Results of Directional Survey

API number:	30-025-40685		
OGRID:		Operator:	COG PRODUCTION, LLC
		Property:	PINTAIL 3 FEDERAL # 2H

surface	ULSTR:	P	03	T	26S	R	32E
				330	FSL	480	FEL

BH Loc	ULSTR:	A	03	T	26S	R	32E
14000	MD	9522.9	TVD	278	FNL	429	FEL
				5002	FSL		

Top Perf/OH	ULSTR:	P	03	T	26S	R	32E
9684	MD	9505.8	TVD	689	FSL	465	FEL

Bot Perf/OH	ULSTR:	A	03	T	26S	R	32E
13914	MD	9522.0	TVD	364	FNL	430	FEL
				4916	FSL		

	MD	N/S	E/W	VD
	9652	328.60	15.80	9496.4
TOP PERFS/OH	**9684**	359.20	15.40	9505.80
	9684	359.20	15.40	9505.80
	13877	4548.60	49.40	9521.50
BOT PERFS/OH	**13914**	4585.55	49.97	9522.01
	13949	4620.50	50.50	9522.50

NEXT TO LAST	13949	4620.50	50.50	9522.50
LAST READING	14000	4671.50	51.20	9522.90
TD	**14000**	4671.50	51.20	9522.90

Surface Location	330	FS	480	FE
Projected BHL	5002	FS	429	FE
Location of				
Top Perfs/OH	689	FS	465	FE
Bottom Perfs/OH	4916	FS	430	FE

SUMMARY of Subsurface Locations

Surface Location	P-03-26S-32E	330	FS	480	FE	Vert. Depth
Top Perfs/OH	P-03-26S-32E	689	FS	465	FE	9505.80
Bottom Perfs/OH	A-03-26S-32E	4916	FS	430	FE	9522.01
Projected TD	A-03-26S-32E	5002	FS	429	FE	9522.90

MAR 14 2013

30-025-40685

PO Box 1370
Artesia, NM 88211-1370
(575) 748-1288

October 24, 2012

COG, LLC
One Concho Center
600 W. Illinois Ave.
Midland, TX 79701

RE: Pin Tail 3 Federal #2H
330' FSL & 480' FEL
Sec. 3, T26S, R32E
Lea County, New Mexico

Dear Sir,

The attached is the Deviation Survey for the above captioned well.

Very truly yours,

Eddie LaRue
Operations Manager

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 24th day of October, 2012.

Notary Public

OFFICIAL SEAL
REGINIA L. GARNER
NOTARY PUBLIC - STATE OF NEW MEXICO
My commission expires Aug 30, 2016

Pin Tail 3 Federal #2H

Date	Depth	Deviation	Direction	TVD	Horiz Depth
10/5/2012	301	1.00			
10/5/2012	425	0.80			
10/5/2012	624	1.50			
10/5/2012	799	1.04			
10/7/2012	1090	2.40	75.30	1089.68	5.79
10/7/2012	1186	1.70	71.10	1185.02	0.75
10/7/2012	1376	1.80	358.10	1375.56	10.59
10/7/2012	1471	1.00	13.90	1470.53	12.98
10/7/2012	1567	0.80	29.70	1566.52	
10/7/2012	1758	1.10	42.90	1757.50	
10/7/2012	1853	1.40	60.30	1852.48	
10/8/2012	2423	1.60	97.30	2422.00	
10/8/2012	2615	0.40	139.00	2614.23	22.63
10/8/2012	2710	0.70	212.70	2709.23	21.89
10/8/2012	2805	0.70	241.70	2804.22	21.20
10/8/2012	2901	0.90	252.60	2900.21	20.57
10/8/2012	2995	1.10	255.70	2994.20	
10/8/2012	3091	0.90	244.00	3090.18	
10/8/2012	3184	0.20	236.40	3183.18	
10/8/2012	3278	0.60	90.80	3277.17	
10/8/2012	3374	1.00	67.20	3373.17	
10/9/2012	3468	2.00	68.00		
10/9/2012	3564	1.90	52.20		
10/9/2012	3754	0.70	165.70	3753.05	22.97
10/9/2012	3850	0.70	174.20	3899.04	21.42
10/9/2012	3995	1.40	146.10	3944.03	19.90
10/9/2012	4040	1.70	144.20	4038.99	17.83
10/9/2012	4135	1.00	168.00	4133.97	15.90
10/10/2012	4230	1.20	170.50	4228.00	
10/10/2012	4326	1.90	164.70	4324.91	
10/10/2012	4419	1.40	167.90	4419.87	
10/11/2012	4779	0.80			
10/12/2012	5247	1.30			
10/12/2012	5731	1.40			
10/12/2012	6197	0.10			
10/12/2012	6702	0.00			
10/12/2012	7176	0.50			
10/13/2012	7676	1.20			
10/13/2012	8163	1.80			
10/13/2012	8634	1.50			
10/15/2012	8986	2.50	304.20		
10/15/2012	9081	15.10	350.10	9077.67	
10/15/2012	9112	17.10	348.00	9107.00	

Date	Depth	Deviation	Direction	TVD	Horiz Depth
10/15/2012	9144	19.00	347.80	9137.00	
10/16/2012	9176	21.80	253.30	9167.00	
10/16/2012	9207	23.60	353.30	9196.00	
10/16/2012	9239	25.30	358.60	9225.00	35.00
10/16/2012	9271	25.50	1.50	9254.00	49.00
10/16/2012	9303	29.20	1.00		
10/16/2012	9335	33.40	356.80	9310.00	80.00
10/16/2012	9492	54.40	358.60		
10/16/2012	9524	57.00	0.50	9441.00	
10/16/2012	9556	60.50	1.50	9458.00	
10/16/2012	9588	64.20	360.00	9472.00	
10/17/2012	9652	72.30	359.60		
10/17/2012	9715	77.60	358.60		
10/18/2012	9748	82.70	359.10	9519.00	
10/18/2012	9875	88.00	0.10	9529.00	
10/18/2012	9906	90.50	1.20		
10/18/2012	10160	90.10	360.00	9527.00	
10/18/2012	10542	90.90	358.90		
10/18/2012	10637	89.40	359.40		
10/18/2012	10733	89.40	359.80	9524.00	
10/18/2012	10828	90.10	358.90	9524.00	
10/18/2012	10923	89.00	1.20	9525.00	
10/19/2012	11113	89.70	359.40	9527.00	
10/19/2012	11210	89.60	0.30	9528.00	
10/19/2012	11304	89.90	2.20	9528.00	1977.00
10/19/2012	11686	89.40	0.10	9531.00	
10/19/2012	11781	90.00	359.30	9531.00	
10/19/2012	12163	89.90	202.00	9533.00	
10/19/2012	12353	88.70	1.00	9534.00	
10/19/2012	12448	88.20	0.30	9537.00	
10/20/2012	12639	92.20	1.40	9537.00	3311.00
10/20/2012	12735	93.00	0.50	9533.00	3407.00
10/20/2012	12829	91.50	0.70	9529.00	3500.00
10/20/2012	13021	89.10	2.10	9531.00	3692.00
10/20/2012	13116	89.20	1.70	9532.00	3787.00
10/20/2012	13211	88.50	1.00	9534.00	3882.00
10/20/2012	13307	89.20	1.00	9536.00	3978.00
10/20/2012	13402	90.80	1.20	9536.00	
10/20/2012	13595	93.50	0.30	9528.00	
10/20/2012	13687	92.90	0.50	9523.00	
10/21/2012	13782	90.00	1.20	9521.00	
10/21/2012	13877	89.00	1.00	9521.00	
10/21/2012	13949	89.50	0.80	9522.00	4620.00

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

October 19, 2012

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

Attn: Kanicia Castillo

Re: **Pintail 3 Federal No. 002H**

Please find enclosed a copy of the survey from 0' to 8,850' 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.

Sincerely,

Keith Havelka
Operations

Company: COG Operating, LLC (Concho)
Lease/Well: Pintail 3 Federal/No. 002H
Location: 30 Miles West from Jal
Rig Name: Silver Oak #12
State/County: New Mexico/Lea
Latitude: 32.07, Longitude: -103.66
GRID North is 0.36 Degrees East of True North
VS-Azi: 0.00 Degrees

Depth Reference : RKB 18 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS
Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 10/19/2012 / 13:45

Vaughn Energy Services
Midland, Texas
432-563-5444
Surveyor: Jordan Rolando
Pintail 3 Federal No. 002H / API 30-025-40685

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	0.50	115.25	100.00	-0.18	0.39	0.43	115.25	0.50
200.00	0.72	99.69	199.99	-0.48	1.40	1.48	108.69	0.28
300.00	0.82	88.99	299.98	-0.57	2.75	2.80	101.70	0.18
400.00	0.93	78.28	399.97	-0.39	4.26	4.27	95.26	0.19
500.00	1.19	49.02	499.96	0.45	5.83	5.85	85.56	0.59
600.00	1.45	19.76	599.93	2.33	7.04	7.42	71.73	0.71
700.00	1.56	38.10	699.90	4.59	8.31	9.49	61.09	0.49
800.00	1.67	56.43	799.86	6.47	10.37	12.22	58.03	0.53
900.00	1.87	66.20	899.81	7.93	13.08	15.30	58.75	0.36
1000.00	2.06	75.97	999.75	9.03	16.32	18.65	61.04	0.39
1100.00	1.96	76.03	1099.69	9.88	19.73	22.06	63.40	0.10
1200.00	1.82	76.10	1199.63	10.68	22.93	25.29	65.04	0.14
1300.00	1.74	46.03	1299.59	12.11	25.57	28.29	64.65	0.93
1400.00	1.66	15.96	1399.55	14.57	27.06	30.73	61.71	0.89
1500.00	1.04	23.49	1499.52	16.79	27.82	32.50	58.89	0.65
1600.00	0.37	41.01	1599.51	17.87	28.40	33.55	57.82	0.69
1700.00	0.74	47.70	1699.51	18.55	29.09	34.50	57.47	0.37
1800.00	1.07	49.39	1799.49	19.59	30.27	36.06	57.09	0.33

VES Survey Date: 10/13/2012

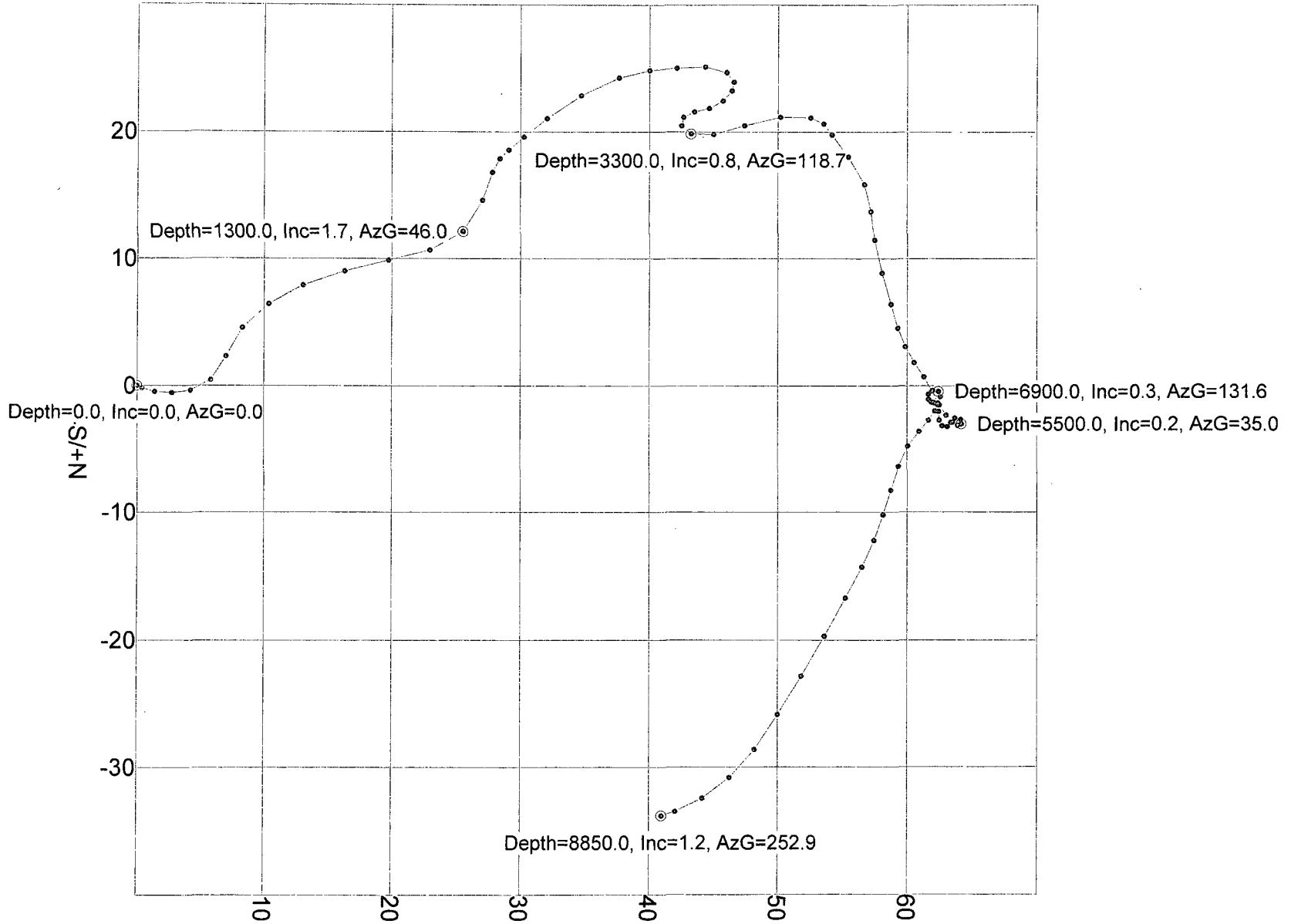
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	1.59	51.66	1899.47	21.05	32.06	38.36	56.71	0.52
2000.00	2.11	58.93	1999.41	22.86	34.72	41.57	56.64	0.57
2100.00	1.63	71.17	2099.36	24.27	37.65	44.79	57.19	0.62
2200.00	1.16	83.41	2199.33	24.85	40.01	47.09	58.16	0.56
2300.00	1.25	86.30	2299.31	25.03	42.10	48.98	59.27	0.11
2400.00	1.30	89.19	2399.28	25.12	44.33	50.95	60.46	0.08
2500.00	0.81	131.39	2499.27	24.67	45.99	52.19	61.79	0.89
2600.00	0.31	173.60	2599.26	23.93	46.54	52.34	62.79	0.61
2700.00	0.52	203.24	2699.26	23.25	46.40	51.90	63.38	0.29
2800.00	0.72	232.88	2799.25	22.46	45.72	50.94	63.84	0.37
2900.00	0.70	248.78	2899.25	21.86	44.65	49.71	63.92	0.20
3000.00	0.68	264.68	2999.24	21.58	43.49	48.55	63.61	0.19
3100.00	0.51	213.70	3099.24	21.15	42.66	47.62	63.62	0.53
3200.00	0.35	162.71	3199.23	20.49	42.50	47.18	64.26	0.40
3300.00	0.83	118.75	3299.23	19.85	43.23	47.57	65.33	0.63
3400.00	1.32	74.79	3399.21	19.80	44.98	49.14	66.24	0.92
3500.00	1.55	72.62	3499.18	20.51	47.38	51.63	66.59	0.24
3600.00	1.75	80.45	3599.14	21.17	50.18	54.46	67.13	0.30
3700.00	1.02	109.09	3699.11	21.13	52.53	56.62	68.09	0.98
3800.00	0.29	137.73	3799.10	20.65	53.54	57.38	68.91	0.78
3900.00	0.94	145.32	3899.10	19.79	54.18	57.68	69.93	0.66
4000.00	1.56	142.90	3999.07	18.03	55.46	58.32	71.99	0.62
4100.00	1.37	159.32	4099.04	15.83	56.71	58.87	74.40	0.46
4200.00	1.18	175.74	4199.02	13.68	57.20	58.82	76.55	0.41
4300.00	1.40	170.25	4298.99	11.45	57.49	58.62	78.74	0.25
4400.00	1.62	164.76	4398.95	8.88	58.07	58.74	81.30	0.26
4500.00	1.27	164.12	4498.92	6.45	58.74	59.10	83.73	0.34
4600.00	0.97	163.48	4598.90	4.57	59.29	59.46	85.59	0.30
4700.00	0.87	154.76	4698.89	3.07	59.85	59.93	87.07	0.17
4800.00	0.77	146.05	4798.88	1.82	60.55	60.58	88.27	0.16
4900.00	0.76	148.92	4898.87	0.70	61.27	61.27	89.35	0.04
5000.00	0.75	153.80	4998.86	-0.45	61.90	61.90	90.42	0.07
5100.00	0.62	149.21	5098.86	-1.51	62.46	62.48	91.38	0.14
5200.00	0.50	144.63	5198.85	-2.33	63.00	63.04	92.12	0.13
5300.00	0.35	129.25	5298.85	-2.88	63.48	63.55	92.60	0.19
5400.00	0.20	113.87	5398.85	-3.14	63.88	63.96	92.82	0.17
5500.00	0.25	34.99	5498.85	-3.04	64.16	64.23	92.71	0.29
5600.00	0.30	316.11	5598.85	-2.67	64.11	64.16	92.39	0.35
5700.00	0.31	253.33	5698.84	-2.56	63.67	63.72	92.31	0.31

VES Survey Date: 10/13/2012

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	0.32	190.56	5798.84	-2.91	63.37	63.43	92.63	0.32
5900.00	0.28	253.07	5898.84	-3.25	63.08	63.16	92.95	0.31
6000.00	0.25	315.59	5998.84	-3.17	62.70	62.78	92.90	0.28
6100.00	0.35	343.02	6098.84	-2.73	62.46	62.52	92.50	0.17
6200.00	0.45	10.44	6198.84	-2.05	62.44	62.47	91.88	0.21
6300.00	0.28	313.36	6298.84	-1.50	62.33	62.35	91.38	0.38
6400.00	0.10	256.27	6398.84	-1.36	62.07	62.09	91.25	0.24
6500.00	0.16	294.44	6498.84	-1.32	61.86	61.87	91.22	0.10
6600.00	0.22	332.60	6598.83	-1.09	61.64	61.65	91.01	0.14
6700.00	0.27	21.39	6698.83	-0.70	61.63	61.64	90.65	0.21
6800.00	0.31	70.17	6798.83	-0.39	61.97	61.97	90.36	0.24
6900.00	0.29	131.58	6898.83	-0.46	62.42	62.42	90.43	0.31
7000.00	0.27	192.99	6998.83	-0.87	62.55	62.56	90.79	0.29
7100.00	0.36	200.72	7098.83	-1.39	62.39	62.40	91.28	0.10
7200.00	0.41	208.44	7198.83	-2.00	62.11	62.14	91.85	0.07
7300.00	0.58	215.64	7298.82	-2.73	61.64	61.70	92.53	0.18
7400.00	0.74	222.83	7398.82	-3.61	60.91	61.01	93.39	0.19
7500.00	0.92	210.70	7498.81	-4.78	60.05	60.24	94.55	0.25
7600.00	1.10	198.56	7598.79	-6.39	59.34	59.68	96.14	0.28
7700.00	1.16	197.42	7698.77	-8.26	58.73	59.31	98.01	0.06
7800.00	1.17	196.28	7798.75	-10.20	58.14	59.03	99.95	0.03
7900.00	1.26	201.46	7898.73	-12.21	57.45	58.73	101.99	0.14
8000.00	1.36	206.63	7998.70	-14.29	56.52	58.30	104.19	0.15
8100.00	1.76	208.37	8098.66	-16.71	55.26	57.73	106.82	0.41
8200.00	2.13	209.12	8198.61	-19.68	53.62	57.12	110.16	0.37
8300.00	2.05	210.04	8298.54	-22.85	51.82	56.64	113.80	0.08
8400.00	1.98	211.96	8398.48	-25.87	50.01	56.30	117.35	0.10
8500.00	1.79	215.23	8498.42	-28.61	48.19	56.05	120.70	0.22
8600.00	1.61	228.49	8598.38	-30.82	46.24	55.57	123.68	0.43
8700.00	1.45	235.47	8698.34	-32.47	44.15	54.80	126.33	0.24
8800.00	1.30	252.44	8798.32	-33.53	42.02	53.76	128.58	0.43
8850.00	1.22	252.89	8848.30	-33.85	40.97	53.15	129.57	0.16

VES Survey Date: 10/13/2012

Vaughn Energy Services
Midland, Texas
432-563-5444
Surveyor: Jordan Rolando
Pintail 3 Federal No. 002H / API 30-025-40685



VES Survey Date: 10/13/2012

CRESCENT DIRECTIONAL DRILLING

COG Operating LLC

Lea County, NM (NAD 83)
Pintail 3 Federal
#2H

OH

Design: OH

Standard Survey Report

22 October, 2012

CONCHO

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #2H
Project:	Lea County, NM (NAD 83)	**TVD Reference:**	WELL @ 3264.0usft (Silver Oak #12 - 18' KB)
Site:	Pintail 3 Federal	**MD Reference:**	WELL @ 3264.0usft (Silver Oak #12 - 18' KB)
Well:	#2H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Houston R5000 Database

Project Lea County, NM (NAD 83)

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site Pintail 3 Federal

Site Position:		**Northing:**	388,231.32 usft	**Latitude:**	32° 3' 58.257 N
From:	Map	**Easting:**	708,221.28 usft	**Longitude:**	103° 47' 40.538 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.29 °

Well #2H

Well Position	**+N/-S**	0.0 usft	**Northing:**	388,317.30 usft	**Latitude:**	32° 3' 59.018 N
	+E/-W	0.0 usft	**Easting:**	710,031.50 usft	**Longitude:**	103° 47' 19.496 W
Position Uncertainty		2.0 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,246.0 usft

Wellbore OH

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF200510	9/10/2012	7.52	60.00	48,417

Design OH

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.0

Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**
	0.0	0.0	0.0	1.30

Survey Program **Date** 10/22/2012

From (usft)	**To (usft)**	**Survey (Wellbore)**	**Tool Name**	**Description**
100.0	8,850.0	Survey #1 - Gyro1 (OH)	MWD	MWD - Standard
8,954.0	13,949.0	Survey #2 - MWD1 (OH)	MWD	MWD - Standard
14,000.0	14,000.0	Survey #3 - PTB (OH)	MWD	MWD - Standard

Survey

Measured Depth (usft)	**Inclination (°)**	**Azimuth (°)**	**Vertical Depth (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Vertical Section (usft)**	**Dogleg Rate (°/100usft)**	**Build Rate (°/100usft)**	**Turn Rate (°/100usft)**
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.50	115.25	100.0	-0.2	0.4	-0.2	0.50	0.50	0.00
200.0	0.72	99.69	200.0	-0.5	1.4	-0.4	0.27	0.22	-15.56
300.0	0.82	88.99	300.0	-0.6	2.7	-0.5	0.17	0.10	-10.70
400.0	0.93	78.28	400.0	-0.4	4.3	-0.3	0.20	0.11	-10.71
500.0	1.19	49.02	500.0	0.5	5.8	0.6	0.59	0.26	-29.26
600.0	1.45	19.76	599.9	2.3	7.0	2.5	0.71	0.26	-29.26
700.0	1.56	38.10	699.9	4.6	8.3	4.8	0.49	0.11	18.34
800.0	1.67	56.43	799.9	6.5	10.4	6.7	0.53	0.11	18.33

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #2H
Project:	Lea County, NM (NAD 83)	**TVD Reference:**	WELL @ 3264.0usft (Silver Oak #12 - 18' KB)
Site:	Pintail 3 Federal	**MD Reference:**	WELL @ 3264.0usft (Silver Oak #12 - 18' KB)
Well:	#2H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Houston R5000 Database

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
900.0	1.87	66.20	899.8	7.9	13.1	8.2	0.36	0.20	9.77
1,000.0	2.06	75.97	999.8	9.0	16.3	9.4	0.38	0.19	9.77
1,100.0	1.96	76.03	1,099.7	9.9	19.7	10.3	0.10	-0.10	0.06
1,200.0	1.82	76.10	1,199.6	10.7	22.9	11.2	0.14	-0.14	0.07
1,300.0	1.74	46.03	1,299.6	12.1	25.5	12.7	0.93	-0.08	-30.07
1,400.0	1.66	15.96	1,399.5	14.5	27.0	15.2	0.89	-0.08	-30.07
1,500.0	1.04	23.49	1,499.5	16.8	27.8	17.4	0.64	-0.62	7.53
1,600.0	0.37	41.01	1,599.5	17.8	28.4	18.5	0.70	-0.67	17.52
1,700.0	0.74	47.70	1,699.5	18.5	29.1	19.2	0.38	0.37	6.69
1,800.0	1.07	49.39	1,799.5	19.6	30.2	20.2	0.33	0.33	1.69
1,900.0	1.59	51.66	1,899.5	21.0	32.0	21.8	0.52	0.52	2.27
2,000.0	2.11	58.93	1,999.4	22.8	34.7	23.6	0.57	0.52	7.27
2,100.0	1.63	71.17	2,099.4	24.3	37.6	25.1	0.62	-0.48	12.24
2,200.0	1.16	83.41	2,199.3	24.8	40.0	25.7	0.55	-0.47	12.24
2,300.0	1.25	86.30	2,299.3	25.0	42.1	26.0	0.11	0.09	2.89
2,400.0	1.30	89.19	2,399.3	25.1	44.3	26.1	0.08	0.05	2.89
2,500.0	0.81	131.39	2,499.3	24.7	46.0	25.7	0.89	-0.49	42.20
2,600.0	0.31	173.60	2,599.3	23.9	46.5	25.0	0.62	-0.50	42.21
2,700.0	0.52	203.24	2,699.3	23.2	46.4	24.3	0.29	0.21	29.64
2,800.0	0.72	232.88	2,799.3	22.4	45.7	23.5	0.37	0.20	29.64
2,900.0	0.70	248.78	2,899.2	21.8	44.6	22.8	0.20	-0.02	15.90
3,000.0	0.68	264.68	2,999.2	21.6	43.5	22.5	0.19	-0.02	15.90
3,100.0	0.51	213.70	3,099.2	21.1	42.6	22.1	0.53	-0.17	-50.98
3,200.0	0.35	162.71	3,199.2	20.5	42.5	21.4	0.40	-0.16	-50.99
3,300.0	0.83	118.75	3,299.2	19.8	43.2	20.8	0.63	0.48	-43.96
3,400.0	1.32	74.79	3,399.2	19.8	44.9	20.8	0.92	0.49	-43.96
3,500.0	1.55	72.62	3,499.2	20.5	47.3	21.6	0.24	0.23	-2.17
3,600.0	1.75	80.45	3,599.1	21.1	50.1	22.3	0.30	0.20	7.83
3,700.0	1.02	109.09	3,699.1	21.1	52.5	22.3	0.98	-0.73	28.64
3,800.0	0.29	137.73	3,799.1	20.6	53.5	21.8	0.78	-0.73	28.64
3,900.0	0.94	145.32	3,899.1	19.8	54.1	21.0	0.65	0.65	7.59
4,000.0	1.56	142.90	3,999.1	18.0	55.4	19.3	0.62	0.62	-2.42
4,100.0	1.37	159.32	4,099.0	15.8	56.7	17.1	0.46	-0.19	16.42
4,200.0	1.18	175.74	4,199.0	13.7	57.2	15.0	0.41	-0.19	16.42
4,300.0	1.40	170.25	4,299.0	11.4	57.5	12.7	0.25	0.22	-5.49
4,400.0	1.62	164.76	4,399.0	8.9	58.0	10.2	0.26	0.22	-5.49
4,500.0	1.27	164.12	4,498.9	6.4	58.7	7.8	0.35	-0.35	-0.64
4,600.0	0.97	163.48	4,598.9	4.6	59.2	5.9	0.30	-0.30	-0.64
4,700.0	0.87	154.76	4,698.9	3.1	59.8	4.4	0.17	-0.10	-8.72
4,800.0	0.77	146.05	4,798.9	1.8	60.5	3.2	0.16	-0.10	-8.71
4,900.0	0.76	148.92	4,898.9	0.7	61.2	2.1	0.04	-0.01	2.87
5,000.0	0.75	153.80	4,998.9	-0.5	61.9	0.9	0.07	-0.01	4.88
5,100.0	0.62	149.21	5,098.9	-1.5	62.4	-0.1	0.14	-0.13	-4.59

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #2H
Project:	Lea County, NM (NAD 83)	**TVD Reference:**	WELL @ 3264.0usft (Silver Oak #12 - 18' KB)
Site:	Pintail 3 Federal	**MD Reference:**	WELL @ 3264.0usft (Silver Oak #12 - 18' KB)
Well:	#2H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Houston R5000 Database

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,200.0	0.50	144.63	5,198.9	-2.3	63.0	-0.9	0.13	-0.12	-4.58
5,300.0	0.35	129.25	5,298.8	-2.9	63.4	-1.4	0.19	-0.15	-15.38
5,400.0	0.20	113.87	5,398.8	-3.2	63.8	-1.7	0.17	-0.15	-15.38
5,500.0	0.25	34.99	5,498.8	-3.0	64.1	-1.6	0.29	0.05	-78.88
5,600.0	0.30	316.11	5,598.8	-2.7	64.1	-1.2	0.35	0.05	-78.88
5,700.0	0.31	253.33	5,698.8	-2.6	63.6	-1.1	0.32	0.01	-62.78
5,800.0	0.32	190.56	5,798.8	-2.9	63.3	-1.5	0.33	0.01	-62.77
5,900.0	0.28	253.07	5,898.8	-3.3	63.0	-1.8	0.31	-0.04	62.51
6,000.0	0.25	315.59	5,998.8	-3.2	62.6	-1.8	0.28	-0.03	62.52
6,100.0	0.35	343.02	6,098.8	-2.7	62.4	-1.3	0.17	0.10	27.43
6,200.0	0.45	10.44	6,198.8	-2.1	62.4	-0.6	0.21	0.10	27.42
6,300.0	0.28	313.36	6,298.8	-1.5	62.3	-0.1	0.38	-0.17	-57.08
6,400.0	0.10	256.27	6,398.8	-1.4	62.0	0.1	0.24	-0.18	-57.09
6,500.0	0.16	294.44	6,498.8	-1.3	61.8	0.1	0.10	0.06	38.17
6,600.0	0.22	332.60	6,598.8	-1.1	61.6	0.3	0.14	0.06	38.16
6,700.0	0.27	21.39	6,698.8	-0.7	61.6	0.7	0.21	0.05	48.79
6,800.0	0.31	70.17	6,798.8	-0.4	61.9	1.0	0.24	0.04	48.78
6,900.0	0.29	131.58	6,898.8	-0.5	62.4	1.0	0.31	-0.02	61.41
7,000.0	0.27	192.99	6,998.8	-0.9	62.5	0.6	0.29	-0.02	61.41
7,100.0	0.36	200.72	7,098.8	-1.4	62.3	0.0	0.10	0.09	7.73
7,200.0	0.41	208.44	7,198.8	-2.0	62.1	-0.6	0.07	0.05	7.72
7,300.0	0.58	215.64	7,298.8	-2.7	61.6	-1.3	0.18	0.17	7.20
7,400.0	0.74	222.83	7,398.8	-3.6	60.9	-2.2	0.18	0.16	7.19
7,500.0	0.92	210.70	7,498.8	-4.8	60.0	-3.4	0.25	0.18	-12.13
7,600.0	1.10	198.56	7,598.8	-6.4	59.3	-5.0	0.28	0.18	-12.14
7,700.0	1.16	197.42	7,698.8	-8.2	58.7	-6.9	0.06	0.06	-1.14
7,800.0	1.17	196.28	7,798.8	-10.2	58.1	-8.9	0.03	0.01	-1.14
7,900.0	1.26	201.46	7,898.7	-12.2	57.4	-10.9	0.14	0.09	5.18
8,000.0	1.36	206.63	7,998.7	-14.3	56.5	-13.0	0.15	0.10	5.17
8,100.0	1.76	208.37	8,098.7	-16.7	55.2	-15.4	0.40	0.40	1.74
8,200.0	2.13	209.12	8,198.6	-19.7	53.6	-18.4	0.37	0.37	0.75
8,300.0	2.05	210.04	8,298.5	-22.8	51.8	-21.7	0.09	-0.08	0.92
8,400.0	1.98	211.96	8,398.5	-25.8	50.0	-24.7	0.10	-0.07	1.92
8,500.0	1.79	215.23	8,498.4	-28.6	48.2	-27.5	0.22	-0.19	3.27
8,600.0	1.61	228.49	8,598.4	-30.8	46.2	-29.7	0.43	-0.18	13.26
8,700.0	1.45	235.47	8,698.3	-32.4	44.1	-31.4	0.25	-0.16	6.98
8,800.0	1.30	252.44	8,798.3	-33.5	42.0	-32.5	0.43	-0.15	16.97
8,850.0	1.22	252.89	8,848.3	-33.8	40.9	-32.9	0.16	-0.16	0.90
Tie into Gyro @ 8850' MD									
8,954.0	1.60	258.40	8,952.3	-34.4	38.5	-33.6	0.39	0.37	5.30
KOP - 8954.0' MD, 8952.3' TVD, 1.60° INC, 258.40° AZI, -33.6' VS									
8,986.0	2.50	304.20	8,984.3	-34.1	37.4	-33.3	5.62	2.81	143.13
9,017.0	7.60	331.30	9,015.1	-32.0	35.9	-31.1	17.72	16.45	87.42
9,049.0	12.80	338.30	9,046.6	-26.8	33.6	-26.0	16.68	16.25	21.88

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #2H
Project:	Lea County, NM (NAD 83)	**TVD Reference:**	WELL @ 3264.0usft (Silver Oak #12 - 18' KB)
Site:	Pintail 3 Federal	**MD Reference:**	WELL @ 3264.0usft (Silver Oak #12 - 18' KB)
Well:	#2H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Houston R5000 Database

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,081.0	15.10	350.10	9,077.7	-19.4	31.5	-18.7	11.40	7.19	36.88
9,112.0	17.10	348.00	9,107.5	-11.0	29.9	-10.3	6.72	6.45	-6.77
9,144.0	19.00	347.80	9,137.9	-1.3	27.8	-0.6	5.94	5.94	-0.63
9,148.1	19.35	348.59	9,141.8	0.0	27.5	0.7	10.60	8.50	19.25
Cross into 330' Lease - 9148.1' MD, 9141.8' TVD, 19.35° INC, 0.7' VS									
9,176.0	21.80	353.30	9,167.9	9.7	26.0	10.3	10.60	8.79	16.88
9,208.0	23.60	354.30	9,197.4	22.0	24.7	22.5	5.75	5.63	3.13
9,239.0	25.30	358.60	9,225.6	34.8	23.9	35.3	7.94	5.48	13.87
9,271.0	25.50	1.50	9,254.5	48.5	23.9	49.0	3.94	0.63	9.06
9,303.0	29.30	1.00	9,282.9	63.2	24.2	63.8	11.90	11.88	-1.56
9,335.0	33.40	356.80	9,310.3	79.9	23.9	80.4	14.51	12.81	-13.13
9,367.0	37.70	354.50	9,336.3	98.4	22.5	98.9	14.07	13.44	-7.19
9,398.0	40.80	352.90	9,360.3	117.9	20.3	118.3	10.52	10.00	-5.16
9,430.0	45.60	354.00	9,383.6	139.7	17.8	140.0	15.18	15.00	3.44
9,461.0	50.00	356.80	9,404.4	162.5	16.0	162.9	15.69	14.19	9.03
9,492.0	54.40	358.60	9,423.4	187.0	15.0	187.3	14.92	14.19	5.81
9,524.0	57.00	0.50	9,441.5	213.4	14.8	213.7	9.49	8.13	5.94
9,556.0	60.50	1.50	9,458.1	240.8	15.3	241.1	11.26	10.94	3.13
9,588.0	64.20	0.00	9,472.9	269.1	15.7	269.4	12.28	11.56	-4.69
9,620.0	68.60	0.50	9,485.7	298.4	15.8	298.7	13.82	13.75	1.56
9,652.0	72.30	359.60	9,496.4	328.6	15.8	328.9	11.86	11.56	-2.81
9,684.0	73.50	358.70	9,505.8	359.2	15.4	359.4	4.61	3.75	-2.81
9,715.0	77.60	358.60	9,513.6	389.2	14.7	389.4	13.23	13.23	-0.32
9,748.0	82.70	359.10	9,519.2	421.7	14.0	421.9	15.53	15.45	1.52
9,780.0	84.80	359.30	9,522.7	453.5	13.6	453.7	6.59	6.56	0.63
9,812.0	84.90	359.30	9,525.6	485.3	13.2	485.5	0.31	0.31	0.00
9,843.0	86.30	359.40	9,527.9	516.2	12.8	516.4	4.53	4.52	0.32
9,875.0	88.00	0.10	9,529.5	548.2	12.7	548.4	5.74	5.31	2.19
9,945.4	90.00	0.62	9,530.8	618.6	13.1	618.7	2.94	2.84	0.74
EOC - 9945.4' MD, 9530.8' TVD, 90.00° INC, 0.62° AZI, 618.7' VS									
9,970.0	90.70	0.80	9,530.6	643.2	13.4	643.3	2.94	2.84	0.74
10,065.0	91.20	0.50	9,529.0	738.2	14.5	738.3	0.61	0.53	-0.32
10,161.0	90.10	0.00	9,527.9	834.2	14.9	834.3	1.26	-1.15	-0.52
10,256.0	90.40	359.10	9,527.5	929.2	14.2	929.2	1.00	0.32	-0.95
10,351.0	90.50	358.70	9,526.8	1,024.1	12.4	1,024.1	0.43	0.11	-0.42
10,447.0	91.40	358.20	9,525.2	1,120.1	9.8	1,120.0	1.07	0.94	-0.52
10,542.0	90.90	358.90	9,523.3	1,215.0	7.4	1,214.9	0.91	-0.53	0.74
10,637.0	89.40	359.40	9,523.0	1,310.0	5.9	1,309.8	1.66	-1.58	0.53
10,733.0	89.40	359.80	9,524.0	1,406.0	5.3	1,405.8	0.42	0.00	0.42
10,828.0	90.10	358.90	9,524.5	1,501.0	4.2	1,500.7	1.20	0.74	-0.95
10,923.0	89.00	1.20	9,525.2	1,596.0	4.3	1,595.7	2.68	-1.16	2.42
11,019.0	89.20	0.30	9,526.7	1,692.0	5.5	1,691.7	0.96	0.21	-0.94
11,114.0	89.70	359.40	9,527.6	1,787.0	5.3	1,786.6	1.08	0.53	-0.95

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #2H
Project:	Lea County, NM (NAD 83)	**TVD Reference:**	WELL @ 3264.0usft (Silver Oak #12 - 18' KB)
Site:	Pintail 3 Federal	**MD Reference:**	WELL @ 3264.0usft (Silver Oak #12 - 18' KB)
Well:	#2H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Houston R5000 Database

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,210.0	89.60	0.30	9,528.2	1,883.0	5.0	1,882.6	0.94	-0.10	0.94
11,304.0	89.90	2.20	9,528.6	1,976.9	7.1	1,976.6	2.05	0.32	2.02
11,400.0	90.80	0.70	9,528.0	2,072.9	9.5	2,072.6	1.82	0.94	-1.56
11,495.0	89.30	2.10	9,527.9	2,167.9	11.8	2,167.6	2.16	-1.58	1.47
11,591.0	88.80	1.00	9,529.5	2,263.8	14.4	2,263.6	1.26	-0.52	-1.15
11,686.0	89.40	0.10	9,531.0	2,358.8	15.3	2,358.5	1.14	0.63	-0.95
11,781.0	90.00	359.30	9,531.5	2,453.8	14.9	2,453.5	1.05	0.63	-0.84
11,876.0	90.90	358.40	9,530.8	2,548.8	12.9	2,548.4	1.34	0.95	-0.95
11,972.0	89.30	0.00	9,530.6	2,644.8	11.6	2,644.3	2.36	-1.67	1.67
12,068.0	88.90	1.90	9,532.1	2,740.7	13.2	2,740.3	2.02	-0.42	1.98
12,163.0	89.90	2.20	9,533.1	2,835.7	16.6	2,835.3	1.10	1.05	0.32
12,258.0	89.90	1.50	9,533.3	2,930.6	19.7	2,930.3	0.74	0.00	-0.74
12,353.0	88.70	1.00	9,534.4	3,025.6	21.7	3,025.3	1.37	-1.26	-0.53
12,448.0	88.20	0.30	9,537.0	3,120.5	22.8	3,120.2	0.91	-0.53	-0.74
12,544.0	89.40	0.80	9,539.0	3,216.5	23.7	3,216.2	1.35	1.25	0.52
12,639.0	92.20	1.40	9,537.7	3,311.5	25.6	3,311.2	3.01	2.95	0.63
12,735.0	93.00	0.50	9,533.3	3,407.4	27.1	3,407.1	1.25	0.83	-0.94
12,829.0	91.50	0.70	9,529.7	3,501.3	28.1	3,501.0	1.61	-1.60	0.21
12,925.0	88.80	2.10	9,529.4	3,597.2	30.5	3,597.0	3.17	-2.81	1.46
13,021.0	89.10	2.10	9,531.2	3,693.2	34.0	3,693.0	0.31	0.31	0.00
13,116.0	89.20	1.70	9,532.6	3,788.1	37.1	3,788.0	0.43	0.11	-0.42
13,211.0	88.50	1.00	9,534.5	3,883.0	39.4	3,882.9	1.04	-0.74	-0.74
13,307.0	89.20	1.00	9,536.4	3,979.0	41.1	3,978.9	0.73	0.73	0.00
13,402.0	90.80	1.20	9,536.4	4,074.0	42.9	4,073.9	1.70	1.68	0.21
13,498.0	92.70	0.80	9,533.5	4,169.9	44.6	4,169.9	2.02	1.98	-0.42
13,593.0	93.50	0.30	9,528.3	4,264.8	45.5	4,264.7	0.99	0.84	-0.53
13,687.0	92.90	0.50	9,523.1	4,358.6	46.1	4,358.6	0.67	-0.64	0.21
13,782.0	90.00	1.20	9,520.7	4,453.6	47.5	4,453.5	3.14	-3.05	0.74
13,877.0	89.00	1.00	9,521.5	4,548.6	49.4	4,548.5	1.07	-1.05	-0.21
13,949.0	89.50	0.80	9,522.5	4,620.5	50.5	4,620.5	0.75	0.69	-0.28
14,000.0	89.50	0.80	9,522.9	4,671.5	51.2	4,671.5	0.00	0.00	0.00

BHL - 14000.0' MD, 9522.9' TVD, 89.50° INC, 0.80° AZI, 4671.5' N, 51.2' E, 4671.5' VS

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
8,850.0	8,848.3	-33.8	40.9	Tie into Gyro @ 8850' MD
8,954.0	8,952.3	-34.4	38.5	KOP - 8954.0' MD, 8952.3' TVD, 1.60° INC, 258.40° AZI, -33.6' VS
9,148.1	9,141.8	0.0	27.5	Cross into 330' Lease - 9148.1' MD, 9141.8' TVD, 19.35° INC, 0.7' VS
9,945.4	9,530.8	618.6	13.1	EOC - 9945.4' MD, 9530.8' TVD, 90.00° INC, 0.62° AZI, 618.7' VS
14,000.0	9,522.9	4,671.5	51.2	BHL - 14000.0' MD, 9522.9' TVD, 89.50° INC, 0.80° AZI, 4671.5' N, 51.2' E, 467

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #2H
Project:	Lea County, NM (NAD 83)	**TVD Reference:**	WELL @ 3264.0usft (Silver Oak #12 - 18' KB)
Site:	Pintail 3 Federal	**MD Reference:**	WELL @ 3264.0usft (Silver Oak #12 - 18' KB)
Well:	#2H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Houston R5000 Database

Checked By: _____ Approved By: _____ Date: _____

COG Operating LLC
Project: Lea County, NM (NAD 83)
Site: Pintail 3 Federal
Well: #2H
Wellbore: OH
Plan: Plan #2 (#2H/OH)

CONCHO

Azimuths to Grid North
True North: -0.29°
Magnetic North: 7.23°

Magnetic Field
Strength: 48417.0snT
Dip Angle: 60.00°
Date: 9/10/2012
Model: IGRF200510

WELL DETAILS: #2H

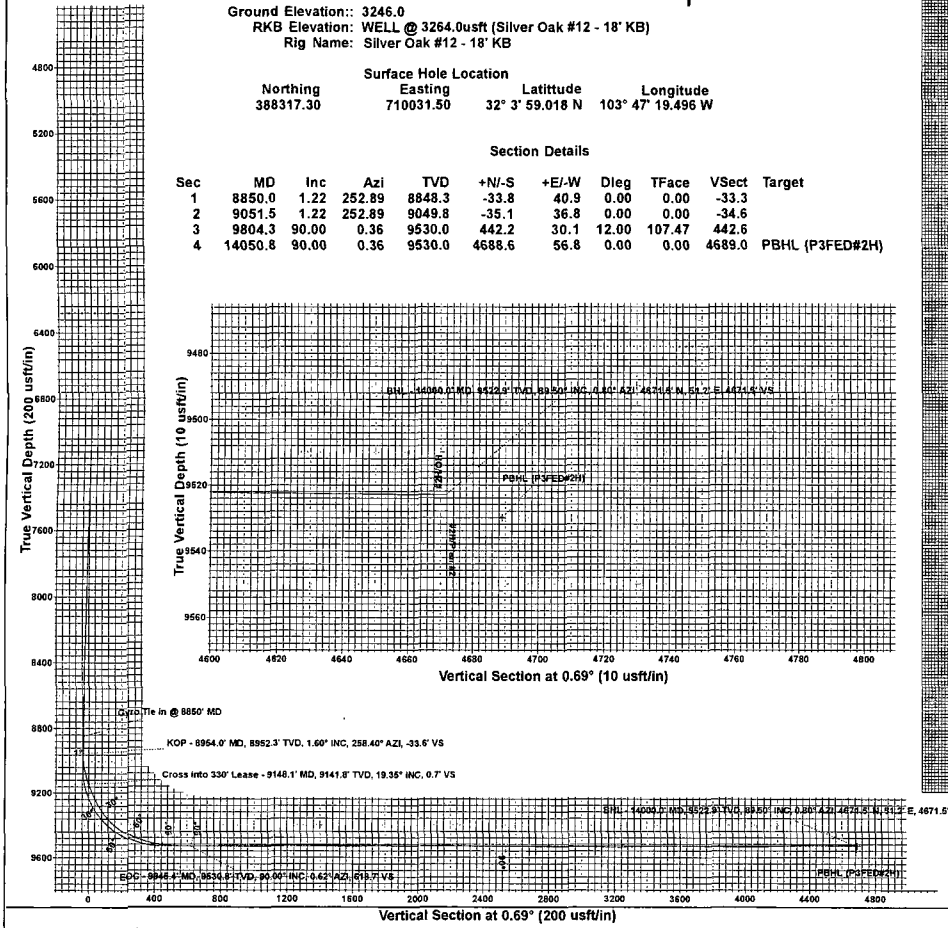
Ground Elevation:: 3246.0
RKB Elevation: WELL @ 3264.0usft (Silver Oak #12 - 18' KB)
Rig Name: Silver Oak #12 - 18' KB

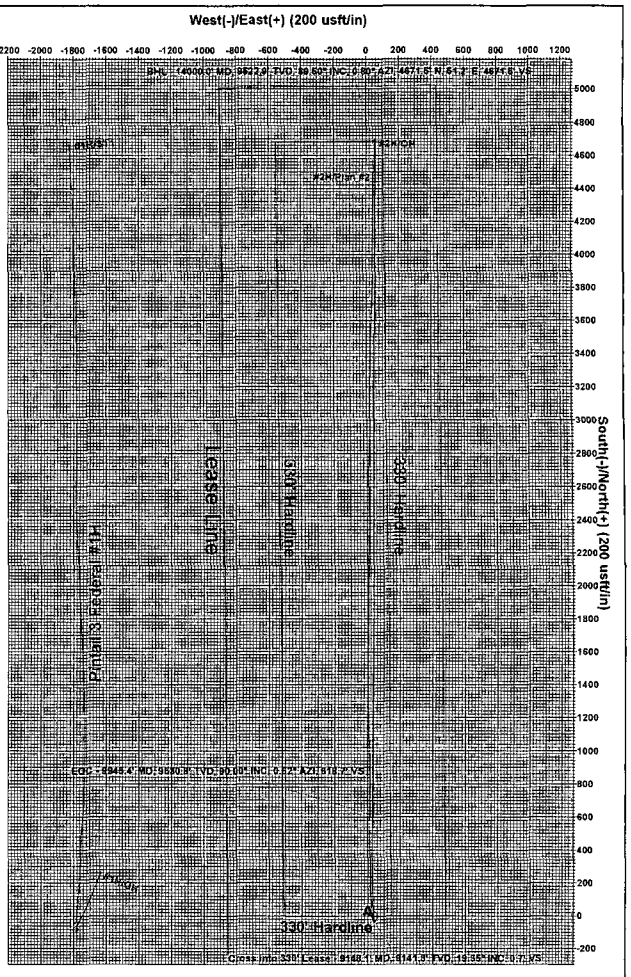
Surface Hole Location

Northing	Easting	Latittude	Longitude
388317.30	710031.50	32° 3' 59.018 N	103° 47' 19.496 W

Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	8850.0	1.22	252.89	8848.3	-33.8	40.9	0.00	0.00	-33.3	
2	9051.5	1.22	252.89	9049.8	-35.1	36.8	0.00	0.00	-34.6	
3	9804.3	90.00	0.36	9530.0	442.2	30.1	12.00	107.47	442.6	
4	14050.8	90.00	0.36	9530.0	4688.6	56.8	0.00	0.00	4689.0	PBHL (P3FED#2H)





PROJECT DETAILS: Lea County, NM (NAD 83)
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level
Local North: Grid

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

Plan: Plan #2 (#2H/OH)
Created By: Matt Higgins Date: 11:08, October 22 2012