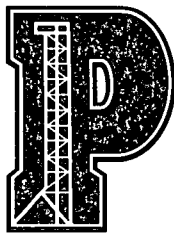


30 015 42826



NM OIL CONSERVATION

ARTESIA DISTRICT

JUL 23 2015

PATRIOT DRILLING, LLC

RECEIVED

OPERATOR:
WELL/LEASE:
COUNTY:

COG Operating, LLC
Flying Squirrel Fed 2H
Eddy Co., New Mexico
Sec. 29, T 18S, R 31E

STATE OF NEW MEXICO
DEVIATION REPORT

<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
560	1/4	5,331	2 1/4
914	1 1/4	5,794	2 1/2
1,295	2	6,229	1 3/4
1,673	3/4	6,637	1 1/4
2,020	1	7,131	1 1/2
2,480	1	7,606	3
2,956	1 3/4	7,922	2 1/2
3,432	2	8,045	1 3/4
3,881	1 1/4		
4,346	1 1/2		
4,822	2		

Patriot Drilling, LLC

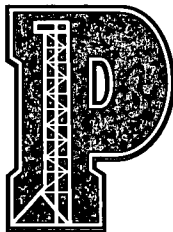
M. Leroy Peterson, Executive Vice-President

The foregoing instrument was acknowledged before me on this 18th day of March, 2015 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



PATRIOT DRILLING, LLC

NM OIL CONSERVATION

ARTESIA DISTRICT

JUL 23 2015

RECEIVED

OPERATOR: COG Operating, LLC
WELL/LEASE: Wild Cap State Com 8H
COUNTY: Eddy Co., New Mexico
Sec. 36, T 19S, R 31E

STATE OF NEW MEXICO
DEVIATION REPORT

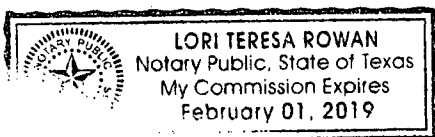
<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
325	1/2	4,331	1/2
780	2 1/2	4,860	1
1,297	1 3/4	5,317	1
1,392	1 1/2	5,795	1
1,987	2	6,648	1
2,461	3/4	7,123	1/2
3,196	1	7,597	1 1/4
3,790	2 1/4	8,085	1 3/4
3,943	1 1/2	8,585	1 1/4

Patriot Drilling, LLC

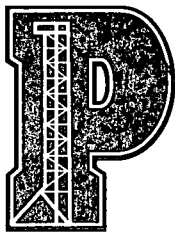
M. Leroy Peterson, Executive Vice-President

The foregoing instrument was acknowledged before me on this 9th day of March, 2015 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



WATER OIL CONSERVATION
ARTESIA DISTRICT

JUL 23 2015

RECEIVED

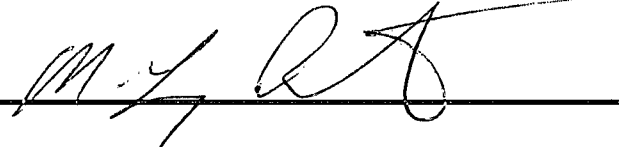
PATRIOT DRILLING, LLC

OPERATOR: COG Operating, LLC
WELL/LEASE: Copperhead Fee A #3H
COUNTY: Eddy Co., New Mexico
Sec. 31, T 26S, R 29E

STATE OF NEW MEXICO
DEVIATION REPORT

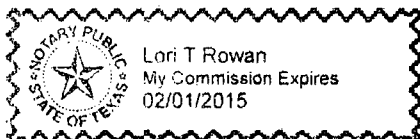
<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
387	1 1/4	4,488	1
707	2	4,960	1 1/2
1,084	1	5,471	1
1,370	3/4	5,945	1 1/4
1,750	1 1/4	6,322	1 3/4
2,037	1 1/2	6,417	2 1/2
2,512	1 3/4	6,861	3
3,066	1	7,051	3
3,540	1/2	7,465	1 1/4
4,016	1/4	7,712	1 1/4

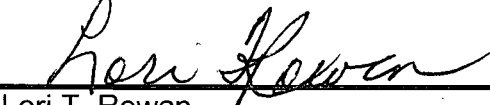
Patriot Drilling, LLC


M. Leroy Peterson, Executive Vice-President

The foregoing instrument was acknowledged before me on this 14th day of January, 2015 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling, LLC.

My Commission Expires: 02/01/2015

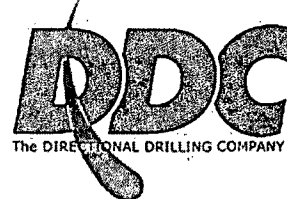



Lori T. Rowan
Notary Public for Ector Co., Texas

The Directional Drilling Company
11390 FM 830
Willis, TX 77318
Phone: (936) 856-4332
Fax: (936) 856-8678

NM OIL CONSERVATION
ARTESIA DISTRICT

JUL 23 2015



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Survey Certification Sheet

Company	Job Number	Date
COG Operating, LLC	WT-150321	5/26/2015

Lease	Well Name	County & State	API No.
Sec19,T26S,R27E	Screech Owl Federal Com #2H	Eddy, NM	30-015-42826

Survey Depth Range	Type of Survey	Directional Supervisor/Surveyor
123 feet to 17458 feet MD	MWD	Joe Hargrove

Certification Statement

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by The Directional Drilling Company (DDC). This report represents a true and correct directional survey of this well based on the original data obtained at the well site. Wellbore coordinates are calculated using minimum curvature.

Bryon Reed

Digitally signed by Bryon Reed
DN: cn=Bryon Reed, o=DDC, ou,
email=Bryon.reed@directionaldri
llers.com, c=US
Date: 2015.05.28 14:55:56 -05'00'

Bryon Reed
MWD General Manager
The Directional Drilling Company



NM OIL CONSERVATION
ARTESIA DISTRICT

JUL 23 2015

RECEIVED

COG Operating, LLC

Eddy County, NM (NAD 27)

Sec 19, T26S, R27E

Screech Owl Federal Com #2H

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

26 May, 2015





HP
Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Screech Owl Federal Com #2H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3366.0usft (Scandriil Freedom)
Site:	Sec 19, T26S, R27E	MD Reference:	Well @ 3366.0usft (Scandriil Freedom)
Well:	Screech Owl Federal Com #2H	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
From:	Map	Easting:	534,736.30 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 2' 4.162 N
		Longitude:	104° 13' 16.453 W
		Grid Convergence:	0.06 °

Well	Screech Owl Federal Com #2H		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft
		Latitude:	32° 2' 5.714 N
		Longitude:	104° 13' 56.309 W
		Ground Level:	3,340.0 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination
	IGRF2015	4/15/2015	(°)
			Dip Angle
			(°)
			Field Strength
			(nT)
			7.47
			59.80
			47,976

Design	Wellbore #1		
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
			(°)
			177.51

Survey Program	Date 5/26/2015		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
123.0	17,458.0	MWD (Wellbore #1)	MWD default
			Description
			MWD - Standard

Survey			
Measured	Inclination	Azimuth	Vertical
Depth	(°)	(°)	Depth
(usft)			(usft)
			+N/-S
			(usft)
			+E/-W
			(usft)
			Map
			Northing
			(usft)
			Map
			Easting
			(usft)
			Latitude
			Longitude
0.0	0.00	0.00	0.0
123.0	0.30	221.20	123.0
First MWD Survey @ 123' MD / 123' TVD			
274.0	0.60	240.10	274.0
367.0	1.00	225.60	367.0
546.0	1.60	211.30	545.9
697.0	1.20	165.80	696.9
881.0	3.10	127.70	880.8
973.0	2.90	133.30	972.6
1,065.0	2.10	146.60	1,064.6
1,157.0	1.30	181.40	1,156.5
1,249.0	0.20	271.30	1,248.5



HP
Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Screech Owl Federal Com #2H
Project:	Eddy County, NM.(NAD.27)	TVD Reference:	Well @ 3366.0usft (Scandrill Freedom)
Site:	Sec.19, T26S, R27E	MD Reference:	Well @ 3366.0usft (Scandrill Freedom)
Well:	Screech Owl Federal Com #2H	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
1,341.0	0.40	351.60	1,340.5	-22.5	5.9	376,422.09	531,311.32	32° 2' 5.491 N	104° 13' 56.241 W
1,433.0	0.80	38.70	1,432.5	-21.7	6.3	376,422.91	531,311.68	32° 2' 5.499 N	104° 13' 56.237 W
1,526.0	1.30	75.60	1,525.5	-20.9	7.7	376,423.68	531,313.11	32° 2' 5.507 N	104° 13' 56.220 W
1,618.0	1.90	79.10	1,617.5	-20.4	10.2	376,424.23	531,315.61	32° 2' 5.512 N	104° 13' 56.191 W
1,712.0	2.40	101.10	1,711.4	-20.5	13.7	376,424.14	531,319.08	32° 2' 5.511 N	104° 13' 56.151 W
1,807.0	1.80	143.80	1,806.3	-22.0	16.5	376,422.56	531,321.91	32° 2' 5.496 N	104° 13' 56.118 W
1,901.0	1.50	213.60	1,900.3	-24.3	16.7	376,420.34	531,322.10	32° 2' 5.474 N	104° 13' 56.116 W
1,970.0	1.90	231.50	1,969.3	-25.7	15.3	376,418.87	531,320.70	32° 2' 5.459 N	104° 13' 56.132 W
2,080.0	1.10	178.60	2,079.2	-27.9	13.9	376,416.68	531,319.30	32° 2' 5.437 N	104° 13' 56.148 W
2,174.0	1.20	171.60	2,173.2	-29.8	14.1	376,414.81	531,319.47	32° 2' 5.419 N	104° 13' 56.146 W
2,268.0	1.10	162.80	2,267.2	-31.6	14.5	376,412.97	531,319.88	32° 2' 5.401 N	104° 13' 56.142 W
2,456.0	1.00	173.70	2,455.2	-35.0	15.2	376,409.62	531,320.59	32° 2' 5.367 N	104° 13' 56.133 W
2,646.0	1.20	169.00	2,645.1	-38.6	15.8	376,406.02	531,321.15	32° 2' 5.332 N	104° 13' 56.127 W
2,835.0	1.20	170.20	2,834.1	-42.5	16.5	376,402.12	531,321.87	32° 2' 5.293 N	104° 13' 56.119 W
3,023.0	1.10	188.10	3,022.0	-46.2	16.5	376,398.40	531,321.95	32° 2' 5.256 N	104° 13' 56.118 W
3,212.0	1.30	185.10	3,211.0	-50.1	16.1	376,394.47	531,321.50	32° 2' 5.218 N	104° 13' 56.123 W
3,401.0	1.20	190.80	3,400.0	-54.2	15.5	376,390.39	531,320.94	32° 2' 5.177 N	104° 13' 56.129 W
3,590.0	1.20	180.90	3,588.9	-58.1	15.1	376,386.46	531,320.54	32° 2' 5.138 N	104° 13' 56.134 W
3,779.0	1.20	186.50	3,777.9	-62.1	14.9	376,382.52	531,320.29	32° 2' 5.099 N	104° 13' 56.137 W
3,970.0	1.10	185.50	3,968.8	-65.9	14.5	376,378.71	531,319.88	32° 2' 5.062 N	104° 13' 56.142 W
4,158.0	1.10	192.00	4,156.8	-69.5	13.9	376,375.15	531,319.34	32° 2' 5.026 N	104° 13' 56.148 W
4,347.0	0.70	206.80	4,345.8	-72.3	13.0	376,372.34	531,318.44	32° 2' 4.999 N	104° 13' 56.159 W
4,537.0	1.00	192.90	4,535.8	-74.9	12.1	376,369.69	531,317.54	32° 2' 4.972 N	104° 13' 56.169 W
4,727.0	1.10	199.60	4,725.7	-78.2	11.2	376,366.35	531,316.56	32° 2' 4.939 N	104° 13' 56.181 W
4,916.0	1.30	216.30	4,914.7	-81.7	9.3	376,362.92	531,314.68	32° 2' 4.905 N	104° 13' 56.202 W
5,104.0	1.60	214.10	5,102.6	-85.6	6.5	376,359.03	531,311.95	32° 2' 4.867 N	104° 13' 56.234 W
5,289.0	0.90	271.60	5,287.6	-87.7	3.6	376,356.93	531,309.05	32° 2' 4.846 N	104° 13' 56.268 W
5,479.0	0.70	265.30	5,477.6	-87.7	1.0	376,356.87	531,306.40	32° 2' 4.846 N	104° 13' 56.299 W
5,669.0	1.60	232.60	5,667.5	-89.4	-2.3	376,355.17	531,303.14	32° 2' 4.829 N	104° 13' 56.337 W
5,857.0	0.30	172.30	5,855.5	-91.5	-4.3	376,353.09	531,301.12	32° 2' 4.808 N	104° 13' 56.360 W
5,952.0	0.60	215.40	5,950.5	-92.2	-4.5	376,352.43	531,300.86	32° 2' 4.802 N	104° 13' 56.363 W
6,047.0	0.70	193.80	6,045.5	-93.1	-5.0	376,351.46	531,300.44	32° 2' 4.792 N	104° 13' 56.368 W
6,141.0	1.00	217.50	6,139.5	-94.3	-5.6	376,350.26	531,299.80	32° 2' 4.780 N	104° 13' 56.375 W
6,235.0	1.40	225.20	6,233.5	-95.8	-6.9	376,348.80	531,298.49	32° 2' 4.766 N	104° 13' 56.391 W
6,329.0	0.30	206.80	6,327.5	-96.8	-7.8	376,347.77	531,297.56	32° 2' 4.756 N	104° 13' 56.402 W
6,422.0	0.30	281.30	6,420.5	-97.0	-8.2	376,347.60	531,297.21	32° 2' 4.754 N	104° 13' 56.406 W
6,515.0	1.20	158.80	6,513.4	-97.9	-8.1	376,346.74	531,297.33	32° 2' 4.745 N	104° 13' 56.404 W
6,610.0	1.40	129.10	6,608.4	-99.5	-6.8	376,345.08	531,298.59	32° 2' 4.729 N	104° 13' 56.390 W
6,704.0	1.10	115.30	6,702.4	-100.6	-5.1	376,343.97	531,300.29	32° 2' 4.718 N	104° 13' 56.370 W
6,799.0	0.70	89.20	6,797.4	-101.0	-3.7	376,343.59	531,301.70	32° 2' 4.714 N	104° 13' 56.353 W
6,862.0	0.10	38.00	6,860.4	-101.0	-3.3	376,343.64	531,302.12	32° 2' 4.715 N	104° 13' 56.349 W
6,945.0	5.20	139.10	6,943.3	-103.8	-0.8	376,340.85	531,304.63	32° 2' 4.687 N	104° 13' 56.320 W
6,976.0	9.70	139.80	6,974.0	-106.8	1.8	376,337.79	531,307.23	32° 2' 4.657 N	104° 13' 56.289 W
7,008.0	14.10	138.00	7,005.3	-111.8	6.2	376,332.83	531,311.58	32° 2' 4.608 N	104° 13' 56.239 W
7,039.0	18.20	140.30	7,035.1	-118.3	11.8	376,326.30	531,317.20	32° 2' 4.543 N	104° 13' 56.174 W
7,071.0	21.40	144.20	7,065.2	-126.9	18.4	376,317.71	531,323.81	32° 2' 4.458 N	104° 13' 56.097 W
7,102.0	24.30	148.80	7,093.8	-136.9	25.0	376,307.67	531,330.43	32° 2' 4.358 N	104° 13' 56.020 W
7,134.0	27.00	152.60	7,122.6	-149.0	31.8	376,295.58	531,337.18	32° 2' 4.239 N	104° 13' 55.942 W
7,165.0	30.10	153.90	7,149.8	-162.2	38.4	376,282.35	531,343.84	32° 2' 4.108 N	104° 13' 55.865 W
7,196.0	33.20	154.90	7,176.2	-176.9	45.5	376,267.68	531,350.86	32° 2' 3.963 N	104° 13' 55.783 W
7,228.0	35.70	155.60	7,202.6	-193.4	53.0	376,251.24	531,358.44	32° 2' 3.800 N	104° 13' 55.695 W
7,260.0	36.80	158.10	7,228.4	-210.8	60.5	376,233.85	531,365.87	32° 2' 3.628 N	104° 13' 55.609 W
7,291.0	38.80	159.30	7,252.9	-228.5	67.4	376,216.14	531,372.77	32° 2' 3.452 N	104° 13' 55.529 W
7,322.0	41.80	158.80	7,276.5	-247.2	74.5	376,197.42	531,379.94	32° 2' 3.267 N	104° 13' 55.446 W
7,353.0	45.50	159.80	7,299.0	-267.2	82.1	376,177.41	531,387.50	32° 2' 3.069 N	104° 13' 55.359 W



HP
Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Screech Owl-Federal Com #2H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3366.0usft (Scandrift Freedom)
Site:	Sec 19, T26S, R27E	MD Reference:	Well @ 3366.0usft (Scandrift Freedom)
Well:	Screech Owl Federal Com #2H	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	
7,385.0	47.90	160.70	7,320.9	-289.1	90.0	376,155.49	531,395.36	32° 2' 2.852 N	104° 13' 55.267 W	
7,416.0	49.20	161.20	7,341.4	-311.1	97.5	376,133.53	531,402.94	32° 2' 2.634 N	104° 13' 55.180 W	
7,448.0	49.70	163.90	7,362.2	-334.3	104.8	376,110.34	531,410.23	32° 2' 2.405 N	104° 13' 55.095 W	
7,479.0	50.20	166.00	7,382.2	-357.2	111.0	376,087.42	531,416.39	32° 2' 2.178 N	104° 13' 55.024 W	
7,511.0	52.20	167.60	7,402.2	-381.5	116.7	376,063.14	531,422.08	32° 2' 1.938 N	104° 13' 54.958 W	
7,514.9	52.55	167.78	7,404.6	-384.5	117.3	376,060.12	531,422.74	32° 2' 1.908 N	104° 13' 54.950 W	
Crossed 330' Hard Line @ 7515' MD / 7405' TVD										
7,542.0	55.00	169.00	7,420.6	-405.9	121.7	376,038.71	531,427.13	32° 2' 1.696 N	104° 13' 54.900 W	
7,574.0	58.40	169.70	7,438.2	-432.2	126.7	376,012.43	531,432.07	32° 2' 1.436 N	104° 13' 54.842 W	
7,606.0	62.40	169.50	7,454.0	-459.5	131.7	375,985.07	531,437.10	32° 2' 1.165 N	104° 13' 54.784 W	
7,637.0	66.00	169.10	7,467.5	-486.9	136.9	375,957.65	531,442.28	32° 2' 0.893 N	104° 13' 54.725 W	
7,669.0	69.60	169.50	7,479.6	-516.1	142.4	375,928.54	531,447.78	32° 2' 0.605 N	104° 13' 54.661 W	
7,700.0	73.50	172.50	7,489.4	-545.1	147.0	375,899.51	531,452.37	32° 2' 0.318 N	104° 13' 54.608 W	
7,732.0	76.50	174.80	7,497.7	-575.8	150.4	375,868.79	531,455.78	32° 2' 0.014 N	104° 13' 54.569 W	
7,764.0	80.50	175.80	7,504.1	-607.1	152.9	375,837.54	531,458.35	32° 1' 59.705 N	104° 13' 54.539 W	
7,795.0	84.50	175.50	7,508.1	-637.7	155.3	375,806.91	531,460.68	32° 1' 59.401 N	104° 13' 54.512 W	
7,889.0	89.10	178.50	7,513.3	-731.4	160.2	375,713.22	531,465.58	32° 1' 58.474 N	104° 13' 54.456 W	
7,984.0	90.20	179.20	7,513.9	-826.4	162.1	375,618.24	531,467.49	32° 1' 57.534 N	104° 13' 54.435 W	
8,078.0	91.00	178.50	7,512.9	-920.3	164.0	375,524.26	531,469.38	32° 1' 56.604 N	104° 13' 54.414 W	
8,173.0	91.00	177.60	7,511.3	-1,015.3	167.2	375,429.33	531,472.61	32° 1' 55.665 N	104° 13' 54.378 W	
8,268.0	91.40	178.60	7,509.3	-1,110.2	170.4	375,334.41	531,475.76	32° 1' 54.725 N	104° 13' 54.342 W	
8,362.0	93.10	178.60	7,505.6	-1,204.1	172.7	375,240.51	531,478.05	32° 1' 53.796 N	104° 13' 54.317 W	
8,457.0	89.10	179.20	7,503.8	-1,299.0	174.5	375,145.57	531,479.88	32° 1' 52.856 N	104° 13' 54.297 W	
8,551.0	89.30	178.80	7,505.1	-1,393.0	176.1	375,051.59	531,481.52	32° 1' 51.926 N	104° 13' 54.279 W	
8,646.0	90.70	178.30	7,505.1	-1,488.0	178.5	374,956.62	531,483.92	32° 1' 50.986 N	104° 13' 54.252 W	
8,740.0	91.90	177.80	7,503.0	-1,581.9	181.7	374,862.71	531,487.12	32° 1' 50.057 N	104° 13' 54.216 W	
8,833.0	90.30	177.10	7,501.2	-1,674.8	185.9	374,769.82	531,491.25	32° 1' 49.137 N	104° 13' 54.169 W	
8,928.0	89.10	177.90	7,501.7	-1,769.7	190.0	374,674.91	531,495.40	32° 1' 48.198 N	104° 13' 54.121 W	
9,022.0	89.60	177.10	7,502.7	-1,863.6	194.1	374,581.01	531,499.50	32° 1' 47.269 N	104° 13' 54.075 W	
9,117.0	90.30	177.40	7,502.8	-1,958.5	198.7	374,486.12	531,504.06	32° 1' 46.330 N	104° 13' 54.023 W	
9,211.0	92.00	177.20	7,500.9	-2,052.4	203.1	374,392.25	531,508.48	32° 1' 45.400 N	104° 13' 53.973 W	
9,306.0	90.70	177.20	7,498.7	-2,147.2	207.7	374,297.39	531,513.12	32° 1' 44.462 N	104° 13' 53.920 W	
9,400.0	89.70	178.10	7,498.4	-2,241.1	211.6	374,203.47	531,516.98	32° 1' 43.532 N	104° 13' 53.876 W	
9,495.0	91.00	177.60	7,497.8	-2,336.1	215.1	374,108.54	531,520.54	32° 1' 42.593 N	104° 13' 53.836 W	
9,589.0	90.50	177.90	7,496.6	-2,430.0	218.8	374,014.62	531,524.23	32° 1' 41.663 N	104° 13' 53.794 W	
9,684.0	91.50	177.80	7,494.9	-2,524.9	222.4	373,919.70	531,527.79	32° 1' 40.724 N	104° 13' 53.753 W	
9,778.0	90.60	177.90	7,493.2	-2,618.8	225.9	373,825.79	531,531.32	32° 1' 39.794 N	104° 13' 53.713 W	
9,873.0	90.00	176.40	7,492.7	-2,713.7	230.6	373,730.91	531,536.04	32° 1' 38.855 N	104° 13' 53.660 W	
9,968.0	88.70	179.30	7,493.8	-2,808.6	234.2	373,635.99	531,539.61	32° 1' 37.916 N	104° 13' 53.619 W	
10,062.0	89.70	180.00	7,495.1	-2,902.6	234.8	373,542.01	531,540.18	32° 1' 36.986 N	104° 13' 53.614 W	
10,157.0	90.80	179.00	7,494.7	-2,997.6	235.6	373,447.01	531,541.01	32° 1' 36.046 N	104° 13' 53.605 W	
10,252.0	92.10	178.30	7,492.3	-3,092.5	237.8	373,352.07	531,543.25	32° 1' 35.106 N	104° 13' 53.580 W	
10,346.0	91.40	177.20	7,489.4	-3,186.4	241.5	373,258.19	531,546.94	32° 1' 34.177 N	104° 13' 53.538 W	
10,439.0	90.30	177.10	7,488.0	-3,279.3	246.2	373,165.32	531,551.56	32° 1' 33.258 N	104° 13' 53.486 W	
10,534.0	90.60	178.80	7,487.3	-3,374.2	249.6	373,070.39	531,554.96	32° 1' 32.318 N	104° 13' 53.447 W	
10,628.0	91.40	177.20	7,485.6	-3,468.1	252.8	372,976.46	531,558.24	32° 1' 31.388 N	104° 13' 53.410 W	
10,723.0	90.80	177.80	7,483.8	-3,563.0	257.0	372,881.57	531,562.38	32° 1' 30.449 N	104° 13' 53.363 W	
10,817.0	89.30	177.90	7,483.7	-3,657.0	260.5	372,787.64	531,565.91	32° 1' 29.520 N	104° 13' 53.323 W	
10,912.0	90.00	179.00	7,484.3	-3,751.9	263.1	372,692.68	531,568.48	32° 1' 28.580 N	104° 13' 53.294 W	
11,007.0	92.10	179.70	7,482.5	-3,846.9	264.2	372,597.70	531,569.55	32° 1' 27.640 N	104° 13' 53.283 W	
11,100.0	91.80	180.00	7,479.4	-3,939.8	264.4	372,504.76	531,569.80	32° 1' 26.720 N	104° 13' 53.281 W	
11,193.0	93.20	180.40	7,475.3	-4,032.7	264.1	372,411.85	531,569.47	32° 1' 25.801 N	104° 13' 53.286 W	
11,289.0	92.00	179.50	7,471.0	-4,128.6	264.2	372,315.95	531,569.56	32° 1' 24.851 N	104° 13' 53.286 W	
11,383.0	90.70	181.10	7,468.8	-4,222.6	263.7	372,221.99	531,569.06	32° 1' 23.922 N	104° 13' 53.293 W	
11,477.0	92.90	180.70	7,465.8	-4,316.5	262.2	372,128.05	531,567.59	32° 1' 22.992 N	104° 13' 53.311 W	



HP
Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Screech Owl Federal Com #2H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3366.0usft (Scandril Freedom)
Site:	Sec 19, T26S, R27E	MD Reference:	Well @ 3366.0usft (Scandril Freedom)
Well:	Screech Owl Federal Com #2H	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
11,571.0	92.90	179.20	7,461.0	-4,410.4	262.3	372,034.17	531,567.67	32° 1' 22.063 N	104° 13' 53.311 W
11,665.0	89.80	178.60	7,458.8	-4,504.4	264.1	371,940.23	531,569.47	32° 1' 21.133 N	104° 13' 53.291 W
11,760.0	89.50	178.10	7,459.4	-4,599.3	266.8	371,845.27	531,572.21	32° 1' 20.193 N	104° 13' 53.260 W
11,854.0	89.50	177.90	7,460.2	-4,693.3	270.1	371,751.33	531,575.49	32° 1' 19.264 N	104° 13' 53.223 W
11,948.0	89.30	177.10	7,461.2	-4,787.2	274.2	371,657.43	531,579.59	32° 1' 18.334 N	104° 13' 53.176 W
12,043.0	89.70	176.70	7,462.0	-4,882.0	279.3	371,562.57	531,584.73	32° 1' 17.395 N	104° 13' 53.118 W
12,137.0	89.40	177.90	7,462.8	-4,975.9	283.8	371,468.68	531,589.15	32° 1' 16.466 N	104° 13' 53.067 W
12,164.0	89.60	178.50	7,463.0	-5,002.9	284.6	371,441.69	531,590.00	32° 1' 16.199 N	104° 13' 53.058 W
12,258.0	89.30	178.60	7,463.9	-5,096.9	287.0	371,347.73	531,592.38	32° 1' 15.269 N	104° 13' 53.031 W
12,352.0	90.60	178.60	7,464.0	-5,190.8	289.3	371,253.76	531,594.68	32° 1' 14.339 N	104° 13' 53.006 W
12,446.0	91.20	177.60	7,462.5	-5,284.8	292.4	371,159.82	531,597.79	32° 1' 13.409 N	104° 13' 52.970 W
12,453.5	91.26	177.62	7,462.4	-5,292.3	292.7	371,152.33	531,598.11	32° 1' 13.335 N	104° 13' 52.967 W
Crossed Section Line @ 12454' MD / 7462' TVD									
12,541.0	92.00	177.80	7,459.9	-5,379.7	296.2	371,064.94	531,601.61	32° 1' 12.470 N	104° 13' 52.927 W
12,635.0	90.80	177.10	7,457.6	-5,473.5	300.4	370,971.06	531,605.79	32° 1' 11.541 N	104° 13' 52.880 W
12,729.0	91.80	177.20	7,455.4	-5,567.4	305.1	370,877.20	531,610.46	32° 1' 10.612 N	104° 13' 52.826 W
12,823.0	90.00	178.30	7,454.0	-5,661.3	308.7	370,783.29	531,614.15	32° 1' 9.683 N	104° 13' 52.785 W
12,917.0	90.20	177.80	7,453.8	-5,755.3	311.9	370,689.35	531,617.35	32° 1' 8.753 N	104° 13' 52.748 W
13,012.0	90.50	177.20	7,453.2	-5,850.2	316.1	370,594.44	531,621.49	32° 1' 7.814 N	104° 13' 52.701 W
13,106.0	90.90	177.80	7,452.1	-5,944.1	320.2	370,500.53	531,625.59	32° 1' 6.884 N	104° 13' 52.655 W
13,200.0	89.70	177.80	7,451.6	-6,038.0	323.8	370,406.61	531,629.20	32° 1' 5.955 N	104° 13' 52.614 W
13,294.0	89.50	177.60	7,452.2	-6,131.9	327.6	370,312.69	531,632.97	32° 1' 5.025 N	104° 13' 52.571 W
13,388.0	90.30	177.60	7,452.4	-6,225.8	331.5	370,218.77	531,636.91	32° 1' 4.096 N	104° 13' 52.526 W
13,482.0	90.80	177.10	7,451.5	-6,319.7	335.9	370,124.87	531,641.25	32° 1' 3.166 N	104° 13' 52.477 W
13,576.0	89.30	177.20	7,451.4	-6,413.6	340.5	370,030.99	531,645.93	32° 1' 2.237 N	104° 13' 52.424 W
13,670.0	89.70	177.60	7,452.2	-6,507.5	344.8	369,937.09	531,650.19	32° 1' 1.308 N	104° 13' 52.375 W
13,764.0	89.90	178.80	7,452.6	-6,601.5	347.7	369,843.14	531,653.14	32° 1' 0.378 N	104° 13' 52.342 W
13,858.0	92.50	179.30	7,450.6	-6,695.4	349.3	369,749.18	531,654.70	32° 0' 59.448 N	104° 13' 52.325 W
13,953.0	92.30	179.20	7,446.6	-6,790.3	350.5	369,654.28	531,655.94	32° 0' 58.509 N	104° 13' 52.312 W
14,047.0	92.50	179.20	7,442.7	-6,884.2	351.9	369,560.37	531,657.26	32° 0' 57.580 N	104° 13' 52.297 W
14,141.0	90.60	179.70	7,440.1	-6,978.2	352.8	369,466.41	531,658.16	32° 0' 56.650 N	104° 13' 52.288 W
14,235.0	90.00	179.90	7,439.7	-7,072.2	353.1	369,372.41	531,658.49	32° 0' 55.719 N	104° 13' 52.285 W
14,329.0	90.20	179.30	7,439.5	-7,166.2	353.7	369,278.42	531,659.14	32° 0' 54.789 N	104° 13' 52.278 W
14,424.0	90.30	179.20	7,439.1	-7,261.2	355.0	369,183.43	531,660.38	32° 0' 53.849 N	104° 13' 52.265 W
14,518.0	90.50	178.80	7,438.4	-7,355.2	356.6	369,089.44	531,662.03	32° 0' 52.919 N	104° 13' 52.247 W
14,612.0	90.80	178.80	7,437.4	-7,449.1	358.6	368,995.47	531,663.99	32° 0' 51.989 N	104° 13' 52.225 W
14,706.0	91.30	178.30	7,435.6	-7,543.1	361.0	368,901.52	531,666.37	32° 0' 51.059 N	104° 13' 52.199 W
14,801.0	91.30	178.10	7,433.5	-7,638.0	364.0	368,806.59	531,669.36	32° 0' 50.119 N	104° 13' 52.165 W
14,895.0	90.00	177.60	7,432.4	-7,731.9	367.5	368,712.66	531,672.88	32° 0' 49.190 N	104° 13' 52.125 W
14,989.0	89.80	177.10	7,432.6	-7,825.8	371.8	368,618.76	531,677.23	32° 0' 48.261 N	104° 13' 52.076 W
15,083.0	90.30	176.40	7,432.5	-7,919.7	377.2	368,524.91	531,682.56	32° 0' 47.332 N	104° 13' 52.015 W
15,178.0	91.00	175.60	7,431.4	-8,014.4	383.8	368,430.15	531,689.18	32° 0' 46.394 N	104° 13' 51.939 W
15,272.0	91.10	177.40	7,429.7	-8,108.3	389.5	368,336.35	531,694.92	32° 0' 45.465 N	104° 13' 51.873 W
15,366.0	91.80	178.10	7,427.3	-8,202.1	393.2	368,242.45	531,698.61	32° 0' 44.536 N	104° 13' 51.831 W
15,460.0	90.50	178.80	7,425.4	-8,296.1	395.7	368,148.51	531,701.15	32° 0' 43.606 N	104° 13' 51.803 W
15,555.0	90.30	179.30	7,424.8	-8,391.1	397.3	368,053.52	531,702.73	32° 0' 42.666 N	104° 13' 51.786 W
15,649.0	90.80	179.30	7,423.9	-8,485.1	398.5	367,959.54	531,703.87	32° 0' 41.736 N	104° 13' 51.773 W
15,743.0	90.70	179.20	7,422.6	-8,579.0	399.7	367,865.55	531,705.11	32° 0' 40.806 N	104° 13' 51.760 W
15,837.0	90.80	179.00	7,421.4	-8,673.0	401.2	367,771.57	531,706.58	32° 0' 39.876 N	104° 13' 51.744 W
15,931.0	91.20	179.00	7,419.8	-8,767.0	402.8	367,677.60	531,708.22	32° 0' 38.946 N	104° 13' 51.726 W
16,025.0	91.90	179.00	7,417.2	-8,860.9	404.5	367,583.65	531,709.86	32° 0' 38.016 N	104° 13' 51.708 W
16,119.0	91.20	178.10	7,414.7	-8,954.9	406.8	367,489.72	531,712.24	32° 0' 37.086 N	104° 13' 51.681 W
16,214.0	90.20	177.60	7,413.5	-9,048.9	410.4	367,394.79	531,715.80	32° 0' 36.147 N	104° 13' 51.641 W
16,308.0	90.70	177.40	7,412.8	-9,143.7	414.5	367,300.88	531,719.90	32° 0' 35.217 N	104° 13' 51.594 W
16,402.0	91.20	177.20	7,411.2	-9,237.6	418.9	367,207.00	531,724.33	32° 0' 34.288 N	104° 13' 51.544 W



HP
Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Screech Owl Federal Com #2H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3366.0usft (Scandrill Freedom)
Site:	Sec 19, T26S, R27E	MD Reference:	Well @ 3366.0usft (Scandrill Freedom)
Well:	Screech Owl Federal Com #2H	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
16,495.0	91.00	177.40	7,409.4	-9,330.5	423.3	367,114.12	531,728.71	32° 0' 33.369 N	104° 13' 51.494 W
16,590.0	91.40	178.10	7,407.4	-9,425.4	427.0	367,019.22	531,732.44	32° 0' 32.430 N	104° 13' 51.452 W
16,684.0	90.20	177.20	7,406.1	-9,519.3	430.9	366,925.31	531,736.29	32° 0' 31.500 N	104° 13' 51.408 W
16,778.0	90.40	177.10	7,405.6	-9,613.2	435.6	366,831.42	531,740.97	32° 0' 30.571 N	104° 13' 51.355 W
16,872.0	91.30	176.90	7,404.2	-9,707.0	440.5	366,737.56	531,745.89	32° 0' 29.642 N	104° 13' 51.299 W
16,966.0	90.40	177.40	7,402.8	-9,800.9	445.2	366,643.69	531,750.56	32° 0' 28.713 N	104° 13' 51.246 W
17,061.0	89.50	177.90	7,402.9	-9,895.8	449.1	366,548.77	531,754.45	32° 0' 27.774 N	104° 13' 51.201 W
17,155.0	90.20	178.60	7,403.2	-9,989.8	451.9	366,454.82	531,757.33	32° 0' 26.844 N	104° 13' 51.169 W
17,249.0	90.10	178.10	7,402.9	-10,083.7	454.6	366,360.86	531,760.03	32° 0' 25.914 N	104° 13' 51.139 W
17,343.0	91.00	178.10	7,402.0	-10,177.7	457.7	366,266.92	531,763.15	32° 0' 24.984 N	104° 13' 51.104 W
17,405.0	91.40	177.60	7,400.7	-10,239.6	460.1	366,204.97	531,765.47	32° 0' 24.371 N	104° 13' 51.077 W
17,458.0	91.40	177.60	7,399.4	-10,292.6	462.3	366,152.04	531,767.69	32° 0' 23.847 N	104° 13' 51.052 W
TD @ 17458' MD / 7399' TVD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
123.0	123.0	-0.2	-0.2	First MWD Survey @ 123' MD / 123' TVD
7,514.9	7,404.6	-384.5	117.3	Crossed 330' Hard Line @ 7515' MD / 7405' TVD
12,453.5	7,462.4	-5,292.3	292.7	Crossed Section Line @ 12454' MD / 7462' TVD
17,458.0	7,399.4	-10,292.6	462.3	TD @ 17458' MD / 7399' TVD

Checked By: _____ Approved By: _____ Date: _____