



NM OIL CONSERVATION
ARTESIA DISTRICT

JUN 1 2015

RECEIVED

January 23, 2015

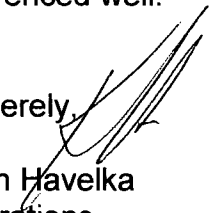
Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

Attn: Kanicia Castillo

RE: **Screech Owl Federal 4H**

Please find enclosed a copy of the survey from 0' to 5670' ran on the above referenced well.

Sincerely,

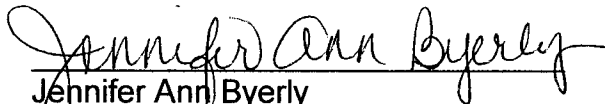

Keith Havelka
Operations

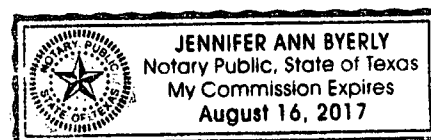
STATE OF TEXAS §

§

COUNTY OF NUECES §

This instrument was acknowledged before me on the 23 day of Jan,
A.D., 2015, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: Concho
Lease/Well: Screech Owl Federal/4H
Location: Sec19 T26S R27E
Rig Name: Scandril Freedom
State/County: New Mexico/Eddy
Latitude: 32.03, Longitude: -104.22
GRID North is 0.06 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB = 27 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 1/23/2015 / 12:32

VES Survey International
West Texas
(432) 563-5444
Surveyor: Noe Garza
Screech Owl Federal 4H / API 30-015-42828

NM OIL CONSERVATION
ARTESIA DISTRICT

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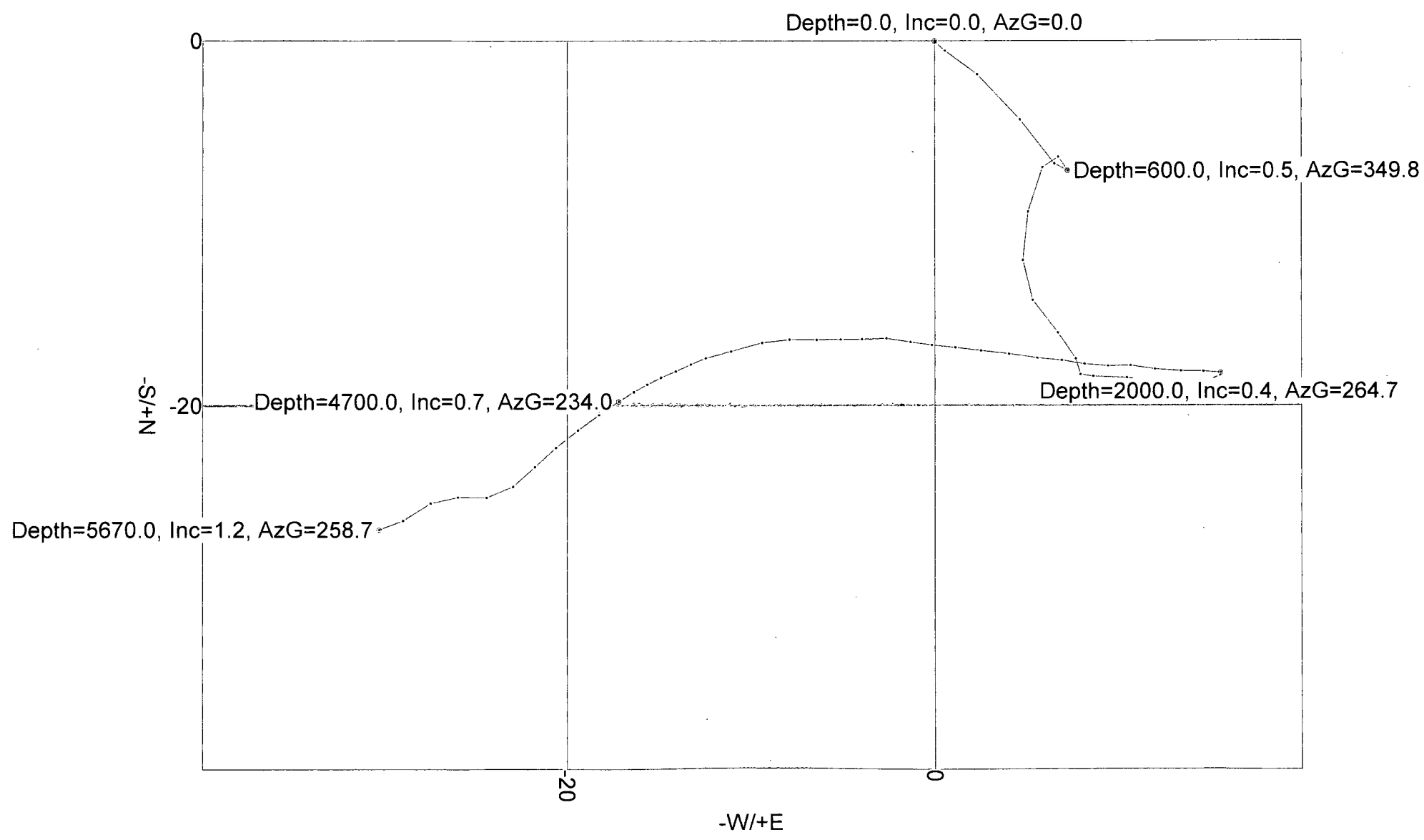
RECEIVED

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	0.09	160.96	100.00	-0.07	0.03	-0.07	0.08	160.96	0.09
200.00	0.72	127.54	200.00	-0.53	0.55	-0.53	0.77	133.98	0.65
300.00	1.78	126.25	299.97	-1.83	2.30	-1.83	2.94	128.54	1.05
400.00	2.20	145.19	399.91	-4.33	4.65	-4.33	6.35	132.95	0.78
500.00	1.33	136.52	499.86	-6.74	6.54	-6.74	9.40	135.87	0.91
600.00	0.54	349.78	599.86	-7.12	7.26	-7.12	10.17	134.48	1.80
700.00	0.59	304.64	699.85	-6.37	6.75	-6.37	9.28	133.35	0.44
800.00	1.12	207.06	799.84	-6.95	5.88	-6.95	9.10	139.75	1.33
900.00	1.82	192.39	899.81	-9.37	5.10	-9.37	10.66	151.45	0.79
1000.00	1.29	177.49	999.78	-12.04	4.80	-12.04	12.96	158.24	0.66
1100.00	1.34	155.20	1099.75	-14.22	5.34	-14.22	15.19	159.40	0.51
1200.00	1.32	129.55	1199.72	-16.01	6.72	-16.01	17.36	157.24	0.59
1300.00	0.79	172.70	1299.71	-17.42	7.69	-17.42	19.04	156.19	0.91
1400.00	0.30	137.45	1399.70	-18.30	7.95	-18.30	19.95	156.51	0.58
1500.00	0.60	80.83	1499.70	-18.41	8.64	-18.41	20.34	154.84	0.50
1600.00	1.51	96.92	1599.68	-18.48	10.47	-18.48	21.24	150.47	0.95
1700.00	1.41	97.77	1699.65	-18.81	12.99	-18.81	22.86	145.36	0.11
1800.00	0.59	63.17	1799.63	-18.74	14.67	-18.74	23.80	141.94	0.98

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	0.50	67.58	1899.63	-18.34	15.54	-18.34	24.04	139.73	0.10
2000.00	0.43	264.69	1999.63	-18.21	15.57	-18.21	23.95	139.47	0.92
2100.00	0.67	280.00	2099.62	-18.14	14.62	-18.14	23.30	141.14	0.27
2200.00	0.75	263.73	2199.62	-18.11	13.40	-18.11	22.53	143.51	0.22
2300.00	0.87	283.59	2299.61	-18.00	12.01	-18.00	21.64	146.30	0.30
2400.00	0.68	271.21	2399.60	-17.81	10.68	-17.81	20.77	149.05	0.25
2500.00	0.74	267.24	2499.59	-17.83	9.44	-17.83	20.18	152.10	0.08
2600.00	0.73	282.86	2599.58	-17.72	8.17	-17.72	19.51	155.24	0.20
2700.00	0.70	274.84	2699.57	-17.53	6.94	-17.53	18.85	158.41	0.11
2800.00	0.85	276.53	2799.57	-17.39	5.59	-17.39	18.27	162.17	0.14
2900.00	0.96	279.83	2899.55	-17.16	4.04	-17.16	17.63	166.76	0.12
3000.00	0.82	272.37	2999.54	-16.99	2.50	-16.99	17.18	171.63	0.18
3100.00	0.79	281.91	3099.53	-16.82	1.11	-16.82	16.86	176.24	0.14
3200.00	0.68	269.13	3199.52	-16.69	-0.16	-16.69	16.69	180.56	0.20
3300.00	0.69	286.33	3299.52	-16.53	-1.33	-16.53	16.58	184.61	0.20
3400.00	0.85	272.60	3399.51	-16.32	-2.65	-16.32	16.54	189.23	0.25
3500.00	0.67	262.82	3499.50	-16.36	-3.97	-16.36	16.84	193.65	0.23
3600.00	0.65	276.13	3599.49	-16.37	-5.12	-16.37	17.16	197.36	0.15
3700.00	0.84	263.77	3699.48	-16.39	-6.42	-16.39	17.60	201.38	0.25
3800.00	0.88	276.60	3799.47	-16.39	-7.91	-16.39	18.19	205.77	0.19
3900.00	0.91	251.00	3899.46	-16.55	-9.42	-16.55	19.05	209.63	0.40
4000.00	1.10	257.12	3999.44	-17.03	-11.10	-17.03	20.33	213.10	0.22
4100.00	0.54	249.80	4099.43	-17.40	-12.48	-17.40	21.42	215.64	0.57
4200.00	0.47	244.56	4199.43	-17.74	-13.29	-17.74	22.17	216.84	0.08
4300.00	0.57	244.83	4299.43	-18.13	-14.11	-18.13	22.97	217.89	0.10
4400.00	0.45	249.40	4399.42	-18.48	-14.92	-18.48	23.75	218.92	0.13
4500.00	0.52	238.87	4499.42	-18.85	-15.67	-18.85	24.51	219.75	0.12
4600.00	0.44	241.47	4599.42	-19.26	-16.40	-19.26	25.30	220.40	0.08
4700.00	0.67	234.01	4699.41	-19.79	-17.21	-19.79	26.22	221.00	0.24
4800.00	0.83	236.28	4799.40	-20.53	-18.28	-20.53	27.49	221.67	0.16
4900.00	0.81	230.53	4899.39	-21.38	-19.42	-21.38	28.89	222.25	0.08
5000.00	0.93	233.26	4999.38	-22.32	-20.62	-22.32	30.38	222.73	0.13
5100.00	0.88	221.39	5099.37	-23.37	-21.77	-23.37	31.94	222.97	0.19
5200.00	0.99	234.38	5199.35	-24.45	-22.98	-24.45	33.56	223.22	0.24
5300.00	0.85	262.26	5299.34	-25.06	-24.42	-25.06	34.99	224.26	0.46
5400.00	0.99	277.81	5399.33	-25.04	-26.01	-25.04	36.10	226.09	0.28
5500.00	0.93	236.49	5499.32	-25.37	-27.54	-25.37	37.44	227.35	0.68
5600.00	1.14	239.49	5599.30	-26.32	-29.07	-26.32	39.21	227.84	0.22
5670.00	1.15	258.66	5669.29	-26.81	-30.35	-26.81	40.50	228.55	0.54



VES Survey International
West Texas
(432) 563-5444
Surveyor: Noe Garza
Screech Owl Federal 4H / API 30-015-42828





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RECEIVED

COG Operating, LLC

Eddy County, NM (NAD 27)

Sec 19, T26S, R27E

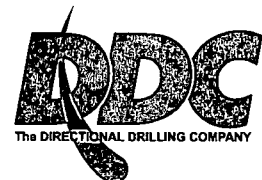
Screech Owl Federal #4H

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

28 January, 2015



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Screech Owl Federal #4H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3342.0usft (Scandrift Freedom)
Site:	Sec 19, T26S, R27E	MD Reference:	Well @ 3342.0usft (Scandrift Freedom)
Well:	Screech Owl Federal #4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Project	Eddy County, NM (NAD 27)		
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: Sec 19, T26S, R27E					
Site Position:		Northing:	376,291.20 usft	Latitude:	32° 2' 4.162 N
From:	Map	Easting:	534,736.30 usft	Longitude:	104° 13' 16.453 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.06 °

Well	Screech Owl Federal #4H					
Well Position	+N/-S	0.0 usft	Northing:	376,291.20 usft	Latitude:	32° 2' 4.162 N
	+E/-W	0.0 usft	Easting:	534,736.30 usft	Longitude:	104° 13' 16.453 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	3,316.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/29/2014	7.44	59.81	48,079

Design		Wellbore #1			
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	179.95	

Survey Program	Date	1/28/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	5,670.0	GYRO (Wellbore #1)	Good_gyro	Good Gyro	
5,775.0	17,318.0	MWD (Wellbore #1)	MWD default	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
0.0	0.00	0.00	0.0	0.0	0.0	376,291.20	534,736.30	32° 2' 4.162 N	104° 13' 16.453 W
100.0	0.09	160.96	100.0	-0.1	0.0	376,291.12	534,736.33	32° 2' 4.161 N	104° 13' 16.452 W
200.0	0.72	127.54	200.0	-0.5	0.5	376,290.67	534,736.85	32° 2' 4.157 N	104° 13' 16.446 W
300.0	1.78	126.25	300.0	-1.8	2.3	376,289.37	534,738.60	32° 2' 4.144 N	104° 13' 16.426 W
400.0	2.20	145.19	399.9	-4.3	4.6	376,286.87	534,740.95	32° 2' 4.119 N	104° 13' 16.399 W
500.0	1.33	136.52	499.9	-6.7	6.5	376,284.45	534,742.84	32° 2' 4.095 N	104° 13' 16.377 W
600.0	0.54	349.78	599.9	-7.1	7.3	376,284.08	534,743.56	32° 2' 4.092 N	104° 13' 16.369 W
700.0	0.59	304.64	699.9	-6.4	6.8	376,284.83	534,743.05	32° 2' 4.099 N	104° 13' 16.374 W
800.0	1.12	207.06	799.8	-6.9	5.9	376,284.25	534,742.18	32° 2' 4.093 N	104° 13' 16.385 W
900.0	1.82	192.39	899.8	-9.4	5.1	376,281.83	534,741.40	32° 2' 4.069 N	104° 13' 16.394 W
1,000.0	1.29	177.49	999.8	-12.0	4.8	376,279.16	534,741.11	32° 2' 4.043 N	104° 13' 16.397 W



Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Screech Owl Federal #4H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3342.0usft (Scandrift Freedom)
Site:	Sec 19, T26S, R27E	MD Reference:	Well @ 3342.0usft (Scandrift Freedom)
Well:	Screech Owl Federal #4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

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	1.34	155.20	1,099.7	-14.2	5.3	376,276.97	534,741.65	32° 2' 4.021 N	104° 13' 16.391 W	
1,200.0	1.32	129.55	1,199.7	-16.0	6.7	376,275.18	534,743.03	32° 2' 4.004 N	104° 13' 16.375 W	
1,300.0	0.79	172.70	1,299.7	-17.4	7.7	376,273.76	534,744.00	32° 2' 3.990 N	104° 13' 16.364 W	
1,400.0	0.30	137.45	1,399.7	-18.3	8.0	376,272.88	534,744.27	32° 2' 3.981 N	104° 13' 16.360 W	
1,500.0	0.60	80.83	1,499.7	-18.4	8.7	376,272.77	534,744.96	32° 2' 3.980 N	104° 13' 16.352 W	
1,600.0	1.51	96.92	1,599.7	-18.5	10.5	376,272.70	534,746.79	32° 2' 3.979 N	104° 13' 16.331 W	
1,700.0	1.41	97.77	1,699.6	-18.8	13.0	376,272.37	534,749.31	32° 2' 3.976 N	104° 13' 16.302 W	
1,800.0	0.59	63.17	1,799.6	-18.8	14.7	376,272.44	534,750.99	32° 2' 3.976 N	104° 13' 16.282 W	
1,900.0	0.50	67.58	1,899.6	-18.4	15.6	376,272.84	534,751.85	32° 2' 3.980 N	104° 13' 16.272 W	
2,000.0	0.43	264.69	1,999.6	-18.2	15.6	376,272.97	534,751.88	32° 2' 3.982 N	104° 13' 16.272 W	
2,100.0	0.67	280.00	2,099.6	-18.2	14.6	376,273.04	534,750.93	32° 2' 3.982 N	104° 13' 16.283 W	
2,200.0	0.75	263.73	2,199.6	-18.1	13.4	376,273.07	534,749.71	32° 2' 3.983 N	104° 13' 16.297 W	
2,300.0	0.87	283.59	2,299.6	-18.0	12.0	376,273.17	534,748.32	32° 2' 3.984 N	104° 13' 16.313 W	
2,400.0	0.68	271.21	2,399.6	-17.8	10.7	376,273.36	534,746.99	32° 2' 3.986 N	104° 13' 16.329 W	
2,500.0	0.74	267.24	2,499.6	-17.9	9.4	376,273.34	534,745.75	32° 2' 3.985 N	104° 13' 16.343 W	
2,600.0	0.73	282.86	2,599.6	-17.7	8.2	376,273.46	534,744.48	32° 2' 3.986 N	104° 13' 16.358 W	
2,700.0	0.70	274.84	2,699.6	-17.5	7.0	376,273.65	534,743.25	32° 2' 3.988 N	104° 13' 16.372 W	
2,800.0	0.85	276.53	2,799.6	-17.4	5.6	376,273.78	534,741.91	32° 2' 3.990 N	104° 13' 16.388 W	
2,900.0	0.96	279.83	2,899.6	-17.2	4.0	376,274.01	534,740.35	32° 2' 3.992 N	104° 13' 16.406 W	
3,000.0	0.82	272.37	2,999.5	-17.0	2.5	376,274.18	534,738.81	32° 2' 3.994 N	104° 13' 16.424 W	
3,100.0	0.79	281.91	3,099.5	-16.8	1.1	376,274.36	534,737.42	32° 2' 3.995 N	104° 13' 16.440 W	
3,200.0	0.68	269.13	3,199.5	-16.7	-0.2	376,274.49	534,736.15	32° 2' 3.997 N	104° 13' 16.455 W	
3,300.0	0.69	286.33	3,299.5	-16.5	-1.3	376,274.65	534,734.98	32° 2' 3.998 N	104° 13' 16.468 W	
3,400.0	0.85	272.60	3,399.5	-16.3	-2.6	376,274.85	534,733.66	32° 2' 4.000 N	104° 13' 16.484 W	
3,500.0	0.67	262.82	3,499.5	-16.4	-4.0	376,274.81	534,732.34	32° 2' 4.000 N	104° 13' 16.499 W	
3,600.0	0.65	276.13	3,599.5	-16.4	-5.1	376,274.80	534,731.19	32° 2' 4.000 N	104° 13' 16.512 W	
3,700.0	0.84	263.77	3,699.5	-16.4	-6.4	376,274.78	534,729.90	32° 2' 4.000 N	104° 13' 16.527 W	
3,800.0	0.88	276.60	3,799.5	-16.4	-7.9	376,274.79	534,728.41	32° 2' 4.000 N	104° 13' 16.545 W	
3,900.0	0.91	251.00	3,899.5	-16.6	-9.4	376,274.62	534,726.89	32° 2' 3.998 N	104° 13' 16.562 W	
4,000.0	1.10	257.12	3,999.4	-17.1	-11.1	376,274.15	534,725.21	32° 2' 3.994 N	104° 13' 16.582 W	
4,100.0	0.54	249.80	4,099.4	-17.4	-12.5	376,273.77	534,723.83	32° 2' 3.990 N	104° 13' 16.598 W	
4,200.0	0.47	244.56	4,199.4	-17.8	-13.3	376,273.43	534,723.02	32° 2' 3.986 N	104° 13' 16.607 W	
4,300.0	0.57	244.83	4,299.4	-18.2	-14.1	376,273.04	534,722.20	32° 2' 3.983 N	104° 13' 16.617 W	
4,400.0	0.45	249.40	4,399.4	-18.5	-14.9	376,272.70	534,721.38	32° 2' 3.979 N	104° 13' 16.626 W	
4,500.0	0.52	238.87	4,499.4	-18.9	-15.7	376,272.32	534,720.62	32° 2' 3.976 N	104° 13' 16.635 W	
4,600.0	0.44	241.47	4,599.4	-19.3	-16.4	376,271.90	534,719.90	32° 2' 3.971 N	104° 13' 16.644 W	
4,700.0	0.67	234.01	4,699.4	-19.8	-17.2	376,271.38	534,719.09	32° 2' 3.966 N	104° 13' 16.653 W	
4,800.0	0.83	236.28	4,799.4	-20.6	-18.3	376,270.63	534,718.01	32° 2' 3.959 N	104° 13' 16.666 W	
4,900.0	0.81	230.53	4,899.4	-21.4	-19.4	376,269.78	534,716.86	32° 2' 3.950 N	104° 13' 16.679 W	
5,000.0	0.93	233.26	4,999.4	-22.4	-20.6	376,268.85	534,715.67	32° 2' 3.941 N	104° 13' 16.693 W	
5,100.0	0.88	221.39	5,099.4	-23.4	-21.8	376,267.78	534,714.51	32° 2' 3.931 N	104° 13' 16.706 W	
5,200.0	0.99	234.38	5,199.4	-24.5	-23.0	376,266.70	534,713.30	32° 2' 3.920 N	104° 13' 16.720 W	
5,300.0	0.85	262.26	5,299.3	-25.1	-24.4	376,266.10	534,711.86	32° 2' 3.914 N	104° 13' 16.737 W	
5,400.0	0.99	277.81	5,399.3	-25.1	-26.0	376,266.12	534,710.27	32° 2' 3.914 N	104° 13' 16.755 W	
5,500.0	0.93	236.49	5,499.3	-25.4	-27.6	376,265.79	534,708.74	32° 2' 3.911 N	104° 13' 16.773 W	
5,600.0	1.14	239.49	5,599.3	-26.4	-29.1	376,264.84	534,707.21	32° 2' 3.902 N	104° 13' 16.791 W	
5,670.0	1.15	258.66	5,669.3	-26.9	-30.4	376,264.34	534,705.92	32° 2' 3.897 N	104° 13' 16.806 W	
Tie in @ 5670' MD / 5669' TVD										
5,775.0	2.00	269.50	5,774.2	-27.1	-33.3	376,264.12	534,703.05	32° 2' 3.895 N	104° 13' 16.839 W	
5,964.0	0.70	325.90	5,963.2	-26.2	-37.2	376,265.05	534,699.11	32° 2' 3.904 N	104° 13' 16.885 W	
6,152.0	1.10	300.20	6,151.2	-24.3	-39.4	376,266.91	534,696.90	32° 2' 3.922 N	104° 13' 16.911 W	
6,342.0	1.30	267.40	6,341.1	-23.5	-43.1	376,267.73	534,693.17	32° 2' 3.930 N	104° 13' 16.954 W	
6,531.0	0.40	225.40	6,530.1	-24.0	-45.7	376,267.17	534,690.56	32° 2' 3.925 N	104° 13' 16.984 W	
6,715.0	0.90	209.20	6,714.1	-25.7	-46.9	376,265.45	534,689.40	32° 2' 3.908 N	104° 13' 16.998 W	
6,903.0	1.40	228.70	6,902.1	-28.5	-49.3	376,262.65	534,686.95	32° 2' 3.880 N	104° 13' 17.026 W	

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Screech Owl Federal #4H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3342.0usft (Scandril Freedom)
Site:	Sec 19, T26S, R27E	MD Reference:	Well @ 3342.0usft (Scandril Freedom)
Well:	Screech Owl Federal #4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,935.0	3.50	190.40	6,934.0	-29.8	-49.8	376,261.43	534,686.48	32° 2' 3.868 N	104° 13' 17.032 W
6,966.0	7.20	181.60	6,964.9	-32.6	-50.0	376,258.56	534,686.26	32° 2' 3.840 N	104° 13' 17.035 W
6,997.0	10.50	178.80	6,995.5	-37.4	-50.0	376,253.79	534,686.26	32° 2' 3.792 N	104° 13' 17.035 W
7,029.0	14.50	183.30	7,026.8	-44.3	-50.2	376,246.87	534,686.09	32° 2' 3.724 N	104° 13' 17.037 W
7,061.0	18.00	183.30	7,057.5	-53.3	-50.7	376,237.93	534,685.58	32° 2' 3.636 N	104° 13' 17.043 W
7,092.0	21.70	183.30	7,086.6	-63.8	-51.3	376,227.43	534,684.97	32° 2' 3.532 N	104° 13' 17.050 W
7,124.0	25.10	181.60	7,116.0	-76.5	-51.9	376,214.73	534,684.44	32° 2' 3.406 N	104° 13' 17.056 W
7,155.0	28.80	179.80	7,143.6	-90.5	-52.0	376,200.69	534,684.28	32° 2' 3.267 N	104° 13' 17.058 W
7,187.0	31.80	178.60	7,171.2	-106.7	-51.8	376,184.55	534,684.52	32° 2' 3.107 N	104° 13' 17.056 W
7,218.0	34.50	180.20	7,197.2	-123.6	-51.6	376,167.60	534,684.69	32° 2' 2.939 N	104° 13' 17.054 W
7,245.4	36.62	181.71	7,219.5	-139.5	-51.9	376,151.67	534,684.41	32° 2' 2.782 N	104° 13' 17.057 W
FTP / Crossed 330' Hard Line @ 7245' MD / 7220' TVD									
7,249.0	36.90	181.90	7,222.4	-141.7	-52.0	376,149.51	534,684.35	32° 2' 2.761 N	104° 13' 17.058 W
7,281.0	39.30	180.90	7,247.5	-161.4	-52.4	376,129.78	534,683.87	32° 2' 2.565 N	104° 13' 17.064 W
7,312.0	41.60	181.90	7,271.1	-181.5	-52.9	376,109.67	534,683.37	32° 2' 2.366 N	104° 13' 17.070 W
7,344.0	44.80	182.10	7,294.5	-203.4	-53.7	376,087.78	534,682.61	32° 2' 2.150 N	104° 13' 17.079 W
7,375.0	47.80	182.10	7,315.9	-225.8	-54.5	376,065.39	534,681.79	32° 2' 1.928 N	104° 13' 17.089 W
7,407.0	50.00	179.30	7,336.9	-249.9	-54.8	376,041.28	534,681.50	32° 2' 1.689 N	104° 13' 17.092 W
7,438.0	53.20	178.80	7,356.2	-274.2	-54.4	376,016.99	534,681.91	32° 2' 1.449 N	104° 13' 17.088 W
7,470.0	56.10	177.90	7,374.7	-300.3	-53.6	375,990.91	534,682.66	32° 2' 1.191 N	104° 13' 17.080 W
7,501.0	60.10	177.50	7,391.1	-326.6	-52.6	375,964.62	534,683.72	32° 2' 0.931 N	104° 13' 17.068 W
7,533.0	63.30	177.40	7,406.2	-354.7	-51.3	375,936.47	534,684.97	32° 2' 0.652 N	104° 13' 17.053 W
7,565.0	66.40	178.10	7,419.8	-383.7	-50.2	375,907.53	534,686.11	32° 2' 0.366 N	104° 13' 17.041 W
7,596.0	68.00	177.90	7,431.8	-412.2	-49.2	375,878.97	534,687.11	32° 2' 0.083 N	104° 13' 17.029 W
7,627.0	70.60	178.40	7,442.8	-441.2	-48.3	375,849.99	534,688.04	32° 1' 59.796 N	104° 13' 17.019 W
7,659.0	73.20	178.20	7,452.7	-471.6	-47.4	375,819.59	534,688.94	32° 1' 59.495 N	104° 13' 17.009 W
7,690.0	74.80	178.60	7,461.3	-501.4	-46.5	375,789.81	534,689.78	32° 1' 59.201 N	104° 13' 16.999 W
7,722.0	76.70	179.10	7,469.2	-532.4	-45.9	375,758.80	534,690.40	32° 1' 58.894 N	104° 13' 16.992 W
7,753.0	77.90	179.50	7,476.0	-562.6	-45.5	375,728.56	534,690.77	32° 1' 58.594 N	104° 13' 16.989 W
7,785.0	79.30	178.90	7,482.3	-594.0	-45.1	375,697.19	534,691.21	32° 1' 58.284 N	104° 13' 16.984 W
7,816.0	81.90	178.90	7,487.4	-624.6	-44.5	375,666.62	534,691.79	32° 1' 57.981 N	104° 13' 16.977 W
7,847.0	84.20	178.40	7,491.1	-655.3	-43.8	375,635.86	534,692.52	32° 1' 57.677 N	104° 13' 16.969 W
7,879.0	84.40	178.40	7,494.3	-687.2	-42.9	375,604.03	534,693.41	32° 1' 57.362 N	104° 13' 16.959 W
7,911.0	86.80	178.80	7,496.7	-719.1	-42.1	375,572.13	534,694.19	32° 1' 57.046 N	104° 13' 16.951 W
7,942.0	89.80	179.50	7,497.7	-750.0	-41.7	375,541.16	534,694.65	32° 1' 56.740 N	104° 13' 16.946 W
8,016.0	91.30	179.10	7,497.0	-824.0	-40.8	375,467.17	534,695.55	32° 1' 56.007 N	104° 13' 16.936 W
8,105.0	90.50	178.80	7,495.6	-913.0	-39.1	375,378.19	534,697.18	32° 1' 55.127 N	104° 13' 16.918 W
8,197.0	91.70	178.10	7,493.8	-1,005.0	-36.6	375,286.25	534,699.67	32° 1' 54.217 N	104° 13' 16.890 W
8,288.0	90.80	177.90	7,491.8	-1,095.9	-33.5	375,195.32	534,702.84	32° 1' 53.317 N	104° 13' 16.855 W
8,379.0	90.20	177.50	7,491.0	-1,186.8	-29.8	375,104.40	534,706.50	32° 1' 52.417 N	104° 13' 16.813 W
8,474.0	89.60	177.00	7,491.2	-1,281.7	-25.2	375,009.51	534,711.05	32° 1' 51.478 N	104° 13' 16.762 W
8,569.0	90.40	176.80	7,491.2	-1,376.5	-20.1	374,914.65	534,716.19	32° 1' 50.539 N	104° 13' 16.703 W
8,663.0	89.90	178.20	7,490.9	-1,470.5	-16.0	374,820.74	534,720.29	32° 1' 49.610 N	104° 13' 16.657 W
8,758.0	90.80	178.40	7,490.3	-1,565.4	-13.2	374,725.79	534,723.11	32° 1' 48.670 N	104° 13' 16.625 W
8,853.0	90.50	179.10	7,489.3	-1,660.4	-11.1	374,630.82	534,725.18	32° 1' 47.730 N	104° 13' 16.602 W
8,947.0	89.60	180.20	7,489.2	-1,754.4	-10.5	374,536.82	534,725.76	32° 1' 46.800 N	104° 13' 16.596 W
9,042.0	90.30	179.80	7,489.3	-1,849.4	-10.5	374,441.82	534,725.76	32° 1' 45.860 N	104° 13' 16.598 W
9,137.0	89.30	179.80	7,489.6	-1,944.4	-10.2	374,346.83	534,726.09	32° 1' 44.919 N	104° 13' 16.595 W
9,232.0	89.90	179.80	7,490.3	-2,039.4	-9.9	374,251.83	534,726.42	32° 1' 43.979 N	104° 13' 16.592 W
9,326.0	89.90	180.90	7,490.4	-2,133.4	-10.5	374,157.83	534,725.84	32° 1' 43.049 N	104° 13' 16.600 W
9,421.0	90.80	180.90	7,489.8	-2,228.4	-11.9	374,062.85	534,724.35	32° 1' 42.109 N	104° 13' 16.618 W
9,515.0	89.80	181.40	7,489.4	-2,322.3	-13.8	373,968.87	534,722.47	32° 1' 41.179 N	104° 13' 16.641 W
9,609.0	90.80	180.50	7,488.9	-2,416.3	-15.4	373,874.88	534,720.91	32° 1' 40.249 N	104° 13' 16.661 W
9,704.0	90.00	181.20	7,488.2	-2,511.3	-16.8	373,779.90	534,719.50	32° 1' 39.309 N	104° 13' 16.678 W
9,798.0	90.90	181.90	7,487.5	-2,605.3	-19.3	373,685.94	534,716.96	32° 1' 38.379 N	104° 13' 16.709 W

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Screech Owl Federal #4H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3342.0usft (Scandril Freedom)
Site:	Sec 19, T26S, R27E	MD Reference:	Well @ 3342.0usft (Scandril Freedom)
Well:	Screech Owl Federal #4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
9,892.0	91.80	181.60	7,485.2	-2,699.2	-22.2	373,592.01	534,714.09	32° 1' 37.449 N	104° 13' 16.743 W	
9,986.0	90.30	181.60	7,483.5	-2,793.1	-24.8	373,498.06	534,711.46	32° 1' 36.520 N	104° 13' 16.775 W	
10,081.0	89.00	180.40	7,484.1	-2,888.1	-26.5	373,403.08	534,709.80	32° 1' 35.580 N	104° 13' 16.795 W	
10,176.0	90.00	179.50	7,484.9	-2,983.1	-26.4	373,308.09	534,709.89	32° 1' 34.640 N	104° 13' 16.796 W	
10,270.0	91.00	179.30	7,484.1	-3,077.1	-25.4	373,214.10	534,710.87	32° 1' 33.709 N	104° 13' 16.785 W	
10,365.0	89.20	179.60	7,483.9	-3,172.1	-24.5	373,119.11	534,711.78	32° 1' 32.769 N	104° 13' 16.776 W	
10,481.0	90.00	178.60	7,484.8	-3,288.1	-22.7	373,003.13	534,713.60	32° 1' 31.621 N	104° 13' 16.756 W	
10,571.0	89.10	178.80	7,485.5	-3,378.0	-20.7	372,913.15	534,715.65	32° 1' 30.731 N	104° 13' 16.733 W	
10,661.0	88.90	179.80	7,487.0	-3,468.0	-19.6	372,823.18	534,716.75	32° 1' 29.841 N	104° 13' 16.722 W	
10,752.0	89.30	179.10	7,488.5	-3,559.0	-18.7	372,732.19	534,717.62	32° 1' 28.940 N	104° 13' 16.713 W	
10,842.0	90.00	178.90	7,489.0	-3,649.0	-17.1	372,642.21	534,719.19	32° 1' 28.049 N	104° 13' 16.696 W	
10,933.0	90.80	179.10	7,488.4	-3,740.0	-15.5	372,551.23	534,720.78	32° 1' 27.149 N	104° 13' 16.678 W	
11,024.0	91.60	179.30	7,486.5	-3,830.9	-14.3	372,460.25	534,722.05	32° 1' 26.249 N	104° 13' 16.665 W	
11,115.0	90.60	179.60	7,484.7	-3,921.9	-13.4	372,369.28	534,722.92	32° 1' 25.348 N	104° 13' 16.655 W	
11,209.0	91.60	179.80	7,482.9	-4,015.9	-12.9	372,275.30	534,723.41	32° 1' 24.418 N	104° 13' 16.651 W	
11,304.0	90.90	180.90	7,480.9	-4,110.9	-13.5	372,180.32	534,722.83	32° 1' 23.478 N	104° 13' 16.659 W	
11,398.0	90.20	180.70	7,479.9	-4,204.9	-14.8	372,086.34	534,721.52	32° 1' 22.548 N	104° 13' 16.675 W	
11,492.0	91.60	180.50	7,478.5	-4,298.8	-15.8	371,992.36	534,720.54	32° 1' 21.618 N	104° 13' 16.688 W	
11,586.0	91.20	180.40	7,476.2	-4,392.8	-16.5	371,898.39	534,719.80	32° 1' 20.688 N	104° 13' 16.697 W	
11,680.0	90.00	181.40	7,475.2	-4,486.8	-18.0	371,804.41	534,718.32	32° 1' 19.758 N	104° 13' 16.716 W	
11,774.0	90.40	181.10	7,474.9	-4,580.8	-20.0	371,710.43	534,716.27	32° 1' 18.828 N	104° 13' 16.741 W	
11,868.0	91.00	180.40	7,473.7	-4,674.8	-21.3	371,616.45	534,715.04	32° 1' 17.898 N	104° 13' 16.756 W	
11,962.0	90.60	180.50	7,472.4	-4,768.7	-22.0	371,522.46	534,714.30	32° 1' 16.968 N	104° 13' 16.766 W	
12,056.0	91.40	180.70	7,470.8	-4,862.7	-23.0	371,428.48	534,713.32	32° 1' 16.038 N	104° 13' 16.778 W	
12,150.0	90.40	181.60	7,469.3	-4,956.7	-24.9	371,334.51	534,711.43	32° 1' 15.108 N	104° 13' 16.801 W	
12,244.0	91.40	181.20	7,467.8	-5,050.6	-27.2	371,240.55	534,709.14	32° 1' 14.178 N	104° 13' 16.829 W	
12,339.0	89.50	181.60	7,467.1	-5,145.6	-29.5	371,145.59	534,706.82	32° 1' 13.238 N	104° 13' 16.857 W	
12,339.6	89.49	181.60	7,467.1	-5,146.2	-29.5	371,144.99	534,706.80	32° 1' 13.232 N	104° 13' 16.857 W	
Crossed Section Line @ 12340' MD / 7467' TVD										
12,433.0	87.90	180.90	7,469.2	-5,239.6	-31.5	371,051.64	534,704.77	32° 1' 12.308 N	104° 13' 16.882 W	
12,527.0	87.70	180.50	7,472.8	-5,333.5	-32.7	370,957.72	534,703.62	32° 1' 11.379 N	104° 13' 16.897 W	
12,621.0	87.40	179.50	7,476.8	-5,427.4	-32.7	370,863.80	534,703.62	32° 1' 10.449 N	104° 13' 16.898 W	
12,715.0	88.60	178.90	7,480.1	-5,521.3	-31.4	370,769.87	534,704.93	32° 1' 9.520 N	104° 13' 16.884 W	
12,809.0	88.60	178.10	7,482.4	-5,615.3	-28.9	370,675.93	534,707.39	32° 1' 8.590 N	104° 13' 16.856 W	
12,903.0	89.40	178.90	7,484.0	-5,709.2	-26.5	370,581.98	534,709.85	32° 1' 7.660 N	104° 13' 16.829 W	
12,997.0	90.20	178.40	7,484.4	-5,803.2	-24.2	370,488.01	534,712.06	32° 1' 6.730 N	104° 13' 16.804 W	
13,092.0	91.10	178.60	7,483.3	-5,898.2	-21.8	370,393.05	534,714.55	32° 1' 5.790 N	104° 13' 16.777 W	
13,186.0	92.10	178.90	7,480.7	-5,992.1	-19.7	370,299.11	534,716.60	32° 1' 4.861 N	104° 13' 16.754 W	
13,280.0	93.00	178.40	7,476.5	-6,086.0	-17.5	370,205.23	534,718.81	32° 1' 3.931 N	104° 13' 16.729 W	
13,374.0	89.90	179.30	7,474.1	-6,179.9	-15.6	370,111.29	534,720.70	32° 1' 3.002 N	104° 13' 16.708 W	
13,468.0	89.70	179.50	7,474.4	-6,273.9	-14.6	370,017.30	534,721.68	32° 1' 2.072 N	104° 13' 16.698 W	
13,562.0	90.00	179.10	7,474.7	-6,367.9	-13.5	369,923.30	534,722.83	32° 1' 1.141 N	104° 13' 16.686 W	
13,656.0	90.60	179.50	7,474.2	-6,461.9	-12.3	369,829.31	534,723.98	32° 1' 0.211 N	104° 13' 16.674 W	
13,751.0	91.30	179.60	7,472.6	-6,556.9	-11.6	369,734.33	534,724.73	32° 0' 59.271 N	104° 13' 16.666 W	
13,845.0	91.50	179.50	7,470.3	-6,650.8	-10.8	369,640.36	534,725.46	32° 0' 58.341 N	104° 13' 16.659 W	
13,939.0	92.10	179.10	7,467.4	-6,744.8	-9.7	369,546.41	534,726.61	32° 0' 57.411 N	104° 13' 16.647 W	
14,033.0	91.10	179.80	7,464.7	-6,838.7	-8.8	369,452.46	534,727.51	32° 0' 56.481 N	104° 13' 16.637 W	
14,127.0	90.00	179.30	7,463.8	-6,932.7	-8.1	369,358.47	534,728.25	32° 0' 55.551 N	104° 13' 16.630 W	
14,222.0	90.50	178.90	7,463.4	-7,027.7	-6.6	369,263.48	534,729.74	32° 0' 54.611 N	104° 13' 16.614 W	
14,316.0	90.20	180.00	7,462.8	-7,121.7	-5.7	369,169.49	534,730.65	32° 0' 53.681 N	104° 13' 16.604 W	
14,409.0	89.90	180.20	7,462.8	-7,214.7	-5.8	369,076.49	534,730.48	32° 0' 52.761 N	104° 13' 16.607 W	
14,504.0	90.40	179.80	7,462.5	-7,309.7	-5.8	368,981.49	534,730.48	32° 0' 51.820 N	104° 13' 16.608 W	
14,598.0	90.80	179.80	7,461.5	-7,403.7	-5.5	368,887.49	534,730.81	32° 0' 50.890 N	104° 13' 16.606 W	
14,691.0	89.30	179.10	7,461.5	-7,496.7	-4.6	368,794.50	534,731.70	32° 0' 49.970 N	104° 13' 16.597 W	
14,785.0	89.70	179.10	7,462.3	-7,590.7	-3.1	368,700.52	534,733.18	32° 0' 49.040 N	104° 13' 16.580 W	

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Screech Owl Federal #4H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3342.0usft (Scandrill Freedom)
Site:	Sec 19, T26S, R27E	MD Reference:	Well @ 3342.0usft (Scandrill Freedom)
Well:	Screech Owl Federal #4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
14,880.0	90.40	178.90	7,462.2	-7,685.7	-1.5	368,605.53	534,734.84	32° 0' 48.100 N	104° 13' 16.562 W
14,974.0	91.20	179.30	7,460.9	-7,779.6	0.0	368,511.55	534,736.31	32° 0' 47.170 N	104° 13' 16.546 W
15,068.0	90.60	179.30	7,459.4	-7,873.6	1.2	368,417.57	534,737.46	32° 0' 46.239 N	104° 13' 16.534 W
15,162.0	91.20	178.90	7,457.9	-7,967.6	2.6	368,323.60	534,738.94	32° 0' 45.309 N	104° 13' 16.518 W
15,256.0	90.00	178.90	7,456.9	-8,061.6	4.4	368,229.62	534,740.74	32° 0' 44.379 N	104° 13' 16.498 W
15,350.0	89.40	178.20	7,457.4	-8,155.5	6.8	368,135.65	534,743.12	32° 0' 43.449 N	104° 13' 16.472 W
15,444.0	89.50	178.40	7,458.3	-8,249.5	9.6	368,041.70	534,745.91	32° 0' 42.519 N	104° 13' 16.441 W
15,538.0	88.90	178.60	7,459.6	-8,343.5	12.1	367,947.74	534,748.37	32° 0' 41.589 N	104° 13' 16.413 W
15,633.0	88.80	178.20	7,461.6	-8,438.4	14.7	367,852.80	534,751.02	32° 0' 40.650 N	104° 13' 16.383 W
15,727.0	89.10	179.80	7,463.3	-8,532.4	16.4	367,758.83	534,752.66	32° 0' 39.720 N	104° 13' 16.366 W
15,821.0	89.50	179.50	7,464.4	-8,626.4	16.9	367,664.84	534,753.24	32° 0' 38.790 N	104° 13' 16.360 W
15,915.0	90.00	179.80	7,464.8	-8,720.4	17.5	367,570.84	534,753.81	32° 0' 37.859 N	104° 13' 16.354 W
16,009.0	90.40	179.80	7,464.5	-8,814.4	17.8	367,476.84	534,754.14	32° 0' 36.929 N	104° 13' 16.352 W
16,103.0	90.60	180.40	7,463.7	-8,908.4	17.7	367,382.85	534,753.98	32° 0' 35.999 N	104° 13' 16.355 W
16,197.0	91.50	179.80	7,462.0	-9,002.3	17.5	367,288.86	534,753.81	32° 0' 35.069 N	104° 13' 16.358 W
16,291.0	91.40	180.20	7,459.6	-9,096.3	17.5	367,194.90	534,753.81	32° 0' 34.139 N	104° 13' 16.359 W
16,385.0	91.80	179.80	7,457.0	-9,190.3	17.5	367,100.93	534,753.81	32° 0' 33.209 N	104° 13' 16.360 W
16,479.0	91.90	180.20	7,453.9	-9,284.2	17.5	367,006.98	534,753.81	32° 0' 32.279 N	104° 13' 16.361 W
16,573.0	91.10	179.80	7,451.5	-9,378.2	17.5	366,913.01	534,753.81	32° 0' 31.349 N	104° 13' 16.362 W
16,668.0	90.70	180.40	7,450.0	-9,473.2	17.3	366,818.03	534,753.65	32° 0' 30.409 N	104° 13' 16.365 W
16,761.0	90.00	180.50	7,449.4	-9,566.2	16.6	366,725.03	534,752.92	32° 0' 29.489 N	104° 13' 16.375 W
16,855.0	90.20	179.80	7,449.2	-9,660.2	16.4	366,631.03	534,752.67	32° 0' 28.558 N	104° 13' 16.379 W
16,950.0	90.60	179.80	7,448.6	-9,755.2	16.7	366,536.04	534,753.00	32° 0' 27.618 N	104° 13' 16.376 W
17,044.0	91.30	179.30	7,447.0	-9,849.1	17.4	366,442.05	534,753.74	32° 0' 26.688 N	104° 13' 16.369 W
17,138.0	91.70	178.40	7,444.6	-9,943.1	19.3	366,348.11	534,755.62	32° 0' 25.758 N	104° 13' 16.348 W
17,265.0	92.40	178.10	7,440.0	-10,070.0	23.2	366,221.25	534,759.50	32° 0' 24.503 N	104° 13' 16.305 W
17,318.0	92.40	178.10	7,437.8	-10,122.9	25.0	366,168.32	534,761.26	32° 0' 23.979 N	104° 13' 16.285 W
TD @ 17318' MD / 7438' TVD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,670.0	5,669.3	-26.9	-30.4	Tie in @ 5670' MD / 5669' TVD
7,245.4	7,219.5	-139.5	-51.9	FTP / Crossed 330' Hard Line @ 7245' MD / 7220' TVD
12,339.6	7,467.1	-5,146.2	-29.5	Crossed Section Line @ 12340' MD / 7467' TVD
17,318.0	7,437.8	-10,122.9	25.0	TD @ 17318' MD / 7438' TVD

Checked By: _____	Approved By: _____	Date: _____
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