

Results of Directional Survey

API number:	30-025-41333		
OGRID:		Operator:	COG OPERATING LLC
		Property:	ROY BATTY FEDERAL COM # 3H

surface	ULSTR:	O	11	T	24S	R	33E
				190	FSL	1887	FEL

BH Loc	ULSTR:	B	11	T	24S	R	33E
15601	MD	11116.2	TVD	370	FNL	1927	FEL
				4910	FSL		

Top Perf/OH	ULSTR:	O	11	T	24S	R	33E
11304	MD	11126.2	TVD	621	FSL	1775	FEL

Bot Perf/OH	ULSTR:	B	11	T	24S	R	33E
15380	MD	11126.7	TVD	591	FSL	1925	FEL
				4689	FSL		

	MD	N/S	E/W	VD
	11303	429.90	112.50	11126
TOP PERFS/OH	11304	430.88	112.50	11126.23
	11335	461.10	112.50	11133.20
	15298	4417.30	-36.50	11130.50
BOT PERFS/OH	15380	4499.21	-38.42	11126.66
	15392	4511.20	-38.70	11126.10

NEXT TO LAST	15553	4672.00	-40.20	11118.40
LAST READING	15601	4719.90	-40.40	11116.20
TD	15601	4719.90	-40.40	11116.20

Surface Location	190	FS	1887	FE
Projected BHL	4910	FS	1927	FE
Location of				
Top Perfs/OH	621	FS	1775	FE
Bottom Perfs/OH	4689	FS	1925	FE

SUMMARY of Subsurface Locations

Surface Location	O-11-24S-33E	190	FS	1887	FE	Vert. Depth
Top Perfs/OH	O-11-24S-33E	621	FS	1775	FE	11126.23
Bottom Perfs/OH	B-11-24S-33E	4689	FS	1925	FE	11126.66
Projected TD	B-11-24S-33E	4910	FS	1927	FE	11116.20

APR 14 2014



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

COG OPERATIONS, LLC

RECEIVED

JAN 10 2014

ARTESIA WEST

HOBBS OCD

MAR 13 2014

RECEIVED

December 23, 2013

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

RE: Roy Batty Federal Com #3H
190' FSL & 1887' FEL
Sec. 11, T24S, R33E
Lea County, New Mexico

Dear Sir,

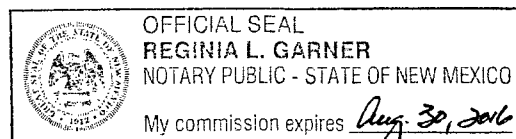
The attached is the Deviation Survey for the above captioned well.

Very truly yours,

Eddie LaRue
Operations Manager

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 23rd day of December, 2013.

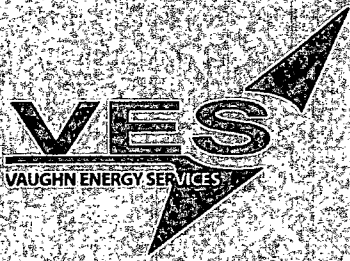
Notary Public

Roy Batty Fed Com 3H

#	Date	Depth	Deviation	Direction
11/28/2013		250	0.70	0.00
11/28/2013		500	1.00	0.00
11/28/2013		776	0.40	0.00
11/29/2013		960	0.20	0.00
11/29/2013		1294	1.00	0.00
11/29/2013		1350	1.00	0.00
12/1/2013		1659	0.70	0.00
12/1/2013		1849	0.90	0.00
12/1/2013		2038	0.90	0.00
12/1/2013		2227	1.01	0.00
12/1/2013		2416	1.23	0.00
12/1/2013		2604	1.10	0.00
12/1/2013		2793	1.10	0.00
12/2/2013		3171	0.97	0.00
12/2/2013		3361	0.57	0.00
12/2/2013		3550	0.48	0.00
12/2/2013		3739	0.13	0.00
12/2/2013		3929	0.66	0.00
12/2/2013		4118	0.80	0.00
12/2/2013		4306	1.10	0.00
12/3/2013		4495	0.60	0.00
12/3/2013		4684	1.70	0.00
12/3/2013		4873	1.80	0.00
12/3/2013		4962	2.20	0.00
12/3/2013		5061	1.70	0.00
12/5/2013		5420	0.80	0.00
12/5/2013		5859	0.80	0.00
12/5/2013		6238	0.40	0.00
12/5/2013		6657	0.30	0.00
12/5/2013		7128	0.60	0.00
12/6/2013		7557	0.20	0.00
12/6/2013		7975	0.70	0.00
12/6/2013		8376	0.50	0.00
12/6/2013		8762	1.40	0.00
12/7/2013		8969	1.40	0.00
12/7/2013		9411	1.40	0.00
12/7/2013		9530	2.90	0.00
12/8/2013		9625	2.70	0.00
12/8/2013		9751	2.40	0.00
12/8/2013		9877	2.40	0.00
12/8/2013		10003	2.50	0.00
12/8/2013		10272	2.60	0.00
12/9/2013		10500	2.30	0.00

#	Date	Depth	Deviation	Direction
	12/10/2013	10518	2.02	49.30
	12/10/2013	10612	2.20	57.90
	12/10/2013	10675	8.80	9.70
	12/10/2013	10738	17.40	359.40
	12/10/2013	10800	20.80	353.40
	12/11/2013	10895	31.10	353.30
	12/11/2013	10926	33.30	357.40
	12/11/2013	10989	40.00	4.10
	12/11/2013	11021	44.40	4.80
	12/11/2013	11052	47.10	4.80
	12/11/2013	11084	49.10	3.10
	12/11/2013	11115	51.90	0.60
	12/11/2013	11146	55.60	359.60
	12/11/2013	11178	59.60	359.60
	12/11/2013	11209	63.10	359.40
	12/12/2013	11303	74.50	360.00
	12/12/2013	11335	79.40	360.00
	12/12/2013	11429	86.50	0.30
	12/12/2013	11523	90.30	0.70
	12/12/2013	11618	90.70	1.20
	12/13/2013	11712	91.50	2.00
	12/13/2013	11807	90.40	0.20
	12/13/2013	11901	89.60	0.20
	12/13/2013	11995	88.80	358.60
	12/13/2013	12090	87.70	359.10
	12/13/2013	12184	89.40	356.90
	12/13/2013	12279	90.70	357.30
	12/13/2013	12373	90.50	357.50
	12/13/2013	12467	89.80	357.60
	12/13/2013	12656	89.20	356.30
	12/13/2013	12845	90.50	356.30
	12/14/2013	12940	92.50	355.30
	12/14/2013	13034	91.60	354.50
	12/14/2013	13128	90.40	354.60
	12/15/2013	13224	88.10	354.90
	12/15/2013	13318	89.00	355.00
	12/15/2013	13413	89.60	354.50
	12/15/2013	13507	90.90	354.70
	12/15/2013	13601	89.10	355.90
	12/15/2013	13696	88.90	355.60
	12/15/2013	13790	89.00	357.10
	12/15/2013	13978	88.30	358.50
	12/16/2013	14166	89.90	358.40
	12/16/2013	14260	90.40	358.40
	12/16/2013	14354	90.80	358.80

#	Date	Depth	Deviation	Direction
	12/16/2013	14448	91.40	358.50
	12/16/2013	14542	92.00	358.90
	12/17/2013	14637	88.90	358.90
	12/17/2013	14732	90.90	0.00
	12/17/2013	14920	92.30	359.60
	12/17/2013	15015	91.60	359.00
	12/17/2013	15110	92.70	359.00
	12/18/2013	15204	92.00	358.90
	12/18/2013	15298	92.60	358.50
	12/18/2013	15397	92.80	358.90
	12/18/2013	15553	92.70	359.70
#	EOF			



A GYRO TECHNOLOGIES INC. COMPANY

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

December 30, 2013

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

HOBBS OCD

MAR 13 2014

Attn: Kanicia Castillo

RECEIVED

Re: **Roy Batty Federal Com No 003H**

Please find enclosed a copy of the survey from 0' to 10,400' 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

STATE OF TEXAS §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 30th day of December A.D. 2013, by Keith Havelka.




Meredith Darden
Notary Public, State of Texas



Company: COG Operating LLC-Concho
Lease/Well: Roy Batty Federal Com/No 003H
Location: Sec 11 T24S R33E
Rig Name: Silver Oak 12
State/County: New Mexico/Lea
Latitude: 32.23, Longitude: -103.54
GRID North is 0.42 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB = 18 Feet

HOBBS OCD

DRILLOG HA GYRO SURVEY CALCULATIONS

MAR 13 2014

Filename: ...federal com #3h gyro-de_01.ut

Minimum Curvature Method

Report Date/Time: 12/30/2013 / 08:27

RECEIVED

Vaughn Energy Services

West Texas

432-563-5444

Surveyor: Chris Bankson

Roy Batty Federal Com No 003H / API 30-025-41333

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	1.42	55.31	99.99	0.71	1.02	0.71	1.24	55.31	1.42
200.00	1.24	55.01	199.96	2.03	2.92	2.03	3.56	55.22	0.18
300.00	1.31	60.76	299.94	3.21	4.81	3.21	5.78	56.28	0.15
400.00	0.89	64.62	399.92	4.10	6.52	4.10	7.70	57.79	0.43
500.00	0.91	54.97	499.91	4.90	7.87	4.90	9.27	58.12	0.15
600.00	1.05	63.90	599.89	5.76	9.35	5.76	10.98	58.37	0.20
700.00	0.66	61.86	699.88	6.43	10.67	6.43	12.46	58.94	0.39
800.00	0.42	57.00	799.88	6.90	11.49	6.90	13.40	59.01	0.24
900.00	0.60	50.08	899.87	7.43	12.19	7.43	14.28	58.63	0.19
1000.00	0.49	60.74	999.87	7.98	12.97	7.98	15.23	58.40	0.15
1100.00	0.04	42.12	1099.87	8.21	13.36	8.21	15.69	58.43	0.45
1200.00	0.32	30.81	1199.87	8.48	13.53	8.48	15.97	57.93	0.28
1300.00	0.10	324.52	1299.87	8.79	13.62	8.79	16.21	57.17	0.30
1400.00	0.60	309.16	1399.86	9.19	13.17	9.19	16.06	55.09	0.50
1500.00	0.64	321.42	1499.86	9.95	12.42	9.95	15.91	51.28	0.14
1600.00	0.49	319.76	1599.85	10.72	11.79	10.72	15.93	47.72	0.15
1700.00	1.01	329.35	1699.84	11.80	11.07	11.80	16.18	43.16	0.53
1800.00	0.83	345.92	1799.83	13.26	10.44	13.26	16.88	38.23	0.32

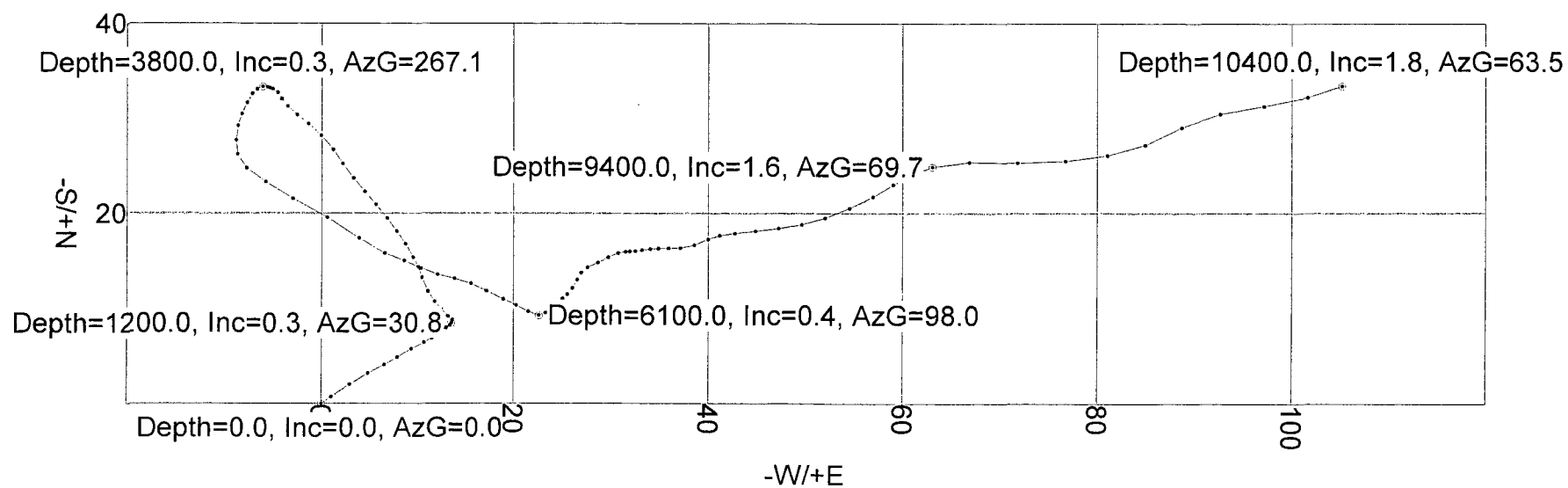
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.49	333.16	1899.82	14.34	10.07	14.34	17.53	35.08	0.36
2000.00	0.83	331.53	1999.82	15.36	9.53	15.36	18.08	31.82	0.33
2100.00	1.02	329.26	2099.80	16.76	8.74	16.76	18.90	27.53	0.20
2200.00	0.90	321.30	2199.79	18.13	7.79	18.13	19.74	23.26	0.18
2300.00	1.04	326.12	2299.78	19.49	6.80	19.49	20.65	19.23	0.17
2400.00	1.11	316.81	2399.76	20.95	5.63	20.95	21.70	15.05	0.19
2500.00	0.97	322.30	2499.74	22.33	4.45	22.33	22.77	11.28	0.17
2600.00	1.11	318.69	2599.73	23.73	3.29	23.73	23.95	7.91	0.15
2700.00	1.04	329.10	2699.71	25.23	2.19	25.23	25.33	4.96	0.21
2800.00	1.03	323.73	2799.69	26.74	1.19	26.74	26.76	2.55	0.10
2900.00	1.20	316.55	2899.67	28.22	-0.06	28.22	28.22	359.87	0.22
3000.00	0.87	307.74	2999.66	29.45	-1.39	29.45	29.48	357.30	0.37
3100.00	0.82	311.08	3099.65	30.39	-2.53	30.39	30.49	355.24	0.07
3200.00	0.72	313.11	3199.64	31.29	-3.53	31.29	31.49	353.56	0.10
3300.00	0.45	339.85	3299.63	32.09	-4.13	32.09	32.36	352.67	0.38
3400.00	0.45	316.38	3399.63	32.75	-4.54	32.75	33.06	352.11	0.18
3500.00	0.28	287.62	3499.63	33.11	-5.04	33.11	33.49	351.34	0.25
3600.00	0.09	283.04	3599.63	33.20	-5.35	33.20	33.63	350.85	0.19
3700.00	0.23	294.00	3699.63	33.30	-5.61	33.30	33.77	350.44	0.14
3800.00	0.34	267.05	3799.62	33.37	-6.09	33.37	33.92	349.66	0.17
3900.00	0.44	228.73	3899.62	33.09	-6.68	33.09	33.76	348.59	0.28
4000.00	0.33	220.71	3999.62	32.62	-7.15	32.62	33.40	347.63	0.13
4100.00	0.90	206.02	4099.61	31.70	-7.68	31.70	32.62	346.37	0.59
4200.00	0.58	203.98	4199.61	30.53	-8.24	30.53	31.62	344.90	0.32
4300.00	0.98	194.56	4299.60	29.24	-8.66	29.24	30.49	343.51	0.41
4400.00	0.79	176.71	4399.58	27.73	-8.83	27.73	29.10	342.33	0.33
4500.00	0.90	173.82	4499.57	26.25	-8.71	26.25	27.66	341.65	0.12
4600.00	1.26	127.89	4599.56	24.79	-7.75	24.79	25.97	342.63	0.91
4700.00	1.54	125.66	4699.53	23.33	-5.79	23.33	24.04	346.05	0.28
4800.00	2.29	118.98	4799.47	21.58	-2.96	21.58	21.78	352.20	0.78
4900.00	2.37	120.56	4899.39	19.56	0.57	19.56	19.57	1.66	0.10
5000.00	2.17	126.73	4999.31	17.38	3.86	17.38	17.81	12.53	0.32
5100.00	1.44	111.44	5099.26	15.79	6.55	15.79	17.10	22.52	0.87
5200.00	1.07	110.12	5199.24	15.01	8.59	15.01	17.30	29.78	0.37
5300.00	1.15	117.83	5299.22	14.22	10.35	14.22	17.59	36.05	0.17
5400.00	1.00	103.98	5399.20	13.54	12.09	13.54	18.15	41.75	0.30
5500.00	1.08	101.77	5499.18	13.14	13.86	13.14	19.10	46.52	0.09
5600.00	0.96	113.58	5599.17	12.61	15.55	12.61	20.02	50.96	0.24
5700.00	1.15	116.92	5699.15	11.82	17.22	11.82	20.89	55.53	0.20

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	1.04	114.92	5799.13	10.98	18.94	10.98	21.89	59.89	0.12
5900.00	0.71	117.64	5899.12	10.31	20.31	10.31	22.78	63.08	0.33
6000.00	0.90	116.23	5999.11	9.68	21.57	9.68	23.64	65.84	0.19
6100.00	0.42	97.95	6099.10	9.28	22.64	9.28	24.47	67.71	0.51
6200.00	0.51	47.15	6199.10	9.53	23.33	9.53	25.20	67.78	0.41
6300.00	0.60	49.35	6299.10	10.17	24.05	10.17	26.11	67.08	0.09
6400.00	0.34	49.54	6399.09	10.70	24.67	10.70	26.89	66.55	0.26
6500.00	0.28	50.46	6499.09	11.05	25.09	11.05	27.42	66.23	0.06
6600.00	0.46	46.52	6599.09	11.49	25.57	11.49	28.03	65.81	0.18
6700.00	0.51	31.52	6699.09	12.14	26.09	12.14	28.78	65.05	0.13
6800.00	0.62	28.89	6799.08	12.99	26.59	12.99	29.59	63.96	0.12
6900.00	0.37	28.92	6899.08	13.74	27.00	13.74	30.30	63.03	0.25
7000.00	0.64	62.14	6999.07	14.28	27.65	14.28	31.12	62.68	0.39
7100.00	0.72	65.76	7099.07	14.80	28.71	14.80	32.30	62.73	0.09
7200.00	0.64	56.48	7199.06	15.37	29.75	15.37	33.49	62.68	0.13
7300.00	0.66	77.22	7299.05	15.80	30.78	15.80	34.60	62.82	0.23
7400.00	0.23	85.62	7399.05	15.95	31.54	15.95	35.34	63.18	0.43
7500.00	0.27	86.61	7499.05	15.98	31.97	15.98	35.74	63.45	0.04
7600.00	0.36	85.45	7599.05	16.01	32.51	16.01	36.24	63.78	0.09
7700.00	0.45	79.11	7699.04	16.11	33.21	16.11	36.91	64.12	0.10
7800.00	0.54	82.93	7799.04	16.24	34.06	16.24	37.73	64.50	0.10
7900.00	0.42	92.66	7899.04	16.29	34.89	16.29	38.51	64.98	0.15
8000.00	0.79	86.24	7999.03	16.31	35.95	16.31	39.47	65.59	0.38
8100.00	0.61	92.97	8099.02	16.33	37.16	16.33	40.59	66.28	0.20
8200.00	1.08	68.81	8199.01	16.65	38.57	16.65	42.01	66.66	0.58
8300.00	0.70	65.92	8299.00	17.24	40.01	17.24	43.57	66.69	0.38
8400.00	0.71	74.84	8398.99	17.65	41.17	17.65	44.80	66.80	0.11
8500.00	1.11	84.95	8498.98	17.90	42.73	17.90	46.33	67.28	0.43
8600.00	1.32	81.94	8598.96	18.14	44.83	18.14	48.36	67.97	0.22
8700.00	1.43	84.80	8698.93	18.42	47.21	18.42	50.68	68.69	0.13
8800.00	1.39	76.72	8798.90	18.81	49.63	18.81	53.08	69.25	0.20
8900.00	1.48	70.54	8898.87	19.51	52.02	19.51	55.56	69.44	0.18
9000.00	1.67	65.19	8998.83	20.55	54.56	20.55	58.30	69.36	0.24
9100.00	1.43	60.57	9098.79	21.78	56.97	21.78	60.99	69.08	0.27
9200.00	1.33	57.26	9198.76	23.02	59.04	23.02	63.37	68.70	0.13
9300.00	1.07	65.50	9298.74	24.04	60.86	24.04	65.43	68.45	0.32
9400.00	1.65	69.72	9398.71	24.92	63.06	24.92	67.80	68.44	0.59
9500.00	2.80	90.11	9498.64	25.41	66.85	25.41	71.52	69.19	1.38
9600.00	2.87	91.27	9598.52	25.35	71.80	25.35	76.14	70.55	0.09

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	2.80	84.43	9698.39	25.54	76.73	25.54	80.87	71.59	0.34
9800.00	2.21	79.06	9798.30	26.14	81.05	26.14	85.16	72.13	0.64
9900.00	2.45	69.92	9898.22	27.24	84.95	27.24	89.21	72.22	0.44
10000.00	2.35	58.58	9998.13	29.04	88.70	29.04	93.34	71.87	0.48
10100.00	2.58	80.19	10098.04	30.49	92.67	30.49	97.56	71.79	0.95
10200.00	2.67	78.97	10197.93	31.32	97.18	31.32	102.10	72.14	0.11
10300.00	2.51	77.35	10297.83	32.25	101.61	32.25	106.60	72.39	0.18
10400.00	1.80	63.47	10397.76	33.43	105.15	33.43	110.34	72.36	0.88



Vaughn Energy Services
West Texas
432-563-5444
Surveyor: Chris Bankson
Roy Batty Federal Com No 003H / API 30-025-41333



COG Production LLC

Lea County, NM (NAD27 NME)

Roy Batty Fed Com

3H

OH

HOBBS OCD
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Design: OH

Survey Report - Geographic

19 December, 2013

Nexus Directional Solutions, LP

Survey Report - Geographic

Company:	COG Production LLC	Local Co-ordinate Reference:	Well 3H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	WELL @ 3625.6usft (Original Well Elev)
Site:	Roy Batty Fed Com	MD Reference:	WELL @ 3625.6usft (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 (NAD27 NME)		
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:	Roy Batty Fed Com		
Site Position:		Northing:	446,694.70 usft
From:	Map	Easting:	742,531.00 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 13' 32.331 N
		Longitude:	103° 32' 56.565 W
		Grid Convergence:	0.42 °

Well:	3H		
Well Position	+N/-S	0.0 usft	Northing: 446,575.00 usft
	+E/-W	0.0 usft	Easting: 745,259.10 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 13' 30.948 N
		Longitude:	103° 32' 24.818 W
		Ground Level:	3,607.6 usft

Wellbore:	OH		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010	11/14/2013	7.27
			60.13
			48,377

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
			359.49

Survey Program	Date: 12/19/2013		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.0	10,400.0	GYRO (OH)	MWD
10,518.0	15,601.0	Nexus MWD (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)		
0.0	0.00	0.00	0.0	0.0	0.0	446,575.00	745,259.10	32° 13' 30.948 N	103° 32' 24.818 W
100.0	1.42	55.31	100.0	0.7	1.0	446,575.71	745,260.12	32° 13' 30.955 N	103° 32' 24.806 W
200.0	1.24	55.01	200.0	2.0	2.9	446,577.03	745,262.02	32° 13' 30.968 N	103° 32' 24.784 W
300.0	1.31	60.76	299.9	3.2	4.8	446,578.21	745,263.90	32° 13' 30.979 N	103° 32' 24.762 W
400.0	0.89	64.62	399.9	4.1	6.5	446,579.10	745,265.60	32° 13' 30.988 N	103° 32' 24.742 W
500.0	0.91	54.97	499.9	4.9	7.9	446,579.89	745,266.96	32° 13' 30.996 N	103° 32' 24.726 W
600.0	1.05	63.90	599.9	5.7	9.3	446,580.75	745,268.43	32° 13' 31.004 N	103° 32' 24.709 W
700.0	0.66	61.86	699.9	6.4	10.7	446,581.42	745,269.76	32° 13' 31.011 N	103° 32' 24.694 W
800.0	0.42	57.00	799.9	6.9	11.5	446,581.89	745,270.57	32° 13' 31.015 N	103° 32' 24.684 W
900.0	0.60	50.08	899.9	7.4	12.2	446,582.43	745,271.28	32° 13' 31.021 N	103° 32' 24.676 W
1,000.0	0.49	60.74	999.9	8.0	13.0	446,582.98	745,272.06	32° 13' 31.026 N	103° 32' 24.667 W

Nexus Directional Solutions, LP

Survey Report - Geographic

Company:	COG Production LLC	Local Co-ordinate Reference:	Well 3H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	WELL @ 3625.6usft (Original Well Elev)
Site:	Roy Batty Fed Com	MD Reference:	WELL @ 3625.6usft (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	
1,100.0	0.04	42.12	1,099.9	8.2	13.4	446,583.21	745,272.45	32° 13' 31.028 N	103° 32' 24.662 W	
1,200.0	0.32	30.81	1,199.9	8.5	13.5	446,583.48	745,272.62	32° 13' 31.031 N	103° 32' 24.660 W	
1,300.0	0.10	324.52	1,299.9	8.8	13.6	446,583.79	745,272.71	32° 13' 31.034 N	103° 32' 24.659 W	
1,400.0	0.60	309.16	1,399.9	9.2	13.2	446,584.19	745,272.26	32° 13' 31.038 N	103° 32' 24.664 W	
1,500.0	0.64	321.42	1,499.9	10.0	12.4	446,584.96	745,271.50	32° 13' 31.046 N	103° 32' 24.673 W	
1,600.0	0.49	319.76	1,599.9	10.7	11.8	446,585.72	745,270.88	32° 13' 31.053 N	103° 32' 24.680 W	
1,700.0	1.01	329.35	1,699.8	11.8	11.1	446,586.80	745,270.15	32° 13' 31.064 N	103° 32' 24.688 W	
1,800.0	0.83	345.92	1,799.8	13.3	10.4	446,588.26	745,269.53	32° 13' 31.078 N	103° 32' 24.696 W	
1,900.0	0.49	333.16	1,899.8	14.3	10.1	446,589.35	745,269.16	32° 13' 31.089 N	103° 32' 24.700 W	
2,000.0	0.83	331.53	1,999.8	15.4	9.5	446,590.37	745,268.62	32° 13' 31.099 N	103° 32' 24.706 W	
2,100.0	1.02	329.26	2,099.8	16.8	8.7	446,591.77	745,267.82	32° 13' 31.113 N	103° 32' 24.715 W	
2,200.0	0.90	321.30	2,199.8	18.1	7.8	446,593.15	745,266.87	32° 13' 31.127 N	103° 32' 24.726 W	
2,300.0	1.04	326.12	2,299.8	19.5	6.8	446,594.51	745,265.88	32° 13' 31.141 N	103° 32' 24.738 W	
2,400.0	1.11	316.81	2,399.8	21.0	5.6	446,595.97	745,264.71	32° 13' 31.155 N	103° 32' 24.751 W	
2,500.0	0.97	322.30	2,499.7	22.3	4.4	446,597.35	745,263.53	32° 13' 31.169 N	103° 32' 24.765 W	
2,600.0	1.11	318.69	2,599.7	23.7	3.3	446,598.75	745,262.37	32° 13' 31.183 N	103° 32' 24.778 W	
2,700.0	1.04	329.10	2,699.7	25.3	2.2	446,600.25	745,261.26	32° 13' 31.198 N	103° 32' 24.791 W	
2,800.0	1.03	323.73	2,799.7	26.8	1.2	446,601.75	745,260.27	32° 13' 31.213 N	103° 32' 24.802 W	
2,900.0	1.20	316.55	2,899.7	28.2	-0.1	446,603.24	745,259.01	32° 13' 31.227 N	103° 32' 24.817 W	
3,000.0	0.87	307.74	2,999.7	29.5	-1.4	446,604.46	745,257.69	32° 13' 31.240 N	103° 32' 24.832 W	
3,100.0	0.82	311.08	3,099.6	30.4	-2.5	446,605.40	745,256.55	32° 13' 31.249 N	103° 32' 24.845 W	
3,200.0	0.72	313.11	3,199.6	31.3	-3.5	446,606.30	745,255.56	32° 13' 31.258 N	103° 32' 24.857 W	
3,300.0	0.45	339.85	3,299.6	32.1	-4.1	446,607.10	745,254.96	32° 13' 31.266 N	103° 32' 24.864 W	
3,400.0	0.45	316.38	3,399.6	32.7	-4.5	446,607.75	745,254.56	32° 13' 31.272 N	103° 32' 24.868 W	
3,500.0	0.28	287.62	3,499.6	33.1	-5.0	446,608.11	745,254.05	32° 13' 31.276 N	103° 32' 24.874 W	
3,600.0	0.09	283.04	3,599.6	33.2	-5.4	446,608.20	745,253.74	32° 13' 31.277 N	103° 32' 24.878 W	
3,700.0	0.23	294.00	3,699.6	33.3	-5.6	446,608.30	745,253.48	32° 13' 31.278 N	103° 32' 24.881 W	
3,800.0	0.34	267.05	3,799.6	33.4	-6.1	446,608.37	745,253.00	32° 13' 31.279 N	103° 32' 24.886 W	
3,900.0	0.44	228.73	3,899.6	33.1	-6.7	446,608.10	745,252.42	32° 13' 31.276 N	103° 32' 24.893 W	
4,000.0	0.33	220.71	3,999.6	32.6	-7.2	446,607.63	745,251.94	32° 13' 31.271 N	103° 32' 24.899 W	
4,100.0	0.90	206.02	4,099.6	31.7	-7.7	446,606.70	745,251.41	32° 13' 31.262 N	103° 32' 24.905 W	
4,200.0	0.58	203.98	4,199.6	30.5	-8.2	446,605.53	745,250.86	32° 13' 31.251 N	103° 32' 24.911 W	
4,300.0	0.98	194.56	4,299.6	29.2	-8.7	446,604.24	745,250.44	32° 13' 31.238 N	103° 32' 24.916 W	
4,400.0	0.79	176.71	4,399.6	27.7	-8.8	446,602.73	745,250.26	32° 13' 31.223 N	103° 32' 24.919 W	
4,500.0	0.90	173.82	4,499.6	26.3	-8.7	446,601.26	745,250.39	32° 13' 31.208 N	103° 32' 24.917 W	
4,600.0	1.26	127.89	4,599.6	24.8	-7.8	446,599.80	745,251.34	32° 13' 31.194 N	103° 32' 24.906 W	
4,700.0	1.54	125.66	4,699.5	23.3	-5.8	446,598.34	745,253.30	32° 13' 31.179 N	103° 32' 24.884 W	
4,800.0	2.29	118.98	4,799.5	21.6	-3.0	446,596.59	745,256.14	32° 13' 31.162 N	103° 32' 24.851 W	
4,900.0	2.37	120.56	4,899.4	19.6	0.6	446,594.57	745,259.67	32° 13' 31.142 N	103° 32' 24.810 W	
5,000.0	2.17	126.73	4,999.3	17.4	3.9	446,592.39	745,262.96	32° 13' 31.120 N	103° 32' 24.772 W	
5,100.0	1.44	111.44	5,099.3	15.8	6.6	446,590.80	745,265.65	32° 13' 31.104 N	103° 32' 24.741 W	
5,200.0	1.07	110.12	5,199.2	15.0	8.6	446,590.02	745,267.70	32° 13' 31.096 N	103° 32' 24.717 W	
5,300.0	1.15	117.83	5,299.2	14.2	10.4	446,589.23	745,269.46	32° 13' 31.088 N	103° 32' 24.696 W	
5,400.0	1.00	103.98	5,399.2	13.5	12.1	446,588.55	745,271.20	32° 13' 31.081 N	103° 32' 24.676 W	
5,500.0	1.08	101.77	5,499.2	13.1	13.9	446,588.15	745,272.97	32° 13' 31.077 N	103° 32' 24.656 W	
5,600.0	0.96	113.58	5,599.2	12.6	15.6	446,587.62	745,274.66	32° 13' 31.072 N	103° 32' 24.636 W	
5,700.0	1.15	116.92	5,699.2	11.8	17.2	446,586.83	745,276.32	32° 13' 31.064 N	103° 32' 24.617 W	
5,800.0	1.04	114.92	5,799.1	11.0	18.9	446,585.99	745,278.04	32° 13' 31.055 N	103° 32' 24.597 W	
5,900.0	0.71	117.64	5,899.1	10.3	20.3	446,585.32	745,279.41	32° 13' 31.049 N	103° 32' 24.581 W	
6,000.0	0.90	116.23	5,999.1	9.7	21.6	446,584.69	745,280.66	32° 13' 31.042 N	103° 32' 24.566 W	
6,100.0	0.42	97.95	6,099.1	9.3	22.6	446,584.29	745,281.73	32° 13' 31.038 N	103° 32' 24.554 W	
6,200.0	0.51	47.15	6,199.1	9.5	23.3	446,584.54	745,282.42	32° 13' 31.041 N	103° 32' 24.546 W	
6,300.0	0.60	49.35	6,299.1	10.2	24.0	446,585.19	745,283.14	32° 13' 31.047 N	103° 32' 24.537 W	
6,400.0	0.34	49.54	6,399.1	10.7	24.7	446,585.72	745,283.77	32° 13' 31.052 N	103° 32' 24.530 W	
6,500.0	0.28	50.46	6,499.1	11.1	25.1	446,586.07	745,284.18	32° 13' 31.056 N	103° 32' 24.525 W	

Nexus Directional Solutions, LP

Survey Report - Geographic

Company:	COG Production LLC	Local Co-ordinate Reference:	Well 3H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	WELL @ 3625.6usft (Original Well Elev)
Site:	Roy Batty Fed Corn	MD Reference:	WELL @ 3625.6usft (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
6,600.0	0.46	46.52	6,599.1	11.5	25.6	446,586.50	745,284.66	32° 13' 31.060 N	103° 32' 24.520 W
6,700.0	0.51	31.52	6,699.1	12.2	26.1	446,587.15	745,285.18	32° 13' 31.066 N	103° 32' 24.513 W
6,800.0	0.62	28.89	6,799.1	13.0	26.6	446,588.01	745,285.68	32° 13' 31.075 N	103° 32' 24.508 W
6,900.0	0.37	28.92	6,899.1	13.8	27.0	446,588.76	745,286.09	32° 13' 31.082 N	103° 32' 24.503 W
7,000.0	0.64	62.14	6,999.1	14.3	27.6	446,589.31	745,286.74	32° 13' 31.088 N	103° 32' 24.495 W
7,100.0	0.72	65.76	7,099.1	14.8	28.7	446,589.83	745,287.81	32° 13' 31.093 N	103° 32' 24.483 W
7,200.0	0.64	56.48	7,199.1	15.4	29.8	446,590.39	745,288.85	32° 13' 31.098 N	103° 32' 24.471 W
7,300.0	0.66	77.22	7,299.1	15.8	30.8	446,590.83	745,289.88	32° 13' 31.102 N	103° 32' 24.459 W
7,400.0	0.23	85.62	7,399.0	16.0	31.5	446,590.97	745,290.64	32° 13' 31.104 N	103° 32' 24.450 W
7,500.0	0.27	86.61	7,499.0	16.0	32.0	446,591.00	745,291.07	32° 13' 31.104 N	103° 32' 24.445 W
7,600.0	0.36	85.45	7,599.0	16.0	32.5	446,591.04	745,291.62	32° 13' 31.104 N	103° 32' 24.438 W
7,700.0	0.45	79.11	7,699.0	16.1	33.2	446,591.14	745,292.32	32° 13' 31.105 N	103° 32' 24.430 W
7,800.0	0.54	82.93	7,799.0	16.3	34.1	446,591.27	745,293.17	32° 13' 31.106 N	103° 32' 24.420 W
7,900.0	0.42	92.66	7,899.0	16.3	34.9	446,591.31	745,294.01	32° 13' 31.107 N	103° 32' 24.410 W
8,000.0	0.79	86.24	7,999.0	16.3	36.0	446,591.34	745,295.06	32° 13' 31.107 N	103° 32' 24.398 W
8,100.0	0.61	92.97	8,099.0	16.4	37.2	446,591.36	745,296.28	32° 13' 31.107 N	103° 32' 24.384 W
8,200.0	1.08	68.81	8,199.0	16.7	38.6	446,591.67	745,297.69	32° 13' 31.110 N	103° 32' 24.367 W
8,300.0	0.70	65.92	8,299.0	17.3	40.0	446,592.26	745,299.13	32° 13' 31.116 N	103° 32' 24.351 W
8,400.0	0.71	74.84	8,399.0	17.7	41.2	446,592.67	745,300.28	32° 13' 31.120 N	103° 32' 24.337 W
8,500.0	1.11	84.95	8,499.0	17.9	42.8	446,592.92	745,301.85	32° 13' 31.122 N	103° 32' 24.319 W
8,600.0	1.32	81.94	8,599.0	18.2	44.9	446,593.17	745,303.95	32° 13' 31.124 N	103° 32' 24.294 W
8,700.0	1.43	84.80	8,698.9	18.4	47.2	446,593.44	745,306.34	32° 13' 31.127 N	103° 32' 24.267 W
8,800.0	1.39	76.72	8,798.9	18.8	49.7	446,593.83	745,308.76	32° 13' 31.131 N	103° 32' 24.238 W
8,900.0	1.48	70.54	8,898.9	19.5	52.1	446,594.54	745,311.16	32° 13' 31.138 N	103° 32' 24.211 W
9,000.0	1.67	65.19	8,998.8	20.6	54.6	446,595.58	745,313.70	32° 13' 31.148 N	103° 32' 24.181 W
9,100.0	1.43	60.57	9,098.8	21.8	57.0	446,596.81	745,316.11	32° 13' 31.160 N	103° 32' 24.153 W
9,200.0	1.33	57.26	9,198.8	23.0	59.1	446,598.05	745,318.17	32° 13' 31.172 N	103° 32' 24.129 W
9,300.0	1.07	65.50	9,298.7	24.1	60.9	446,599.06	745,320.00	32° 13' 31.182 N	103° 32' 24.107 W
9,400.0	1.65	69.72	9,398.7	24.9	63.1	446,599.95	745,322.20	32° 13' 31.190 N	103° 32' 24.082 W
9,500.0	2.80	90.11	9,498.6	25.4	66.9	446,600.44	745,325.99	32° 13' 31.195 N	103° 32' 24.037 W
9,600.0	2.87	91.27	9,598.5	25.4	71.8	446,600.38	745,330.93	32° 13' 31.194 N	103° 32' 23.980 W
9,700.0	2.80	84.43	9,698.4	25.6	76.8	446,600.56	745,335.87	32° 13' 31.195 N	103° 32' 23.922 W
9,800.0	2.21	79.06	9,798.3	26.2	81.1	446,601.17	745,340.19	32° 13' 31.201 N	103° 32' 23.872 W
9,900.0	2.45	69.92	9,898.2	27.3	85.0	446,602.27	745,344.09	32° 13' 31.212 N	103° 32' 23.826 W
10,000.0	2.35	58.58	9,998.1	29.1	88.8	446,604.07	745,347.85	32° 13' 31.229 N	103° 32' 23.783 W
10,100.0	2.58	80.19	10,098.0	30.5	92.7	446,605.52	745,351.82	32° 13' 31.243 N	103° 32' 23.736 W
10,200.0	2.67	78.97	10,197.9	31.4	97.2	446,606.35	745,356.32	32° 13' 31.251 N	103° 32' 23.684 W
10,300.0	2.51	77.35	10,297.8	32.3	101.6	446,607.28	745,360.74	32° 13' 31.260 N	103° 32' 23.632 W
10,400.0	1.80	63.47	10,397.8	33.5	105.2	446,608.46	745,364.29	32° 13' 31.271 N	103° 32' 23.591 W
10,518.0	2.02	49.30	10,515.7	35.6	108.4	446,610.64	745,367.52	32° 13' 31.293 N	103° 32' 23.553 W
10,581.0	2.50	55.00	10,578.6	37.2	110.4	446,612.15	745,369.49	32° 13' 31.308 N	103° 32' 23.530 W
10,612.0	2.20	57.90	10,609.6	37.9	111.4	446,612.86	745,370.55	32° 13' 31.314 N	103° 32' 23.518 W
10,643.0	4.40	24.40	10,640.6	39.3	112.4	446,614.26	745,371.54	32° 13' 31.328 N	103° 32' 23.506 W
10,675.0	8.80	9.70	10,672.4	42.8	113.4	446,617.79	745,372.46	32° 13' 31.363 N	103° 32' 23.495 W
10,707.0	13.90	5.10	10,703.7	49.0	114.1	446,624.04	745,373.22	32° 13' 31.425 N	103° 32' 23.486 W
10,738.0	17.40	359.70	10,733.6	57.4	114.4	446,632.38	745,373.52	32° 13' 31.507 N	103° 32' 23.481 W
10,769.0	18.30	355.40	10,763.1	66.9	114.0	446,641.87	745,373.11	32° 13' 31.601 N	103° 32' 23.485 W
10,800.0	20.80	353.40	10,792.3	77.2	113.0	446,652.19	745,372.08	32° 13' 31.704 N	103° 32' 23.496 W
10,832.0	24.30	353.40	10,821.8	89.4	111.6	446,664.38	745,370.67	32° 13' 31.824 N	103° 32' 23.512 W
10,864.0	28.20	352.00	10,850.5	103.4	109.8	446,678.41	745,368.86	32° 13' 31.963 N	103° 32' 23.532 W
10,895.0	31.10	353.30	10,877.5	118.6	107.8	446,693.62	745,366.91	32° 13' 32.114 N	103° 32' 23.553 W
10,926.0	33.30	357.40	10,903.7	135.1	106.5	446,710.08	745,365.59	32° 13' 32.277 N	103° 32' 23.567 W
10,958.0	36.10	1.90	10,930.0	153.3	106.4	446,728.28	745,365.50	32° 13' 32.457 N	103° 32' 23.566 W
10,989.0	40.00	4.10	10,954.4	172.4	107.4	446,747.35	745,366.52	32° 13' 32.646 N	103° 32' 23.553 W
11,021.0	44.40	4.80	10,978.1	193.8	109.1	446,768.78	745,368.19	32° 13' 32.858 N	103° 32' 23.532 W

Nexus Directional Solutions, LP

Survey Report - Geographic

Company:	COG Production LLC	Local Co-ordinate Reference:	Well 3H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	WELL @ 3625.6usft (Original Well Elev)
Site:	Roy Batty Fed Com	MD Reference:	WELL @ 3625.6usft (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	
11,052.0	47.10	4.80	10,999.7	215.9	111.0	446,790.90	745,370.05	32° 13' 33.076 N	103° 32' 23.508 W	
11,084.0	49.10	3.10	11,021.1	239.7	112.6	446,814.66	745,371.69	32° 13' 33.311 N	103° 32' 23.487 W	
11,115.0	51.90	0.60	11,040.8	263.6	113.4	446,838.56	745,372.45	32° 13' 33.548 N	103° 32' 23.476 W	
11,146.0	55.60	359.60	11,059.2	288.6	113.4	446,863.56	745,372.49	32° 13' 33.795 N	103° 32' 23.473 W	
11,178.0	59.60	359.60	11,076.3	315.6	113.2	446,890.57	745,372.30	32° 13' 34.062 N	103° 32' 23.473 W	
11,209.0	63.10	359.40	11,091.2	342.8	113.0	446,917.77	745,372.06	32° 13' 34.332 N	103° 32' 23.474 W	
11,241.0	66.00	359.50	11,104.9	371.7	112.7	446,946.66	745,371.78	32° 13' 34.618 N	103° 32' 23.475 W	
11,272.0	69.90	359.80	11,116.6	400.4	112.5	446,975.39	745,371.61	32° 13' 34.902 N	103° 32' 23.474 W	
11,303.0	74.50	0.00	11,126.0	429.9	112.5	447,004.90	745,371.56	32° 13' 35.194 N	103° 32' 23.472 W	
11,335.0	79.40	0.20	11,133.2	461.1	112.5	447,036.06	745,371.61	32° 13' 35.502 N	103° 32' 23.469 W	
11,367.0	82.20	0.30	11,138.4	492.6	112.7	447,067.65	745,371.75	32° 13' 35.815 N	103° 32' 23.465 W	
11,398.0	84.10	0.50	11,142.1	523.4	112.9	447,098.42	745,371.96	32° 13' 36.119 N	103° 32' 23.459 W	
11,429.0	86.50	0.30	11,144.6	554.3	113.1	447,129.31	745,372.18	32° 13' 36.425 N	103° 32' 23.454 W	
11,523.0	90.30	0.70	11,147.2	648.3	113.9	447,223.26	745,373.00	32° 13' 37.354 N	103° 32' 23.437 W	
11,618.0	90.70	1.20	11,146.4	743.2	115.5	447,318.24	745,374.57	32° 13' 38.294 N	103° 32' 23.410 W	
11,712.0	91.50	2.00	11,144.6	837.2	118.1	447,412.18	745,377.20	32° 13' 39.224 N	103° 32' 23.371 W	
11,807.0	90.40	0.20	11,143.0	932.1	119.9	447,507.15	745,379.02	32° 13' 40.163 N	103° 32' 23.342 W	
11,901.0	89.60	0.20	11,143.0	1,026.1	120.3	447,601.15	745,379.35	32° 13' 41.093 N	103° 32' 23.330 W	
11,995.0	88.80	358.60	11,144.3	1,120.1	119.3	447,695.13	745,378.37	32° 13' 42.023 N	103° 32' 23.334 W	
12,090.0	87.70	359.10	11,147.2	1,215.1	117.4	447,790.06	745,376.46	32° 13' 42.963 N	103° 32' 23.348 W	
12,184.0	89.40	356.90	11,149.6	1,309.0	114.1	447,883.97	745,373.18	32° 13' 43.892 N	103° 32' 23.378 W	
12,279.0	90.70	357.30	11,149.5	1,403.8	109.3	447,978.84	745,368.37	32° 13' 44.832 N	103° 32' 23.425 W	
12,373.0	90.50	357.50	11,148.5	1,497.7	105.0	448,072.74	745,364.11	32° 13' 45.761 N	103° 32' 23.467 W	
12,467.0	89.80	357.60	11,148.3	1,591.7	101.0	448,166.65	745,360.09	32° 13' 46.691 N	103° 32' 23.506 W	
12,562.0	90.50	358.10	11,148.0	1,686.6	97.4	448,261.59	745,356.53	32° 13' 47.630 N	103° 32' 23.539 W	
12,656.0	89.20	356.30	11,148.3	1,780.5	92.8	448,355.47	745,351.94	32° 13' 48.560 N	103° 32' 23.584 W	
12,750.0	89.30	356.10	11,149.5	1,874.3	86.6	448,449.25	745,345.71	32° 13' 49.488 N	103° 32' 23.649 W	
12,845.0	90.50	356.30	11,149.7	1,969.0	80.3	448,544.04	745,339.41	32° 13' 50.427 N	103° 32' 23.714 W	
12,940.0	92.50	355.30	11,147.2	2,063.7	73.4	448,638.75	745,332.46	32° 13' 51.364 N	103° 32' 23.787 W	
13,034.0	91.60	354.50	11,143.8	2,157.3	65.0	448,732.31	745,324.11	32° 13' 52.291 N	103° 32' 23.876 W	
13,128.0	90.40	354.60	11,142.2	2,250.9	56.1	448,825.87	745,315.18	32° 13' 53.217 N	103° 32' 23.972 W	
13,224.0	88.10	354.90	11,143.5	2,346.5	47.3	448,921.46	745,306.40	32° 13' 54.164 N	103° 32' 24.066 W	
13,318.0	89.00	355.00	11,145.8	2,440.1	39.0	449,015.06	745,298.13	32° 13' 55.091 N	103° 32' 24.154 W	
13,413.0	89.60	354.50	11,147.0	2,534.7	30.3	449,109.65	745,289.43	32° 13' 56.027 N	103° 32' 24.247 W	
13,507.0	90.90	354.70	11,146.6	2,628.2	21.5	449,203.23	745,280.59	32° 13' 56.954 N	103° 32' 24.342 W	
13,601.0	89.10	355.90	11,146.6	2,721.9	13.8	449,296.91	745,272.89	32° 13' 57.881 N	103° 32' 24.424 W	
13,696.0	88.90	355.60	11,148.2	2,816.6	6.7	449,391.64	745,265.85	32° 13' 58.819 N	103° 32' 24.498 W	
13,790.0	89.00	357.10	11,150.0	2,910.4	0.8	449,485.43	745,259.86	32° 13' 59.748 N	103° 32' 24.559 W	
13,884.0	88.30	357.00	11,152.2	3,004.3	-4.1	449,579.28	745,255.03	32° 14' 0.677 N	103° 32' 24.607 W	
13,978.0	88.30	358.50	11,155.0	3,098.2	-7.8	449,673.16	745,251.34	32° 14' 1.606 N	103° 32' 24.642 W	
14,072.0	89.50	357.20	11,156.8	3,192.1	-11.3	449,767.07	745,247.81	32° 14' 2.536 N	103° 32' 24.675 W	
14,166.0	89.90	358.40	11,157.3	3,286.0	-14.9	449,861.00	745,244.20	32° 14' 3.465 N	103° 32' 24.709 W	
14,260.0	90.40	358.40	11,157.0	3,380.0	-17.5	449,954.96	745,241.58	32° 14' 4.395 N	103° 32' 24.732 W	
14,354.0	90.80	358.80	11,156.0	3,473.9	-19.8	450,048.93	745,239.28	32° 14' 5.325 N	103° 32' 24.750 W	
14,448.0	91.40	358.80	11,154.2	3,567.9	-21.8	450,142.89	745,237.32	32° 14' 6.255 N	103° 32' 24.765 W	
14,542.0	92.00	358.90	11,151.4	3,661.8	-23.7	450,236.83	745,235.43	32° 14' 7.185 N	103° 32' 24.779 W	
14,637.0	88.90	358.90	11,150.7	3,756.8	-25.5	450,331.80	745,233.61	32° 14' 8.125 N	103° 32' 24.792 W	
14,732.0	90.90	359.10	11,150.9	3,851.8	-27.1	450,426.78	745,231.95	32° 14' 9.065 N	103° 32' 24.803 W	
14,826.0	92.00	359.00	11,148.5	3,945.7	-28.7	450,520.73	745,230.39	32° 14' 9.995 N	103° 32' 24.813 W	
14,920.0	92.30	359.60	11,145.0	4,039.7	-29.9	450,614.66	745,229.24	32° 14' 10.924 N	103° 32' 24.819 W	
15,015.0	91.60	359.00	11,141.7	4,134.6	-31.0	450,709.60	745,228.08	32° 14' 11.864 N	103° 32' 24.824 W	
15,110.0	92.70	359.00	11,138.2	4,229.5	-32.7	450,804.51	745,226.43	32° 14' 12.803 N	103° 32' 24.835 W	
15,204.0	92.00	358.90	11,134.3	4,323.4	-34.4	450,898.42	745,224.70	32° 14' 13.733 N	103° 32' 24.847 W	
15,298.0	92.60	358.50	11,130.5	4,417.3	-36.5	450,992.32	745,222.57	32° 14' 14.662 N	103° 32' 24.864 W	
15,392.0	92.80	358.90	11,126.1	4,511.2	-38.7	451,086.19	745,220.44	32° 14' 15.591 N	103° 32' 24.880 W	

Nexus Directional Solutions, LP

Survey Report - Geographic

Company:	COG Production LLC	Local Co-ordinate Reference:	Well 3H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	WELL @ 3625.6usft (Original Well Elev)
Site:	Roy Batty Fed Com	MD Reference:	WELL @ 3625.6usft (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
15,487.0	92.70	359.70	11,121.5	4,606.1	-39.8	451,181.07	745,219.28	32° 14' 16.530 N	103° 32' 24.886 W
Last Nexus MWD Survey									
15,553.0	92.70	359.70	11,118.4	4,672.0	-40.2	451,247.00	745,218.94	32° 14' 17.182 N	103° 32' 24.884 W
15,601.0	92.70	359.70	11,116.2	4,719.9	-40.4	451,294.94	745,218.69	32° 14' 17.657 N	103° 32' 24.883 W
SLPB - PBHL Roy Batty Fee #3H									

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
15,487.0	11,121.5	4,606.1	-39.8	Last Nexus MWD Survey	
15,601.0	11,116.2	4,719.9	-40.4	SLPB	

Checked By: _____	Approved By: _____	Date: _____
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