



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

30-025-416666

March 17, 2015

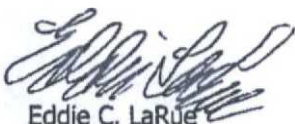
COG, LLC
One Concho Center
600 W. Illinois Ave.
Midland, TX 79701

RE: Sebastian Federal Com #2H
190' FNL & 1830' FWL
Sec. 18, T24S, R34E
Lea County, New Mexico

Dear Sir,

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

Very truly yours,


Eddie C. LaRue
Operations Manager

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 17th day of March, 2015.


Regina L. Garner
Notary Public



NOV 11 2015

Sebastian Federal Com #2H

Date	Depth	Deviation	Direction	TVD	Horiz Disp
2/25/2015	216	0.50	0.00	0.00	0.00
2/25/2015	696	0.40	0.00	0.00	0.00
2/25/2015	986	0.30	0.00	0.00	0.00
2/25/2015	1239	0.30	0.00	0.00	0.00
2/25/2015	1334	0.50	0.00	0.00	0.00
2/27/2015	1491	1.00	0.00	0.00	0.00
2/27/2015	1554	0.70	0.00	0.00	0.00
2/27/2015	1839	0.80	0.00	0.00	0.00
2/27/2015	2123	1.40	0.00	0.00	0.00
2/27/2015	2407	1.40	0.00	0.00	0.00
2/28/2015	2691	1.50	284.30	0.00	0.00
2/28/2015	2976	1.40	300.70	0.00	0.00
2/28/2015	3261	1.40	309.00	0.00	0.00
2/28/2015	3545	1.00	0.00	0.00	0.00
2/28/2015	3830	1.10	0.00	0.00	0.00
2/28/2015	4115	0.40	0.00	0.00	0.00
3/1/2015	4399	1.30	0.00	0.00	0.00
3/1/2015	4684	2.50	0.00	0.00	0.00
3/1/2015	4969	2.70	0.00	0.00	0.00
3/1/2015	5148	1.80	0.00	0.00	0.00
3/3/2015	5427	1.60	0.00	0.00	0.00
3/3/2015	5734	0.60	0.00	0.00	0.00
3/3/2015	6019	0.90	0.00	0.00	0.00
3/3/2015	6376	0.50	0.00	0.00	0.00
3/3/2015	6692	0.50	0.00	0.00	0.00
3/4/2015	6968	2.40	0.00	0.00	0.00
3/4/2015	7126	1.60	0.00	0.00	0.00
3/4/2015	7285	2.00	0.00	0.00	0.00
3/4/2015	7443	1.60	0.00	0.00	0.00
3/4/2015	7728	0.80	0.00	0.00	0.00
3/4/2015	8013	0.30	0.00	0.00	0.00
3/4/2015	8360	0.10	0.00	0.00	0.00
3/5/2015	8677	0.70	0.00	0.00	0.00
3/5/2015	8961	1.30	0.00	0.00	0.00
3/5/2015	9246	1.70	0.00	0.00	0.00
3/6/2015	9566	0.30	0.00	0.00	0.00
3/6/2015	9851	0.30	0.00	0.00	0.00
3/7/2015	10211	1.70	318.20	0.00	0.00
3/7/2015	10243	1.70	293.20	0.00	0.00
3/7/2015	10274	2.40	239.50	0.00	0.00
3/7/2015	10306	4.10	213.80	0.00	0.00
3/8/2015	10338	6.40	200.80	0.00	0.00
3/8/2015	10369	8.90	195.40	0.00	0.00

Date	Depth	Deviation	Direction	TVD	Horiz Disp
3/8/2015	10401	11.50	193.10	0.00	0.00
3/8/2015	10433	13.90	190.90	0.00	0.00
3/8/2015	10496	19.20	188.40	0.00	0.00
3/8/2015	10527	21.90	187.00	0.00	0.00
3/8/2015	10559	24.70	186.90	10548.00	0.00
3/8/2015	10590	27.80	184.20	10576.00	0.00
3/8/2015	10622	30.60	180.60	10604.00	0.00
3/9/2015	10654	33.80	177.40	0.00	0.00
3/9/2015	10717	40.90	174.00	0.00	0.00
3/9/2015	10749	44.70	173.20	0.00	0.00
3/9/2015	10780	48.70	172.20	0.00	0.00
3/9/2015	10812	53.00	170.90	0.00	0.00
3/9/2015	10875	61.20	170.30	10780.00	0.00
3/9/2015	10906	65.80	170.50	10794.00	0.00
3/9/2015	10938	70.30	170.60	10806.10	0.00
3/9/2015	10969	74.80	170.40	10815.00	0.00
3/10/2015	11000	78.90	171.70	0.00	0.00
3/10/2015	11032	81.50	171.60	0.00	0.00
3/10/2015	11063	82.60	171.50	0.00	0.00
3/10/2015	11127	86.30	171.80	10838.00	0.00
3/10/2015	11158	87.60	172.30	10840.00	0.00
3/10/2015	11190	88.10	172.20	10841.00	0.00
3/10/2015	11285	89.40	172.00	10843.00	0.00
3/10/2015	11380	89.50	171.40	10844.00	0.00
3/10/2015	11475	89.00	171.20	10845.00	0.00
3/11/2015	11665	87.60	170.10	0.00	0.00
3/11/2015	11950	88.50	168.90	0.00	0.00
3/11/2015	12046	89.60	169.70	0.00	0.00
3/11/2015	12140	90.40	170.20	0.00	0.00
3/11/2015	12235	90.70	170.60	0.00	0.00
3/11/2015	12330	90.00	171.00	0.00	0.00
3/11/2015	12425	89.80	172.10	0.00	0.00
3/11/2015	12580	89.60	171.80	0.00	0.00
3/11/2015	12615	89.10	172.10	10816.00	0.00
3/11/2015	12710	88.40	173.30	10863.00	0.00
3/11/2015	12805	87.60	173.10	10867.00	0.00
3/11/2015	12900	88.20	174.50	10870.00	0.00
3/11/2015	12995	89.90	174.90	10872.00	0.00
3/12/2015	13090	91.90	175.20	0.00	0.00
3/12/2015	13185	90.30	174.50	0.00	0.00
3/12/2015	13280	87.70	173.70	0.00	0.00
3/12/2015	13375	88.30	173.10	0.00	0.00
3/12/2015	13469	87.40	173.80	0.00	0.00
3/12/2015	13564	87.70	174.60	0.00	0.00
3/13/2015	13659	87.50	174.90	10885.00	0.00

Date	Depth	Deviation	Direction	TVD	Horiz Disp
3/13/2015	13754	87.50	175.30	10889.00	0.00
3/13/2015	13849	88.50	175.20	10893.00	0.00
3/13/2015	13943	88.70	175.90	10895.00	0.00
3/13/2015	14039	89.20	176.40	0.00	0.00
3/13/2015	14134	90.70	176.40	0.00	0.00
3/13/2015	14229	90.60	175.90	0.00	0.00
3/13/2015	14324	89.50	176.00	0.00	0.00
3/13/2015	14418	88.70	175.60	10897.00	0.00
3/13/2015	14513	87.60	174.90	10900.00	3874.00
3/13/2015	14608	87.70	175.90	10904.00	3969.00
3/13/2015	14703	89.80	176.70	10906.00	4064.00
3/14/2015	14798	89.40	176.60	10907.00	0.00
3/14/2015	14893	89.10	76.40	10908.00	0.00
3/14/2015	14988	87.80	176.40	10911.00	0.00
3/14/2015	15083	86.60	176.70	10915.00	0.00
3/14/2015	15176	87.20	176.60	10921.00	0.00
3/14/2015	15273	88.50	176.50	0.00	0.00
3/14/2015	15358	89.30	175.60	0.00	0.00



March 17, 2015

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

Attn: Kanicia Castillo

RE: **Sebastian Federal Com 2H**

Please find enclosed a copy of the survey from 0.00' to 10132.00' ran on the above referenced well.

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

Sincerely,

A handwritten signature in cursive script that reads "Kim Moller".

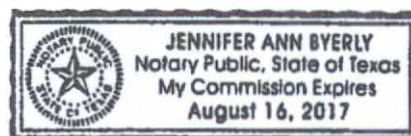
Kimberly D Moller
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 17 day of March, A.D., 2015, by Kimberly D Moller.

A handwritten signature in cursive script that reads "Jennifer Ann Byerly".

Jennifer Ann Byerly
Notary Public, State of Texas





Company: COG Operating

Lease/Well: Sebastian Federal Com/2H

Location: S18 T24S R34E

Rig Name: Silveroak 12

State/County: New Mexico/Lea

Latitude: 32.22, Longitude: -103.51

GRID North is 0.44 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: 3/17/2015 / 14:04

VES Survey International
Midland, TX

432-563-5444

Surveyor: Andrew Askew

Sebastian Federal Com 2H / API 30-025-41666

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	0.24	340.70	100.00	0.20	-0.07	0.20	0.21	340.70	0.24
200.00	0.43	317.99	200.00	0.68	-0.39	0.68	0.78	330.02	0.23
300.00	0.46	299.37	299.99	1.16	-0.99	1.16	1.52	319.28	0.15
400.00	0.42	282.31	399.99	1.43	-1.70	1.43	2.22	310.07	0.14
500.00	0.24	273.34	499.99	1.52	-2.27	1.52	2.73	303.84	0.18
600.00	0.10	215.48	599.99	1.46	-2.53	1.46	2.92	300.09	0.21
700.00	0.26	156.14	699.99	1.20	-2.49	1.20	2.76	295.66	0.22
800.00	0.25	192.97	799.99	0.78	-2.45	0.78	2.57	287.70	0.16
900.00	0.03	206.18	899.99	0.54	-2.51	0.54	2.57	282.21	0.22
1000.00	0.08	160.34	999.99	0.45	-2.50	0.45	2.54	280.22	0.06
1100.00	0.21	180.95	1099.99	0.20	-2.48	0.20	2.48	274.63	0.14
1200.00	0.18	185.96	1199.99	-0.14	-2.50	-0.14	2.50	266.86	0.03
1300.00	0.23	194.83	1299.99	-0.49	-2.56	-0.49	2.51	259.24	0.06
1400.00	0.42	211.08	1399.99	-1.00	-2.81	-1.00	2.98	250.42	0.21
1500.00	0.70	225.23	1499.98	-1.74	-3.43	-1.74	3.85	243.04	0.31
1600.00	0.73	241.81	1599.97	-2.48	-4.43	-2.48	5.07	240.78	0.21
1700.00	0.95	245.50	1699.96	-3.12	-5.75	-3.12	6.54	241.48	0.22
1800.00	0.87	247.69	1799.95	-3.75	-7.20	-3.75	8.12	242.47	0.09

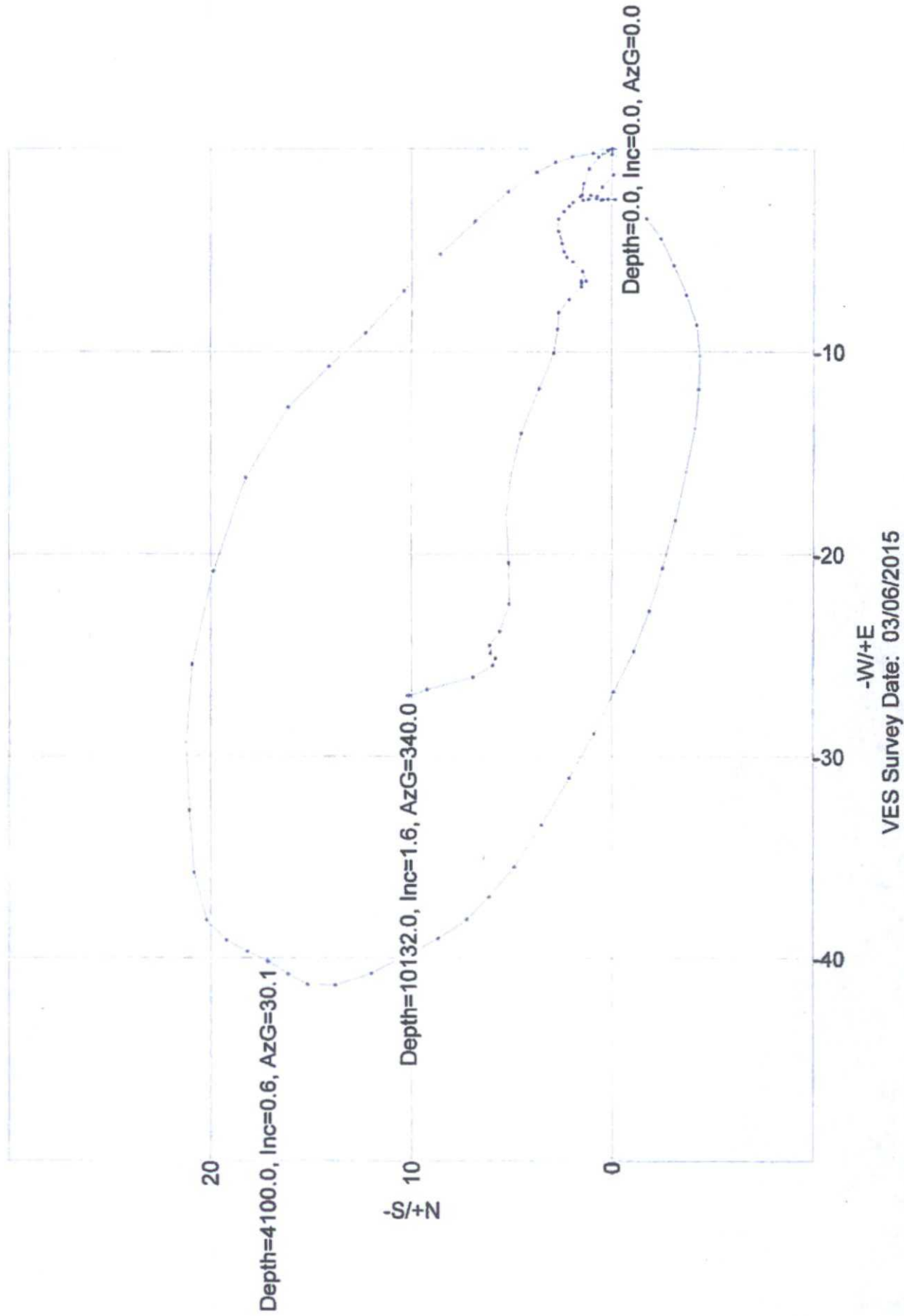
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.91	253.68	1899.94	-4.26	-8.66	-4.26	9.66	243.79	0.10
2000.00	0.88	273.63	1999.93	-4.44	-10.19	-4.44	11.12	246.46	0.31
2100.00	1.03	271.87	2099.91	-4.36	-11.86	-4.36	12.63	249.80	0.16
2200.00	1.17	278.92	2199.89	-4.17	-13.77	-4.17	14.39	253.14	0.20
2300.00	1.33	284.51	2299.87	-3.72	-15.90	-3.72	16.33	256.82	0.20
2400.00	1.51	280.78	2399.84	-3.19	-18.32	-3.19	18.60	260.14	0.20
2500.00	1.32	290.71	2499.81	-2.53	-20.69	-2.53	20.85	263.02	0.31
2600.00	1.23	284.33	2599.78	-1.86	-22.80	-1.86	22.88	266.33	0.17
2700.00	1.24	298.46	2699.76	-1.08	-24.79	-1.08	24.81	267.50	0.30
2800.00	1.31	294.61	2799.74	-0.09	-26.78	-0.09	26.78	269.80	0.11
2900.00	1.34	296.53	2899.71	0.91	-28.86	0.91	28.88	271.80	0.05
3000.00	1.55	302.34	2999.68	2.15	-31.06	2.15	31.13	273.97	0.26
3100.00	1.55	299.06	3099.64	3.54	-33.39	3.54	33.57	276.05	0.09
3200.00	1.29	307.83	3199.61	4.89	-35.46	4.89	35.80	277.85	0.34
3300.00	0.92	313.43	3299.59	6.13	-36.93	6.13	37.44	279.42	0.39
3400.00	0.88	317.26	3399.58	7.24	-38.04	7.24	38.72	280.78	0.07
3500.00	1.15	331.75	3499.56	8.69	-39.03	8.69	39.99	282.55	0.37
3600.00	1.00	332.59	3599.55	10.35	-39.91	10.35	41.23	284.53	0.15
3700.00	1.14	333.23	3699.53	12.01	-40.76	12.01	42.49	286.42	0.14
3800.00	1.08	351.87	3799.51	13.83	-41.34	13.83	43.59	288.49	0.36
3900.00	0.52	19.91	3899.50	15.18	-41.32	15.18	44.02	290.17	0.67
4000.00	0.74	34.15	3999.49	16.13	-40.80	16.13	43.88	291.58	0.27
4100.00	0.63	30.10	4099.49	17.14	-40.17	17.14	43.67	293.11	0.12
4200.00	0.69	22.97	4199.48	18.17	-39.65	18.17	43.62	294.62	0.10
4300.00	0.84	30.18	4299.47	19.21	-39.14	19.21	43.60	296.14	0.10
4400.00	1.04	57.87	4399.46	20.18	-38.09	20.18	43.10	297.91	0.55
4500.00	1.80	83.44	4499.43	20.84	-35.76	20.84	41.39	300.23	0.98
4600.00	1.75	87.85	4599.38	21.07	-32.68	21.07	38.88	302.82	0.15
4700.00	2.11	86.77	4699.33	21.23	-29.32	21.23	36.20	305.92	0.36
4800.00	2.38	101.33	4799.25	20.93	-25.44	20.93	32.95	309.44	0.63
4900.00	3.04	104.30	4899.14	19.87	-20.84	19.87	28.79	313.64	0.88
5000.00	2.60	114.74	4999.02	18.26	-16.20	18.26	24.41	318.42	0.68
5100.00	2.10	129.92	5098.93	16.14	-12.74	16.14	20.56	321.71	0.79
5200.00	1.20	143.94	5198.89	14.12	-10.72	14.12	17.72	322.80	0.98
5300.00	1.63	133.53	5298.86	12.29	-9.07	12.29	15.28	323.57	0.50
5400.00	1.60	131.95	5398.82	10.38	-7.01	10.38	12.53	325.99	0.05
5500.00	1.35	138.66	5498.79	8.57	-5.19	8.57	10.02	328.79	0.30
5600.00	1.39	135.63	5598.76	6.81	-3.56	6.81	7.69	332.40	0.08
5700.00	1.12	142.62	5698.74	5.17	-2.12	5.17	5.59	337.70	0.31

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	0.82	149.42	5798.72	3.77	-1.16	3.77	3.95	342.90	0.32
5900.00	0.39	156.25	5898.72	2.84	-0.66	2.84	2.91	346.98	0.44
6000.00	0.63	166.45	5998.71	1.99	-0.39	1.99	2.03	348.92	0.25
6100.00	0.59	175.08	6098.71	0.94	-0.22	0.94	0.97	347.05	0.10
6200.00	0.49	191.81	6198.70	0.01	-0.26	0.01	0.26	272.85	0.19
6300.00	0.21	225.05	6298.70	-0.54	-0.48	-0.54	0.72	221.78	0.33
6400.00	0.32	271.12	6398.70	-0.66	-0.89	-0.66	1.11	233.36	0.23
6500.00	0.15	26.89	6498.70	-0.54	-1.12	-0.54	1.24	243.99	0.41
6600.00	0.48	329.78	6598.70	-0.07	-1.27	-0.07	1.27	266.95	0.42
6700.00	0.51	296.89	6698.69	0.50	-1.88	0.50	1.94	284.79	0.28
6800.00	0.10	304.42	6798.69	0.75	-2.34	0.75	2.46	287.65	0.41
6900.00	0.35	24.57	6898.69	1.07	-2.29	1.07	2.53	295.02	0.34
7000.00	0.36	324.81	6998.69	1.60	-2.35	1.60	2.84	304.28	0.35
7100.00	0.17	311.88	7098.69	1.95	-2.64	1.95	3.28	306.54	0.20
7200.00	0.14	317.90	7198.69	2.14	-2.83	2.14	3.55	307.13	0.03
7300.00	0.29	316.64	7298.69	2.41	-3.08	2.41	3.91	308.07	0.15
7400.00	0.25	293.26	7398.69	2.68	-3.45	2.68	4.37	307.83	0.11
7500.00	0.47	257.87	7498.68	2.68	-4.05	2.68	4.86	303.48	0.30
7600.00	0.24	245.23	7598.68	2.50	-4.64	2.50	5.27	298.34	0.24
7700.00	0.26	269.09	7698.68	2.41	-5.06	2.41	5.61	295.46	0.11
7800.00	0.16	197.00	7798.68	2.27	-5.34	2.27	5.80	293.06	0.26
7900.00	0.29	226.63	7898.68	1.96	-5.56	1.96	5.90	289.41	0.17
8000.00	0.48	222.18	7998.68	1.48	-6.03	1.48	6.21	283.78	0.19
8100.00	0.27	300.38	8098.68	1.29	-6.51	1.29	6.54	281.21	0.50
8200.00	0.17	38.67	8198.68	1.53	-6.52	1.53	6.80	282.99	0.34
8300.00	0.12	164.96	8298.68	1.54	-6.50	1.54	6.68	283.36	0.26
8400.00	0.37	288.29	8398.68	1.54	-6.78	1.54	6.95	282.82	0.45
8500.00	0.71	326.20	8498.67	2.16	-7.43	2.16	7.74	286.19	0.47
8600.00	0.34	271.67	8598.67	2.68	-8.07	2.68	8.50	288.36	0.58
8700.00	0.80	274.09	8698.66	2.72	-8.89	2.72	9.29	287.04	0.26
8800.00	0.78	283.41	8798.66	2.92	-10.08	2.92	10.49	286.16	0.21
8900.00	1.40	297.31	8898.64	3.64	-11.83	3.64	12.37	287.10	0.65
9000.00	1.32	286.70	8998.61	4.53	-14.01	4.53	14.73	287.91	0.26
9100.00	1.12	281.11	9098.59	5.05	-16.08	5.05	16.85	287.44	0.24
9200.00	1.18	272.09	9198.57	5.27	-18.07	5.27	18.82	286.28	0.19
9300.00	1.52	263.52	9298.54	5.16	-20.41	5.16	21.06	284.19	0.39
9400.00	0.84	279.00	9398.52	5.13	-22.46	5.13	23.03	282.86	0.75
9500.00	0.84	300.07	9498.51	5.61	-23.81	5.61	24.46	283.25	0.31
9600.00	0.16	336.87	9598.50	6.11	-24.50	6.11	25.25	283.99	0.71

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	0.42	241.78	9698.50	6.06	-24.88	6.06	25.61	283.69	0.46
9800.00	0.13	135.84	9798.50	5.81	-25.13	5.81	25.79	283.02	0.47
9900.00	0.56	235.92	9898.50	5.94	-25.49	5.94	26.18	283.13	0.69
10000.00	0.89	350.37	9998.49	6.93	-26.07	6.93	26.97	284.88	0.73
10100.00	1.87	342.54	10098.46	9.25	-26.68	9.25	28.24	289.11	0.99
10132.00	1.56	340.05	10130.45	10.16	-26.99	10.16	28.84	290.62	0.98



VES Survey International
Midland, TX
432-563-5444
Surveyor: Andrew Askew
Sebastian Federal Com 2H / API 30-025-41666





COG Operating LLC

Lea County, NM

Sebastian Federal Com

#2H

OH

Survey: MWD #1

Survey Report - Geographic

30 March, 2015



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H
Project:	Lea County, NM	TVD Reference:	WELL @ 3809.5usft (Original Well Elev)
Site:	Sebastian Federal Com	MD Reference:	WELL @ 3809.5usft (Original Well Elev)
Well:	#2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Project	Lea County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Sebastian Federal Com		
Site Position:		Northing:	446,247.40 usft
From:	Map	Easting:	754,263.30 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 13' 27.036 N
		Longitude:	103° 30' 40.034 W
		Grid Convergence:	0.44 "

Well	#2H		
Well Position	+N/-S	0.0 usft	Northing: 446,247.40 usft
	+E/-W	0.0 usft	Easting: 754,263.30 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 13' 27.036 N
		Longitude:	103° 30' 40.034 W
		Ground Level:	3,591.5 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2010	2/10/2015	7.11
			Dip Angle (°)
			60.11
			Field Strength (nT)
			48,256

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)
	0.0	0.0	0.0
			Direction (°)
			174.39

Survey Program	Date 3/30/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
100.0	10,132.0	GYRO (OH)	NS-GYRO-SS
10,211.0	15,397.0	MWD #1 (OH)	MWD
			Description
			NS Gyro single shots
			MWD - Standard

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,132.0	1.56	340.05	10,130.4	10.2	-27.0	446,257.61	754,236.34	32° 13' 27.140 N	103° 30' 40.347 W
10,211.0	1.70	318.20	10,209.4	12.1	-28.1	446,259.49	754,235.20	32° 13' 27.158 N	103° 30' 40.360 W
10,243.0	1.70	293.20	10,241.4	12.6	-28.9	446,260.04	754,234.44	32° 13' 27.164 N	103° 30' 40.369 W
10,274.0	2.40	239.50	10,272.4	12.5	-29.8	446,259.89	754,233.46	32° 13' 27.162 N	103° 30' 40.380 W
10,306.0	4.10	213.80	10,304.3	11.2	-31.0	446,258.60	754,232.25	32° 13' 27.150 N	103° 30' 40.395 W
10,338.0	6.40	200.80	10,336.2	8.8	-32.3	446,255.98	754,230.98	32° 13' 27.124 N	103° 30' 40.410 W
10,369.0	8.90	195.40	10,366.9	4.7	-33.6	446,252.05	754,229.73	32° 13' 27.085 N	103° 30' 40.425 W
10,401.0	11.50	193.10	10,398.4	-0.8	-35.0	446,246.58	754,228.35	32° 13' 27.031 N	103° 30' 40.441 W
10,433.0	13.90	190.90	10,429.8	-7.7	-36.4	446,239.67	754,226.90	32° 13' 26.983 N	103° 30' 40.459 W
10,464.0	16.60	189.50	10,459.5	-15.8	-37.8	446,231.65	754,225.46	32° 13' 26.883 N	103° 30' 40.476 W
10,496.0	19.20	188.40	10,490.0	-25.5	-39.4	446,221.93	754,223.94	32° 13' 26.787 N	103° 30' 40.495 W



Wellplanning Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H
Project:	Lea County, NM	TVD Reference:	WELL @ 3609.5usft (Original Well Elev)
Site:	Sebastian Federal Com	MD Reference:	WELL @ 3609.5usft (Original Well Elev)
Well:	#2H	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
10,527.0	21.90	187.00	10,519.0	-36.2	-40.8	446,211.15	754,222.49	32° 13' 26.881 N	103° 30' 40.512 W
10,559.0	24.70	186.90	10,548.4	-48.8	-42.3	446,198.59	754,220.96	32° 13' 28.557 N	103° 30' 40.531 W
10,590.0	27.80	184.70	10,576.2	-62.5	-43.7	446,184.95	754,219.59	32° 13' 28.422 N	103° 30' 40.549 W
10,622.0	30.60	180.60	10,604.1	-78.0	-44.4	446,169.38	754,218.89	32° 13' 28.268 N	103° 30' 40.558 W
10,654.0	33.80	177.40	10,631.2	-95.1	-44.1	446,152.32	754,219.21	32° 13' 28.099 N	103° 30' 40.556 W
10,685.0	37.40	175.30	10,656.4	-113.1	-42.9	446,134.32	754,220.37	32° 13' 25.921 N	103° 30' 40.544 W
10,717.0	40.90	174.00	10,681.2	-133.2	-41.0	446,114.21	754,222.26	32° 13' 25.722 N	103° 30' 40.524 W
10,749.0	44.70	173.20	10,704.7	-154.8	-38.6	446,092.61	754,224.69	32° 13' 25.508 N	103° 30' 40.487 W
10,780.0	48.70	172.20	10,726.0	-177.2	-35.7	446,070.23	754,227.58	32° 13' 25.286 N	103° 30' 40.466 W
10,812.0	53.00	170.90	10,746.2	-201.7	-32.1	446,045.70	754,231.22	32° 13' 25.043 N	103° 30' 40.426 W
10,843.0	57.00	170.20	10,763.9	-226.7	-27.9	446,020.65	754,235.39	32° 13' 24.795 N	103° 30' 40.379 W
10,875.0	61.20	170.30	10,780.4	-253.8	-23.3	445,993.60	754,240.04	32° 13' 24.527 N	103° 30' 40.327 W
10,906.0	65.80	170.50	10,794.2	-281.2	-18.6	445,968.25	754,244.66	32° 13' 24.258 N	103° 30' 40.276 W
10,938.0	70.30	170.60	10,806.1	-310.4	-13.8	445,936.98	754,249.53	32° 13' 23.966 N	103° 30' 40.222 W
10,969.0	74.80	170.40	10,815.4	-339.6	-8.9	445,907.82	754,254.41	32° 13' 23.677 N	103° 30' 40.168 W
11,000.0	78.90	171.70	10,822.5	-369.4	-4.2	445,878.01	754,259.11	32° 13' 23.381 N	103° 30' 40.116 W
11,032.0	81.50	171.60	10,827.9	-400.6	0.4	445,846.81	754,263.69	32° 13' 23.072 N	103° 30' 40.065 W
11,063.0	82.60	171.50	10,832.2	-431.0	4.9	445,816.44	754,268.20	32° 13' 22.772 N	103° 30' 40.016 W
11,095.0	84.20	171.80	10,835.9	-462.4	9.6	445,785.00	754,272.67	32° 13' 22.460 N	103° 30' 39.964 W
11,127.0	86.30	171.80	10,839.6	-494.0	14.2	445,753.45	754,277.47	32° 13' 22.148 N	103° 30' 39.913 W
11,158.0	87.60	172.30	10,840.2	-524.6	18.5	445,722.79	754,281.75	32° 13' 21.844 N	103° 30' 39.866 W
11,190.0	88.10	172.20	10,841.4	-556.3	22.8	445,691.10	754,286.07	32° 13' 21.530 N	103° 30' 39.819 W
11,225.0	89.40	172.00	10,843.5	-590.4	35.8	445,657.03	754,299.12	32° 13' 20.598 N	103° 30' 39.675 W
11,250.0	89.50	171.40	10,844.4	-624.4	49.5	445,603.03	754,312.83	32° 13' 19.667 N	103° 30' 39.524 W
11,285.0	89.00	171.20	10,845.6	-658.3	63.9	445,549.13	754,327.20	32° 13' 18.737 N	103° 30' 39.365 W
11,320.0	89.90	170.50	10,846.5	-692.1	79.0	445,515.34	754,342.31	32° 13' 17.807 N	103° 30' 39.198 W
11,355.0	87.60	170.10	10,848.6	-725.7	95.0	445,481.73	754,358.31	32° 13' 16.880 N	103° 30' 39.020 W
11,390.0	87.50	170.10	10,852.7	-759.2	111.3	445,448.20	754,374.63	32° 13' 15.953 N	103° 30' 38.838 W
11,425.0	87.60	169.60	10,856.7	-792.8	128.1	445,414.80	754,391.35	32° 13' 15.028 N	103° 30' 38.652 W
11,460.0	88.50	168.90	10,860.0	-826.9	145.8	444,941.53	754,409.08	32° 13' 14.103 N	103° 30' 38.454 W
11,495.0	89.60	169.70	10,861.6	-860.2	163.6	444,847.21	754,426.88	32° 13' 13.169 N	103° 30' 38.255 W
11,530.0	90.40	170.20	10,861.6	-893.6	180.0	444,754.65	754,443.29	32° 13' 12.252 N	103° 30' 38.072 W
11,565.0	90.70	170.60	10,860.6	-926.4	195.8	444,660.99	754,459.13	32° 13' 11.324 N	103° 30' 37.886 W
11,600.0	90.00	171.00	10,860.1	-959.2	211.0	444,567.21	754,474.32	32° 13' 10.394 N	103° 30' 37.728 W
11,635.0	89.80	172.10	10,860.2	-992.2	225.0	444,473.25	754,488.28	32° 13' 9.464 N	103° 30' 37.573 W
11,670.0	89.60	171.80	10,860.7	-1,025.3	238.3	444,379.18	754,501.58	32° 13' 8.532 N	103° 30' 37.427 W
11,705.0	89.10	172.10	10,861.8	-1,058.3	251.6	444,285.13	754,514.88	32° 13' 7.600 N	103° 30' 37.281 W
11,740.0	88.40	173.30	10,863.9	-1,091.5	263.7	444,190.92	754,526.95	32° 13' 6.667 N	103° 30' 37.148 W
11,775.0	87.60	173.10	10,867.2	-1,124.8	274.9	444,096.65	754,538.19	32° 13' 5.733 N	103° 30' 37.028 W
11,810.0	88.20	174.50	10,870.7	-1,158.1	285.1	444,002.27	754,548.44	32° 13' 4.798 N	103° 30' 36.915 W
11,845.0	89.90	174.90	10,872.3	-1,191.7	293.9	443,907.89	754,557.22	32° 13' 3.862 N	103° 30' 36.821 W
11,880.0	91.90	175.20	10,870.8	-1,224.3	302.1	443,813.06	754,565.41	32° 13' 2.925 N	103° 30' 36.734 W
11,915.0	90.30	174.50	10,868.9	-1,257.9	310.6	443,718.47	754,573.94	32° 13' 1.988 N	103° 30' 36.644 W
11,950.0	87.70	173.70	10,870.6	-1,290.6	320.4	443,624.00	754,583.70	32° 13' 1.053 N	103° 30' 36.536 W
11,985.0	88.30	173.10	10,873.9	-1,323.7	331.3	443,529.88	754,594.61	32° 13' 0.119 N	103° 30' 36.420 W
12,020.0	87.40	173.80	10,877.4	-1,356.0	342.0	443,436.36	754,605.33	32° 12' 59.194 N	103° 30' 36.303 W
12,055.0	87.70	174.60	10,881.5	-1,389.5	351.6	443,341.94	754,614.92	32° 12' 58.259 N	103° 30' 36.200 W
12,090.0	87.50	174.90	10,885.5	-1,422.0	360.3	443,247.42	754,623.61	32° 12' 57.323 N	103° 30' 36.108 W
12,125.0	87.38	175.14	10,888.0	-1,455.1	365.3	443,150.29	754,628.58	32° 12' 56.758 N	103° 30' 36.055 W
Government L2 #2									
13,754.0	87.30	175.30	10,889.8	-3,094.5	368.4	443,152.66	754,631.71	32° 12' 56.387 N	103° 30' 36.022 W
13,789.0	88.50	175.20	10,893.3	-3,128.1	376.3	443,058.28	754,639.57	32° 12' 55.450 N	103° 30' 35.939 W
13,824.0	88.70	175.90	10,895.6	-3,161.8	383.8	442,964.57	754,646.87	32° 12' 54.523 N	103° 30' 35.862 W
13,859.0	89.20	176.40	10,897.3	-3,195.6	390.0	442,868.80	754,653.31	32° 12' 53.574 N	103° 30' 35.796 W
13,894.0	90.60	176.40	10,897.5	-3,229.4	396.0	442,773.99	754,659.27	32° 12' 52.636 N	103° 30' 35.735 W



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H
Project:	Lea County, NM	TVD Reference:	WELL @ 3609.5usft (Original Well Elev)
Site:	Sebastian Federal Com	MD Reference:	WELL @ 3609.5usft (Original Well Elev)
Well:	#2H	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
14,229.0	90.60	175.90	10,896.5	-3,588.2	402.4	442,879.21	754,885.85	32° 12' 51.697 N	103° 30' 35.669 W
14,324.0	89.50	176.00	10,896.4	-3,663.0	409.1	442,584.45	754,872.38	32° 12' 50.759 N	103° 30' 35.599 W
14,418.0	88.70	175.60	10,897.9	-3,756.7	415.9	442,490.71	754,879.25	32° 12' 49.831 N	103° 30' 35.527 W
14,513.0	87.80	174.90	10,901.0	-3,851.3	423.8	442,398.09	754,887.11	32° 12' 48.894 N	103° 30' 35.444 W
14,608.0	87.70	175.90	10,904.8	-3,945.9	431.4	442,301.48	754,894.72	32° 12' 47.957 N	103° 30' 35.364 W
14,703.0	89.80	176.70	10,906.9	-4,040.7	437.6	442,208.71	754,700.85	32° 12' 47.019 N	103° 30' 35.301 W
14,798.0	89.40	176.60	10,907.6	-4,135.5	443.1	442,111.87	754,706.40	32° 12' 46.080 N	103° 30' 35.245 W
14,893.0	89.10	176.40	10,908.8	-4,230.3	448.9	442,017.06	754,712.20	32° 12' 45.142 N	103° 30' 35.186 W
14,988.0	87.80	176.40	10,911.4	-4,325.1	454.9	441,922.26	754,718.16	32° 12' 44.203 N	103° 30' 35.125 W
15,083.0	86.60	176.70	10,916.0	-4,419.8	460.6	441,827.57	754,723.87	32° 12' 43.266 N	103° 30' 35.067 W
15,178.0	87.20	176.60	10,921.2	-4,514.5	466.1	441,732.87	754,729.42	32° 12' 42.328 N	103° 30' 35.011 W
15,273.0	86.50	176.50	10,924.7	-4,609.3	471.8	441,638.11	754,735.13	32° 12' 41.390 N	103° 30' 34.953 W
15,358.0	89.30	175.60	10,926.4	-4,694.1	477.7	441,553.33	754,740.98	32° 12' 40.551 N	103° 30' 34.893 W
15,397.0	89.30	175.60	10,926.8	-4,733.0	480.7	441,514.45	754,743.97	32° 12' 40.168 N	103° 30' 34.861 W
PBHL(SFC#2)									

Checked By: _____ Approved By: _____ Date: _____