



PATRIOT DRILLING, LLC

OPERATOR: COG Operating, LLC
WELL/LEASE: SL East 30 Fed Com 2H
COUNTY: Lea Co., New Mexico
Sec. 19, T 19S, R 32E

30-025-42524

**STATE OF NEW MEXICO
DEVIATION REPORT**

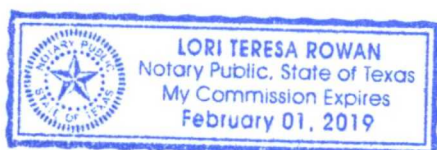
<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
601	1/2	4,626	1 1/2
1,177	1/4	5,003	1 1/4
1,556	1/4	5,382	3/4
1,935	3/4	5,761	3/4
2,314	3/4	6,043	1/2
2,502	3/4	6,422	1/2
3,003	1	6,893	1
3,542	1 1/4	7,176	1/2
3,906	1 3/4	7,553	3/4
4,221	1 1/4	7,928	1/4

Patriot Drilling, LLC

M. Leroy Peterson, Executive Vice-President

The foregoing instrument was acknowledged before me on this 27th day of January 2016 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling, LLC.

My Commission Expires: 02/01/2019



Lori T. Rowan
Notary Public for Ector Co., Texas

January 20, 2016

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

Attn: Kanicia Castillo

RE: **SL East 30 Federal Com No 002H**

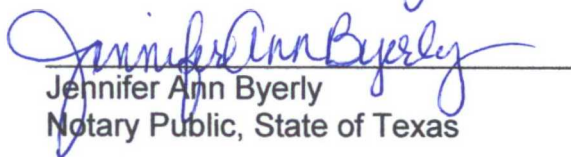
Please find enclosed a copy of the survey from 0' to 8557' ran on the above referenced well.

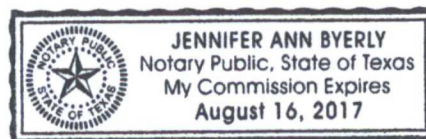
Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 20 day of January,
A.D., 2016, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: Concho

Lease/Well: SL East 30 Federal Com No/002H

Rig Name: Patriot 2

State/County: New Mexico/Lea

VS-Azi: 178.00 Degrees

Latitude: 32.64002, Longitude: -103.79816

Grid North = True North -0.29 degs (NAD 27)

Grid Correction Applied = -0.29 degs



Depth Reference : RKB = 18 feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut

Minimum Curvature Method

Report Date/Time: 1/20/2016 / 14:34

VES Survey International
Midland, Texas
432-563-5444

Surveyor: Adam Askew

SL East 30 Federal Com No 002H / API 30-025-42524

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	0.33	302.61	100.00	0.16	-0.25	-0.17	0.29	302.61	0.33
200.00	0.08	316.99	200.00	0.36	-0.54	-0.38	0.65	304.11	0.26
300.00	0.35	1.62	300.00	0.72	-0.58	-0.74	0.92	321.26	0.30
400.00	0.41	306.55	400.00	1.23	-0.85	-1.26	1.50	325.35	0.35
500.00	0.45	350.72	499.99	1.83	-1.20	-1.87	2.19	326.76	0.32
600.00	0.47	317.37	599.99	2.53	-1.54	-2.58	2.96	328.55	0.27
700.00	0.50	339.88	699.99	3.24	-1.98	-3.31	3.80	328.65	0.19
800.00	0.41	311.93	799.98	3.89	-2.39	-3.98	4.57	328.44	0.24
900.00	0.59	358.55	899.98	4.64	-2.67	-4.73	5.36	330.10	0.43
1000.00	0.49	346.41	999.98	5.57	-2.78	-5.66	6.22	333.44	0.15
1100.00	0.13	13.11	1099.97	6.09	-2.86	-6.19	6.73	334.86	0.38
1200.00	0.19	78.52	1199.97	6.23	-2.67	-6.32	6.78	336.77	0.18
1300.00	0.18	63.50	1299.97	6.33	-2.38	-6.41	6.76	339.41	0.05
1400.00	0.20	49.64	1399.97	6.51	-2.11	-6.58	6.85	342.06	0.05
1500.00	0.23	145.48	1499.97	6.46	-1.86	-6.52	6.73	343.91	0.32
1600.00	0.11	188.72	1599.97	6.20	-1.77	-6.26	6.45	344.10	0.16

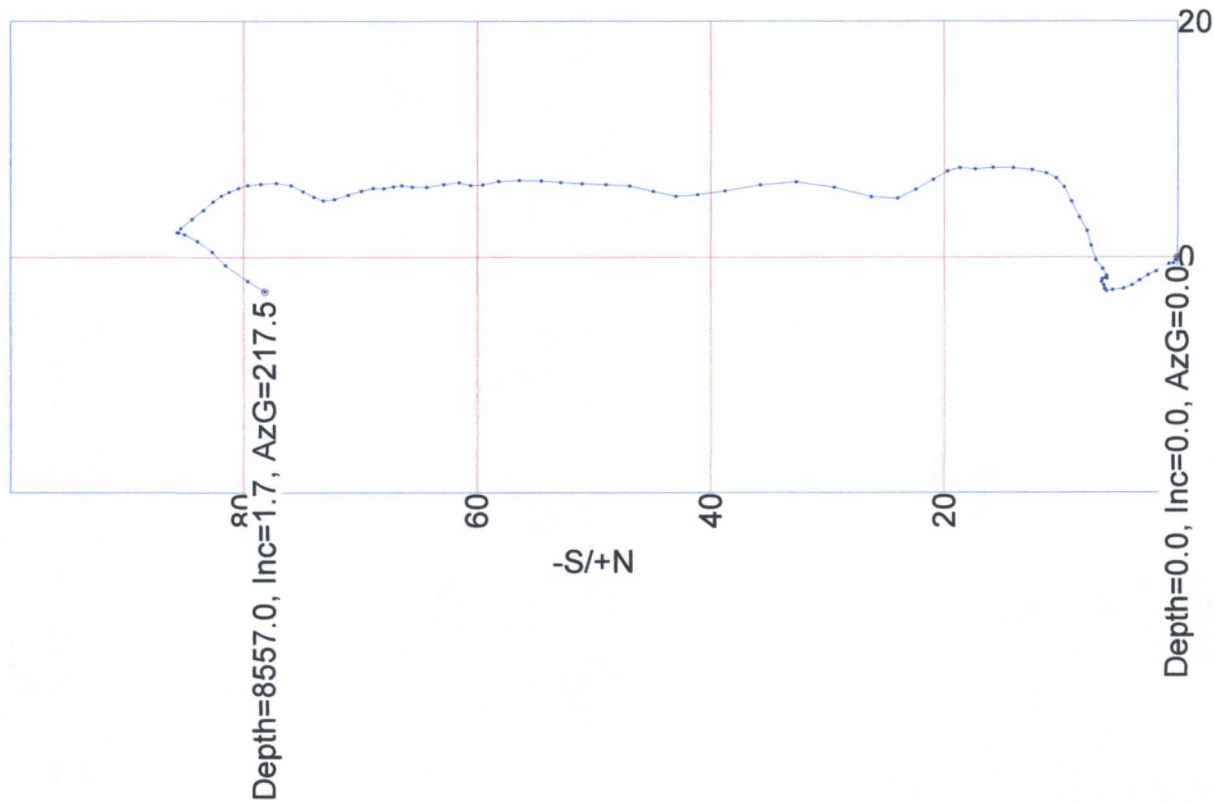
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1700.00	0.08	208.80	1699.97	6.05	-1.82	-6.11	6.31	343.27	0.04
1800.00	0.33	72.67	1799.97	6.07	-1.58	-6.12	6.27	345.43	0.39
1900.00	0.47	51.34	1899.97	6.41	-0.98	-6.44	6.48	351.27	0.20
2000.00	0.63	53.13	1999.96	6.99	-0.23	-7.00	7.00	358.16	0.16
2100.00	0.88	83.07	2099.96	7.42	0.98	-7.38	7.48	7.52	0.46
2200.00	0.65	62.04	2199.95	7.78	2.24	-7.69	8.09	16.10	0.36
2300.00	0.87	59.38	2299.94	8.43	3.40	-8.30	9.08	21.95	0.22
2400.00	0.86	66.54	2399.93	9.11	4.73	-8.94	10.27	27.46	0.11
2500.00	0.75	59.00	2499.92	9.75	5.99	-9.53	11.44	31.55	0.15
2600.00	0.43	28.99	2599.91	10.41	6.73	-10.17	12.40	32.87	0.43
2700.00	0.66	24.42	2699.91	11.27	7.15	-11.01	13.35	32.40	0.23
2800.00	0.78	3.29	2799.90	12.47	7.43	-12.20	14.52	30.78	0.29
2900.00	1.08	9.20	2899.89	14.08	7.62	-13.80	16.01	28.42	0.32
3000.00	0.95	349.58	2999.87	15.82	7.62	-15.55	17.56	25.71	0.37
3100.00	0.80	1.66	3099.86	17.34	7.49	-17.07	18.89	23.36	0.24
3200.00	0.73	8.64	3199.85	18.66	7.60	-18.39	20.15	22.17	0.12
3300.00	0.68	319.61	3299.84	19.74	7.32	-19.47	21.05	20.34	0.58
3400.00	0.93	337.74	3399.83	20.94	6.63	-20.70	21.96	17.56	0.36
3500.00	1.08	323.53	3499.82	22.45	5.76	-22.24	23.18	14.38	0.29
3600.00	0.95	345.67	3599.80	24.02	4.99	-23.83	24.53	11.74	0.41
3700.00	1.70	13.26	3699.78	26.27	5.13	-26.07	26.76	11.04	0.96
3800.00	2.05	15.35	3799.72	29.43	5.94	-29.21	30.03	11.41	0.35
3900.00	1.77	0.33	3899.67	32.70	6.42	-32.46	33.32	11.11	0.57
4000.00	1.78	349.78	3999.62	35.77	6.15	-35.54	36.30	9.76	0.33
4100.00	1.74	350.44	4099.57	38.79	5.63	-38.57	39.20	8.25	0.05
4200.00	0.98	354.81	4199.55	41.14	5.30	-40.93	41.48	7.34	0.77
4300.00	1.15	357.78	4299.53	42.99	5.18	-42.78	43.30	6.87	0.18
4400.00	1.20	25.08	4399.51	44.93	5.59	-44.71	45.28	7.09	0.56
4500.00	1.23	1.69	4499.49	46.95	6.06	-46.71	47.34	7.36	0.49
4600.00	1.10	4.38	4599.47	48.98	6.17	-48.74	49.37	7.18	0.14
4700.00	1.25	0.99	4699.44	51.03	6.26	-50.78	51.41	6.99	0.16
4800.00	0.85	7.27	4799.43	52.85	6.37	-52.60	53.24	6.87	0.41
4900.00	1.07	2.39	4899.41	54.53	6.51	-54.27	54.91	6.80	0.24
5000.00	1.09	359.50	4999.40	56.41	6.54	-56.15	56.79	6.61	0.06
5100.00	0.94	355.51	5099.38	58.18	6.46	-57.92	58.54	6.34	0.16
5200.00	0.70	336.02	5199.37	59.55	6.15	-59.30	59.87	5.90	0.37
5300.00	0.60	22.14	5299.36	60.59	6.10	-60.35	60.90	5.75	0.52
5400.00	0.57	6.01	5399.36	61.57	6.35	-61.31	61.90	5.89	0.17
5500.00	0.99	345.56	5499.35	62.90	6.19	-62.64	63.20	5.62	0.50

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
5500.00	0.71	357.88	5599.34	64.35	5.95	-64.10	64.63	5.28	0.33
5700.00	0.71	4.24	5699.33	65.59	5.97	-65.34	65.86	5.20	0.08
5800.00	0.32	19.32	5799.33	66.47	6.11	-66.22	66.76	5.25	0.41
5900.00	0.57	337.07	5899.32	67.20	6.01	-66.95	67.47	5.11	0.39
6000.00	0.42	5.31	5999.32	68.02	5.85	-67.77	68.27	4.92	0.28
6100.00	0.62	358.29	6099.32	68.92	5.87	-68.68	69.17	4.87	0.21
6200.00	0.62	335.63	6199.31	69.96	5.63	-69.72	70.18	4.60	0.24
6300.00	0.73	348.43	6299.30	71.08	5.28	-70.85	71.27	4.24	0.18
6400.00	0.68	337.59	6399.30	72.25	4.92	-72.04	72.42	3.90	0.14
6500.00	0.48	16.54	6499.29	73.20	4.81	-72.99	73.36	3.76	0.43
6600.00	0.52	24.50	6599.29	74.02	5.12	-73.79	74.19	3.96	0.08
6700.00	0.66	28.61	6699.28	74.93	5.58	-74.69	75.14	4.26	0.15
6800.00	0.66	26.77	6799.28	75.95	6.12	-75.69	76.20	4.60	0.02
6900.00	0.84	355.10	6899.27	77.20	6.31	-76.93	77.45	4.68	0.44
7000.00	0.72	357.57	6999.26	78.55	6.22	-78.28	78.80	4.53	0.13
7100.00	0.55	352.27	7099.25	79.65	6.13	-79.39	79.88	4.40	0.18
7200.00	0.46	330.20	7199.25	80.47	5.87	-80.22	80.69	4.17	0.21
7300.00	0.53	343.34	7299.24	81.26	5.54	-81.02	81.45	3.90	0.13
7400.00	0.33	319.98	7399.24	81.93	5.22	-81.69	82.09	3.64	0.26
7500.00	0.67	326.40	7499.24	82.64	4.71	-82.42	82.77	3.26	0.34
7600.00	0.59	312.62	7599.23	83.47	4.01	-83.28	83.56	2.75	0.17
7700.00	0.84	327.91	7699.22	84.44	3.24	-84.28	84.50	2.20	0.32
7800.00	0.58	309.38	7799.22	85.39	2.46	-85.25	85.42	1.65	0.35
7900.00	0.05	84.92	7899.21	85.71	2.11	-85.58	85.74	1.41	0.62
8000.00	0.15	210.18	7999.21	85.60	2.09	-85.47	85.62	1.40	0.19
8100.00	0.50	192.15	8099.21	85.06	1.93	-84.94	85.08	1.30	0.35
8200.00	0.96	214.61	8199.20	83.95	1.36	-83.85	83.96	0.93	0.54
8300.00	0.83	218.16	8299.19	82.68	0.43	-82.62	82.69	0.30	0.14
8400.00	1.00	230.34	8399.18	81.56	-0.69	-81.53	81.56	359.52	0.25
8500.00	1.75	206.50	8499.15	79.63	-2.04	-79.65	79.66	358.53	0.93
8557.00	1.67	217.53	8556.13	78.19	-2.93	-78.25	78.25	357.85	0.60



VES Survey International
Midland, Texas
432-563-5444

Surveyor: Adam Askew
SL East 30 Federal Com No 002H / API 30-025-42524



VES Survey Date: 1/16/2016



I Adam Askew certify that I am employed by VES Survey International. That I did on the day(s) of 01/17/16 through 01/17/16 conduct or supervise the taking of a Rate Gyro survey from a depth of 0.00 feet to a depth of 8,557.00 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Vaughn Energy Services, that I am authorized and qualified to make this report; that this survey was conducted at the request of Concho for the SL East 30 Fed Com Well # 2H API # 30-025-42524 in Lea County / Parish New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Vaughn Energy Services

A handwritten signature in blue ink, appearing to be "Adam Askew", is written over a horizontal line.

Adam Askew
Service Technician
Vaughn Energy Services



COG Operating LLC

Lea County, NM (NAD27 NME)

SL East 30 Federal Com

#2H

OH

Survey: MWD #1

Survey Report - Geographic

27 January, 2016



Wellplanning

Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	WELL @ 3581.7usft (Original Well Elev)
Site:	SL East 30 Federal Com	MD Reference:	WELL @ 3581.7usft (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 (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	SL East 30 Federal Com		
Site Position:		Northing:	596,965.80 usft
From:	Map	Easting:	664,737.60 usft
Position Uncertainty:	3.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 38' 24.075 N
		Longitude:	103° 47' 53.395 W
		Grid Convergence:	0.29 °

Well	#2H		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 38' 24.075 N
		Longitude:	103° 47' 53.395 W
		Ground Level:	3,561.7 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2015	12/26/2015	7.25
			Dip Angle
			(°)
			60.43
			Field Strength
			(nT)
			48,312

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
			Direction
			(°)
			178.19

Survey Program	Date 1/27/2016		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.0	8,557.0	GYRO (OH)	NS-GYRO-MS
8,708.0	14,545.0	MWD #1 (OH)	MWD
			Description
			North sensing gyrocompassing m/s
			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)		
8,557.0	1.67	217.53	8,556.1	78.3	-2.9	597,044.06	664,734.71	32° 38' 24.849 N	103° 47' 53.424 W
Old Gas Well									
8,708.0	1.90	208.40	8,707.1	74.3	-5.4	597,040.11	664,732.18	32° 38' 24.810 N	103° 47' 53.454 W
8,739.0	4.90	193.70	8,738.0	72.6	-6.0	597,038.37	664,731.62	32° 38' 24.793 N	103° 47' 53.460 W
8,771.0	9.10	182.10	8,769.7	68.7	-6.4	597,034.52	664,731.20	32° 38' 24.755 N	103° 47' 53.466 W
8,802.0	13.20	175.80	8,800.2	62.7	-6.2	597,028.53	664,731.37	32° 38' 24.696 N	103° 47' 53.464 W
8,834.0	16.90	172.70	8,831.1	54.5	-5.4	597,020.27	664,732.23	32° 38' 24.614 N	103° 47' 53.454 W
8,866.0	20.30	171.20	8,861.4	44.4	-3.9	597,010.17	664,733.67	32° 38' 24.514 N	103° 47' 53.438 W
8,897.0	23.20	170.50	8,890.2	33.0	-2.1	596,998.83	664,735.50	32° 38' 24.402 N	103° 47' 53.417 W
8,928.0	25.90	170.50	8,918.4	20.3	0.0	596,986.13	664,737.63	32° 38' 24.276 N	103° 47' 53.393 W
8,960.0	28.20	171.40	8,946.9	6.0	2.3	596,971.76	664,739.91	32° 38' 24.133 N	103° 47' 53.367 W



Wellplanning

Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	WELL @ 3581.7usft (Original Well Elev)
Site:	SL East 30 Federal Com	MD Reference:	WELL @ 3581.7usft (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	
8,992.0	31.00	170.90	8,974.7	-9.7	4.7	596,956.14	664,742.35	32° 38' 23.979 N	103° 47' 53.340 W	
9,023.0	34.10	170.50	9,000.8	-26.1	7.4	596,939.69	664,745.05	32° 38' 23.816 N	103° 47' 53.309 W	
9,055.0	37.20	168.90	9,026.8	-44.5	10.8	596,921.34	664,748.39	32° 38' 23.634 N	103° 47' 53.271 W	
9,085.0	40.40	168.90	9,050.2	-62.9	14.4	596,902.90	664,752.01	32° 38' 23.451 N	103° 47' 53.230 W	
9,117.0	43.30	169.20	9,074.0	-83.9	18.5	596,881.94	664,756.06	32° 38' 23.244 N	103° 47' 53.184 W	
9,148.0	46.20	169.50	9,096.0	-105.3	22.5	596,860.49	664,760.09	32° 38' 23.031 N	103° 47' 53.138 W	
9,180.0	49.10	169.60	9,117.6	-128.6	26.8	596,837.24	664,764.38	32° 38' 22.801 N	103° 47' 53.089 W	
9,211.0	52.00	170.60	9,137.3	-152.1	30.9	596,813.66	664,768.49	32° 38' 22.568 N	103° 47' 53.043 W	
9,242.0	55.80	170.40	9,155.5	-176.8	35.0	596,788.96	664,772.63	32° 38' 22.323 N	103° 47' 52.996 W	
9,273.0	59.10	170.80	9,172.2	-202.6	39.3	596,763.18	664,776.89	32° 38' 22.068 N	103° 47' 52.947 W	
9,290.0	60.38	171.61	9,180.8	-217.2	41.5	596,748.64	664,779.14	32° 38' 21.924 N	103° 47' 52.922 W	
Lusk Deep Unit "A" #23H										
9,305.0	61.50	172.30	9,188.1	-230.1	43.4	596,735.69	664,780.97	32° 38' 21.795 N	103° 47' 52.901 W	
9,336.0	63.90	173.00	9,202.3	-257.4	46.9	596,708.37	664,784.49	32° 38' 21.525 N	103° 47' 52.862 W	
9,368.0	66.30	174.20	9,215.8	-286.3	50.1	596,679.53	664,787.73	32° 38' 21.239 N	103° 47' 52.825 W	
9,399.0	69.70	175.00	9,227.4	-314.9	52.8	596,650.92	664,790.43	32° 38' 20.956 N	103° 47' 52.796 W	
9,430.0	73.20	175.00	9,237.2	-344.2	55.4	596,621.65	664,792.99	32° 38' 20.666 N	103° 47' 52.767 W	
9,459.0	76.10	174.90	9,244.9	-372.0	57.8	596,593.79	664,795.45	32° 38' 20.391 N	103° 47' 52.740 W	
9,491.0	78.50	174.40	9,252.0	-403.1	60.8	596,562.71	664,798.36	32° 38' 20.083 N	103° 47' 52.708 W	
9,522.0	79.80	173.70	9,257.8	-433.4	63.9	596,532.43	664,801.52	32° 38' 19.783 N	103° 47' 52.673 W	
9,554.0	81.10	173.00	9,263.1	-464.7	67.6	596,501.09	664,805.17	32° 38' 19.473 N	103° 47' 52.632 W	
9,585.0	83.80	172.00	9,267.2	-495.2	71.6	596,470.62	664,809.19	32° 38' 19.171 N	103° 47' 52.587 W	
9,617.0	86.50	171.60	9,269.9	-526.7	76.1	596,439.07	664,813.73	32° 38' 18.859 N	103° 47' 52.536 W	
9,648.0	87.50	171.80	9,271.5	-557.4	80.6	596,408.43	664,818.20	32° 38' 18.555 N	103° 47' 52.485 W	
9,744.0	90.00	174.70	9,273.6	-652.7	91.9	596,313.14	664,829.48	32° 38' 17.612 N	103° 47' 52.359 W	
9,839.0	88.70	177.50	9,274.7	-747.4	98.3	596,218.38	664,835.94	32° 38' 16.674 N	103° 47' 52.289 W	
9,934.0	89.40	179.60	9,276.2	-842.4	100.7	596,123.43	664,838.34	32° 38' 15.734 N	103° 47' 52.266 W	
10,029.0	87.30	178.60	9,279.0	-937.3	102.2	596,028.48	664,839.83	32° 38' 14.794 N	103° 47' 52.254 W	
10,123.0	88.30	178.10	9,282.6	-1,031.2	104.9	595,934.59	664,842.54	32° 38' 13.865 N	103° 47' 52.228 W	
10,218.0	89.00	176.90	9,284.8	-1,126.1	109.1	595,839.71	664,846.68	32° 38' 12.926 N	103° 47' 52.186 W	
10,313.0	89.30	178.50	9,286.2	-1,221.0	112.9	595,744.80	664,850.49	32° 38' 11.987 N	103° 47' 52.147 W	
10,407.0	90.30	178.30	9,286.6	-1,315.0	115.5	595,650.84	664,853.12	32° 38' 11.057 N	103° 47' 52.121 W	
10,502.0	91.10	178.30	9,285.4	-1,409.9	118.3	595,555.89	664,855.94	32° 38' 10.117 N	103° 47' 52.094 W	
10,595.0	91.40	179.80	9,283.4	-1,502.9	119.9	595,462.93	664,857.48	32° 38' 9.197 N	103° 47' 52.082 W	
10,690.0	89.50	179.60	9,282.6	-1,597.9	120.4	595,367.94	664,857.98	32° 38' 8.257 N	103° 47' 52.081 W	
10,787.0	88.10	180.10	9,284.7	-1,694.8	120.6	595,270.96	664,858.23	32° 38' 7.298 N	103° 47' 52.084 W	
10,881.0	88.70	179.80	9,287.3	-1,788.8	120.7	595,177.00	664,858.31	32° 38' 6.368 N	103° 47' 52.089 W	
10,976.0	89.60	179.80	9,288.7	-1,883.8	121.0	595,082.01	664,858.64	32° 38' 5.428 N	103° 47' 52.090 W	
11,069.0	88.90	180.10	9,289.9	-1,976.8	121.1	594,989.02	664,858.72	32° 38' 4.508 N	103° 47' 52.095 W	
11,163.0	89.10	179.80	9,291.6	-2,070.8	121.2	594,895.03	664,858.81	32° 38' 3.578 N	103° 47' 52.099 W	
11,258.0	89.80	179.80	9,292.5	-2,165.8	121.5	594,800.04	664,859.14	32° 38' 2.638 N	103° 47' 52.101 W	
11,352.0	91.20	179.20	9,291.6	-2,259.8	122.4	594,706.05	664,859.96	32° 38' 1.708 N	103° 47' 52.097 W	
11,447.0	89.40	179.20	9,291.1	-2,354.7	123.7	594,611.06	664,861.28	32° 38' 0.768 N	103° 47' 52.087 W	
11,542.0	88.30	178.90	9,293.1	-2,449.7	125.3	594,516.10	664,862.86	32° 37' 59.828 N	103° 47' 52.074 W	
11,636.0	90.30	178.70	9,294.2	-2,543.7	127.2	594,422.13	664,864.83	32° 37' 58.898 N	103° 47' 52.057 W	
11,731.0	88.60	178.50	9,295.1	-2,638.6	129.5	594,327.17	664,867.15	32° 37' 57.958 N	103° 47' 52.035 W	
11,826.0	89.10	178.00	9,297.0	-2,733.6	132.4	594,232.23	664,870.05	32° 37' 57.019 N	103° 47' 52.007 W	
11,920.0	89.90	177.50	9,297.8	-2,827.5	136.1	594,138.31	664,873.74	32° 37' 56.089 N	103° 47' 51.969 W	
12,015.0	88.70	177.60	9,299.0	-2,922.4	140.2	594,043.40	664,877.80	32° 37' 55.150 N	103° 47' 51.928 W	
12,110.0	90.00	177.20	9,300.1	-3,017.3	144.5	593,948.51	664,882.11	32° 37' 54.210 N	103° 47' 51.883 W	
12,205.0	89.10	178.20	9,300.8	-3,112.2	148.3	593,853.59	664,885.92	32° 37' 53.271 N	103° 47' 51.844 W	
12,299.0	87.70	178.90	9,303.4	-3,206.1	150.7	593,759.66	664,888.30	32° 37' 52.341 N	103° 47' 51.821 W	
12,394.0	87.90	179.70	9,307.1	-3,301.1	151.9	593,664.74	664,889.46	32° 37' 51.402 N	103° 47' 51.814 W	
12,489.0	88.10	179.00	9,310.4	-3,396.0	152.9	593,569.80	664,890.54	32° 37' 50.463 N	103° 47' 51.807 W	
12,584.0	89.70	179.00	9,312.2	-3,491.0	154.6	593,474.84	664,892.19	32° 37' 49.523 N	103° 47' 51.793 W	



Wellplanning

Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	WELL @ 3581.7usft (Original Well Elev)
Site:	SL East 30 Federal Com	MD Reference:	WELL @ 3581.7usft (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	
12,677.0	90.20	178.00	9,312.3	-3,583.9	157.0	593,381.87	664,894.63	32° 37' 48.603 N	103° 47' 51.770 W	
12,772.0	91.30	177.60	9,311.1	-3,678.9	160.7	593,286.95	664,898.27	32° 37' 47.663 N	103° 47' 51.733 W	
12,866.0	89.90	177.00	9,310.1	-3,772.7	165.1	593,193.06	664,902.70	32° 37' 46.734 N	103° 47' 51.686 W	
12,960.0	88.40	178.20	9,311.5	-3,866.6	169.0	593,099.16	664,906.64	32° 37' 45.805 N	103° 47' 51.646 W	
13,055.0	88.70	179.60	9,313.9	-3,961.6	170.9	593,004.21	664,908.46	32° 37' 44.865 N	103° 47' 51.630 W	
13,150.0	88.60	180.90	9,316.1	-4,056.6	170.4	592,909.24	664,908.05	32° 37' 43.925 N	103° 47' 51.641 W	
13,244.0	89.00	180.40	9,318.1	-4,150.5	169.4	592,815.27	664,906.98	32° 37' 42.995 N	103° 47' 51.659 W	
13,338.0	89.70	179.50	9,319.2	-4,244.5	169.5	592,721.28	664,907.06	32° 37' 42.065 N	103° 47' 51.663 W	
13,432.0	90.00	178.80	9,319.4	-4,338.5	170.9	592,627.29	664,908.46	32° 37' 41.135 N	103° 47' 51.653 W	
13,526.0	89.20	179.70	9,320.1	-4,432.5	172.1	592,533.30	664,909.69	32° 37' 40.205 N	103° 47' 51.644 W	
13,620.0	88.10	180.00	9,322.3	-4,526.5	172.3	592,439.33	664,909.93	32° 37' 39.275 N	103° 47' 51.646 W	
13,714.0	89.00	181.10	9,324.7	-4,620.4	171.4	592,345.36	664,909.03	32° 37' 38.345 N	103° 47' 51.662 W	
13,808.0	89.60	180.00	9,325.8	-4,714.4	170.5	592,251.38	664,908.13	32° 37' 37.415 N	103° 47' 51.679 W	
13,904.0	89.80	179.60	9,326.3	-4,810.4	170.9	592,155.38	664,908.46	32° 37' 36.466 N	103° 47' 51.680 W	
13,999.0	90.50	179.60	9,326.1	-4,905.4	171.5	592,060.38	664,909.13	32° 37' 35.525 N	103° 47' 51.678 W	
14,094.0	90.60	179.10	9,325.1	-5,000.4	172.6	591,965.39	664,910.20	32° 37' 34.585 N	103° 47' 51.671 W	
14,188.0	91.80	177.90	9,323.2	-5,094.4	175.1	591,871.45	664,912.66	32° 37' 33.656 N	103° 47' 51.648 W	
14,283.0	90.20	178.00	9,321.5	-5,189.3	178.5	591,776.53	664,916.06	32° 37' 32.716 N	103° 47' 51.614 W	
14,378.0	91.60	177.40	9,320.0	-5,284.2	182.3	591,681.62	664,919.87	32° 37' 31.777 N	103° 47' 51.575 W	
14,498.0	92.50	176.50	9,315.7	-5,403.9	188.6	591,561.87	664,926.25	32° 37' 30.592 N	103° 47' 51.507 W	
14,545.0	92.50	176.50	9,313.7	-5,450.8	191.5	591,515.00	664,929.12	32° 37' 30.128 N	103° 47' 51.476 W	
PBHL(SLE30#2H)										

Checked By: _____	Approved By: _____	Date: _____
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