

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018

Carlsbad Field Office
OCD Hobbs

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

3. Lease Serial No.
NMNM114981

6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on page 2

7. If Unit or CA/Agreement, Name and/or No.

1. Type of Well

Oil Well Gas Well Other

8. Well Name and No.
RINGO 32 FEDERAL COM 1H

2. Name of Operator
COG OPERATING LLC

Contact: MAYTE X REYES
E-Mail: mreyes1@concho.com

9. API Well No.
30-025-41411

3a. Address
2208 WEST MAIN STREET
ARTESIA, NM 88210

3b. Phone No. (include area code)
Ph: 575-748-6945

10. Field and Pool or Exploratory Area
LUSK; BONE SPRING, SOUTH

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 32 T19S R32E SESE 330FSL 490FEL

11. County or Parish, State

LEA COUNTY, NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

COG Operating LLC, respectfully requests approval for the following changes to the original approved APD.

Casing Design:

Operator will drill 26" Surface to 980ft MD and set 20" 106.5# K55 BTC to section TD.
Operator will drill 17" Intermediate 1 to 2,800ft MD and set 13 3/8" 68# L80 BTC to section TD.
Operator will drill 12" Intermediate 2 down to 4,500ft MD and set 9 5/8" 48# J55 BTC casing at section TD. Set DV Tool 50" outside Intermediate #1 at 2,850ft
Operator will drill Production down to 19,925ft MD and set 5 1/2" 17# P110 BTC.

Casing setting depth verified by Robert Salas

Cement Design:

-All previous COA still apply. Additional COA is not required.

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #384481 verified by the BLM Well Information System
For COG OPERATING LLC, sent to the Hobbs
Committed to AFMSS for processing by MUSTAFA HAQUE on 08/17/2017 ()

Name (Printed/Typed) MAYTE X REYES

Title REGULATORY ANALYST

Signature (Electronic Submission)

Date 08/14/2017

APPROVED
AUG 17 2017
PETROLEUM ENGINEER
BUREAU OF LAND MANAGEMENT
CARLSBAD FIELD OFFICE

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By Mustafa Haque

Title PETROLEUM ENGINEER

Date 8-17-2017

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office CFO

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

**** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ****

[Handwritten signature]

Additional data for EC transaction #384481 that would not fit on the form

32. Additional remarks, continued

20? Surface ? Calculated to surface with 100% excess
Lead: 900 sx Class C + 4% Gel + 2% Cacl2 (13.5 ppg : 1.75 cuft/sx)
Tail: 550 sx Class C + 2% Cacl2 (14.8 ppg : 1.35 cuft/sx)

13 3/8? Intermediate - Calculated to surface with 60% excess
Lead: 1,500 sx Class C + 4% Gel + 2% Cacl2 (13.5 ppg : 1.75 cuft/sx)
Tail: 250 sx Class C + 2% Cacl2 (14.8 ppg : 1.35 cuft/sx)

9 5/8? 2nd Intermediate ? Calculated to surface with 60% excess DV Tool set at 2,850ft
1st Stage: Lead: 300 sx Class C 35:65:6 (12.7 ppg : 1.89 cuft/sx)
Tail: 200 sx Class C + 2% Cacl2 (14.8 ppg : 1.35 cuft/sx)
2nd Stage: Lead: 450 sx Class C 4% Gel (13.5 ppg : 1.75 cuft/sx)
Tail: 200 sx Class C (14.8 ppg : 1.35 cuft/sx)

5 ?? Production - Calculated to 100? above reef with 60% excess
Lead: 900 sx Class H ? NeoCem (11.0 ppg : 2.81 cuft/sx)
Tail: 1,400 sx Class H + 2% Cacl2 (13.2 ppg : 1.4 cuft/sx)

COG Operating, LLC

Lea County, NM

Sec 32, T19S, R32E

Ringo 32 Federal COM #1H

Wellbore #1H

Plan: Design #1

QES Well Planning Report

11 August, 2017

Well Planning Report

Database: EDM 5000.1 Single User Db
 Company: COG Operating, LLC
 Project: Lea County, NM
 Site: Sec 32, T19S, R32E
 Well: Ringo 32 Federal COM #1H
 Wellbore: Wellbore #1H
 Design: Design #1

Local Co-ordinate Reference: Well Ringo 32 Federal COM #1H
 TVD Reference: RKB @ 3564.0usft (Noram #21)
 MD Reference: RKB @ 3564.0usft (Noram #21)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

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

Site	Sec 32, T19S, R32E				
Site Position:		Northing:	586,219.30 usft	Latitude:	32° 36' 37.462 N
From:	Map	Easting:	670,116.00 usft	Longitude:	103° 46' 51.150 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.30 °

Well	Ringo 32 Federal COM #1H					
Well Position	+N/-S	0.2 usft	Northing:	586,219.50 usft	Latitude:	32° 36' 37.464 N
	+E/-W	-0.2 usft	Easting:	670,115.81 usft	Longitude:	103° 46' 51.153 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	3,535.0 usft

Wellbore	Wellbore #1H				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF2015	9/14/2015	(°)	(°)	(nT)
			7.27	60.41	48,326.00906581

Design	Design #1				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.0	
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	180.91	

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(usft)	(usft)	Rate	Rate	Rate	(°)	
(usft)			(usft)			(°/100usft)	(°/100usft)	(°/100usft)		
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
8,922.6	0.00	0.00	8,922.6	0.0	0.0	0.00	0.00	0.00	0.00	
9,663.1	88.86	167.98	9,400.0	-457.7	97.4	12.00	12.00	0.00	167.98	
10,254.7	88.86	179.81	9,411.9	-1,044.7	160.2	2.00	0.00	2.00	90.12	
19,925.7	88.86	179.81	9,605.0	-10,713.8	191.7	0.00	0.00	0.00	0.00	PBHL - Ringo 32 Fed

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Planned 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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00	
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00	
Rustler										
944.0	0.00	0.00	944.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
TOS										
1,034.0	0.00	0.00	1,034.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
BOS										
2,393.0	0.00	0.00	2,393.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
Yates										
2,542.0	0.00	0.00	2,542.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
Seven Rivers										
2,646.0	0.00	0.00	2,646.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
Capitan Reef										
2,862.0	0.00	0.00	2,862.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00	

Well Planning Report

Database: EDM 5000.1 Single User Db
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Design: Design #1

Local Co-ordinate Reference: Well Ringo 32 Federal COM #1H
TVD Reference: RKB @ 3564.0usft (Noram #21)
MD Reference: RKB @ 3564.0usft (Noram #21)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned 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)	
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
Base of reef										
4,166.0	0.00	0.00	4,166.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
Delaware										
4,646.0	0.00	0.00	4,646.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,600.0	0.00	0.00	5,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,800.0	0.00	0.00	5,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,000.0	0.00	0.00	6,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,200.0	0.00	0.00	6,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,300.0	0.00	0.00	6,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,600.0	0.00	0.00	6,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,700.0	0.00	0.00	6,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,800.0	0.00	0.00	6,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,900.0	0.00	0.00	6,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,200.0	0.00	0.00	7,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
Bone Spring (BSGL)										
7,374.0	0.00	0.00	7,374.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,400.0	0.00	0.00	7,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,600.0	0.00	0.00	7,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,700.0	0.00	0.00	7,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,800.0	0.00	0.00	7,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,900.0	0.00	0.00	7,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,000.0	0.00	0.00	8,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,100.0	0.00	0.00	8,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,200.0	0.00	0.00	8,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,300.0	0.00	0.00	8,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,400.0	0.00	0.00	8,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
FBSG_sand										
8,498.0	0.00	0.00	8,498.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,500.0	0.00	0.00	8,500.0	0.0	0.0	0.0	0.00	0.00	0.00	

Well Planning Report

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Planned 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)
8,600.0	0.00	0.00	8,600.0	0.0	0.0	0.0	0.00	0.00	0.00
8,700.0	0.00	0.00	8,700.0	0.0	0.0	0.0	0.00	0.00	0.00
8,800.0	0.00	0.00	8,800.0	0.0	0.0	0.0	0.00	0.00	0.00
8,900.0	0.00	0.00	8,900.0	0.0	0.0	0.0	0.00	0.00	0.00
Build 12°/100'									
8,922.6	0.00	0.00	8,922.6	0.0	0.0	0.0	0.00	0.00	0.00
8,925.0	0.28	167.98	8,925.0	0.0	0.0	0.0	12.00	12.00	0.00
8,950.0	3.28	167.98	8,950.0	-0.8	0.2	0.8	12.00	12.00	0.00
8,975.0	6.28	167.98	8,974.9	-2.8	0.6	2.8	12.00	12.00	0.00
9,000.0	9.28	167.98	8,999.7	-6.1	1.3	6.1	12.00	12.00	0.00
9,025.0	12.28	167.98	9,024.2	-10.7	2.3	10.7	12.00	12.00	0.00
9,050.0	15.28	167.98	9,048.5	-16.5	3.5	16.5	12.00	12.00	0.00
9,075.0	18.28	167.98	9,072.4	-23.6	5.0	23.5	12.00	12.00	0.00
9,100.0	21.28	167.98	9,095.9	-31.9	6.8	31.7	12.00	12.00	0.00
9,125.0	24.28	167.98	9,119.0	-41.3	8.8	41.2	12.00	12.00	0.00
9,150.0	27.28	167.98	9,141.5	-52.0	11.1	51.8	12.00	12.00	0.00
9,175.0	30.28	167.98	9,163.4	-63.7	13.6	63.5	12.00	12.00	0.00
9,200.0	33.28	167.98	9,184.7	-76.6	16.3	76.3	12.00	12.00	0.00
9,225.0	36.28	167.98	9,205.2	-90.5	19.3	90.2	12.00	12.00	0.00
9,250.0	39.28	167.98	9,224.9	-105.5	22.5	105.2	12.00	12.00	0.00
9,275.0	42.28	167.98	9,243.9	-121.5	25.9	121.1	12.00	12.00	0.00
9,300.0	45.28	167.98	9,261.9	-138.4	29.5	137.9	12.00	12.00	0.00
9,325.0	48.28	167.98	9,279.0	-156.2	33.3	155.7	12.00	12.00	0.00
9,350.0	51.28	167.98	9,295.2	-174.9	37.2	174.3	12.00	12.00	0.00
9,375.0	54.28	167.98	9,310.3	-194.4	41.4	193.7	12.00	12.00	0.00
9,400.0	57.28	167.98	9,324.4	-214.6	45.7	213.8	12.00	12.00	0.00
9,425.0	60.28	167.98	9,337.3	-235.5	50.1	234.7	12.00	12.00	0.00
SBSG_sand									
9,445.3	62.72	167.98	9,347.0	-253.0	53.9	252.1	12.00	12.00	0.00
9,450.0	63.28	167.98	9,349.1	-257.0	54.7	256.1	12.00	12.00	0.00
9,475.0	66.28	167.98	9,359.8	-279.2	59.4	278.2	12.00	12.00	0.00
9,500.0	69.28	167.98	9,369.2	-301.8	64.3	300.7	12.00	12.00	0.00
9,525.0	72.28	167.98	9,377.5	-324.9	69.2	323.7	12.00	12.00	0.00
9,550.0	75.28	167.98	9,384.4	-348.4	74.2	347.1	12.00	12.00	0.00
9,575.0	78.28	167.98	9,390.2	-372.2	79.2	370.9	12.00	12.00	0.00
9,600.0	81.28	167.98	9,394.6	-396.2	84.4	394.8	12.00	12.00	0.00
9,625.0	84.28	167.98	9,397.7	-420.5	89.5	419.0	12.00	12.00	0.00
9,650.0	87.28	167.98	9,399.6	-444.9	94.7	443.3	12.00	12.00	0.00
EOC @ 88.86° Inc / 167.98° Azm / 9400.0' TVD - Turn 2°/100'									
9,663.1	88.86	167.98	9,400.0	-457.7	97.4	456.1	12.00	12.00	0.00
9,700.0	88.85	168.72	9,400.7	-493.8	104.9	492.1	2.00	0.00	2.00
9,800.0	88.85	170.72	9,402.7	-592.2	122.7	590.1	2.00	0.00	2.00
9,900.0	88.85	172.72	9,404.8	-691.1	137.1	688.8	2.00	0.00	2.00
10,000.0	88.85	174.72	9,406.8	-790.5	148.1	788.0	2.00	0.00	2.00
10,100.0	88.85	176.72	9,408.8	-890.2	155.5	887.6	2.00	0.00	2.00
10,200.0	88.85	178.72	9,410.8	-990.1	159.5	987.4	2.00	0.00	2.00
EOT @ 179.81° Azm									
10,254.7	88.86	179.81	9,411.9	-1,044.7	160.2	1,042.0	2.00	0.00	2.00
10,300.0	88.86	179.81	9,412.8	-1,090.0	160.4	1,087.4	0.00	0.00	0.00
10,400.0	88.86	179.81	9,414.8	-1,190.0	160.7	1,187.3	0.00	0.00	0.00
10,500.0	88.86	179.81	9,416.8	-1,290.0	161.0	1,287.3	0.00	0.00	0.00
10,600.0	88.86	179.81	9,418.8	-1,390.0	161.3	1,387.2	0.00	0.00	0.00
10,700.0	88.86	179.81	9,420.8	-1,490.0	161.7	1,487.2	0.00	0.00	0.00

Well Planning Report

Database: EDM 5000.1 Single User Db
Company: COG Operating, LLC
Project: Lea County, NM
Site: Sec 32, T19S, R32E
Well: Ringo 32 Federal COM #1H
Wellbore: Wellbore #1H
Design: Design #1

Local Co-ordinate Reference: Well Ringo 32 Federal COM #1H
TVD Reference: RKB @ 3564.0usft (Noram #21)
MD Reference: RKB @ 3564.0usft (Noram #21)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned 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)
10,800.0	88.86	179.81	9,422.8	-1,589.9	162.0	1,587.2	0.00	0.00	0.00
10,900.0	88.86	179.81	9,424.8	-1,689.9	162.3	1,687.1	0.00	0.00	0.00
11,000.0	88.86	179.81	9,426.7	-1,789.9	162.6	1,787.1	0.00	0.00	0.00
11,100.0	88.86	179.81	9,428.7	-1,889.9	163.0	1,887.0	0.00	0.00	0.00
11,200.0	88.86	179.81	9,430.7	-1,989.9	163.3	1,987.0	0.00	0.00	0.00
11,300.0	88.86	179.81	9,432.7	-2,089.8	163.6	2,087.0	0.00	0.00	0.00
11,400.0	88.86	179.81	9,434.7	-2,189.8	163.9	2,186.9	0.00	0.00	0.00
11,500.0	88.86	179.81	9,436.7	-2,289.8	164.3	2,286.9	0.00	0.00	0.00
11,600.0	88.86	179.81	9,438.7	-2,389.8	164.6	2,386.9	0.00	0.00	0.00
11,700.0	88.86	179.81	9,440.7	-2,489.8	164.9	2,486.8	0.00	0.00	0.00
11,800.0	88.86	179.81	9,442.7	-2,589.7	165.2	2,586.8	0.00	0.00	0.00
11,900.0	88.86	179.81	9,444.7	-2,689.7	165.6	2,686.7	0.00	0.00	0.00
12,000.0	88.86	179.81	9,446.7	-2,789.7	165.9	2,786.7	0.00	0.00	0.00
12,100.0	88.86	179.81	9,448.7	-2,889.7	166.2	2,886.7	0.00	0.00	0.00
12,200.0	88.86	179.81	9,450.7	-2,989.7	166.6	2,986.6	0.00	0.00	0.00
12,300.0	88.86	179.81	9,452.7	-3,089.6	166.9	3,086.6	0.00	0.00	0.00
12,400.0	88.86	179.81	9,454.7	-3,189.6	167.2	3,186.5	0.00	0.00	0.00
12,500.0	88.86	179.81	9,456.7	-3,289.6	167.5	3,286.5	0.00	0.00	0.00
12,600.0	88.86	179.81	9,458.7	-3,389.6	167.9	3,386.5	0.00	0.00	0.00
12,700.0	88.86	179.81	9,460.7	-3,489.5	168.2	3,486.4	0.00	0.00	0.00
12,800.0	88.86	179.81	9,462.7	-3,589.5	168.5	3,586.4	0.00	0.00	0.00
12,900.0	88.86	179.81	9,464.7	-3,689.5	168.8	3,686.4	0.00	0.00	0.00
13,000.0	88.86	179.81	9,466.7	-3,789.5	169.2	3,786.3	0.00	0.00	0.00
13,100.0	88.86	179.81	9,468.7	-3,889.5	169.5	3,886.3	0.00	0.00	0.00
13,200.0	88.86	179.81	9,470.7	-3,989.4	169.8	3,986.2	0.00	0.00	0.00
13,300.0	88.86	179.81	9,472.7	-4,089.4	170.1	4,086.2	0.00	0.00	0.00
13,400.0	88.86	179.81	9,474.7	-4,189.4	170.5	4,186.2	0.00	0.00	0.00
13,500.0	88.86	179.81	9,476.7	-4,289.4	170.8	4,286.1	0.00	0.00	0.00
13,600.0	88.86	179.81	9,478.7	-4,389.4	171.1	4,386.1	0.00	0.00	0.00
13,700.0	88.86	179.81	9,480.7	-4,489.3	171.4	4,486.1	0.00	0.00	0.00
13,800.0	88.86	179.81	9,482.7	-4,589.3	171.8	4,586.0	0.00	0.00	0.00
13,900.0	88.86	179.81	9,484.7	-4,689.3	172.1	4,686.0	0.00	0.00	0.00
14,000.0	88.86	179.81	9,486.7	-4,789.3	172.4	4,785.9	0.00	0.00	0.00
14,100.0	88.86	179.81	9,488.7	-4,889.3	172.7	4,885.9	0.00	0.00	0.00
14,200.0	88.86	179.81	9,490.7	-4,989.2	173.1	4,985.9	0.00	0.00	0.00
14,300.0	88.86	179.81	9,492.7	-5,089.2	173.4	5,085.8	0.00	0.00	0.00
14,400.0	88.86	179.81	9,494.6	-5,189.2	173.7	5,185.8	0.00	0.00	0.00
14,500.0	88.86	179.81	9,496.6	-5,289.2	174.0	5,285.7	0.00	0.00	0.00
14,600.0	88.86	179.81	9,498.6	-5,389.2	174.4	5,385.7	0.00	0.00	0.00
14,700.0	88.86	179.81	9,500.6	-5,489.1	174.7	5,485.7	0.00	0.00	0.00
14,800.0	88.86	179.81	9,502.6	-5,589.1	175.0	5,585.6	0.00	0.00	0.00
14,900.0	88.86	179.81	9,504.6	-5,689.1	175.3	5,685.6	0.00	0.00	0.00
15,000.0	88.86	179.81	9,506.6	-5,789.1	175.7	5,785.6	0.00	0.00	0.00
15,100.0	88.86	179.81	9,508.6	-5,889.1	176.0	5,885.5	0.00	0.00	0.00
15,200.0	88.86	179.81	9,510.6	-5,989.0	176.3	5,985.5	0.00	0.00	0.00
15,300.0	88.86	179.81	9,512.6	-6,089.0	176.6	6,085.4	0.00	0.00	0.00
15,400.0	88.86	179.81	9,514.6	-6,189.0	177.0	6,185.4	0.00	0.00	0.00
15,500.0	88.86	179.81	9,516.6	-6,289.0	177.3	6,285.4	0.00	0.00	0.00
15,600.0	88.86	179.81	9,518.6	-6,389.0	177.6	6,385.3	0.00	0.00	0.00
15,700.0	88.86	179.81	9,520.6	-6,488.9	177.9	6,485.3	0.00	0.00	0.00
15,800.0	88.86	179.81	9,522.6	-6,588.9	178.3	6,585.2	0.00	0.00	0.00
15,900.0	88.86	179.81	9,524.6	-6,688.9	178.6	6,685.2	0.00	0.00	0.00
16,000.0	88.86	179.81	9,526.6	-6,788.9	178.9	6,785.2	0.00	0.00	0.00
16,100.0	88.86	179.81	9,528.6	-6,888.9	179.2	6,885.1	0.00	0.00	0.00

Well Planning Report

Database: EDM 5000.1 Single User Db
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 Site: Sec 32, T19S, R32E
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 Wellbore: Wellbore #1H
 Design: Design #1

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 TVD Reference: RKB @ 3564.0usft (Noram #21)
 MD Reference: RKB @ 3564.0usft (Noram #21)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned 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)
16,200.0	88.86	179.81	9,530.6	-6,988.8	179.6	6,985.1	0.00	0.00	0.00
16,300.0	88.86	179.81	9,532.6	-7,088.8	179.9	7,085.1	0.00	0.00	0.00
16,400.0	88.86	179.81	9,534.6	-7,188.8	180.2	7,185.0	0.00	0.00	0.00
16,500.0	88.86	179.81	9,536.6	-7,288.8	180.5	7,285.0	0.00	0.00	0.00
16,600.0	88.86	179.81	9,538.6	-7,388.8	180.9	7,384.9	0.00	0.00	0.00
16,700.0	88.86	179.81	9,540.6	-7,488.7	181.2	7,484.9	0.00	0.00	0.00
16,800.0	88.86	179.81	9,542.6	-7,588.7	181.5	7,584.9	0.00	0.00	0.00
16,900.0	88.86	179.81	9,544.6	-7,688.7	181.9	7,684.8	0.00	0.00	0.00
17,000.0	88.86	179.81	9,546.6	-7,788.7	182.2	7,784.8	0.00	0.00	0.00
17,100.0	88.86	179.81	9,548.6	-7,888.6	182.5	7,884.7	0.00	0.00	0.00
17,200.0	88.86	179.81	9,550.6	-7,988.6	182.8	7,984.7	0.00	0.00	0.00
17,300.0	88.86	179.81	9,552.6	-8,088.6	183.2	8,084.7	0.00	0.00	0.00
17,400.0	88.86	179.81	9,554.6	-8,188.6	183.5	8,184.6	0.00	0.00	0.00
17,500.0	88.86	179.81	9,556.6	-8,288.6	183.8	8,284.6	0.00	0.00	0.00
17,600.0	88.86	179.81	9,558.6	-8,388.5	184.1	8,384.6	0.00	0.00	0.00
17,700.0	88.86	179.81	9,560.6	-8,488.5	184.5	8,484.5	0.00	0.00	0.00
17,800.0	88.86	179.81	9,562.5	-8,588.5	184.8	8,584.5	0.00	0.00	0.00
17,900.0	88.86	179.81	9,564.5	-8,688.5	185.1	8,684.4	0.00	0.00	0.00
18,000.0	88.86	179.81	9,566.5	-8,788.5	185.4	8,784.4	0.00	0.00	0.00
18,100.0	88.86	179.81	9,568.5	-8,888.4	185.8	8,884.4	0.00	0.00	0.00
18,200.0	88.86	179.81	9,570.5	-8,988.4	186.1	8,984.3	0.00	0.00	0.00
18,300.0	88.86	179.81	9,572.5	-9,088.4	186.4	9,084.3	0.00	0.00	0.00
18,400.0	88.86	179.81	9,574.5	-9,188.4	186.7	9,184.3	0.00	0.00	0.00
18,500.0	88.86	179.81	9,576.5	-9,288.4	187.1	9,284.2	0.00	0.00	0.00
18,600.0	88.86	179.81	9,578.5	-9,388.3	187.4	9,384.2	0.00	0.00	0.00
18,700.0	88.86	179.81	9,580.5	-9,488.3	187.7	9,484.1	0.00	0.00	0.00
18,800.0	88.86	179.81	9,582.5	-9,588.3	188.0	9,584.1	0.00	0.00	0.00
18,900.0	88.86	179.81	9,584.5	-9,688.3	188.4	9,684.1	0.00	0.00	0.00
19,000.0	88.86	179.81	9,586.5	-9,788.3	188.7	9,784.0	0.00	0.00	0.00
19,100.0	88.86	179.81	9,588.5	-9,888.2	189.0	9,884.0	0.00	0.00	0.00
19,200.0	88.86	179.81	9,590.5	-9,988.2	189.3	9,983.9	0.00	0.00	0.00
19,300.0	88.86	179.81	9,592.5	-10,088.2	189.7	10,083.9	0.00	0.00	0.00
19,400.0	88.86	179.81	9,594.5	-10,188.2	190.0	10,183.9	0.00	0.00	0.00
19,500.0	88.86	179.81	9,596.5	-10,288.2	190.3	10,283.8	0.00	0.00	0.00
19,600.0	88.86	179.81	9,598.5	-10,388.1	190.6	10,383.8	0.00	0.00	0.00
19,700.0	88.86	179.81	9,600.5	-10,488.1	191.0	10,483.8	0.00	0.00	0.00
19,800.0	88.86	179.81	9,602.5	-10,588.1	191.3	10,583.7	0.00	0.00	0.00
19,900.0	88.86	179.81	9,604.5	-10,688.1	191.6	10,683.7	0.00	0.00	0.00
TD @ 19925.7' MD / 9605.0' TVD									
19,925.7	88.86	179.81	9,605.0	-10,713.8	191.7	10,709.4	0.00	0.00	0.00

Well Planning Report

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 Project: Lea County, NM
 Site: Sec 32, T19S, R32E
 Well: Ringo 32 Federal COM #1H
 Wellbore: Wellbore #1H
 Design: Design #1

Local Co-ordinate Reference: Well Ringo 32 Federal COM #1H
 TVD Reference: RKB @ 3564.0usft (Noram #21)
 MD Reference: RKB @ 3564.0usft (Noram #21)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SHL - Ringo 32 FedCOM - plan hits target center - Point	0.00	0.00	0.1	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
FTP - Ringo 32 Fed Con - plan misses target center by 26.1usft at 9871.3usft MD (9404.2 TVD, -662.7 N, 133.4 E) - Point	0.00	0.00	9,400.0	-659.0	158.8	585,560.46	670,274.65	32° 36' 30.935 N	103° 46' 49.336 W
PBHL - Ringo 32 Fed Co - plan hits target center - Point	0.00	0.00	9,605.0	-10,713.8	191.7	575,505.70	670,307.50	32° 34' 51.438 N	103° 46' 49.563 W
LTP - Ringo 32 Fed Corr - plan misses target center by 2.6usft at 19795.9usft MD (9602.4 TVD, -10584.0 N, 191.3 E) - Point	0.00	0.00	9,605.0	-10,583.9	191.4	575,635.58	670,307.16	32° 34' 52.723 N	103° 46' 49.559 W

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
944.0	944.0	Rustler			
1,034.0	1,034.0	TOS			
2,393.0	2,393.0	BOS			
2,542.0	2,542.0	Yates			
2,646.0	2,646.0	Seven Rivers			
2,862.0	2,862.0	Capitan Reef			
4,166.0	4,166.0	Base of reef			
4,646.0	4,646.0	Delaware			
7,374.0	7,374.0	Bone Spring (BSGL)			
8,498.0	8,498.0	FBSG_sand			
9,445.3	9,347.0	SBSG_sand			

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
8,922.6	8,922.6	0.0	0.0	Build 12°/100'
9,663.1	9,400.0	-457.7	97.4	EOC @ 88.86° Inc / 167.98° Azm / 9400.0' TVD - Turn 2°/100'
10,254.7	9,411.9	-1,044.7	160.2	EOT @ 179.81° Azm
19,925.7	9,605.0	-10,713.8	191.7	TD @ 19925.7' MD / 9605.0' TVD



Ringo 32 Federal COM #1H
Lea County, NM
Q170*** & WT-170***
Design #1

Company Name: CGG Operations, LLC
Ringo 32 Federal COM #1H
Lea County, NM
Rig: Noram RCT
Created By: Chase Chambers
Date: 8/11/2017

WELL DETAILS: Ringo 32 Federal COM #1H						
+N-E	+E-W	Northing	Easting	Latitude	Longitude	Spot
0.0	0.0	886219.49	471115.88	32° 36' 37.684 N	107° 48' 21.193 W	

DETAILED TARGET DETAILS							
Name	TVD	WOB	WOB	Surfing	Easting	Latitude	Longitude
INC - Ringo 32 Fed COM 1H	7.1	0.0	0.0	0.0	886219.50	471115.88	32° 36' 37.684 N 107° 48' 21.193 W
170 - Ringo 32 Fed Com 1H	8865.0	405.0	188.0	0.0	885524.61	471214.81	32° 35' 59.258 N 107° 48' 59.258 W
LTP - Ringo 32 Fed Com 1H	8865.0	48825.0	191.0	0.0	878325.26	470387.15	32° 34' 52.222 N 107° 48' 48.500 W
PHIL - Ringo 32 Fed Com 1H	8865.0	48812.0	191.7	0.0	878367.76	470387.15	32° 34' 52.222 N 107° 48' 48.500 W

ANNOTATIONS									
MD	Inc	Asl	TVD	+N-E	+E-W	V-East	Departure	Annotation	
8822.8	0.00	0.00	8822.8	0.0	0.0	0.0	0.0	Bull 12°10'	
8865.1	88.86	187.38	8678.0	487.7	87.4	406.1	487.9	ESC @ 88.86' Inc / 187.38' Ann / 869.0' TVD - Turn 2°10'	
10254.7	88.86	179.81	9411.9	-3944.7	166.2	1842.9	1095.4	SOT @ 179.81' Ann	
18925.7	88.86	179.81	9695.9	-10713.8	191.7	18796.8	10726.5	TD @ 9695.9' MD / 8695.9' TVD	

PROJECT DETAILS: Lea County, NM	
Geodetic System:	US State Plane 1927 (Exact section)
S datum:	NAD 1927 (NADCON CONUS)
Ellipsoid:	Clarke 1866
Zone:	New Mexico East 3001
System Datum:	Mean Sea Level

Azimuths to Grid North: -0.30°
 Magnetic North: 6.97°
 Magnetic Field Strength: 48326.0snT
 Dip Angle: 60.41°
 Date: 9/14/2015
 Model: IGRF2015

