

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals & Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-104
Revised August 1, 2011

Submit one copy to appropriate District Office

☒ AMENDED REPORT

I. REQUEST FOR ALLOWABLE AND AUTHORIZATION TO TRANSPORT

¹ Operator name and Address COG Operating LLC 2208 W. Main Street Artesia, NM 88210		² OGRID Number 229137	
		³ Reason for Filing Code/ Effective Date NW	
API Number 30-025-46758	⁵ Pool Name Bobcat Draw; Upper Wolfcamp		⁶ Pool Code 98094
⁷ Property Code 39912	⁸ Property Name Gunner 8 Federal Com		⁹ Well Number 604H

II. ¹⁰ Surface Location

Ul or lot no. D	Section 5	Township 26S	Range 34E	Lot Idn	Feet from the 250	North/South Line North	Feet from the 560	East/West line West	County Lea
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¹¹ Bottom Hole Location

Ul or lot no. N	Section 8	Township 26S	Range 34E	Lot Idn	Feet from the 77	North/South Line South	Feet from the 1651	East/West line West	County Lea
¹² Lse Code F	¹³ Producing Method Code F		¹⁴ Gas Connection Date 1/21/21		¹⁵ C-129 Permit Number		¹⁶ C-129 Effective Date		¹⁷ C-129 Expiration Date

III. Oil and Gas Transporters

¹⁸ Transporter OGRID	¹⁹ Transporter Name and Address	²⁰ O/G/W
	ACC	O
298751	ETC	G
278421	Holly Refining and Marketing PO Box 159 Artesia, NM 88210	O

IV. Well Completion Data

²¹ Spud Date 3/15/20	²² Ready Date 1/18/21	²³ TD 23,020’	²⁴ PBTD 22,895’	²⁵ Perforations 12,990-22,870’	²⁶ DHC, MC
²⁷ Hole Size		²⁸ Casing & Tubing Size		²⁹ Depth Set	³⁰ Sacks Cement
14 3/4”		10 3/4”		897’	627
8 3/4”		7 5/8”		12,013’’	1315
6 3/4”		5 1/2”		23,020’	1750
		2 7/8”		12,247’	

V. Well Test Data

³¹ Date New Oil 1/21/21	³² Gas Delivery Date 1/21/21	³³ Test Date 1/21/21	³⁴ Test Length 24 Hrs	³⁵ Tbg. Pressure 3400	³⁶ Csg. Pressure 3500
³⁷ Choke Size 14/64	³⁸ Oil 511	³⁹ Water 1532	⁴⁰ Gas 733		⁴¹ Test Method Flowing
⁴² I hereby certify that the rules of the Oil Conservation Division have been complied with and that the information given above is true and complete to the best of my knowledge and belief. Signature: <i>Amanda Avery</i>			OIL CONSERVATION DIVISION Approved by: <i>KURT SIMMONS</i> Title: <i>NMOCD, SANTA FE</i> Approval Date: <i>04/15/2021</i>		
Printed name: Amanda Avery					
Title: Regulatory Analyst					
E-mail Address:					
Date: 3/17/21		Phone: 575-748-6962			

DISTRICT I
1625 N. FRENCH DR., HOBBS, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
511 S. FIRST ST., ARTESIA, NM 88210
Phone: (575) 746-1283 Fax: (575) 746-9720

DISTRICT III
1000 RIO BRAZOS RD., AZTEC, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. ST. FRANCIS DR., SANTA FE, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☒ AMENDED REPORT

As Drilled

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-025-46758		Pool Code 98094	Pool Name Bobcat Draw; Upper Wolfcamp
Property Code 39912	Property Name GUNNER 8 FEDERAL COM		Well Number 604H
OGRID No. 229137	Operator Name COG OPERATING, LLC		Elevation 3333.4'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	5	26-S	34-E		250	NORTH	560	WEST	LEA

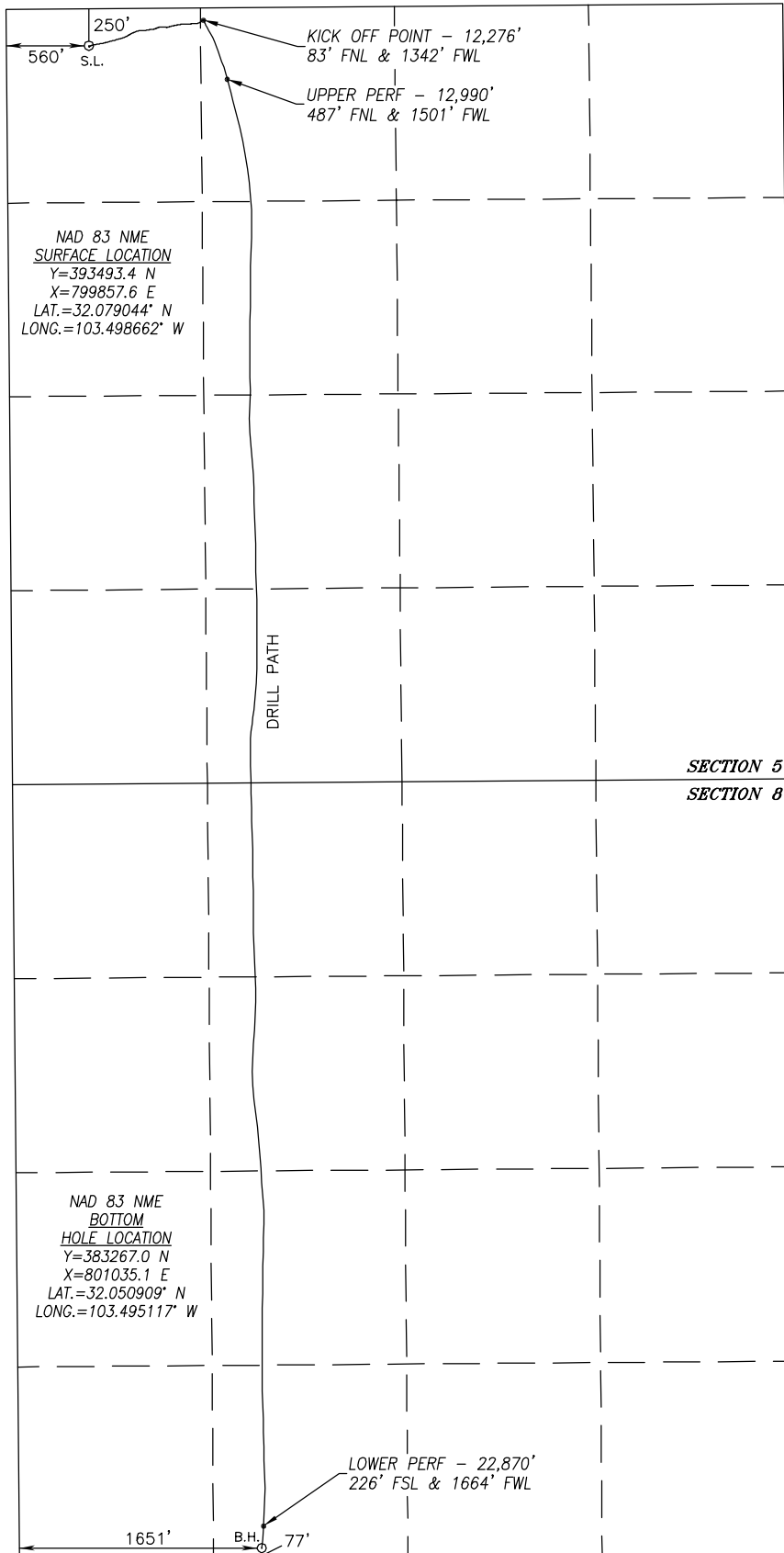
Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	8	26-S	34-E		77	SOUTH	1651	WEST	LEA
Dedicated Acres 640		Joint or Infill	Consolidation Code		Order No.				

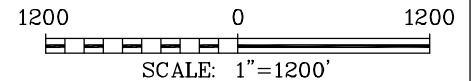
NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

SEE PAGE 2

Property Code 39912	Property Name GUNNER 8 FEDERAL COM	Well Number 604H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3333.4'



SURFACE INFO AND BOREPATH SHOWN HEREON IS BASED ON DIRECTIONAL SURVEY REPORT PROVIDED BY COG OPERATING, LLC FOR THE GUNNER 8 FEDERAL COM #604H SUPPLIED TO HARCROW SURVEYING, LLC ON JANUARY 4, 2021



OPERATOR CERTIFICATION

I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Amanda Avery 1/14/20

Signature Date

Amanda Avery

Printed Name

aaavery@concho.com

E-mail Address

SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

NOV. 15, 2019/JUNE 15, 2020

Date of Survey/Date of Geographic Survey

Signature & Seal of Professional Surveyor



Chad Harcrow 1/4/21

Certificate No. CHAD HARCROW 17777

PAGE 2 OF 2

W.O. #21-3

DRAWN BY: WN

Intent ☐ As Drilled ☐

API #		
Operator Name:	Property Name:	Well Number

Kick Off Point (KOP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
Latitude					Longitude			NAD	

First Take Point (FTP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
Latitude					Longitude			NAD	

Last Take Point (LTP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
Latitude					Longitude			NAD	

Is this well the defining well for the Horizontal Spacing Unit? ☐Is this well an infill well? ☐

If infill is yes please provide API if available, Operator Name and well number for Defining well for Horizontal Spacing Unit.

API #		
Operator Name:	Property Name:	Well Number

KZ 06/29/2018



COG Operating LLC

Lea County, NM (NAD27 NME)

Gunner 8 Federal Com

604H

OH / 66564

Design: Surveys (McVay 8)

Standard Survey Report

15 June, 2020





Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 604H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3359.40usft (McVay 8)
Site:	Gunner 8 Federal Com	MD Reference:	RKB @ 3359.40usft (McVay 8)
Well:	604H	North Reference:	Grid
Wellbore:	OH / 66564	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

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	Gunner 8 Federal Com		
Site Position:		Northing:	393,259.80 usft
From:	Map	Easting:	759,100.10 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 4' 42.331178 N
		Longitude:	103° 29' 48.524929 W
		Grid Convergence:	0.44 °

Well	604H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	1.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 4' 44.108400 N
		Longitude:	103° 29' 53.502000 W
		Ground Level:	3,333.40 usft

Wellbore	OH / 66564		
Magnetics	Model Name	Sample Date	Declination (°)
	User Defined	5/22/2020	6.55
			Dip Angle (°)
			59.68
			Field Strength (nT)
			47,607.40000000

Design	Surveys (McVay 8)		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°)
			173.45

Survey Program	Date	6/15/2020		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	11,900.00	SDI Gyro Surveys (OH / 66564)	Scientific Keeper	Scientific Drilling Intl. Standard Wireline Keeper
11,900.00	23,020.00	Gordon MWD Surveys - Corrected (OH / 6	MWD+IFR1+FDIR	OWSG MWD + IFR1 + FDIR Correction

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.53	196.11	100.00	-0.44	-0.13	0.43	0.53	0.53	0.00	
125.00	0.65	186.29	125.00	-0.70	-0.18	0.67	0.63	0.48	-39.28	
150.00	0.55	181.96	150.00	-0.96	-0.20	0.93	0.44	-0.40	-17.32	
175.00	0.50	196.00	174.99	-1.18	-0.23	1.15	0.55	-0.20	56.16	
200.00	0.58	198.53	199.99	-1.41	-0.30	1.36	0.33	0.32	10.12	
225.00	0.60	196.41	224.99	-1.65	-0.38	1.60	0.12	0.08	-8.48	
250.00	0.71	197.92	249.99	-1.93	-0.46	1.86	0.45	0.44	6.04	
275.00	0.69	193.27	274.99	-2.22	-0.54	2.14	0.24	-0.08	-18.60	
300.00	0.63	187.87	299.99	-2.50	-0.60	2.42	0.35	-0.24	-21.60	



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 604H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3359.40usft (McVay 8)
Site:	Gunner 8 Federal Com	MD Reference:	RKB @ 3359.40usft (McVay 8)
Well:	604H	North Reference:	Grid
Wellbore:	OH / 66564	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
325.00	0.47	187.24	324.99	-2.74	-0.63	2.65	0.64	-0.64	-2.52
350.00	0.62	196.51	349.98	-2.97	-0.68	2.87	0.69	0.60	37.08
375.00	0.61	177.03	374.98	-3.23	-0.71	3.13	0.83	-0.04	-77.92
400.00	0.58	185.71	399.98	-3.49	-0.72	3.39	0.38	-0.12	34.72
425.00	0.54	180.83	424.98	-3.74	-0.73	3.63	0.25	-0.16	-19.52
450.00	0.53	189.90	449.98	-3.97	-0.75	3.86	0.34	-0.04	36.28
475.00	0.46	187.90	474.98	-4.18	-0.79	4.06	0.29	-0.28	-8.00
500.00	0.42	197.25	499.98	-4.37	-0.83	4.25	0.33	-0.16	37.40
525.00	0.69	198.41	524.98	-4.60	-0.90	4.47	1.08	1.08	4.64
550.00	0.38	204.21	549.98	-4.82	-0.98	4.67	1.26	-1.24	23.20
575.00	0.72	204.96	574.97	-5.03	-1.08	4.88	1.36	1.36	3.00
600.00	0.66	197.05	599.97	-5.32	-1.19	5.14	0.45	-0.24	-31.64
625.00	0.20	184.97	624.97	-5.50	-1.24	5.32	1.87	-1.84	-48.32
650.00	0.33	203.40	649.97	-5.61	-1.27	5.42	0.62	0.52	73.72
675.00	0.26	218.95	674.97	-5.72	-1.34	5.53	0.42	-0.28	62.20
700.00	0.32	197.42	699.97	-5.83	-1.39	5.63	0.49	0.24	-86.12
725.00	0.14	198.63	724.97	-5.92	-1.42	5.72	0.72	-0.72	4.84
750.00	0.21	228.96	749.97	-5.98	-1.47	5.77	0.46	0.28	121.32
775.00	0.26	222.61	774.97	-6.05	-1.54	5.84	0.23	0.20	-25.40
800.00	0.17	212.54	799.97	-6.13	-1.60	5.90	0.39	-0.36	-40.28
825.00	0.33	196.00	824.97	-6.23	-1.64	6.00	0.70	0.64	-66.16
850.00	0.31	167.23	849.97	-6.36	-1.64	6.13	0.64	-0.08	-115.08
875.00	0.15	78.11	874.97	-6.42	-1.60	6.20	1.37	-0.64	-356.48
900.00	0.10	130.63	899.97	-6.43	-1.55	6.21	0.48	-0.20	210.08
925.00	0.35	112.41	924.97	-6.47	-1.46	6.26	1.03	1.00	-72.88
950.00	0.39	101.55	949.97	-6.52	-1.31	6.33	0.32	0.16	-43.44
975.00	0.42	94.31	974.97	-6.54	-1.13	6.37	0.24	0.12	-28.96
1,000.00	0.28	131.79	999.97	-6.59	-1.00	6.43	1.04	-0.56	149.92
1,025.00	0.33	119.95	1,024.97	-6.67	-0.89	6.52	0.32	0.20	-47.36
1,050.00	0.39	121.51	1,049.97	-6.75	-0.75	6.62	0.24	0.24	6.24
1,075.00	0.45	99.73	1,074.97	-6.81	-0.58	6.70	0.68	0.24	-87.12
1,100.00	0.42	97.09	1,099.97	-6.84	-0.40	6.75	0.14	-0.12	-10.56
1,125.00	0.32	129.15	1,124.97	-6.89	-0.25	6.82	0.90	-0.40	128.24
1,150.00	0.41	95.34	1,149.96	-6.94	-0.11	6.89	0.92	0.36	-135.24
1,175.00	0.27	109.93	1,174.96	-6.97	0.04	6.93	0.65	-0.56	58.36
1,200.00	0.29	117.06	1,199.96	-7.02	0.15	6.99	0.16	0.08	28.52
1,225.00	0.34	122.35	1,224.96	-7.09	0.27	7.07	0.23	0.20	21.16
1,250.00	0.39	98.10	1,249.96	-7.14	0.41	7.14	0.64	0.20	-97.00
1,275.00	0.30	117.62	1,274.96	-7.18	0.56	7.20	0.59	-0.36	78.08
1,300.00	0.35	114.21	1,299.96	-7.24	0.68	7.28	0.21	0.20	-13.64
1,325.00	0.46	115.41	1,324.96	-7.32	0.85	7.37	0.44	0.44	4.80
1,350.00	0.49	101.13	1,349.96	-7.38	1.04	7.45	0.49	0.12	-57.12
1,375.00	0.49	92.66	1,374.96	-7.41	1.25	7.50	0.29	0.00	-33.88



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 604H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3359.40usft (McVay 8)
Site:	Gunner 8 Federal Com	MD Reference:	RKB @ 3359.40usft (McVay 8)
Well:	604H	North Reference:	Grid
Wellbore:	OH / 66564	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
1,400.00	0.35	102.11	1,399.96	-7.43	1.43	7.54	0.62	-0.56	37.80	
1,425.00	0.38	126.05	1,424.96	-7.49	1.58	7.62	0.62	0.12	95.76	
1,450.00	0.40	121.78	1,449.96	-7.59	1.72	7.74	0.14	0.08	-17.08	
1,475.00	0.51	106.91	1,474.96	-7.67	1.90	7.83	0.64	0.44	-59.48	
1,500.00	0.53	94.98	1,499.96	-7.71	2.12	7.90	0.44	0.08	-47.72	
1,525.00	0.48	93.26	1,524.96	-7.73	2.34	7.94	0.21	-0.20	-6.88	
1,550.00	0.45	87.17	1,549.95	-7.73	2.54	7.97	0.23	-0.12	-24.36	
1,575.00	0.30	116.13	1,574.95	-7.75	2.70	8.01	0.95	-0.60	115.84	
1,600.00	0.35	82.07	1,599.95	-7.77	2.83	8.04	0.79	0.20	-136.24	
1,625.00	0.42	100.81	1,624.95	-7.78	3.00	8.07	0.57	0.28	74.96	
1,650.00	0.52	92.07	1,649.95	-7.80	3.20	8.11	0.49	0.40	-34.96	
1,675.00	0.59	66.71	1,674.95	-7.75	3.43	8.09	1.01	0.28	-101.44	
1,700.00	0.61	60.91	1,699.95	-7.63	3.67	8.00	0.26	0.08	-23.20	
1,725.00	0.53	68.49	1,724.95	-7.53	3.89	7.92	0.44	-0.32	30.32	
1,750.00	0.66	65.73	1,749.95	-7.43	4.13	7.85	0.53	0.52	-11.04	
1,775.00	0.69	51.04	1,774.95	-7.27	4.38	7.72	0.70	0.12	-58.76	
1,800.00	0.68	54.11	1,799.94	-7.09	4.62	7.57	0.15	-0.04	12.28	
1,825.00	0.61	56.88	1,824.94	-6.93	4.85	7.44	0.31	-0.28	11.08	
1,850.00	0.84	44.04	1,849.94	-6.73	5.09	7.26	1.12	0.92	-51.36	
1,875.00	0.70	38.74	1,874.94	-6.48	5.31	7.04	0.63	-0.56	-21.20	
1,900.00	0.72	37.79	1,899.94	-6.23	5.50	6.82	0.09	0.08	-3.80	
1,925.00	0.84	40.21	1,924.93	-5.97	5.72	6.58	0.50	0.48	9.68	
1,950.00	0.84	34.43	1,949.93	-5.68	5.94	6.32	0.34	0.00	-23.12	
1,975.00	0.79	33.03	1,974.93	-5.38	6.14	6.05	0.22	-0.20	-5.60	
2,000.00	0.81	37.88	1,999.93	-5.10	6.34	5.79	0.28	0.08	19.40	
2,025.00	1.75	53.00	2,024.92	-4.73	6.75	5.47	3.96	3.76	60.48	
2,050.00	2.51	61.16	2,049.90	-4.23	7.54	5.07	3.27	3.04	32.64	
2,075.00	3.00	59.44	2,074.87	-3.64	8.58	4.59	1.99	1.96	-6.88	
2,100.00	3.06	60.16	2,099.84	-2.97	9.72	4.06	0.28	0.24	2.88	
2,125.00	3.11	59.81	2,124.80	-2.30	10.89	3.53	0.21	0.20	-1.40	
2,150.00	3.20	62.01	2,149.76	-1.63	12.09	3.00	0.60	0.36	8.80	
2,175.00	3.37	63.48	2,174.72	-0.98	13.36	2.49	0.76	0.68	5.88	
2,200.00	3.33	61.21	2,199.68	-0.30	14.66	1.97	0.55	-0.16	-9.08	
2,225.00	3.22	62.90	2,224.64	0.37	15.92	1.45	0.59	-0.44	6.76	
2,250.00	3.44	63.53	2,249.60	1.03	17.21	0.94	0.89	0.88	2.52	
2,275.00	3.67	64.34	2,274.55	1.71	18.61	0.43	0.94	0.92	3.24	
2,300.00	4.01	66.79	2,299.49	2.40	20.13	-0.09	1.51	1.36	9.80	
2,325.00	5.07	74.71	2,324.41	3.03	22.00	-0.50	4.92	4.24	31.68	
2,350.00	5.81	77.45	2,349.30	3.60	24.30	-0.80	3.14	2.96	10.96	
2,375.00	6.21	78.97	2,374.16	4.13	26.86	-1.04	1.72	1.60	6.08	
2,400.00	6.31	77.68	2,399.02	4.69	29.53	-1.29	0.69	0.40	-5.16	
2,425.00	6.59	78.34	2,423.86	5.27	32.28	-1.55	1.16	1.12	2.64	
2,450.00	6.68	80.04	2,448.69	5.81	35.12	-1.77	0.86	0.36	6.80	



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 604H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3359.40usft (McVay 8)
Site:	Gunner 8 Federal Com	MD Reference:	RKB @ 3359.40usft (McVay 8)
Well:	604H	North Reference:	Grid
Wellbore:	OH / 66564	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
2,475.00	7.02	79.07	2,473.51	6.35	38.05	-1.97	1.44	1.36	-3.88
2,500.00	6.96	80.99	2,498.33	6.88	41.04	-2.15	0.96	-0.24	7.68
2,525.00	7.07	82.37	2,523.14	7.32	44.06	-2.24	0.81	0.44	5.52
2,550.00	7.14	81.97	2,547.95	7.74	47.13	-2.31	0.34	0.28	-1.60
2,575.00	7.33	81.55	2,572.75	8.19	50.24	-2.41	0.79	0.76	-1.68
2,600.00	7.52	80.41	2,597.54	8.70	53.43	-2.55	0.96	0.76	-4.56
2,625.00	7.63	80.35	2,622.32	9.25	56.68	-2.72	0.44	0.44	-0.24
2,650.00	7.59	81.90	2,647.10	9.76	59.95	-2.86	0.84	-0.16	6.20
2,675.00	7.93	80.11	2,671.87	10.29	63.29	-3.00	1.67	1.36	-7.16
2,700.00	7.88	79.83	2,696.63	10.89	66.67	-3.21	0.25	-0.20	-1.12
2,725.00	8.13	79.59	2,721.39	11.51	70.10	-3.44	1.01	1.00	-0.96
2,750.00	8.14	80.37	2,746.14	12.13	73.58	-3.65	0.44	0.04	3.12
2,775.00	8.17	78.66	2,770.88	12.77	77.07	-3.90	0.98	0.12	-6.84
2,800.00	8.26	78.27	2,795.63	13.49	80.57	-4.21	0.42	0.36	-1.56
2,825.00	8.56	78.08	2,820.36	14.23	84.15	-4.54	1.21	1.20	-0.76
2,850.00	8.74	77.87	2,845.07	15.02	87.83	-4.90	0.73	0.72	-0.84
2,875.00	8.91	78.10	2,869.78	15.82	91.58	-5.27	0.69	0.68	0.92
2,900.00	8.93	77.59	2,894.48	16.63	95.37	-5.65	0.33	0.08	-2.04
2,925.00	9.00	77.85	2,919.17	17.46	99.17	-6.03	0.32	0.28	1.04
2,950.00	9.01	77.76	2,943.86	18.29	103.00	-6.42	0.07	0.04	-0.36
2,975.00	8.55	76.01	2,968.57	19.15	106.71	-6.85	2.13	-1.84	-7.00
3,000.00	8.58	75.30	2,993.29	20.07	110.32	-7.36	0.44	0.12	-2.84
3,025.00	8.59	76.06	3,018.01	21.00	113.94	-7.86	0.46	0.04	3.04
3,050.00	8.44	76.11	3,042.74	21.89	117.53	-8.34	0.60	-0.60	0.20
3,075.00	8.60	76.20	3,067.46	22.77	121.13	-8.81	0.64	0.64	0.36
3,100.00	8.74	75.43	3,092.17	23.70	124.78	-9.31	0.73	0.56	-3.08
3,125.00	8.54	76.59	3,116.89	24.61	128.42	-9.80	1.06	-0.80	4.64
3,150.00	9.15	74.63	3,141.59	25.56	132.15	-10.32	2.72	2.44	-7.84
3,175.00	9.49	74.23	3,166.26	26.65	136.05	-10.96	1.38	1.36	-1.60
3,200.00	9.96	73.52	3,190.90	27.82	140.10	-11.66	1.94	1.88	-2.84
3,225.00	10.03	75.58	3,215.52	28.98	144.29	-12.33	1.46	0.28	8.24
3,250.00	10.24	74.93	3,240.13	30.10	148.54	-12.96	0.96	0.84	-2.60
3,275.00	10.33	74.94	3,264.73	31.26	152.85	-13.62	0.36	0.36	0.04
3,300.00	10.26	76.23	3,289.33	32.37	157.18	-14.23	0.96	-0.28	5.16
3,325.00	10.27	76.45	3,313.93	33.42	161.51	-14.78	0.16	0.04	0.88
3,350.00	10.39	76.38	3,338.52	34.48	165.86	-15.33	0.48	0.48	-0.28
3,375.00	10.29	76.18	3,363.12	35.54	170.22	-15.89	0.42	-0.40	-0.80
3,400.00	9.64	76.51	3,387.74	36.56	174.43	-16.43	2.61	-2.60	1.32
3,425.00	9.51	75.08	3,412.39	37.58	178.46	-16.98	1.08	-0.52	-5.72
3,450.00	9.32	74.22	3,437.06	38.66	182.40	-17.61	0.95	-0.76	-3.44
3,475.00	9.36	74.97	3,461.72	39.74	186.31	-18.23	0.51	0.16	3.00
3,500.00	9.38	74.56	3,486.39	40.81	190.24	-18.85	0.28	0.08	-1.64
3,525.00	9.51	74.41	3,511.05	41.91	194.19	-19.48	0.53	0.52	-0.60
3,550.00	9.57	73.81	3,535.71	43.04	198.18	-20.16	0.46	0.24	-2.40



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 604H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3359.40usft (McVay 8)
Site:	Gunner 8 Federal Com	MD Reference:	RKB @ 3359.40usft (McVay 8)
Well:	604H	North Reference:	Grid
Wellbore:	OH / 66564	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,575.00	9.66	73.64	3,560.36	44.21	202.19	-20.86	0.38	0.36	-0.68
3,600.00	9.59	73.58	3,585.00	45.39	206.20	-21.58	0.28	-0.28	-0.24
3,625.00	9.50	73.82	3,609.66	46.56	210.17	-22.28	0.39	-0.36	0.96
3,650.00	8.48	74.02	3,634.35	47.64	213.93	-22.93	4.08	-4.08	0.80
3,675.00	7.65	73.30	3,659.10	48.63	217.29	-23.52	3.34	-3.32	-2.88
3,700.00	7.22	72.11	3,683.89	49.59	220.38	-24.12	1.83	-1.72	-4.76
3,725.00	7.21	71.74	3,708.69	50.56	223.37	-24.75	0.19	-0.04	-1.48
3,750.00	7.18	71.50	3,733.50	51.55	226.34	-25.39	0.17	-0.12	-0.96
3,775.00	7.10	70.38	3,758.30	52.56	229.28	-26.07	0.64	-0.32	-4.48
3,800.00	6.99	70.07	3,783.11	53.60	232.16	-26.77	0.47	-0.44	-1.24
3,825.00	6.93	71.13	3,807.93	54.61	235.02	-27.44	0.57	-0.24	4.24
3,850.00	6.99	71.63	3,832.75	55.57	237.89	-28.07	0.34	0.24	2.00
3,875.00	6.90	69.90	3,857.56	56.57	240.74	-28.74	0.91	-0.36	-6.92
3,900.00	6.79	68.88	3,882.38	57.62	243.53	-29.46	0.66	-0.44	-4.08
3,925.00	6.52	68.82	3,907.22	58.66	246.23	-30.19	1.08	-1.08	-0.24
3,950.00	6.39	66.60	3,932.06	59.73	248.83	-30.95	1.13	-0.52	-8.88
3,975.00	6.27	65.11	3,956.91	60.85	251.35	-31.79	0.81	-0.48	-5.96
4,000.00	6.09	64.12	3,981.76	62.01	253.78	-32.65	0.84	-0.72	-3.96
4,025.00	6.04	61.79	4,006.62	63.21	256.13	-33.58	1.00	-0.20	-9.32
4,050.00	6.13	59.98	4,031.48	64.50	258.45	-34.60	0.85	0.36	-7.24
4,075.00	6.14	58.94	4,056.34	65.86	260.75	-35.68	0.45	0.04	-4.16
4,100.00	6.15	60.88	4,081.19	67.20	263.06	-36.75	0.83	0.04	7.76
4,125.00	6.68	58.66	4,106.04	68.61	265.48	-37.87	2.34	2.12	-8.88
4,150.00	7.02	57.84	4,130.86	70.17	268.01	-39.14	1.42	1.36	-3.28
4,175.00	7.00	58.63	4,155.67	71.78	270.61	-40.44	0.39	-0.08	3.16
4,200.00	7.08	58.61	4,180.48	73.38	273.22	-41.73	0.32	0.32	-0.08
4,225.00	7.12	59.92	4,205.29	74.96	275.88	-43.00	0.67	0.16	5.24
4,250.00	6.94	61.86	4,230.10	76.44	278.55	-44.17	1.19	-0.72	7.76
4,275.00	7.04	61.86	4,254.92	77.88	281.23	-45.29	0.40	0.40	0.00
4,300.00	7.27	61.02	4,279.72	79.37	283.97	-46.46	1.01	0.92	-3.36
4,325.00	6.95	62.25	4,304.53	80.84	286.69	-47.61	1.42	-1.28	4.92
4,350.00	6.98	61.13	4,329.35	82.28	289.36	-48.73	0.56	0.12	-4.48
4,375.00	7.06	62.00	4,354.16	83.73	292.05	-49.87	0.53	0.32	3.48
4,400.00	6.86	64.63	4,378.97	85.09	294.75	-50.91	1.50	-0.80	10.52
4,425.00	6.51	69.42	4,403.80	86.23	297.43	-51.74	2.63	-1.40	19.16
4,450.00	6.31	70.25	4,428.65	87.19	300.05	-52.40	0.88	-0.80	3.32
4,475.00	6.16	70.59	4,453.50	88.10	302.60	-53.01	0.62	-0.60	1.36
4,500.00	6.04	69.06	4,478.36	89.02	305.10	-53.63	0.81	-0.48	-6.12
4,525.00	5.84	68.91	4,503.22	89.95	307.51	-54.28	0.80	-0.80	-0.60
4,550.00	5.69	68.14	4,528.10	90.87	309.85	-54.93	0.68	-0.60	-3.08
4,575.00	5.82	65.72	4,552.97	91.85	312.16	-55.64	1.10	0.52	-9.68
4,600.00	5.78	66.04	4,577.84	92.88	314.46	-56.40	0.21	-0.16	1.28
4,625.00	5.87	65.74	4,602.71	93.92	316.78	-57.17	0.38	0.36	-1.20



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 604H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3359.40usft (McVay 8)
Site:	Gunner 8 Federal Com	MD Reference:	RKB @ 3359.40usft (McVay 8)
Well:	604H	North Reference:	Grid
Wellbore:	OH / 66564	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,650.00	5.86	66.14	4,627.58	94.96	319.11	-57.94	0.17	-0.04	1.60	
4,675.00	5.94	66.47	4,652.45	95.99	321.46	-58.70	0.35	0.32	1.32	
4,700.00	5.60	69.28	4,677.32	96.94	323.79	-59.37	1.77	-1.36	11.24	
4,725.00	5.18	74.08	4,702.21	97.68	326.02	-59.85	2.46	-1.68	19.20	
4,750.00	5.10	75.67	4,727.11	98.26	328.18	-60.19	0.65	-0.32	6.36	
4,775.00	4.74	75.90	4,752.02	98.79	330.26	-60.47	1.44	-1.44	0.92	
4,800.00	4.71	78.10	4,776.94	99.25	332.26	-60.71	0.73	-0.12	8.80	
4,825.00	4.92	77.29	4,801.85	99.70	334.31	-60.92	0.88	0.84	-3.24	
4,850.00	4.89	76.13	4,826.76	100.19	336.39	-61.17	0.41	-0.12	-4.64	
4,875.00	4.81	76.30	4,851.67	100.70	338.45	-61.43	0.33	-0.32	0.68	
4,900.00	4.92	77.23	4,876.58	101.18	340.51	-61.68	0.54	0.44	3.72	
4,925.00	4.85	83.40	4,901.49	101.54	342.61	-61.80	2.12	-0.28	24.68	
4,950.00	4.85	85.15	4,926.40	101.75	344.71	-61.77	0.59	0.00	7.00	
4,975.00	4.84	89.54	4,951.31	101.85	346.82	-61.62	1.48	-0.04	17.56	
5,000.00	4.92	91.60	4,976.22	101.83	348.94	-61.36	0.77	0.32	8.24	
5,025.00	4.95	91.34	5,001.12	101.77	351.09	-61.06	0.15	0.12	-1.04	
5,050.00	5.01	89.94	5,026.03	101.75	353.26	-60.79	0.54	0.24	-5.60	
5,075.00	4.85	89.58	5,050.94	101.76	355.41	-60.55	0.65	-0.64	-1.44	
5,100.00	4.64	89.29	5,075.85	101.78	357.48	-60.34	0.85	-0.84	-1.16	
5,125.00	4.36	87.72	5,100.77	101.83	359.44	-60.16	1.22	-1.12	-6.28	
5,150.00	4.21	87.74	5,125.71	101.90	361.31	-60.02	0.60	-0.60	0.08	
5,175.00	4.13	86.93	5,150.64	101.99	363.12	-59.90	0.40	-0.32	-3.24	
5,200.00	4.00	87.03	5,175.58	102.08	364.89	-59.79	0.52	-0.52	0.40	
5,225.00	3.82	88.08	5,200.52	102.15	366.59	-59.67	0.77	-0.72	4.20	
5,250.00	3.62	86.50	5,225.47	102.23	368.21	-59.56	0.90	-0.80	-6.32	
5,275.00	3.49	85.83	5,250.42	102.33	369.76	-59.49	0.55	-0.52	-2.68	
5,300.00	3.29	85.70	5,275.37	102.44	371.24	-59.43	0.80	-0.80	-0.52	
5,325.00	3.29	84.69	5,300.33	102.56	372.67	-59.38	0.23	0.00	-4.04	
5,350.00	3.27	84.87	5,325.29	102.69	374.09	-59.35	0.09	-0.08	0.72	
5,375.00	3.20	84.88	5,350.25	102.82	375.49	-59.31	0.28	-0.28	0.04	
5,400.00	3.25	85.49	5,375.21	102.94	376.90	-59.27	0.24	0.20	2.44	
5,425.00	3.27	84.01	5,400.17	103.07	378.31	-59.24	0.35	0.08	-5.92	
5,450.00	3.12	83.40	5,425.13	103.22	379.70	-59.23	0.62	-0.60	-2.44	
5,475.00	3.03	82.87	5,450.10	103.38	381.03	-59.24	0.38	-0.36	-2.12	
5,500.00	3.02	82.72	5,475.06	103.54	382.34	-59.26	0.05	-0.04	-0.60	
5,525.00	3.05	83.28	5,500.03	103.71	383.65	-59.27	0.17	0.12	2.24	
5,550.00	3.07	85.57	5,524.99	103.84	384.98	-59.24	0.50	0.08	9.16	
5,575.00	2.97	84.56	5,549.96	103.95	386.29	-59.21	0.45	-0.40	-4.04	
5,600.00	2.89	81.11	5,574.92	104.11	387.56	-59.22	0.77	-0.32	-13.80	
5,625.00	2.98	79.41	5,599.89	104.32	388.82	-59.29	0.50	0.36	-6.80	
5,650.00	2.72	82.25	5,624.86	104.52	390.05	-59.35	1.18	-1.04	11.36	
5,675.00	2.81	80.31	5,649.83	104.71	391.24	-59.39	0.52	0.36	-7.76	
5,700.00	2.72	88.91	5,674.80	104.82	392.44	-59.37	1.70	-0.36	34.40	



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 604H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3359.40usft (McVay 8)
Site:	Gunner 8 Federal Com	MD Reference:	RKB @ 3359.40usft (McVay 8)
Well:	604H	North Reference:	Grid
Wellbore:	OH / 66564	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,725.00	2.76	88.26	5,699.77	104.85	393.63	-59.26	0.20	0.16	-2.60	
5,750.00	2.83	87.33	5,724.74	104.90	394.85	-59.17	0.33	0.28	-3.72	
5,775.00	2.80	84.98	5,749.71	104.98	396.07	-59.11	0.48	-0.12	-9.40	
5,800.00	2.68	81.83	5,774.68	105.12	397.26	-59.11	0.77	-0.48	-12.60	
5,825.00	2.68	81.97	5,799.66	105.28	398.42	-59.15	0.03	0.00	0.56	
5,850.00	2.61	78.42	5,824.63	105.48	399.55	-59.21	0.71	-0.28	-14.20	
5,875.00	2.53	76.05	5,849.61	105.72	400.65	-59.33	0.53	-0.32	-9.48	
5,900.00	2.40	77.02	5,874.58	105.97	401.69	-59.46	0.55	-0.52	3.88	
5,925.00	2.44	73.89	5,899.56	106.24	402.71	-59.61	0.55	0.16	-12.52	
5,950.00	2.36	75.69	5,924.54	106.52	403.72	-59.77	0.44	-0.32	7.20	
5,975.00	2.24	76.18	5,949.52	106.76	404.70	-59.90	0.49	-0.48	1.96	
6,000.00	2.17	76.24	5,974.50	106.99	405.63	-60.02	0.28	-0.28	0.24	
6,025.00	2.25	77.13	5,999.48	107.21	406.57	-60.13	0.35	0.32	3.56	
6,050.00	2.35	78.97	6,024.46	107.42	407.55	-60.23	0.50	0.40	7.36	
6,075.00	2.39	74.33	6,049.44	107.66	408.56	-60.35	0.78	0.16	-18.56	
6,100.00	2.32	71.99	6,074.42	107.95	409.54	-60.53	0.48	-0.28	-9.36	
6,125.00	2.24	74.36	6,099.40	108.24	410.49	-60.71	0.49	-0.32	9.48	
6,150.00	2.24	72.88	6,124.38	108.52	411.43	-60.88	0.23	0.00	-5.92	
6,175.00	2.37	72.04	6,149.36	108.82	412.39	-61.07	0.54	0.52	-3.36	
6,200.00	2.22	77.94	6,174.34	109.08	413.35	-61.22	1.12	-0.60	23.60	
6,225.00	2.17	84.74	6,199.32	109.23	414.30	-61.25	1.06	-0.20	27.20	
6,250.00	2.31	83.15	6,224.30	109.33	415.27	-61.25	0.61	0.56	-6.36	
6,275.00	2.20	82.22	6,249.28	109.45	416.24	-61.26	0.46	-0.44	-3.72	
6,300.00	2.19	85.85	6,274.26	109.55	417.20	-61.25	0.56	-0.04	14.52	
6,325.00	2.31	86.10	6,299.24	109.62	418.17	-61.21	0.48	0.48	1.00	
6,350.00	2.30	82.39	6,324.22	109.72	419.17	-61.19	0.60	-0.04	-14.84	
6,375.00	2.18	85.23	6,349.21	109.83	420.15	-61.19	0.65	-0.48	11.36	
6,400.00	2.47	91.60	6,374.18	109.85	421.16	-61.10	1.55	1.16	25.48	
6,425.00	2.55	90.81	6,399.16	109.83	422.25	-60.95	0.35	0.32	-3.16	
6,450.00	2.47	91.27	6,424.14	109.81	423.35	-60.80	0.33	-0.32	1.84	
6,475.00	2.41	92.60	6,449.11	109.78	424.41	-60.65	0.33	-0.24	5.32	
6,500.00	2.50	93.86	6,474.09	109.71	425.48	-60.46	0.42	0.36	5.04	
6,525.00	2.61	93.95	6,499.07	109.64	426.59	-60.26	0.44	0.44	0.36	
6,550.00	2.58	92.04	6,524.04	109.58	427.72	-60.07	0.37	-0.12	-7.64	
6,575.00	2.61	89.53	6,549.02	109.56	428.85	-59.93	0.47	0.12	-10.04	
6,600.00	2.56	91.73	6,573.99	109.55	429.98	-59.79	0.44	-0.20	8.80	
6,625.00	2.49	89.84	6,598.97	109.54	431.08	-59.65	0.44	-0.28	-7.56	
6,650.00	2.47	88.32	6,623.94	109.55	432.16	-59.54	0.27	-0.08	-6.08	
6,675.00	2.33	89.23	6,648.92	109.58	433.21	-59.44	0.58	-0.56	3.64	
6,700.00	2.45	85.54	6,673.90	109.62	434.25	-59.37	0.78	0.48	-14.76	
6,725.00	2.36	76.36	6,698.88	109.79	435.28	-59.42	1.58	-0.36	-36.72	
6,750.00	2.31	72.44	6,723.86	110.06	436.26	-59.58	0.67	-0.20	-15.68	
6,775.00	2.27	72.54	6,748.84	110.36	437.22	-59.77	0.16	-0.16	0.40	
6,800.00	2.24	74.82	6,773.82	110.64	438.16	-59.94	0.38	-0.12	9.12	



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 604H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3359.40usft (McVay 8)
Site:	Gunner 8 Federal Com	MD Reference:	RKB @ 3359.40usft (McVay 8)
Well:	604H	North Reference:	Grid
Wellbore:	OH / 66564	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,825.00	2.23	74.99	6,798.80	110.89	439.10	-60.08	0.05	-0.04	0.68
6,850.00	2.26	77.73	6,823.78	111.12	440.05	-60.20	0.45	0.12	10.96
6,875.00	2.28	77.44	6,848.76	111.34	441.02	-60.30	0.09	0.08	-1.16
6,900.00	2.33	74.89	6,873.74	111.58	442.00	-60.43	0.46	0.20	-10.20
6,925.00	2.30	76.27	6,898.72	111.83	442.97	-60.57	0.25	-0.12	5.52
6,950.00	2.32	72.78	6,923.70	112.10	443.95	-60.72	0.57	0.08	-13.96
6,975.00	2.32	73.56	6,948.68	112.39	444.91	-60.90	0.13	0.00	3.12
7,000.00	2.24	71.04	6,973.66	112.69	445.86	-61.10	0.51	-0.32	-10.08
7,025.00	2.17	70.38	6,998.64	113.01	446.77	-61.31	0.30	-0.28	-2.64
7,050.00	2.10	70.51	7,023.62	113.32	447.65	-61.52	0.28	-0.28	0.52
7,075.00	2.07	71.26	7,048.60	113.62	448.51	-61.72	0.16	-0.12	3.00
7,100.00	2.10	71.01	7,073.59	113.91	449.37	-61.91	0.13	0.12	-1.00
7,125.00	2.13	71.53	7,098.57	114.21	450.24	-62.10	0.14	0.12	2.08
7,150.00	2.09	73.55	7,123.55	114.49	451.12	-62.28	0.34	-0.16	8.08
7,175.00	2.11	69.70	7,148.54	114.77	451.99	-62.47	0.57	0.08	-15.40
7,200.00	2.15	68.60	7,173.52	115.11	452.86	-62.70	0.23	0.16	-4.40
7,225.00	2.13	67.89	7,198.50	115.45	453.72	-62.94	0.13	-0.08	-2.84
7,250.00	2.11	65.77	7,223.49	115.81	454.57	-63.21	0.32	-0.08	-8.48
7,275.00	2.01	66.22	7,248.47	116.18	455.39	-63.48	0.41	-0.40	1.80
7,300.00	2.10	64.38	7,273.45	116.56	456.21	-63.75	0.45	0.36	-7.36
7,325.00	2.02	60.39	7,298.44	116.97	457.00	-64.08	0.66	-0.32	-15.96
7,350.00	1.93	59.38	7,323.42	117.40	457.75	-64.42	0.39	-0.36	-4.04
7,375.00	1.93	59.20	7,348.41	117.83	458.47	-64.77	0.02	0.00	-0.72
7,400.00	1.93	61.65	7,373.39	118.25	459.21	-65.10	0.33	0.00	9.80
7,425.00	2.08	60.07	7,398.38	118.68	459.97	-65.43	0.64	0.60	-6.32
7,450.00	2.10	59.58	7,423.36	119.13	460.76	-65.80	0.11	0.08	-1.96
7,475.00	2.03	58.76	7,448.35	119.59	461.53	-66.17	0.30	-0.28	-3.28
7,500.00	2.00	55.61	7,473.33	120.07	462.27	-66.56	0.46	-0.12	-12.60
7,525.00	1.82	59.53	7,498.32	120.52	462.97	-66.92	0.89	-0.72	15.68
7,550.00	1.76	60.94	7,523.30	120.91	463.65	-67.23	0.30	-0.24	5.64
7,575.00	1.85	60.92	7,548.29	121.29	464.34	-67.53	0.36	0.36	-0.08
7,600.00	1.82	59.59	7,573.28	121.69	465.03	-67.85	0.21	-0.12	-5.32
7,625.00	1.81	59.43	7,598.27	122.09	465.71	-68.17	0.04	-0.04	-0.64
7,650.00	1.88	66.11	7,623.25	122.45	466.43	-68.45	0.90	0.28	26.72
7,675.00	3.18	77.09	7,648.23	122.78	467.48	-68.65	5.53	5.20	43.92
7,700.00	3.85	78.60	7,673.18	123.10	468.98	-68.80	2.71	2.68	6.04
7,725.00	3.95	78.97	7,698.12	123.43	470.65	-68.93	0.41	0.40	1.48
7,750.00	3.93	79.44	7,723.06	123.75	472.33	-69.06	0.15	-0.08	1.88
7,775.00	3.87	77.95	7,748.01	124.08	474.00	-69.20	0.47	-0.24	-5.96
7,800.00	3.88	78.22	7,772.95	124.43	475.65	-69.36	0.08	0.04	1.08
7,825.00	3.84	79.37	7,797.89	124.76	477.31	-69.50	0.35	-0.16	4.60
7,850.00	3.96	79.33	7,822.84	125.07	478.98	-69.62	0.48	0.48	-0.16
7,875.00	3.86	78.73	7,847.78	125.40	480.65	-69.75	0.43	-0.40	-2.40



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 604H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3359.40usft (McVay 8)
Site:	Gunner 8 Federal Com	MD Reference:	RKB @ 3359.40usft (McVay 8)
Well:	604H	North Reference:	Grid
Wellbore:	OH / 66564	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
7,900.00	3.67	80.13	7,872.72	125.70	482.26	-69.87	0.84	-0.76	5.60	
7,925.00	3.60	79.29	7,897.67	125.98	483.82	-69.97	0.35	-0.28	-3.36	
7,950.00	3.52	79.42	7,922.62	126.27	485.35	-70.08	0.32	-0.32	0.52	
7,975.00	3.31	81.14	7,947.58	126.52	486.82	-70.16	0.93	-0.84	6.88	
8,000.00	3.17	80.62	7,972.54	126.74	488.21	-70.23	0.57	-0.56	-2.08	
8,025.00	3.16	81.17	7,997.50	126.96	489.57	-70.29	0.13	-0.04	2.20	
8,050.00	3.09	80.10	8,022.46	127.18	490.92	-70.35	0.36	-0.28	-4.28	
8,075.00	2.90	79.38	8,047.43	127.42	492.20	-70.44	0.77	-0.76	-2.88	
8,100.00	2.72	81.56	8,072.40	127.62	493.41	-70.50	0.84	-0.72	8.72	
8,125.00	2.55	84.21	8,097.37	127.76	494.55	-70.52	0.84	-0.68	10.60	
8,150.00	2.51	84.60	8,122.35	127.87	495.65	-70.50	0.17	-0.16	1.56	
8,175.00	2.23	83.63	8,147.33	127.98	496.68	-70.48	1.13	-1.12	-3.88	
8,200.00	2.12	86.47	8,172.31	128.06	497.62	-70.46	0.62	-0.44	11.36	
8,225.00	2.08	91.59	8,197.29	128.07	498.54	-70.37	0.77	-0.16	20.48	
8,250.00	2.02	89.93	8,222.28	128.06	499.43	-70.26	0.34	-0.24	-6.64	
8,275.00	1.92	87.90	8,247.26	128.08	500.29	-70.17	0.49	-0.40	-8.12	
8,300.00	1.75	90.38	8,272.25	128.09	501.09	-70.10	0.75	-0.68	9.92	
8,325.00	1.76	96.84	8,297.24	128.04	501.86	-69.96	0.79	0.04	25.84	
8,350.00	1.73	95.20	8,322.23	127.96	502.61	-69.79	0.23	-0.12	-6.56	
8,375.00	1.81	93.09	8,347.21	127.91	503.38	-69.65	0.41	0.32	-8.44	
8,400.00	1.86	92.31	8,372.20	127.87	504.18	-69.52	0.22	0.20	-3.12	
8,425.00	1.82	91.71	8,397.19	127.84	504.98	-69.40	0.18	-0.16	-2.40	
8,450.00	1.72	89.29	8,422.18	127.83	505.76	-69.31	0.50	-0.40	-9.68	
8,475.00	1.81	91.82	8,447.17	127.83	506.53	-69.21	0.48	0.36	10.12	
8,500.00	2.88	95.01	8,472.14	127.76	507.55	-69.03	4.31	4.28	12.76	
8,525.00	4.05	96.95	8,497.10	127.60	509.05	-68.70	4.70	4.68	7.76	
8,550.00	4.29	97.55	8,522.03	127.37	510.85	-68.26	0.98	0.96	2.40	
8,575.00	4.34	97.80	8,546.96	127.12	512.72	-67.80	0.21	0.20	1.00	
8,600.00	4.37	97.11	8,571.89	126.87	514.60	-67.34	0.24	0.12	-2.76	
8,625.00	4.31	96.09	8,596.82	126.65	516.48	-66.91	0.39	-0.24	-4.08	
8,650.00	4.20	97.47	8,621.75	126.43	518.32	-66.48	0.60	-0.44	5.52	
8,675.00	4.09	99.02	8,646.68	126.18	520.11	-66.02	0.63	-0.44	6.20	
8,700.00	4.12	99.30	8,671.62	125.89	521.87	-65.54	0.14	0.12	1.12	
8,725.00	3.91	99.25	8,696.56	125.61	523.60	-65.06	0.84	-0.84	-0.20	
8,750.00	3.85	100.85	8,721.50	125.31	525.27	-64.58	0.50	-0.24	6.40	
8,775.00	3.81	100.07	8,746.44	125.01	526.91	-64.09	0.26	-0.16	-3.12	
8,800.00	3.81	100.30	8,771.39	124.72	528.54	-63.61	0.06	0.00	0.92	
8,825.00	3.78	100.75	8,796.33	124.41	530.17	-63.13	0.17	-0.12	1.80	
8,850.00	3.95	93.30	8,821.28	124.21	531.84	-62.73	2.12	0.68	-29.80	
8,875.00	4.94	74.38	8,846.20	124.45	533.74	-62.76	7.03	3.96	-75.68	
8,900.00	5.03	73.36	8,871.11	125.05	535.82	-63.12	0.51	0.36	-4.08	
8,925.00	5.00	74.20	8,896.01	125.67	537.92	-63.48	0.32	-0.12	3.36	
8,950.00	4.98	74.18	8,920.92	126.26	540.01	-63.83	0.08	-0.08	-0.08	



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 604H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3359.40usft (McVay 8)
Site:	Gunner 8 Federal Com	MD Reference:	RKB @ 3359.40usft (McVay 8)
Well:	604H	North Reference:	Grid
Wellbore:	OH / 66564	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
8,975.00	4.89	73.81	8,945.83	126.85	542.08	-64.19	0.38	-0.36	-1.48	
9,000.00	4.76	73.15	8,970.74	127.45	544.10	-64.55	0.57	-0.52	-2.64	
9,025.00	4.62	73.87	8,995.65	128.03	546.06	-64.90	0.61	-0.56	2.88	
9,050.00	4.48	74.71	9,020.57	128.57	547.97	-65.22	0.62	-0.56	3.36	
9,075.00	4.32	74.69	9,045.50	129.07	549.82	-65.51	0.64	-0.64	-0.08	
9,100.00	4.06	75.75	9,070.43	129.54	551.58	-65.77	1.09	-1.04	4.24	
9,125.00	3.99	74.93	9,095.37	129.98	553.28	-66.02	0.36	-0.28	-3.28	
9,150.00	3.95	75.11	9,120.31	130.43	554.95	-66.27	0.17	-0.16	0.72	
9,175.00	3.98	73.94	9,145.25	130.89	556.62	-66.54	0.35	0.12	-4.68	
9,200.00	4.02	73.02	9,170.19	131.39	558.29	-66.85	0.30	0.16	-3.68	
9,225.00	4.41	73.36	9,195.12	131.92	560.05	-67.17	1.56	1.56	1.36	
9,250.00	5.76	76.50	9,220.02	132.49	562.19	-67.49	5.51	5.40	12.56	
9,275.00	6.01	77.87	9,244.89	133.05	564.69	-67.77	1.15	1.00	5.48	
9,300.00	6.13	77.65	9,269.75	133.61	567.27	-68.03	0.49	0.48	-0.88	
9,325.00	6.13	77.94	9,294.61	134.18	569.88	-68.30	0.12	0.00	1.16	
9,350.00	5.86	78.40	9,319.47	134.71	572.44	-68.54	1.10	-1.08	1.84	
9,375.00	5.70	78.19	9,344.35	135.23	574.90	-68.76	0.65	-0.64	-0.84	
9,400.00	5.34	78.05	9,369.23	135.72	577.26	-68.99	1.44	-1.44	-0.56	
9,425.00	5.18	76.87	9,394.12	136.22	579.49	-69.23	0.77	-0.64	-4.72	
9,450.00	4.96	76.46	9,419.03	136.73	581.64	-69.49	0.89	-0.88	-1.64	
9,475.00	4.69	75.62	9,443.94	137.23	583.68	-69.76	1.12	-1.08	-3.36	
9,500.00	4.39	76.79	9,468.86	137.71	585.61	-70.01	1.26	-1.20	4.68	
9,525.00	4.15	76.34	9,493.79	138.14	587.42	-70.23	0.97	-0.96	-1.80	
9,550.00	4.02	75.49	9,518.73	138.57	589.14	-70.46	0.57	-0.52	-3.40	
9,575.00	3.92	76.29	9,543.67	138.99	590.82	-70.69	0.46	-0.40	3.20	
9,600.00	4.03	76.26	9,568.61	139.41	592.51	-70.91	0.44	0.44	-0.12	
9,625.00	4.37	80.38	9,593.54	139.77	594.30	-71.07	1.82	1.36	16.48	
9,650.00	4.44	84.12	9,618.47	140.03	596.20	-71.11	1.18	0.28	14.96	
9,675.00	4.52	84.74	9,643.39	140.22	598.14	-71.08	0.37	0.32	2.48	
9,700.00	4.15	81.63	9,668.32	140.44	600.02	-71.08	1.75	-1.48	-12.44	
9,725.00	3.87	81.75	9,693.26	140.70	601.75	-71.14	1.12	-1.12	0.48	
9,750.00	3.45	78.56	9,718.21	140.97	603.32	-71.22	1.87	-1.68	-12.76	
9,775.00	3.11	79.38	9,743.16	141.24	604.73	-71.34	1.37	-1.36	3.28	
9,800.00	3.05	76.18	9,768.13	141.52	606.04	-71.47	0.73	-0.24	-12.80	
9,825.00	3.05	77.03	9,793.09	141.83	607.33	-71.63	0.18	0.00	3.40	
9,850.00	2.98	74.42	9,818.06	142.16	608.61	-71.80	0.62	-0.28	-10.44	
9,875.00	3.05	75.36	9,843.02	142.50	609.88	-72.00	0.34	0.28	3.76	
9,900.00	3.85	78.02	9,867.98	142.84	611.34	-72.17	3.26	3.20	10.64	
9,925.00	4.53	81.07	9,892.91	143.17	613.14	-72.29	2.86	2.72	12.20	
9,950.00	4.54	82.18	9,917.83	143.46	615.09	-72.36	0.35	0.04	4.44	
9,975.00	4.69	82.81	9,942.75	143.72	617.09	-72.39	0.63	0.60	2.52	
10,000.00	4.50	81.68	9,967.67	143.99	619.07	-72.43	0.84	-0.76	-4.52	
10,025.00	4.19	80.62	9,992.60	144.28	620.94	-72.51	1.28	-1.24	-4.24	
10,050.00	3.79	78.57	10,017.54	144.59	622.65	-72.62	1.70	-1.60	-8.20	



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 604H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3359.40usft (McVay 8)
Site:	Gunner 8 Federal Com	MD Reference:	RKB @ 3359.40usft (McVay 8)
Well:	604H	North Reference:	Grid
Wellbore:	OH / 66564	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,075.00	3.49	78.58	10,042.49	144.91	624.21	-72.76	1.20	-1.20	0.04
10,100.00	3.32	77.67	10,067.44	145.21	625.66	-72.89	0.71	-0.68	-3.64
10,125.00	2.93	77.40	10,092.41	145.51	626.99	-73.03	1.56	-1.56	-1.08
10,150.00	3.03	75.13	10,117.37	145.81	628.25	-73.20	0.62	0.40	-9.08
10,175.00	3.17	76.09	10,142.34	146.15	629.56	-73.38	0.60	0.56	3.84
10,200.00	4.25	87.33	10,167.28	146.36	631.16	-73.41	5.19	4.32	44.96
10,225.00	4.60	87.78	10,192.21	146.44	633.09	-73.27	1.41	1.40	1.80
10,250.00	4.66	87.83	10,217.13	146.52	635.10	-73.12	0.24	0.24	0.20
10,275.00	4.48	86.95	10,242.05	146.61	637.09	-72.98	0.77	-0.72	-3.52
10,300.00	4.26	81.76	10,266.98	146.79	638.99	-72.95	1.81	-0.88	-20.76
10,325.00	4.08	80.05	10,291.91	147.08	640.78	-73.03	0.88	-0.72	-6.84
10,350.00	4.02	79.67	10,316.85	147.39	642.52	-73.14	0.26	-0.24	-1.52
10,375.00	3.93	79.32	10,341.79	147.71	644.23	-73.26	0.37	-0.36	-1.40
10,400.00	3.88	81.30	10,366.73	147.99	645.90	-73.35	0.58	-0.20	7.92
10,425.00	3.88	81.65	10,391.67	148.24	647.58	-73.41	0.09	0.00	1.40
10,450.00	3.97	83.34	10,416.61	148.47	649.27	-73.44	0.59	0.36	6.76
10,475.00	5.32	87.71	10,441.53	148.61	651.29	-73.35	5.58	5.40	17.48
10,500.00	6.75	91.16	10,466.39	148.63	653.92	-73.07	5.90	5.72	13.80
10,525.00	6.98	91.84	10,491.21	148.55	656.90	-72.65	0.98	0.92	2.72
10,550.00	6.97	91.82	10,516.03	148.46	659.94	-72.21	0.04	-0.04	-0.08
10,575.00	6.97	91.92	10,540.84	148.36	662.97	-71.76	0.05	0.00	0.40
10,600.00	6.94	90.42	10,565.66	148.30	666.00	-71.36	0.74	-0.12	-6.00
10,625.00	6.72	90.98	10,590.48	148.26	668.97	-70.98	0.92	-0.88	2.24
10,650.00	6.44	90.08	10,615.32	148.23	671.83	-70.63	1.19	-1.12	-3.60
10,675.00	6.15	90.87	10,640.17	148.21	674.58	-70.29	1.21	-1.16	3.16
10,700.00	5.95	91.04	10,665.03	148.17	677.21	-69.95	0.80	-0.80	0.68
10,725.00	5.69	89.95	10,689.90	148.14	679.75	-69.64	1.13	-1.04	-4.36
10,750.00	5.42	89.71	10,714.78	148.15	682.17	-69.37	1.08	-1.08	-0.96
10,775.00	4.83	89.63	10,739.68	148.16	684.40	-69.13	2.36	-2.36	-0.32
10,800.00	4.56	89.79	10,764.60	148.17	686.44	-68.90	1.08	-1.08	0.64
10,825.00	4.44	88.88	10,789.52	148.20	688.41	-68.70	0.56	-0.48	-3.64
10,850.00	4.01	86.88	10,814.45	148.26	690.25	-68.56	1.82	-1.72	-8.00
10,875.00	3.52	86.99	10,839.40	148.35	691.89	-68.46	1.96	-1.96	0.44
10,900.00	3.23	85.69	10,864.35	148.44	693.35	-68.38	1.20	-1.16	-5.20
10,925.00	3.22	87.80	10,889.31	148.52	694.76	-68.30	0.48	-0.04	8.44
10,950.00	4.14	84.04	10,914.26	148.64	696.36	-68.24	3.80	3.68	-15.04
10,975.00	4.66	82.57	10,939.19	148.87	698.26	-68.25	2.13	2.08	-5.88
11,000.00	4.50	83.57	10,964.11	149.11	700.24	-68.26	0.72	-0.64	4.00
11,025.00	4.49	84.89	10,989.03	149.31	702.19	-68.23	0.42	-0.04	5.28
11,050.00	4.31	83.40	11,013.96	149.50	704.10	-68.21	0.85	-0.72	-5.96
11,075.00	4.09	83.37	11,038.89	149.71	705.92	-68.21	0.88	-0.88	-0.12
11,100.00	3.82	84.91	11,063.83	149.89	707.63	-68.19	1.16	-1.08	6.16
11,125.00	3.68	83.56	11,088.78	150.05	709.26	-68.17	0.66	-0.56	-5.40



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 604H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3359.40usft (McVay 8)
Site:	Gunner 8 Federal Com	MD Reference:	RKB @ 3359.40usft (McVay 8)
Well:	604H	North Reference:	Grid
Wellbore:	OH / 66564	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
11,150.00	3.50	84.78	11,113.73	150.21	710.82	-68.15	0.78	-0.72	4.88	
11,175.00	3.59	84.18	11,138.68	150.36	712.36	-68.12	0.39	0.36	-2.40	
11,200.00	3.77	82.82	11,163.63	150.54	713.95	-68.12	0.80	0.72	-5.44	
11,225.00	4.47	84.02	11,188.57	150.75	715.74	-68.12	2.82	2.80	4.80	
11,250.00	5.34	84.43	11,213.47	150.96	717.86	-68.09	3.48	3.48	1.64	
11,275.00	5.50	87.08	11,238.36	151.14	720.22	-68.00	1.19	0.64	10.60	
11,300.00	5.33	88.72	11,263.25	151.22	722.57	-67.81	0.92	-0.68	6.56	
11,325.00	5.28	90.99	11,288.14	151.23	724.89	-67.56	0.86	-0.20	9.08	
11,350.00	5.18	88.89	11,313.04	151.23	727.16	-67.30	0.86	-0.40	-8.40	
11,375.00	5.19	87.34	11,337.94	151.31	729.42	-67.11	0.56	0.04	-6.20	
11,400.00	5.13	86.84	11,362.84	151.42	731.67	-66.97	0.30	-0.24	-2.00	
11,425.00	5.12	83.99	11,387.74	151.60	733.89	-66.89	1.02	-0.04	-11.40	
11,450.00	5.15	83.11	11,412.64	151.85	736.12	-66.89	0.34	0.12	-3.52	
11,475.00	5.08	80.51	11,437.54	152.17	738.32	-66.95	0.97	-0.28	-10.40	
11,500.00	5.16	80.47	11,462.44	152.54	740.52	-67.07	0.32	0.32	-0.16	
11,525.00	5.15	77.16	11,487.33	152.97	742.72	-67.25	1.19	-0.04	-13.24	
11,550.00	5.00	76.88	11,512.24	153.47	744.88	-67.50	0.61	-0.60	-1.12	
11,575.00	5.03	73.24	11,537.14	154.03	746.99	-67.82	1.28	0.12	-14.56	
11,600.00	5.02	72.44	11,562.05	154.68	749.08	-68.22	0.28	-0.04	-3.20	
11,625.00	5.03	69.88	11,586.95	155.38	751.15	-68.69	0.90	0.04	-10.24	
11,650.00	4.75	67.61	11,611.86	156.16	753.14	-69.23	1.36	-1.12	-9.08	
11,675.00	4.85	65.08	11,636.77	157.00	755.06	-69.84	0.94	0.40	-10.12	
11,700.00	4.70	59.16	11,661.68	157.97	756.89	-70.60	2.06	-0.60	-23.68	
11,725.00	4.68	56.44	11,686.60	159.05	758.62	-71.48	0.89	-0.08	-10.88	
11,750.00	4.58	52.77	11,711.52	160.22	760.27	-72.45	1.25	-0.40	-14.68	
11,775.00	4.50	52.71	11,736.44	161.42	761.84	-73.46	0.32	-0.32	-0.24	
11,800.00	4.32	51.00	11,761.37	162.61	763.35	-74.47	0.89	-0.72	-6.84	
11,825.00	3.91	55.31	11,786.30	163.68	764.79	-75.38	2.05	-1.64	17.24	
11,850.00	3.80	54.94	11,811.25	164.65	766.17	-76.17	0.45	-0.44	-1.48	
11,875.00	3.85	48.51	11,836.19	165.68	767.47	-77.05	1.73	0.20	-25.72	
11,900.00	3.33	48.22	11,861.14	166.72	768.64	-77.95	2.08	-2.08	-1.16	
11,958.00	3.03	46.77	11,919.05	168.89	771.02	-79.84	0.54	-0.52	-2.50	
First Gordon MWD Survey										
12,063.00	2.32	55.46	12,023.94	172.00	774.79	-82.49	0.78	-0.68	8.28	
12,094.00	2.11	54.35	12,054.91	172.68	775.77	-83.06	0.69	-0.68	-3.58	
12,188.00	1.36	58.81	12,148.87	174.27	778.13	-84.37	0.81	-0.80	4.74	
12,283.00	2.22	129.00	12,243.83	173.70	780.52	-83.53	2.29	0.91	73.88	
12,314.00	6.93	153.96	12,274.73	171.64	781.81	-81.33	16.15	15.19	80.52	
12,345.00	12.37	159.14	12,305.28	166.85	783.82	-76.35	17.75	17.55	16.71	
12,377.00	17.50	158.32	12,336.19	159.17	786.82	-68.38	16.04	16.03	-2.56	
12,386.00	18.68	156.60	12,344.74	156.59	787.89	-65.69	14.43	13.15	-19.15	
FTP: 12386' MD										
12,408.00	21.63	153.16	12,365.39	149.74	791.12	-58.52	14.43	13.39	-15.62	
12,440.00	26.24	151.05	12,394.63	138.28	797.21	-46.44	14.65	14.41	-6.59	



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 604H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3359.40usft (McVay 8)
Site:	Gunner 8 Federal Com	MD Reference:	RKB @ 3359.40usft (McVay 8)
Well:	604H	North Reference:	Grid
Wellbore:	OH / 66564	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,471.00	29.61	149.99	12,422.02	125.65	804.36	-33.07	10.99	10.87	-3.42
12,519.00	32.06	150.32	12,463.23	104.31	816.60	-10.48	5.12	5.10	0.69
12,566.00	35.38	152.56	12,502.32	81.39	829.05	13.72	7.54	7.06	4.77
12,614.00	40.47	153.15	12,540.17	55.14	842.50	41.33	10.63	10.60	1.23
12,661.00	43.56	156.54	12,575.09	26.66	855.84	71.14	8.15	6.57	7.21
12,708.00	46.38	158.42	12,608.34	-4.02	868.55	103.07	6.63	6.00	4.00
12,756.00	49.01	160.20	12,640.65	-37.23	881.08	137.49	6.13	5.48	3.71
12,803.00	52.88	161.05	12,670.25	-71.65	893.18	173.07	8.35	8.23	1.81
12,850.00	57.53	160.26	12,697.07	-108.06	905.97	210.70	9.99	9.89	-1.68
12,897.00	62.93	161.19	12,720.40	-146.56	919.42	250.48	11.62	11.49	1.98
12,944.00	68.08	164.46	12,739.88	-187.41	932.02	292.50	12.65	10.96	6.96
12,991.00	72.88	166.43	12,755.58	-230.27	943.14	336.35	10.95	10.21	4.19
13,039.00	80.28	165.29	12,766.71	-275.51	954.54	382.60	15.59	15.42	-2.38
13,087.00	90.33	164.88	12,770.64	-321.68	966.84	429.87	20.95	20.94	-0.85
13,142.00	91.50	164.77	12,769.76	-374.75	981.23	484.24	2.14	2.13	-0.20
13,237.00	92.02	165.06	12,766.84	-466.44	1,005.95	578.14	0.63	0.55	0.31
13,331.00	90.60	166.93	12,764.69	-557.61	1,028.69	671.31	2.50	-1.51	1.99
13,426.00	87.59	169.73	12,766.19	-650.62	1,047.90	765.90	4.33	-3.17	2.95
13,520.00	88.21	169.57	12,769.64	-743.02	1,064.77	859.63	0.68	0.66	-0.17
13,615.00	89.48	172.53	12,771.55	-836.84	1,079.55	954.52	3.39	1.34	3.12
13,709.00	90.65	173.20	12,771.45	-930.11	1,091.22	1,048.51	1.43	1.24	0.71
13,803.00	89.47	174.83	12,771.35	-1,023.59	1,101.02	1,142.50	2.14	-1.26	1.73
13,898.00	90.52	178.65	12,771.36	-1,118.42	1,106.43	1,237.33	4.17	1.11	4.02
13,993.00	88.98	177.95	12,771.77	-1,213.37	1,109.24	1,331.98	1.78	-1.62	-0.74
14,088.00	88.32	182.46	12,774.01	-1,308.32	1,108.90	1,426.27	4.80	-0.69	4.75
14,183.00	89.96	184.77	12,775.44	-1,403.11	1,102.92	1,519.76	2.98	1.73	2.43
14,277.00	86.05	180.06	12,778.71	-1,496.92	1,098.95	1,612.51	6.51	-4.16	-5.01
14,371.00	88.14	179.58	12,783.47	-1,590.80	1,099.25	1,705.80	2.28	2.22	-0.51
14,466.00	88.76	179.77	12,786.04	-1,685.76	1,099.79	1,800.21	0.68	0.65	0.20
14,561.00	89.04	181.00	12,787.87	-1,780.74	1,099.15	1,894.49	1.33	0.29	1.29
14,656.00	90.09	182.31	12,788.59	-1,875.69	1,096.41	1,988.52	1.77	1.11	1.38
14,751.00	86.91	179.04	12,791.08	-1,970.63	1,095.29	2,082.70	4.80	-3.35	-3.44
14,847.00	86.96	180.19	12,796.21	-2,066.49	1,095.93	2,178.01	1.20	0.05	1.20
14,942.00	87.43	180.44	12,800.86	-2,161.37	1,095.41	2,272.22	0.56	0.49	0.26
15,037.00	86.79	178.02	12,805.65	-2,256.23	1,096.68	2,366.61	2.63	-0.67	-2.55
15,131.00	89.43	179.79	12,808.75	-2,350.15	1,098.48	2,460.12	3.38	2.81	1.88
15,226.00	89.53	182.46	12,809.61	-2,445.12	1,096.61	2,554.25	2.81	0.11	2.81
15,320.00	89.56	182.31	12,810.36	-2,539.04	1,092.70	2,647.11	0.16	0.03	-0.16
15,415.00	86.69	175.26	12,813.47	-2,633.90	1,094.71	2,741.58	8.01	-3.02	-7.42
15,510.00	88.37	174.09	12,817.56	-2,728.39	1,103.52	2,836.46	2.15	1.77	-1.23
15,604.00	88.67	174.66	12,819.99	-2,821.91	1,112.73	2,930.42	0.69	0.32	0.61
15,699.00	88.97	176.23	12,821.95	-2,916.59	1,120.27	3,025.34	1.68	0.32	1.65
15,794.00	91.26	181.19	12,821.76	-3,011.53	1,122.41	3,119.90	5.75	2.41	5.22



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 604H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3359.40usft (McVay 8)
Site:	Gunner 8 Federal Com	MD Reference:	RKB @ 3359.40usft (McVay 8)
Well:	604H	North Reference:	Grid
Wellbore:	OH / 66564	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
15,889.00	88.80	178.08	12,821.71	-3,106.50	1,123.01	3,214.33	4.17	-2.59	-3.27
15,984.00	87.78	175.39	12,824.54	-3,201.30	1,128.42	3,309.12	3.03	-1.07	-2.83
16,079.00	89.13	178.41	12,827.10	-3,296.11	1,133.55	3,403.90	3.48	1.42	3.18
16,173.00	90.18	179.97	12,827.67	-3,390.10	1,134.88	3,497.42	2.00	1.12	1.66
16,268.00	88.62	178.98	12,828.67	-3,485.08	1,135.75	3,591.89	1.94	-1.64	-1.04
16,364.00	91.34	180.45	12,828.70	-3,581.07	1,136.23	3,687.31	3.22	2.83	1.53
16,458.00	88.51	177.02	12,828.82	-3,675.02	1,138.30	3,780.88	4.73	-3.01	-3.65
16,553.00	88.94	177.06	12,830.94	-3,769.87	1,143.21	3,875.67	0.45	0.45	0.04
16,647.00	92.29	180.56	12,829.93	-3,863.82	1,145.16	3,969.23	5.15	3.56	3.72
16,741.00	95.37	180.93	12,823.65	-3,957.59	1,143.94	4,062.25	3.30	3.28	0.39
16,836.00	94.79	180.44	12,815.24	-4,052.21	1,142.81	4,156.12	0.80	-0.61	-0.52
16,931.00	93.98	179.92	12,807.97	-4,146.93	1,142.51	4,250.19	1.01	-0.85	-0.55
17,025.00	92.67	179.07	12,802.52	-4,240.77	1,143.34	4,343.51	1.66	-1.39	-0.90
17,121.00	89.72	182.81	12,800.52	-4,336.70	1,141.77	4,438.64	4.96	-3.07	3.90
17,215.00	90.10	186.76	12,800.67	-4,430.36	1,133.93	4,530.79	4.22	0.40	4.20
17,309.00	89.96	187.14	12,800.62	-4,523.67	1,122.55	4,622.19	0.43	-0.15	0.40
17,356.00	89.92	188.09	12,800.67	-4,570.25	1,116.32	4,667.76	2.02	-0.09	2.02
17,404.00	88.66	186.48	12,801.26	-4,617.86	1,110.24	4,714.36	4.26	-2.63	-3.35
17,451.00	89.57	185.28	12,801.99	-4,664.60	1,105.42	4,760.25	3.20	1.94	-2.55
17,499.00	90.89	183.65	12,801.79	-4,712.45	1,101.69	4,807.36	4.37	2.75	-3.40
17,594.00	87.21	178.82	12,803.37	-4,807.38	1,099.64	4,901.43	6.39	-3.87	-5.08
17,688.00	87.29	178.89	12,807.88	-4,901.25	1,101.51	4,994.91	0.11	0.09	0.07
17,784.00	87.28	179.12	12,812.43	-4,997.13	1,103.18	5,090.35	0.24	-0.01	0.24
17,879.00	87.39	178.85	12,816.84	-5,092.01	1,104.86	5,184.80	0.31	0.12	-0.28
17,973.00	87.30	179.00	12,821.20	-5,185.89	1,106.62	5,278.27	0.19	-0.10	0.16
18,067.00	88.49	177.77	12,824.65	-5,279.79	1,109.27	5,371.86	1.82	1.27	-1.31
18,162.00	89.80	178.03	12,826.07	-5,374.71	1,112.75	5,466.56	1.41	1.38	0.27
18,257.00	90.87	179.47	12,825.51	-5,469.68	1,114.82	5,561.15	1.89	1.13	1.52
18,351.00	90.80	179.05	12,824.14	-5,563.66	1,116.04	5,654.65	0.45	-0.07	-0.45
18,446.00	91.42	179.21	12,822.30	-5,658.63	1,117.48	5,749.17	0.67	0.65	0.17
18,540.00	91.74	178.96	12,819.71	-5,752.59	1,118.98	5,842.68	0.43	0.34	-0.27
18,635.00	91.10	180.10	12,817.36	-5,847.55	1,119.76	5,937.11	1.38	-0.67	1.20
18,730.00	91.87	180.64	12,814.90	-5,942.52	1,119.15	6,031.39	0.99	0.81	0.57
18,825.00	90.09	178.86	12,813.27	-6,037.49	1,119.56	6,125.79	2.65	-1.87	-1.87
18,920.00	91.03	177.58	12,812.34	-6,132.44	1,122.51	6,220.46	1.67	0.99	-1.35
19,015.00	91.37	177.45	12,810.35	-6,227.33	1,126.63	6,315.20	0.38	0.36	-0.14
19,109.00	90.63	175.64	12,808.71	-6,321.14	1,132.29	6,409.04	2.08	-0.79	-1.93
19,204.00	90.55	180.13	12,807.73	-6,416.05	1,135.80	6,503.73	4.73	-0.08	4.73
19,299.00	89.99	181.99	12,807.29	-6,511.03	1,134.04	6,597.89	2.04	-0.59	1.96
19,394.00	89.97	182.00	12,807.32	-6,605.97	1,130.73	6,691.83	0.02	-0.02	0.01
19,488.00	90.01	183.68	12,807.33	-6,699.85	1,126.08	6,784.57	1.79	0.04	1.79
19,583.00	90.07	184.00	12,807.27	-6,794.64	1,119.71	6,878.01	0.34	0.06	0.34
19,678.00	89.45	182.69	12,807.67	-6,889.47	1,114.17	6,971.59	1.53	-0.65	-1.38



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 604H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3359.40usft (McVay 8)
Site:	Gunner 8 Federal Com	MD Reference:	RKB @ 3359.40usft (McVay 8)
Well:	604H	North Reference:	Grid
Wellbore:	OH / 66564	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
19,772.00	89.78	179.50	12,808.30	-6,983.44	1,112.37	7,064.74	3.41	0.35	-3.39
19,867.00	89.35	176.86	12,809.02	-7,078.38	1,115.39	7,159.41	2.82	-0.45	-2.78
19,962.00	87.98	173.03	12,811.23	-7,172.96	1,123.76	7,254.33	4.28	-1.44	-4.03
20,057.00	87.98	172.31	12,814.58	-7,267.13	1,135.87	7,349.26	0.76	0.00	-0.76
20,151.00	90.54	174.98	12,815.80	-7,360.53	1,146.27	7,443.24	3.93	2.72	2.84
20,245.00	90.76	175.00	12,814.73	-7,454.16	1,154.48	7,537.20	0.24	0.23	0.02
20,339.00	90.55	174.08	12,813.66	-7,547.73	1,163.42	7,631.17	1.00	-0.22	-0.98
20,434.00	90.75	176.29	12,812.58	-7,642.38	1,171.40	7,726.12	2.34	0.21	2.33
20,529.00	90.49	176.54	12,811.55	-7,737.19	1,177.34	7,820.99	0.38	-0.27	0.26
20,624.00	89.66	175.67	12,811.43	-7,831.97	1,183.79	7,915.88	1.27	-0.87	-0.92
20,720.00	89.45	176.16	12,812.17	-7,927.72	1,190.63	8,011.79	0.56	-0.22	0.51
20,815.00	90.32	183.21	12,812.36	-8,022.66	1,191.15	8,106.17	7.48	0.92	7.42
20,909.00	90.62	181.92	12,811.59	-8,116.56	1,186.94	8,198.98	1.41	0.32	-1.37
21,004.00	89.56	179.19	12,811.44	-8,211.54	1,186.02	8,293.24	3.08	-1.12	-2.87
21,098.00	90.11	181.99	12,811.71	-8,305.53	1,185.06	8,386.50	3.04	0.59	2.98
21,193.00	89.46	179.77	12,812.07	-8,400.51	1,183.60	8,480.69	2.43	-0.68	-2.34
21,288.00	90.61	181.68	12,812.01	-8,495.50	1,182.39	8,574.92	2.35	1.21	2.01
21,382.00	89.80	180.62	12,811.67	-8,589.48	1,180.51	8,668.07	1.42	-0.86	-1.13
21,477.00	90.25	181.16	12,811.63	-8,684.46	1,179.03	8,762.27	0.74	0.47	0.57
21,572.00	89.41	179.82	12,811.91	-8,779.46	1,178.22	8,856.55	1.66	-0.88	-1.41
21,666.00	90.00	180.05	12,812.40	-8,873.46	1,178.33	8,949.95	0.67	0.63	0.24
21,761.00	89.46	179.22	12,812.85	-8,968.45	1,178.93	9,044.39	1.04	-0.57	-0.87
21,856.00	89.77	179.39	12,813.48	-9,063.44	1,180.08	9,138.89	0.37	0.33	0.18
21,950.00	89.76	179.11	12,813.87	-9,157.43	1,181.31	9,232.41	0.30	-0.01	-0.30
22,045.00	89.27	177.35	12,814.67	-9,252.38	1,184.25	9,327.07	1.92	-0.52	-1.85
22,140.00	91.69	179.12	12,813.88	-9,347.32	1,187.17	9,421.73	3.16	2.55	1.86
22,234.00	91.08	178.70	12,811.61	-9,441.28	1,188.96	9,515.27	0.79	-0.65	-0.45
22,329.00	90.56	178.37	12,810.25	-9,536.23	1,191.39	9,609.89	0.65	-0.55	-0.35
22,423.00	91.13	178.94	12,808.86	-9,630.20	1,193.60	9,703.49	0.86	0.61	0.61
22,518.00	87.46	176.14	12,810.03	-9,725.08	1,197.67	9,798.22	4.86	-3.86	-2.95
22,612.00	89.50	181.66	12,812.53	-9,818.99	1,199.47	9,891.72	6.26	2.17	5.87
22,707.00	89.82	182.06	12,813.09	-9,913.93	1,196.39	9,985.69	0.54	0.34	0.42
22,801.00	89.54	182.31	12,813.61	-10,007.86	1,192.81	10,078.60	0.40	-0.30	0.27
22,896.00	89.75	183.90	12,814.20	-10,102.72	1,187.66	10,172.25	1.69	0.22	1.67
22,961.00	88.40	185.26	12,815.25	-10,167.50	1,182.47	10,236.02	2.95	-2.08	2.09
Final Gordon MWD Survey									
22,997.00	88.40	185.26	12,816.26	-10,203.33	1,179.17	10,271.24	0.00	0.00	0.00
LTP: 22997' MD									
23,020.00	88.40	185.26	12,816.90	-10,226.23	1,177.06	10,293.75	0.00	0.00	0.00
Projection to TD									



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 604H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3359.40usft (McVay 8)
Site:	Gunner 8 Federal Com	MD Reference:	RKB @ 3359.40usft (McVay 8)
Well:	604H	North Reference:	Grid
Wellbore:	OH / 66564	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
11,958.00	11,919.05	168.89	771.02	First Gordon MWD Survey
12,386.00	12,344.74	156.59	787.89	FTP: 12386' MD
22,961.00	12,815.25	-10,167.50	1,182.47	Final Gordon MWD Survey
22,997.00	12,816.26	-10,203.33	1,179.17	LTP: 22997' MD
23,020.00	12,816.90	-10,226.23	1,177.06	Projection to TD

Checked By: _____ Approved By: _____ Date: _____

Submit To Appropriate District Office Two Copies District I 1625 N. French Dr., Hobbs, NM 88240 District II 811 S. First St., Artesia, NM 88210 District III 1000 Rio Brazos Rd., Aztec, NM 87410 District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505		State of New Mexico Energy, Minerals and Natural Resources Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505				Form C-105 Revised April 3, 2017				
		1. WELL API NO.				30-025-46758				
		2. Type of Lease				☐ STATE ☐ FEE ☒ FED/INDIAN				
		3. State Oil & Gas Lease No.								
WELL COMPLETION OR RECOMPLETION REPORT AND LOG										
4. Reason for filing:						5. Lease Name or Unit Agreement Name				
☒ COMPLETION REPORT (Fill in boxes #1 through #31 for State and Fee wells only)						Gunner Federal Com				
☐ C-144 CLOSURE ATTACHMENT (Fill in boxes #1 through #9, #15 Date Rig Released and #32 and/or #33; attach this and the plat to the C-144 closure report in accordance with 19.15.17.13.K NMAC)						6. Well Number:				
						604H				
7. Type of Completion:										
☒ NEW WELL ☐ WORKOVER ☐ DEEPENING ☐ PLUGBACK ☐ DIFFERENT RESERVOIR ☐ OTHER _____										
8. Name of Operator						9. OGRID				
COG Operating LLC						229137				
10. Address of Operator						11. Pool name or Wildcat				
2208 W. Main Street						Bobcat Draw; Upper Wolfcamp				
Artesia, NM 88210										
12. Location	Unit Ltr	Section	Township	Range	Lot	Feet from the	N/S Line	Feet from the	E/W Line	County
Surface:	D	5	26S	34E		250'	North	560'	West	Lea
BH:	N	8	26S	34E		77'	South	1651'	West	Lea
13. Date Spudded	14. Date T.D. Reached	15. Date Rig Released		16. Date Completed (Ready to Produce)		17. Elevations (DF and RKB, RT, GR, etc.)		2914' GR		
3/15/20	6/10/20	6/13/20		1/15/21						
18. Total Measured Depth of Well		19. Plug Back Measured Depth		20. Was Directional Survey Made?		21. Type Electric and Other Logs Run				
19,991'		19,840'		Yes						
22. Producing Interval(s), of this completion - Top, Bottom, Name										
12,990-22,870' Wolfcamp										
23. CASING RECORD (Report all strings set in well)										
CASING SIZE		WEIGHT LB./FT.		DEPTH SET		HOLE SIZE		CEMENTING RECORD		AMOUNT PULLED
10 3/4"		45.5#		897'		14 3/4"		627 sx		
7 5/8"		29.7#		12013'		8 3/4"		1315 sx		
5 1/2"		23#		23020'		6 3/4"		1750 sx		
24. LINER RECORD						25. TUBING RECORD				
SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN	SIZE	DEPTH SET	PACKER SET			
					2 7/8"	12247'	12237'			
26. Perforation record (interval, size, and number)						27. ACID, SHOT, FRACTURE, CEMENT, SQUEEZE, ETC.				
12,990-22,870' (2220)						DEPTH INTERVAL		AMOUNT AND KIND MATERIAL USED		
						12,990-22,870'		Acidz w/50,736 gal 7 1/2%; Frac w/20,007,862# sand & 18,497,232 gal fluid		
28. PRODUCTION										
Date First Production		Production Method (Flowing, gas lift, pumping - Size and type pump)				Well Status (Prod. or Shut-in)				
1/21/21		Flowing				Producing				
Date of Test	Hours Tested	Choke Size	Prod'n For Test Period	Oil - Bbl	Gas - MCF	Water - Bbl.	Gas - Oil Ratio			
1/21/21	24	14/64"		511	733	1532				
Flow Tubing Press.	Casing Pressure	Calculated 24-Hour Rate	Oil - Bbl.	Gas - MCF	Water - Bbl.	Oil Gravity - API - (Corr.)				
3400#	3500#		511	733	1532					
29. Disposition of Gas (Sold, used for fuel, vented, etc.)						30. Test Witnessed By				
Sold						Juan Villalobos				
31. List Attachments										
Surveys										
32. If a temporary pit was used at the well, attach a plat with the location of the temporary pit.						33. Rig Release Date:				
						6/13/20				
34. If an on-site burial was used at the well, report the exact location of the on-site burial:										
Latitude _____ Longitude _____ NAD83										
I hereby certify that the information shown on both sides of this form is true and complete to the best of my knowledge and belief										
Printed										
Signature <i>Amanda Avery</i>		Name: Amanda Avery		Title Regulatory Analyst		Date: 3/17/21				
E-mail Address: amanda.l.avery@conocophillips.com										

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
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1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 21299

CONDITIONS OF APPROVAL

Operator:	COG OPERATING LLC	600 W Illinois Ave	Midland, TX79701	OGRID:	229137	Action Number:	21299	Action Type:	C-104C
OCD Reviewer									Condition
ksimmons									None