

Results of Directional Survey

API number:	30-025-40914		
OGRID:		Operator:	COG OPERATING LLC
		Property:	DECKARD FEE # 1H

surface	ULSTR:	D	13	T	24S	R	33E
				190	FNL	660	FWL

BH Loc	ULSTR:	M	13	T	24S	R	33E
15540	MD	11034.2	TVD	346	FSL	731	FWL
				4934	FNL		

Top Perf/OH	ULSTR:	D	13	T	24S	R	33E
11150	MD	10928.6	TVD	550	FNL	817	FWL

Bot Perf/OH	ULSTR:	M	13	T	24S	R	33E
15422	MD	11031.2	TVD	464	FSL	727	FWL
				4816	FNL		

	MD	N/S	E/W	VD
	11118	-329.00	157.30	10919.8
TOP PERFS/OH	11150	-359.80	156.90	10928.60
	11150	-359.80	156.90	10928.60
	15404	-4608.50	66.10	11030.80
BOT PERFS/OH	15422	-4626.48	66.68	11031.22
	15494	-4698.40	69.00	11032.90

NEXT TO LAST	15494	-4698.40	69.00	11032.90
LAST READING	15540	-4744.40	70.80	11034.20
TD	15540	-4744.40	70.80	11034.20

Surface Location	190	FN	660	FW
Projected BHL	4934	FN	731	FW
Location of				
Top Perfs/OH	550	FN	817	FW
Bottom Perfs/OH	4816	FN	727	FW

SUMMARY of Subsurface Locations

Surface Location	D-13-24S-33E	190	FN	660	FW	Vert. Depth
Top Perfs/OH	D-13-24S-33E	550	FN	817	FW	10928.60
Bottom Perfs/OH	M-13-24S-33E	4816	FN	727	FW	11031.22
Projected TD	M-13-24S-33E	4934	FN	731	FW	11034.20

AUG 28 2013



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

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April 22, 2013

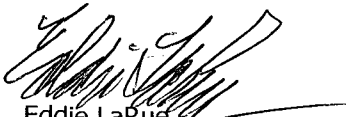
COG, LLC
One Concho Center
600 W. Illinois Ave.
Midland, TX 79701

RE: Deckard Fee #1H
190' FNL & 660' FWL
Sec. 13, T24S, R33E
Lea County, New Mexico

Dear Sir,

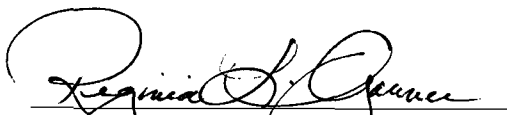
The attached is the Deviation Survey for the above captioned well.

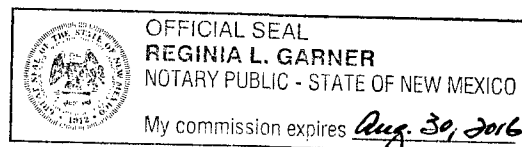
Very truly yours,


Eddie LaRue
Operations Manager

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 22nd day of April, 2013.


Regina L. Garner
Notary Public



Deckard Fee #1H

Date	Depth	Dev	Dir	TVD	Horiz Disp
3/15/2013	300	0.50			
3/15/2013	547	0.20			
3/16/2013	955	1.10		1045.00	
3/18/2013	1385	0.70	46.10	1425.00	
3/18/2013	1480	1.40	30.20	1520.00	
3/18/2013	1575	1.40	42.40	1615.00	
3/18/2013	1670	1.40			
3/18/2013	1956	1.20			
3/18/2013	2051	1.30			
3/18/2013	2337	1.60			
3/18/2013	2433	2.10			
3/18/2013	2523	1.10			
3/19/2013	2623	1.80	331.60	2664.00	
3/19/2013	2719	1.80	343.30	2759.00	
3/19/2013	2814	1.70	335.60	2854.00	
3/19/2013	2909	1.60	332.80	2949.00	
3/19/2013	3005	1.20			
3/19/2013	3195	1.10			
3/19/2013	3479	1.40	328.50		
3/19/2013	3575	1.20	342.80		
3/19/2013	3670	1.50	332.60		
3/20/2013	3766	1.40	354.60	3806.00	
3/20/2013	3861	1.50	353.00	3901.00	
3/20/2013	3956	1.80	325.30	3996.00	
3/20/2013	4052	1.60			
3/20/2013	4147	1.10			
3/20/2013	4242	1.50	314.80		
3/20/2013	4433	0.50	272.70		
3/20/2013	4528	0.80	108.60		
3/21/2013	4624	1.30	130.60	4664.00	
3/21/2013	4718	1.20	130.30	4758.00	
3/21/2013	4813	2.10	126.10	4853.00	
3/21/2013	4908	2.60			
3/21/2013	5004	1.50			
3/21/2013	5067	1.70			
3/23/2013	5303	0.40			
3/23/2013	5626	0.80			
3/23/2013	5926	0.90			
3/23/2013	6249	1.40			
3/23/2013	6693	0.40			
3/24/2013	7011	0.50			
3/24/2013	7233	0.80			
3/24/2013	7582	1.50			

Deckard Fee #1H

Date	Depth	Dev	Dir	TVD	Horiz Disp
3/24/2013	7772	1.70			
3/25/2013	8050	2.20			
3/25/2013	8150	1.80			
3/25/2013	8430	1.20			
3/25/2013	8735	1.60			
3/25/2013	8946	1.20			
3/26/2013	9200	1.90			
3/26/2013	9390	2.30			
3/26/2013	9613	1.70			
3/27/2013	9899	1.20		9986.00	
3/27/2013	10089	1.70			
3/27/2013	10247	1.30			
3/27/2013	10483	1.10			
3/28/2013	10659	1.70			
3/28/2013	10913	0.70			
3/28/2013	11072	1.30			
3/29/2013	11231	1.20		11318.00	
3/29/2013	11389	1.10		11476.00	
3/29/2013	11770	2.70			
3/29/2013	11949	2.30			
4/2/2013	10484	1.10	243.40		
4/3/2013	10551	3.50	217.40		
4/4/2013	10610	18.00	189.80	10606.59	
4/4/2013	10641	22.30	187.80	10635.69	
4/4/2013	10705	24.00	182.00	10693.00	
4/4/2013	10731	32.50	179.90	10715.88	13.78
4/4/2013	10768	37.10	177.80	10745.96	7.33
4/4/2013	10800	40.20	177.60	10770.00	27.30
4/5/2013	10862	43.80	183.30	10913.00	
4/5/2013	10894	47.80	187.70	10944.00	
4/5/2013	10926	49.20	184.70	10976.00	
4/5/2013	10957	45.10	182.60	11008.00	
4/9/2013	10342	3.30	131.40		
4/9/2013	10425	9.80	137.40		
4/9/2013	10455	10.40	136.50		
4/12/2013	10580	21.90	148.80	10573.19	
4/12/2013	10612	25.30	151.30		
4/12/2013	10645	28.20	155.80		
4/12/2013	10675	32.30	162.00		
4/12/2013	10707	34.10	163.00		
4/12/2013	10739	38.10	166.90		
4/13/2013	10771	40.80	170.40	10817.00	
4/13/2013	10802	43.70	173.90	10848.00	

Deckard Fee #1H

Date	Depth	Dev	Dir	TVD	Horiz Disp
4/13/2013	10833	46.40	176.20	10879.00	
4/13/2013	10864	50.00	178.20	10910.00	
4/13/2013	10896	52.90	180.30	10942.00	
4/13/2013	10896	52.90	180.30	10821.00	
4/13/2013	10925	55.70	181.90	10839.70	
4/13/2013	10960	58.80	182.40	10857.00	
4/13/2013	10991	62.20	181.50		
4/13/2013	11023	65.20	181.70		
4/13/2013	11055	68.10	181.10		
4/13/2013	11086	71.10	181.10		
4/13/2013	11118	73.10	181.00		
4/14/2013	11150	74.70	180.40	10928.00	
4/14/2013	11213	78.90	180.40		
4/14/2013	11245	81.80	180.60		
4/14/2013	11277	84.70	181.00		
4/14/2013	11308	86.40	180.80		
4/14/2013	11403	86.40	180.80		
4/14/2013	11498	86.70	180.60		
4/15/2013	11594	88.10	180.80		
4/15/2013	11689	88.90	180.60		
4/15/2013	11784	88.50	180.10		
4/15/2013	11879	88.90	179.90		
4/15/2013	11975	88.80	179.40		
4/15/2013	12070	89.40	180.40		
4/15/2013	12166	89.30	180.10		
4/15/2013	12356	89.50	181.90		
4/15/2013	12451	90.30	181.90		
4/15/2013	12546	89.10	182.00		
4/15/2013	12642	89.90	182.20		
4/16/2013	12737	90.50	181.50		
4/16/2013	12832	89.40	182.70		
4/16/2013	12928	88.00	183.10		
4/16/2013	13023	88.00	182.70		
4/16/2013	13118	88.10	182.60		
4/16/2013	13214	89.20	181.90		
4/16/2013	13309	88.00	182.00		
4/16/2013	13500	89.00	182.40		
4/16/2013	13595	89.30	182.40		
4/16/2013	13690	89.50	182.60		
4/16/2013	13786	89.70	182.40		
4/17/2013	13881	87.90	181.90		
4/17/2013	13977	89.00	182.20		
4/17/2013	14072	89.80	182.20		

Deckard Fee #1H

Date	Depth	Dev	Dir	TVD	Horiz Disp
4/17/2013	14167	88.30	181.70		
4/17/2013	14263	88.90	181.30		
4/17/2013	14358	88.90	181.10		
4/17/2013	14458	89.30	181.00		
4/17/2013	14548	88.80	181.50		
4/17/2013	14643	89.00	181.30		
4/17/2013	14737	88.60	181.00		
4/17/2013	14832	89.00	180.60		
4/17/2013	14928	89.70	180.10		
4/17/2013	15023	90.10	179.70		
4/17/2013	15118	89.30	179.70		
4/18/2013	15214	89.80	179.70		
4/18/2013	15309	89.70	179.40		
4/18/2013	15372	88.60	178.90		



A GYRO TECHNOLOGIES INC. COMPANY

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

HOBAS CO.

AUG 02 2013

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April 4, 2013

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

Attn: Kanicia Castillo

Re: **Deckard Fee No 001H**

Please find enclosed a copy of the survey from 0' to 11,000' ran on the above referenced well.

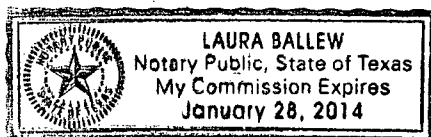
If I can be of any further service, please do not hesitate to call me at 800-606-4976.

Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 4th day of April, A.D., 2013, by Keith Havelka.



Laura Ballew
Notary Public, State of Texas



Company: COG Operating LLC (Concho)
 Lease/Well: Deckard Fee/No 001H
 Location: S13 T24s R33e
 Rig Name: Silver Oak #12
 State/County: New Mexico/Lea
 Latitude: 32.22, Longitude: -103.53
 GRID North is 0.43 Degrees East of True North
 VS-Azi: 0.00 Degrees



RKB : 18 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: deckard fee #1h gyro survey.ut
 Minimum Curvature Method
 Report Date/Time: 4/4/2013 / 09:38

Vaughn Energy Services
 (432) 563-5444
 Gardendale, TX

Surveyor: Dustin Wedel
 Deckard Fee No 001H / API 30-025-40914

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 AUG 02 2013
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Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.23	9.26	100.00	0.20	0.03	0.20	0.20	9.26	0.23
200.00	0.46	0.52	200.00	0.80	0.07	0.80	0.80	4.89	0.24
300.00	0.38	11.70	300.00	1.53	0.14	1.53	1.54	5.22	0.11
400.00	0.30	22.88	399.99	2.10	0.31	2.10	2.12	8.41	0.10
500.00	0.26	58.70	499.99	2.47	0.61	2.47	2.54	13.90	0.18
600.00	0.22	94.52	599.99	2.57	1.00	2.57	2.76	21.27	0.15
700.00	0.27	40.12	699.99	2.73	1.35	2.73	3.05	26.21	0.23
800.00	0.32	345.73	799.99	3.18	1.43	3.18	3.49	24.19	0.27
900.00	0.35	23.46	899.99	3.73	1.48	3.73	4.01	21.69	0.22
1000.00	0.38	61.19	999.99	4.17	1.90	4.17	4.58	24.45	0.24
1100.00	0.53	65.19	1099.98	4.52	2.60	4.52	5.22	29.93	0.15
1200.00	0.67	59.19	1199.98	5.01	3.52	5.01	6.13	35.09	0.16
1300.00	0.74	55.48	1299.97	5.68	4.56	5.68	7.28	38.74	0.08
1400.00	0.80	49.78	1399.96	6.50	5.62	6.50	8.59	40.88	0.10
1500.00	1.07	34.62	1499.95	7.71	6.69	7.71	10.21	40.92	0.36
1600.00	1.33	19.47	1599.93	9.57	7.60	9.57	12.22	38.45	0.41
1700.00	1.40	22.22	1699.90	11.79	8.45	11.79	14.51	35.62	0.10
1800.00	1.48	18.97	1799.87	14.14	9.33	14.14	16.94	33.41	0.11

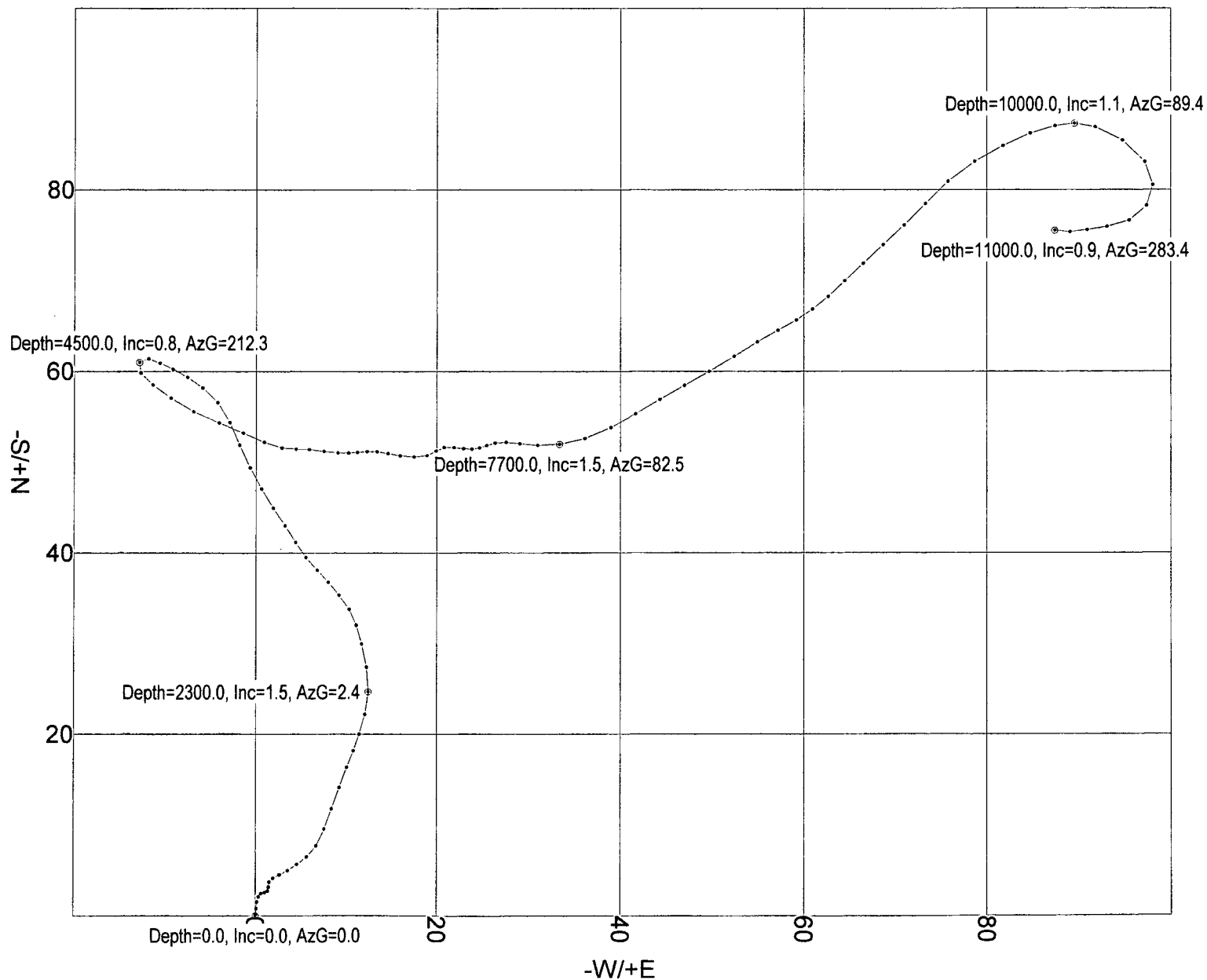
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	1.24	20.45	1899.84	16.38	10.13	16.38	19.26	31.73	0.24
2000.00	1.01	21.94	1999.82	18.21	10.84	18.21	21.19	30.75	0.23
2100.00	1.20	17.41	2099.80	20.03	11.48	20.03	23.09	29.81	0.21
2200.00	1.40	14.88	2199.77	22.21	12.11	22.21	25.30	28.59	0.20
2300.00	1.51	2.37	2299.74	24.71	12.47	24.71	27.68	26.79	0.34
2400.00	1.62	349.86	2399.70	27.42	12.28	27.42	30.04	24.13	0.36
2500.00	1.36	345.77	2499.67	29.96	11.74	29.96	32.18	21.39	0.28
2600.00	1.11	341.68	2599.65	32.03	11.14	32.03	33.92	19.18	0.27
2700.00	1.10	330.49	2699.63	33.79	10.36	33.79	35.34	17.05	0.22
2800.00	1.10	319.30	2799.61	35.35	9.26	35.35	36.55	14.68	0.21
2900.00	1.06	318.68	2899.59	36.78	8.03	36.78	37.64	12.31	0.04
3000.00	1.03	314.06	2999.58	38.10	6.77	38.10	38.70	10.07	0.09
3100.00	1.13	321.68	3099.56	39.50	5.51	39.50	39.88	7.95	0.17
3200.00	1.22	329.30	3199.54	41.19	4.36	41.19	41.42	6.04	0.18
3300.00	1.30	325.97	3299.51	43.04	3.18	43.04	43.16	4.22	0.10
3400.00	1.37	326.65	3399.49	44.97	1.89	44.97	45.01	2.41	0.07
3500.00	1.47	329.96	3499.46	47.08	0.59	47.08	47.08	0.72	0.13
3600.00	1.57	333.26	3599.42	49.42	-0.67	49.42	49.42	359.23	0.14
3700.00	1.57	337.25	3699.38	51.90	-1.81	51.90	51.93	358.00	0.11
3800.00	1.56	335.25	3799.35	54.40	-2.91	54.40	54.47	356.94	0.06
3900.00	1.41	321.10	3899.31	56.59	-4.25	56.59	56.74	355.71	0.39
4000.00	1.26	306.96	3999.29	58.20	-5.90	58.20	58.50	354.22	0.36
4100.00	1.12	301.60	4099.26	59.37	-7.60	59.37	59.85	352.70	0.18
4200.00	0.98	296.25	4199.25	60.26	-9.20	60.26	60.96	351.32	0.17
4300.00	0.84	292.49	4299.24	60.92	-10.64	60.92	61.84	350.09	0.15
4400.00	0.71	288.73	4399.23	61.40	-11.91	61.40	62.54	349.02	0.14
4500.00	0.80	212.33	4499.22	61.01	-12.87	61.01	62.35	348.09	0.94
4600.00	0.89	140.94	4599.21	59.82	-12.76	59.82	61.16	347.96	0.99
4700.00	1.26	129.69	4699.19	58.51	-11.43	58.51	59.62	348.95	0.42
4800.00	1.62	123.44	4799.16	57.03	-9.40	57.03	57.80	350.64	0.40
4900.00	1.71	117.04	4899.12	55.58	-6.89	55.58	56.00	352.93	0.20
5000.00	1.79	110.63	4999.07	54.35	-4.10	54.35	54.50	355.68	0.21
5100.00	1.55	115.32	5099.03	53.22	-1.41	53.22	53.24	358.48	0.28
5200.00	1.31	112.01	5199.00	52.21	0.87	52.21	52.22	0.96	0.25
5300.00	1.04	100.61	5298.98	51.61	2.83	51.61	51.69	3.14	0.36
5400.00	0.77	89.20	5398.97	51.45	4.40	51.45	51.64	4.88	0.32
5500.00	0.90	94.43	5498.95	51.40	5.85	51.40	51.74	6.50	0.15
5600.00	1.02	97.65	5598.94	51.22	7.52	51.22	51.77	8.36	0.14
5700.00	0.79	92.96	5698.93	51.07	9.10	51.07	51.87	10.10	0.25

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	0.56	88.26	5798.92	51.05	10.27	51.05	52.07	11.38	0.24
5900.00	0.58	84.54	5898.92	51.11	11.26	51.11	52.34	12.43	0.04
6000.00	0.60	86.83	5998.91	51.19	12.29	51.19	52.64	13.51	0.03
6100.00	0.67	95.37	6098.90	51.16	13.40	51.16	52.89	14.68	0.12
6200.00	0.73	101.91	6198.90	50.98	14.61	50.98	53.03	15.99	0.10
6300.00	0.83	97.96	6298.89	50.74	15.95	50.74	53.19	17.45	0.11
6400.00	0.92	93.01	6398.88	50.60	17.48	50.60	53.53	19.05	0.12
6500.00	0.74	72.99	6498.87	50.75	18.90	50.75	54.15	20.42	0.34
6600.00	0.55	51.97	6598.86	51.23	19.89	51.23	54.96	21.22	0.30
6700.00	0.60	76.89	6698.85	51.65	20.78	51.65	55.67	21.92	0.25
6800.00	0.66	101.82	6798.85	51.65	21.86	51.65	56.08	22.94	0.28
6900.00	0.57	94.76	6898.84	51.49	22.92	51.49	56.36	23.99	0.12
7000.00	0.48	87.70	6998.84	51.46	23.83	51.46	56.71	24.85	0.11
7100.00	0.48	75.86	7098.84	51.58	24.65	51.58	57.17	25.54	0.10
7200.00	0.48	66.03	7198.83	51.85	25.44	51.85	57.76	26.13	0.08
7300.00	0.61	79.11	7298.83	52.13	26.35	52.13	58.41	26.81	0.18
7400.00	0.74	92.20	7398.82	52.20	27.52	52.20	59.01	27.80	0.20
7500.00	0.99	98.53	7498.81	52.05	29.02	52.05	59.59	29.14	0.26
7600.00	1.23	92.86	7598.79	51.87	30.94	51.87	60.40	30.82	0.27
7700.00	1.51	82.47	7698.76	51.99	33.32	51.99	61.75	32.66	0.37
7800.00	1.78	72.08	7798.72	52.64	36.11	52.64	63.83	34.45	0.40
7900.00	1.78	63.12	7898.67	53.82	38.97	53.82	66.44	35.91	0.28
8000.00	1.77	58.16	7998.63	55.33	41.66	55.33	69.26	36.98	0.15
8100.00	1.77	60.63	8098.58	56.90	44.32	56.90	72.13	37.91	0.08
8200.00	1.78	59.10	8198.53	58.46	47.00	58.46	75.01	38.80	0.05
8300.00	1.81	61.64	8298.48	60.01	49.72	60.01	77.93	39.64	0.09
8400.00	1.84	56.18	8398.43	61.65	52.44	61.65	80.94	40.39	0.18
8500.00	1.60	58.85	8498.38	63.26	54.97	63.26	83.81	40.99	0.26
8600.00	1.35	61.52	8598.35	64.55	57.20	64.55	86.25	41.55	0.25
8700.00	1.27	59.11	8698.33	65.68	59.19	65.68	88.41	42.02	0.10
8800.00	1.18	52.70	8798.30	66.87	60.95	66.87	90.48	42.35	0.16
8900.00	1.35	48.57	8898.28	68.27	62.65	68.27	92.66	42.54	0.20
9000.00	1.53	44.44	8998.25	70.01	64.48	70.01	95.18	42.64	0.21
9100.00	1.64	47.80	9098.21	71.92	66.47	71.92	97.94	42.74	0.14
9200.00	1.75	45.16	9198.16	73.96	68.61	73.96	100.88	42.85	0.13
9300.00	1.86	48.13	9298.12	76.11	70.90	76.11	104.02	42.97	0.14
9400.00	1.97	41.10	9398.06	78.49	73.23	78.49	107.35	43.02	0.26
9500.00	2.05	49.54	9498.00	80.94	75.72	80.94	110.84	43.09	0.31
9600.00	2.13	57.97	9597.93	83.09	78.65	83.09	114.41	43.43	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
9700.00	1.96	62.93	9697.87	84.85	81.75	84.85	117.83	43.94	0.24
9800.00	1.80	67.88	9797.81	86.22	84.73	86.22	120.88	44.50	0.23
9900.00	1.43	78.63	9897.78	87.05	87.40	87.05	123.36	45.11	0.48
10000.00	1.06	89.38	9997.75	87.31	89.54	87.31	125.06	45.72	0.44
10100.00	1.63	106.55	10097.72	86.92	91.83	86.92	126.44	46.57	0.69
10200.00	2.20	123.72	10197.67	85.45	94.78	85.45	127.61	47.97	0.80
10300.00	1.79	148.18	10297.61	83.06	97.20	83.06	127.85	49.49	0.94
10400.00	1.38	177.64	10397.57	80.53	98.08	80.53	126.90	50.61	0.90
10500.00	1.46	213.67	10497.54	78.27	97.42	78.27	124.96	51.22	0.88
10600.00	1.55	244.71	10597.51	76.63	95.48	76.63	122.43	51.25	0.81
10700.00	1.35	264.09	10697.48	75.93	93.09	75.93	120.13	50.80	0.53
10800.00	1.15	258.47	10797.46	75.61	90.93	75.61	118.26	50.26	0.23
10900.00	1.03	268.45	10897.44	75.38	89.05	75.38	116.67	49.75	0.22
11000.00	0.91	283.43	10997.42	75.54	87.37	75.54	115.50	49.15	0.28



Vaughn Energy Services
(432) 563-5444
Gardendale, TX
Surveyor: Dustin Wedel
Deckard Fee No 001H / API 30-025-40914



VES Survey Date: 03/29/2013

HOEBS OCD

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COG Operating LLC

Lea County, NM

Deckard Fee

#1H

ST1

Design: ST1

Standard Survey Report

22 April, 2013



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Lea County, NM	TVD Reference:	RKB @ 3618.8usft (Silver Oak #12)
Site:	Deckard Fee	MD Reference:	RKB @ 3618.8usft (Silver Oak #12)
Well:	#1H	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	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	Deckard Fee		
Site Position:		Northing:	446,208.80 usft
From:	Map	Easting:	747,808.80 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 13' 27.137 N
		Longitude:	103° 31' 55.170 W
		Grid Convergence:	0.43 °

Well	#1H		
Well Position	+N/-S	0.0 usft	Northing: 446,208.80 usft
	+E/-W	0.0 usft	Easting: 747,808.80 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 13' 27.137 N
		Longitude:	103° 31' 55.170 W
		Ground Level:	3,600.8 usft

Wellbore	ST1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/5/2013	7.35	60.15	48,439

Design	ST1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	10,300.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	179.55	

Survey Program	Date	4/22/2013			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	10,300.0	Survey #1 - VES1 (Pilot)	CB-GYRO-MS	Camera based gyro multishot	
10,391.0	15,494.0	Survey #3 - Crescent2 (ST1)	MWD	MWD - Standard	
15,540.0	15,540.0	Survey #4 - PTB (ST1)	BLIND	Blind drilling, where no tool is applied	

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	0.23	9.26	100.0	0.2	0.0	-0.2	0.23	0.23	0.00	
200.0	0.46	0.52	200.0	0.8	0.1	-0.8	0.24	0.23	-8.74	
300.0	0.38	11.70	300.0	1.5	0.1	-1.5	0.11	-0.08	11.18	
400.0	0.30	22.88	400.0	2.1	0.3	-2.1	0.10	-0.08	11.18	
500.0	0.26	58.70	500.0	2.4	0.6	-2.4	0.18	-0.04	35.82	
600.0	0.22	94.52	600.0	2.6	1.0	-2.5	0.15	-0.04	35.82	
700.0	0.27	40.12	700.0	2.7	1.3	-2.7	0.23	0.05	-54.40	
800.0	0.32	345.73	800.0	3.2	1.4	-3.2	0.27	0.05	-54.39	

Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Lea County, NM	TVD Reference:	RKB @ 3618.8usft (Silver Oak #12)
Site:	Deckard Fee	MD Reference:	RKB @ 3618.8usft (Silver Oak #12)
Well:	#1H	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	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	0.35	23.46	900.0	3.7	1.5	-3.7	0.22	0.03	37.73
1,000.0	0.38	61.19	1,000.0	4.2	1.9	-4.1	0.24	0.03	37.73
1,100.0	0.53	65.19	1,100.0	4.5	2.6	-4.5	0.15	0.15	4.00
1,200.0	0.67	59.19	1,200.0	5.0	3.5	-5.0	0.15	0.14	-6.00
1,300.0	0.74	55.48	1,300.0	5.7	4.5	-5.6	0.08	0.07	-3.71
1,400.0	0.80	49.78	1,400.0	6.5	5.6	-6.4	0.10	0.06	-5.70
1,500.0	1.07	34.62	1,499.9	7.7	6.7	-7.7	0.36	0.27	-15.16
1,600.0	1.33	19.47	1,599.9	9.6	7.6	-9.5	0.41	0.26	-15.15
1,700.0	1.40	22.22	1,699.9	11.8	8.4	-11.7	0.10	0.07	2.75
1,800.0	1.48	18.97	1,799.9	14.1	9.3	-14.1	0.11	0.08	-3.25
1,900.0	1.24	20.45	1,899.8	16.4	10.1	-16.3	0.24	-0.24	1.48
2,000.0	1.01	21.94	1,999.8	18.2	10.8	-18.1	0.23	-0.23	1.49
2,100.0	1.20	17.41	2,099.8	20.0	11.5	-19.9	0.21	0.19	-4.53
2,200.0	1.40	14.88	2,199.8	22.2	12.1	-22.1	0.21	0.20	-2.53
2,300.0	1.51	2.37	2,299.7	24.7	12.5	-24.6	0.34	0.11	-12.51
2,400.0	1.62	349.86	2,399.7	27.4	12.3	-27.3	0.36	0.11	-12.51
2,500.0	1.36	345.77	2,499.7	30.0	11.7	-29.9	0.28	-0.26	-4.09
2,600.0	1.11	341.68	2,599.6	32.0	11.1	-31.9	0.26	-0.25	-4.09
2,700.0	1.10	330.49	2,699.6	33.8	10.4	-33.7	0.22	-0.01	-11.19
2,800.0	1.10	319.30	2,799.6	35.3	9.3	-35.3	0.21	0.00	-11.19
2,900.0	1.06	318.68	2,899.6	36.8	8.0	-36.7	0.04	-0.04	-0.62
3,000.0	1.03	314.06	2,999.6	38.1	6.8	-38.0	0.09	-0.03	-4.62
3,100.0	1.13	321.68	3,099.6	39.5	5.5	-39.4	0.17	0.10	7.62
3,200.0	1.22	329.30	3,199.5	41.2	4.4	-41.1	0.18	0.09	7.62
3,300.0	1.30	325.97	3,299.5	43.0	3.2	-43.0	0.11	0.08	-3.33
3,400.0	1.37	326.65	3,399.5	45.0	1.9	-45.0	0.07	0.07	0.68
3,500.0	1.47	329.96	3,499.5	47.1	0.6	-47.1	0.13	0.10	3.31
3,600.0	1.57	333.26	3,599.4	49.4	-0.7	-49.4	0.13	0.10	3.30
3,700.0	1.57	337.25	3,699.4	51.9	-1.8	-51.9	0.11	0.00	3.99
3,800.0	1.56	335.25	3,799.3	54.4	-2.9	-54.4	0.06	-0.01	-2.00
3,900.0	1.41	321.10	3,899.3	56.6	-4.3	-56.6	0.39	-0.15	-14.15
4,000.0	1.26	306.96	3,999.3	58.2	-5.9	-58.3	0.36	-0.15	-14.14
4,100.0	1.12	301.60	4,099.3	59.4	-7.6	-59.4	0.18	-0.14	-5.36
4,200.0	0.98	296.25	4,199.2	60.3	-9.2	-60.3	0.17	-0.14	-5.35
4,300.0	0.84	292.49	4,299.2	60.9	-10.7	-61.0	0.15	-0.14	-3.76
4,400.0	0.71	288.73	4,399.2	61.4	-11.9	-61.5	0.14	-0.13	-3.76
4,500.0	0.80	212.33	4,499.2	61.0	-12.9	-61.1	0.94	0.09	-76.40
4,600.0	0.89	140.94	4,599.2	59.8	-12.8	-59.9	0.99	0.09	-71.39
4,700.0	1.26	129.69	4,699.2	58.5	-11.4	-58.6	0.42	0.37	-11.25
4,800.0	1.62	123.44	4,799.2	57.0	-9.4	-57.1	0.39	0.36	-6.25
4,900.0	1.71	117.04	4,899.1	55.6	-6.9	-55.6	0.21	0.09	-6.40
5,000.0	1.79	110.63	4,999.1	54.4	-4.1	-54.4	0.21	0.08	-6.41
5,100.0	1.55	115.32	5,099.0	53.2	-1.4	-53.2	0.28	-0.24	4.69

Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Lea County, NM	TVD Reference:	RKB @ 3618.8usft (Silver Oak #12)
Site:	Deckard Fee	MD Reference:	RKB @ 3618.8usft (Silver Oak #12)
Well:	#1H	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	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	1.31	112.01	5,199.0	52.2	0.9	-52.2	0.25	-0.24	-3.31
5,300.0	1.04	100.61	5,299.0	51.6	2.8	-51.6	0.36	-0.27	-11.40
5,400.0	0.77	89.20	5,399.0	51.5	4.4	-51.4	0.32	-0.27	-11.41
5,500.0	0.90	94.43	5,499.0	51.4	5.8	-51.4	0.15	0.13	5.23
5,600.0	1.02	97.65	5,598.9	51.2	7.5	-51.2	0.13	0.12	3.22
5,700.0	0.79	92.96	5,698.9	51.1	9.1	-51.0	0.24	-0.23	-4.69
5,800.0	0.56	88.26	5,798.9	51.1	10.2	-51.0	0.24	-0.23	-4.70
5,900.0	0.58	84.54	5,898.9	51.1	11.2	-51.0	0.04	0.02	-3.72
6,000.0	0.60	86.83	5,998.9	51.2	12.3	-51.1	0.03	0.02	2.29
6,100.0	0.67	95.37	6,098.9	51.2	13.4	-51.1	0.12	0.07	8.54
6,200.0	0.73	101.91	6,198.9	51.0	14.6	-50.9	0.10	0.06	6.54
6,300.0	0.83	97.96	6,298.9	50.8	15.9	-50.6	0.11	0.10	-3.95
6,400.0	0.92	93.01	6,398.9	50.6	17.4	-50.5	0.12	0.09	-4.95
6,500.0	0.74	72.99	6,498.9	50.8	18.8	-50.6	0.34	-0.18	-20.02
6,600.0	0.55	51.97	6,598.9	51.2	19.8	-51.1	0.30	-0.19	-21.02
6,700.0	0.60	76.89	6,698.9	51.7	20.7	-51.5	0.25	0.05	24.92
6,800.0	0.66	101.82	6,798.8	51.7	21.8	-51.5	0.28	0.06	24.93
6,900.0	0.57	94.76	6,898.8	51.5	22.9	-51.3	0.12	-0.09	-7.06
7,000.0	0.48	87.70	6,998.8	51.5	23.8	-51.3	0.11	-0.09	-7.06
7,100.0	0.48	75.86	7,098.8	51.6	24.6	-51.4	0.10	0.00	-11.84
7,200.0	0.48	66.03	7,198.8	51.9	25.4	-51.7	0.08	0.00	-9.83
7,300.0	0.61	79.11	7,298.8	52.1	26.3	-51.9	0.18	0.13	13.08
7,400.0	0.74	92.20	7,398.8	52.2	27.5	-52.0	0.20	0.13	13.09
7,500.0	0.99	98.53	7,498.8	52.1	29.0	-51.8	0.27	0.25	6.33
7,600.0	1.23	92.86	7,598.8	51.9	30.9	-51.6	0.26	0.24	-5.67
7,700.0	1.51	82.47	7,698.8	52.0	33.3	-51.7	0.37	0.28	-10.39
7,800.0	1.78	72.08	7,798.7	52.7	36.0	-52.4	0.40	0.27	-10.39
7,900.0	1.78	63.12	7,898.7	53.8	38.9	-53.5	0.28	0.00	-8.96
8,000.0	1.77	58.16	7,998.6	55.3	41.6	-55.0	0.15	-0.01	-4.96
8,100.0	1.77	60.63	8,098.6	56.9	44.3	-56.6	0.08	0.00	2.47
8,200.0	1.78	59.10	8,198.5	58.5	46.9	-58.1	0.05	0.01	-1.53
8,300.0	1.81	61.64	8,298.5	60.0	49.7	-59.6	0.09	0.03	2.54
8,400.0	1.84	56.18	8,398.4	61.7	52.4	-61.3	0.18	0.03	-5.46
8,500.0	1.60	58.85	8,498.4	63.3	54.9	-62.8	0.25	-0.24	2.67
8,600.0	1.35	61.52	8,598.4	64.6	57.1	-64.1	0.26	-0.25	2.67
8,700.0	1.27	59.11	8,698.3	65.7	59.1	-65.2	0.10	-0.08	-2.41
8,800.0	1.18	52.70	8,798.3	66.9	60.9	-66.4	0.16	-0.09	-6.41
8,900.0	1.35	48.57	8,898.3	68.3	62.6	-67.8	0.19	0.17	-4.13
9,000.0	1.53	44.44	8,998.2	70.0	64.4	-69.5	0.21	0.18	-4.13
9,100.0	1.64	47.80	9,098.2	71.9	66.4	-71.4	0.14	0.11	3.36
9,200.0	1.75	45.16	9,198.2	74.0	68.6	-73.4	0.13	0.11	-2.64
9,300.0	1.86	48.13	9,298.1	76.1	70.9	-75.6	0.14	0.11	2.97
9,400.0	1.97	41.10	9,398.1	78.5	73.2	-77.9	0.26	0.11	-7.03

Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Lea County, NM	TVD Reference:	RKB @ 3618.8usft (Silver Oak #12)
Site:	Deckard Fee	MD Reference:	RKB @ 3618.8usft (Silver Oak #12)
Well:	#1H	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	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)
9,500.0	2.05	49.54	9,498.0	81.0	75.7	-80.4	0.31	0.08	8.44
9,600.0	2.13	57.97	9,597.9	83.1	78.6	-82.5	0.32	0.08	8.43
9,700.0	1.96	62.93	9,697.9	84.9	81.7	-84.2	0.25	-0.17	4.96
9,800.0	1.80	67.88	9,797.8	86.3	84.7	-85.6	0.23	-0.16	4.95
9,900.0	1.43	78.63	9,897.8	87.1	87.4	-86.4	0.48	-0.37	10.75
10,000.0	1.06	89.38	9,997.8	87.3	89.5	-86.6	0.44	-0.37	10.75
10,100.0	1.63	106.55	10,097.7	86.9	91.8	-86.2	0.69	0.57	17.17
10,200.0	2.20	123.72	10,197.7	85.5	94.8	-84.7	0.80	0.57	17.17
10,300.0	1.79	148.18	10,297.6	83.1	97.2	-82.3	0.94	-0.41	24.46
Tie into Pilot @ 10300' MD									
10,391.0	3.30	131.40	10,388.5	80.1	99.9	-79.4	1.83	1.66	-18.44
10,455.0	10.40	136.50	10,452.0	74.7	105.3	-73.9	11.12	11.09	7.97
10,487.0	9.90	135.80	10,483.5	70.7	109.2	-69.8	1.61	-1.56	-2.19
10,519.0	12.00	140.20	10,514.9	66.1	113.2	-65.2	7.06	6.56	13.75
KOP - 10519.0' MD, 10514.9' TVD									
10,549.0	17.00	143.90	10,544.0	60.2	117.8	-59.3	16.94	16.67	12.33
10,580.0	21.90	148.80	10,573.2	51.6	123.5	-50.6	16.65	15.81	15.81
10,612.0	25.30	151.30	10,602.5	40.5	129.9	-39.5	11.07	10.63	7.81
10,644.0	28.20	155.80	10,631.1	27.6	136.2	-26.5	11.05	9.06	14.06
10,675.0	31.00	160.20	10,658.0	13.4	141.9	-12.3	11.43	9.03	14.19
10,707.0	34.10	163.00	10,685.0	-3.0	147.4	4.1	10.77	9.69	8.75
10,739.0	38.10	166.90	10,710.9	-21.2	152.2	22.4	14.41	12.50	12.19
10,771.0	40.80	170.40	10,735.6	-41.1	156.2	42.3	10.93	8.44	10.94
10,802.0	43.70	173.90	10,758.5	-61.7	159.0	63.0	12.04	9.35	11.29
10,833.0	46.40	176.20	10,780.4	-83.6	160.9	84.8	10.17	8.71	7.42
10,864.0	50.00	178.20	10,801.1	-106.7	162.0	107.9	12.57	11.61	6.45
10,896.0	52.90	180.30	10,821.0	-131.7	162.4	133.0	10.41	9.06	6.56
10,906.4	53.81	180.83	10,827.2	-140.0	162.3	141.3	9.65	8.73	5.12
Cross into 330 Lease - 10906.4' MD, 10827.2' TVD, 53.81° INC, 141.3° VS									
10,928.0	55.70	181.90	10,839.7	-157.7	161.8	158.9	9.65	8.76	4.94
10,960.0	58.80	182.40	10,857.0	-184.6	160.8	185.8	9.78	9.69	1.56
10,991.0	62.20	181.50	10,872.3	-211.5	159.9	212.8	11.25	10.97	-2.90
11,023.0	65.20	181.70	10,886.5	-240.2	159.1	241.4	9.39	9.38	0.63
11,055.0	68.10	181.10	10,899.1	-269.6	158.4	270.8	9.22	9.06	-1.88
11,086.0	71.10	181.10	10,909.9	-298.6	157.8	299.8	9.68	9.68	0.00
11,118.0	73.10	181.00	10,919.8	-329.0	157.3	330.3	6.26	6.25	-0.31
11,150.0	74.70	180.40	10,928.6	-359.8	156.9	361.0	5.31	5.00	-1.88
11,182.0	76.40	180.30	10,936.6	-390.8	156.7	392.0	5.32	5.31	-0.31
11,213.0	78.90	180.40	10,943.3	-421.1	156.5	422.3	8.07	8.06	0.32
11,245.0	81.80	180.80	10,948.6	-452.6	156.2	453.8	9.15	9.06	1.25
11,277.0	84.70	181.00	10,952.4	-484.4	155.7	485.6	9.08	9.06	0.63
11,308.0	86.40	180.80	10,954.8	-515.3	155.2	516.5	5.52	5.48	-0.65
11,340.0	86.30	181.10	10,956.8	-547.2	154.7	548.4	0.99	-0.31	0.94
EOC - 11340.0' MD, 10956.8' TVD, 86.30° INC, 548.4° VS									

Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Lea County, NM	TVD Reference:	RKB @ 3618.8usft (Silver Oak #12)
Site:	Deckard Fee	MD Reference:	RKB @ 3618.8usft (Silver Oak #12)
Well:	#1H	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	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)
11,403.0	86.40	180.80	10,960.8	-610.1	153.7	611.2	0.50	0.16	-0.48
11,498.0	86.70	180.60	10,966.6	-704.9	152.5	706.1	0.38	0.32	-0.21
11,594.0	88.10	180.80	10,970.9	-800.8	151.3	801.9	1.47	1.46	0.21
11,689.0	88.90	180.60	10,973.4	-895.7	150.2	896.9	0.87	0.84	-0.21
11,784.0	88.50	180.10	10,975.6	-990.7	149.6	991.8	0.67	-0.42	-0.53
11,879.0	88.90	179.90	10,977.7	-1,085.7	149.6	1,086.8	0.47	0.42	-0.21
11,975.0	88.80	179.40	10,979.6	-1,181.7	150.2	1,182.8	0.53	-0.10	-0.52
12,070.0	89.40	180.40	10,981.1	-1,276.6	150.3	1,277.8	1.23	0.63	1.05
12,166.0	89.30	180.10	10,982.2	-1,372.6	149.9	1,373.8	0.33	-0.10	-0.31
12,261.0	89.70	180.30	10,983.0	-1,467.6	149.6	1,468.8	0.47	0.42	0.21
12,356.0	89.50	181.90	10,983.7	-1,562.6	147.8	1,563.7	1.70	-0.21	1.68
12,452.0	90.30	181.90	10,983.9	-1,658.6	144.6	1,659.6	0.83	0.83	0.00
12,547.0	89.10	182.00	10,984.4	-1,753.5	141.3	1,754.6	1.27	-1.26	0.11
12,642.0	89.90	182.20	10,985.2	-1,848.4	137.9	1,849.5	0.87	0.84	0.21
12,737.0	90.50	181.50	10,984.9	-1,943.4	134.8	1,944.4	0.97	0.63	-0.74
12,832.0	89.40	182.70	10,985.0	-2,038.3	131.3	2,039.3	1.71	-1.16	1.26
12,928.0	88.00	183.10	10,987.1	-2,134.2	126.5	2,135.1	1.52	-1.46	0.42
13,023.0	88.00	182.70	10,990.4	-2,229.0	121.7	2,229.9	0.42	0.00	-0.42
13,118.0	88.10	182.60	10,993.7	-2,323.8	117.3	2,324.7	0.15	0.11	-0.11
13,214.0	89.20	181.90	10,995.9	-2,419.7	113.5	2,420.5	1.36	1.15	-0.73
13,309.0	88.00	182.00	10,998.3	-2,514.6	110.3	2,515.4	1.27	-1.26	0.11
13,405.0	88.40	182.20	11,001.3	-2,610.5	106.8	2,611.3	0.47	0.42	0.21
13,500.0	89.00	182.40	11,003.4	-2,705.4	102.9	2,706.1	0.67	0.63	0.21
13,595.0	89.30	182.40	11,004.8	-2,800.3	99.0	2,801.0	0.32	0.32	0.00
13,690.0	89.50	182.50	11,005.8	-2,895.2	94.9	2,895.9	0.24	0.21	0.11
13,786.0	89.70	182.40	11,006.5	-2,991.1	90.8	2,991.8	0.23	0.21	-0.10
13,881.0	87.90	181.90	11,008.5	-3,086.1	87.2	3,086.6	1.97	-1.89	-0.53
13,977.0	89.00	182.20	11,011.1	-3,182.0	83.8	3,182.5	1.19	1.15	0.31
14,072.0	89.80	182.20	11,012.1	-3,276.9	80.2	3,277.4	0.84	0.84	0.00
14,167.0	88.30	181.70	11,013.7	-3,371.8	76.9	3,372.3	1.66	-1.58	-0.53
14,263.0	88.90	181.30	11,016.0	-3,467.7	74.4	3,468.2	0.75	0.63	-0.42
14,358.0	88.90	181.10	11,017.8	-3,562.7	72.4	3,563.2	0.21	0.00	-0.21
14,453.0	89.30	181.00	11,019.3	-3,657.7	70.7	3,658.1	0.43	0.42	-0.11
14,548.0	88.80	181.50	11,020.9	-3,752.6	68.6	3,753.1	0.74	-0.53	0.53
14,643.0	89.00	181.30	11,022.7	-3,847.6	66.3	3,848.0	0.30	0.21	-0.21
14,737.0	88.60	181.00	11,024.7	-3,941.6	64.4	3,941.9	0.53	-0.43	-0.32
14,832.0	89.00	180.60	11,026.7	-4,036.5	63.1	4,036.9	0.60	0.42	-0.42
14,928.0	89.70	180.10	11,027.8	-4,132.5	62.5	4,132.9	0.90	0.73	-0.52
15,023.0	90.10	179.70	11,027.9	-4,227.5	62.7	4,227.9	0.60	0.42	-0.42
15,118.0	89.30	179.70	11,028.4	-4,322.5	63.2	4,322.9	0.84	-0.84	0.00
15,214.0	89.80	179.70	11,029.2	-4,418.5	63.7	4,418.9	0.52	0.52	0.00
15,309.0	89.70	179.40	11,029.6	-4,513.5	64.4	4,513.9	0.33	-0.11	-0.32
15,404.0	88.90	178.50	11,030.8	-4,608.5	66.1	4,608.9	1.27	-0.84	-0.95
15,494.0	88.40	177.80	11,032.9	-4,698.4	69.0	4,698.8	0.96	-0.56	-0.78

Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Lea County, NM	TVD Reference:	RKB @ 3618.8usft (Silver Oak #12)
Site:	Deckard Fee	MD Reference:	RKB @ 3618.8usft (Silver Oak #12)
Well:	#1H	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	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)
15,540.0	88.40	177.80	11,034.2	-4,744.4	70.8	4,744.8	0.00	0.00	0.00
BHL - 15540.0' MD, 11034.2' TVD, 88.40° INC, 177.80° AZI, -4744.4' N, 70.8' E, 4744.8' VS									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,300.0	10,297.6	83.1	97.2	Tie into Pilot @ 10300' MD
10,519.0	10,514.9	66.1	113.2	KOP - 10519.0' MD, 10514.9' TVD
10,906.4	10,827.2	-140.0	162.3	Cross into 330 Lease - 10906.4' MD, 10827.2' TVD, 53.81° INC, 141.3' VS
11,340.0	10,956.8	-547.2	154.7	EOC - 11340.0' MD, 10956.8' TVD, 86.30° INC, 548.4' VS
15,540.0	11,034.2	-4,744.4	70.8	BHL - 15540.0' MD, 11034.2' TVD, 88.40° INC, 177.80° AZI, -4744.4' N, 70.8' E

Checked By: _____ Approved By: _____ Date: _____