,

Checked By: _____ Approved By: _____ Date: _____