

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS**
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.*Field No.
NMNM126965

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.

GRAHAM NASH FEDERAL COM 7H

2. Name of Operator

COG OPERATING LLC

Contact: MAYTE X REYES

E-Mail: mreyes1@concho.com

9. API Well No.

30-015-43811-00-X1

3a. Address

600 W ILLINOIS AVENUE
MIDLAND, TX 79701

3b. Phone No. (include area code)

Ph: 575.748.6945

10. Field and Pool or Exploratory Area

HAY HOLLOW

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

Sec 21 T26S R28E SESW 200FSL 1550FWL

11. County or Parish, State

EDDY COUNTY, NM

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

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original A
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	PD

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.

NAME CHANGE

From: Graham Nash Federal Com #13H

To: Graham Nash Federal Com #7H

C102 Attached

BHL

From: 330' FSL & 2100' FWL

To: 200' FSL & 1980' FWL

C102 Attached

- All previous COAs still apply; additional COA is not required

NM OIL CONSERVATION
ARTESIA DISTRICT

JAN 03 2017

RECEIVED

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

Electronic Submission #361612 verified by the BLM Well Information System

For COG OPERATING LLC, sent to the Carlsbad

Committed to AFMSS for processing by MUSTAFA HAQUE on 12/21/2016 (17MH0023SE)

Name (Printed/Typed) MAYTE X REYES

Title REGULATORY ANALYST

Signature

(Electronic Submission)

Date 12/20/2016

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By MUSTAFA HAQUE

Title PETROLEUM ENGINEER

Date 12/21/2016

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 Carlsbad

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)

** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED **

Additional data for EC transaction #361612 that would not fit on the form

32. Additional remarks, continued

Drilling:

Well is changing to a Second BSS from a Third BSS. Operator will drill the well per the attached well plan to a new TD of 15,299? MD.
Drilling and directional plans attached.

DISTRICT I
1625 N. FREYCH DR., HOBBS, NM 88240
Phone: (505) 302-0181 Fax: (505) 303-0728

DISTRICT II
811 S. FIRST ST., ARTESIA, NM 88210
Phone: (505) 748-1283 Fax: (505) 748-9720

DISTRICT III
1000 RIO BRAZOS RD., AZTEC, NM 87410
Phone: (505) 334-6176 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

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-43811	Pool Code 30215	Pool Name Hay Hollow; Bone Spring
Property Code	Property Name GRAHAM NASH FEDERAL COM	Well Number 7H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 2988.8'

Surface Location

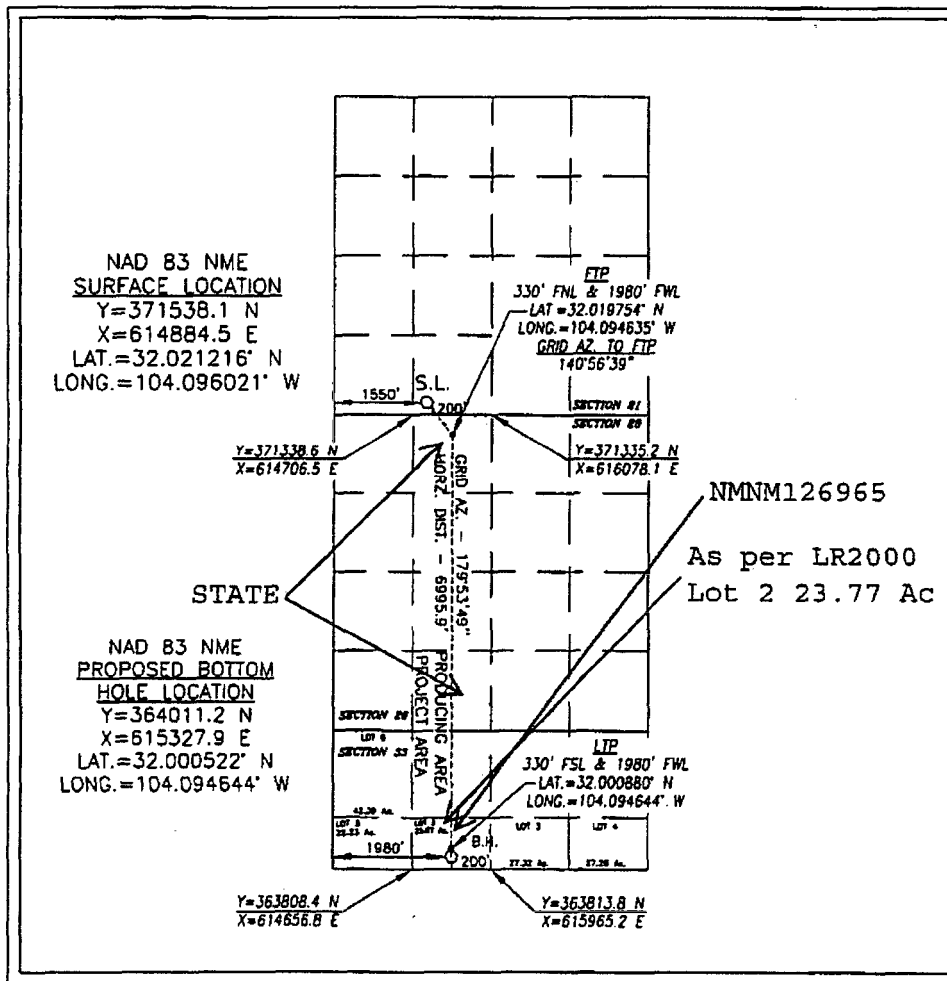
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	21	26-S	28-E		200	SOUTH	1550	WEST	EDDY

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
2	33	26-S	28-E		200	SOUTH	1980	WEST	EDDY

Dedicated Acres 223.77	Joint or Infill	Consolidation Code	Order No.
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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



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.

Signature: *Mayte Reyes* Date: 12-20-16

Printed Name: Mayte Reyes

E-mail Address: mreyes1@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.

NOVEMBER 16, 2016

Date of Survey

Signature & Seal of Professional Surveyor



Certificate No. CHAD HARCROW 17777
W.O. # 16-944 DRAWN BY: VJ



COG OPERATING LLC

EDDY COUNTY, NM

ATLAS

GRAHAM NASH FED COM #7H

OWB

Plan: PWP1

Survey Report - Geographic

14 December, 2016



COG Operating LLC

Survey Report - Geographic

Company: COG OPERATING LLC
 Project: EDDY COUNTY, NM
 Site: ATLAS
 Well: GRAHAM NASH FED COM #7H
 Wellbore: OWB
 Design: PWP1

Local Co-ordinate Reference: Well GRAHAM NASH FED COM #7H
 TVD Reference: RKB=2989+20 @ 3009.0usft (PATRIOT 2)
 MD Reference: RKB=2989+20 @ 3009.0usft (PATRIOT 2)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM_Users

Project	EDDY 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	ATLAS				
Site Position:		Northing:	371,480.80 usft	Latitude:	32° 1' 15.933 N
From:	Map	Easting:	573,599.60 usft	Longitude:	104° 5' 45.086 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.13 °

Well	GRAHAM NASH FED COM #7H				
Well Position	+N/-S	0.0 usft	Northing:	371,481.00 usf	Latitude: 32° 1' 15.933 N
	+E/-W	0.0 usft	Easting:	573,699.60 usf	Longitude: 104° 5' 43.924 W
Position Uncertainty	3.0 usft		Wellhead Elevation:	0.0 usf	Ground Level: 2,989.0 usf

Wellbore	OWB				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM2015	11/7/2016	7.26	59.79	47,816.38081043

Design	PWP1				
Audit Notes:					
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	176.63	

Survey Tool Program	Date	12/14/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	15,298.7	PWP1 (OWB)			

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
100.0	0.00	0.00	100.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
200.0	0.00	0.00	200.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
300.0	0.00	0.00	300.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
400.0	0.00	0.00	400.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
500.0	0.00	0.00	500.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
600.0	0.00	0.00	600.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
700.0	0.00	0.00	700.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
800.0	0.00	0.00	800.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
900.0	0.00	0.00	900.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
1,000.0	0.00	0.00	1,000.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
1,100.0	0.00	0.00	1,100.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W



COG Operating LLC

Survey Report - Geographic

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Wellbore: OWB
Design: PWP1

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MD Reference: RKB=2989+20 @ 3009.0usft (PATRIOT 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,200.0	0.00	0.00	1,200.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
1,300.0	0.00	0.00	1,300.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
1,400.0	0.00	0.00	1,400.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
1,500.0	0.00	0.00	1,500.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
1,600.0	0.00	0.00	1,600.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
1,700.0	0.00	0.00	1,700.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
1,800.0	0.00	0.00	1,800.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
1,900.0	0.00	0.00	1,900.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
2,000.0	0.00	0.00	2,000.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
2,100.0	0.00	0.00	2,100.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
2,200.0	0.00	0.00	2,200.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
2,300.0	0.00	0.00	2,300.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
2,400.0	0.00	0.00	2,400.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
2,500.0	0.00	0.00	2,500.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
2,600.0	0.00	0.00	2,600.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
2,700.0	0.00	0.00	2,700.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
2,800.0	0.00	0.00	2,800.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
2,900.0	0.00	0.00	2,900.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
3,000.0	0.00	0.00	3,000.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
3,100.0	0.00	0.00	3,100.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
3,200.0	0.00	0.00	3,200.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
3,300.0	0.00	0.00	3,300.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
3,400.0	0.00	0.00	3,400.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
3,500.0	0.00	0.00	3,500.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
3,600.0	0.00	0.00	3,600.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
3,700.0	0.00	0.00	3,700.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
3,800.0	0.00	0.00	3,800.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
3,900.0	0.00	0.00	3,900.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
4,000.0	0.00	0.00	4,000.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
4,100.0	0.00	0.00	4,100.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
4,200.0	0.00	0.00	4,200.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
4,300.0	0.00	0.00	4,300.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
4,400.0	0.00	0.00	4,400.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
4,500.0	0.00	0.00	4,500.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
4,600.0	0.00	0.00	4,600.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
4,700.0	0.00	0.00	4,700.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
4,800.0	0.00	0.00	4,800.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
4,900.0	0.00	0.00	4,900.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
5,000.0	0.00	0.00	5,000.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
5,100.0	0.00	0.00	5,100.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
5,200.0	0.00	0.00	5,200.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
5,300.0	0.00	0.00	5,300.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
5,400.0	0.00	0.00	5,400.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
5,500.0	0.00	0.00	5,500.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
5,600.0	0.00	0.00	5,600.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
5,700.0	0.00	0.00	5,700.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
5,800.0	0.00	0.00	5,800.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
5,900.0	0.00	0.00	5,900.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
6,000.0	0.00	0.00	6,000.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
6,100.0	0.00	0.00	6,100.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
6,200.0	0.00	0.00	6,200.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
6,300.0	0.00	0.00	6,300.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
6,400.0	0.00	0.00	6,400.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
6,500.0	0.00	0.00	6,500.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
6,600.0	0.00	0.00	6,600.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W



COG Operating LLC

Survey Report - Geographic

Company: COG OPERATING LLC
Project: EDDY COUNTY, NM
Site: ATLAS
Well: GRAHAM NASH FED COM #7H
Wellbore: OWB
Design: PWP1

Local Co-ordinate Reference: Well GRAHAM NASH FED COM #7H
TVD Reference: RKB=2989+20 @ 3009.0usft (PATRIOT 2)
MD Reference: RKB=2989+20 @ 3009.0usft (PATRIOT 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,700.0	0.00	0.00	6,700.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
6,800.0	0.00	0.00	6,800.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
6,900.0	0.00	0.00	6,900.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
7,000.0	0.00	0.00	7,000.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
7,100.0	0.00	0.00	7,100.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
7,200.0	0.00	0.00	7,200.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
7,300.0	0.00	0.00	7,300.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
7,400.0	0.00	0.00	7,400.0	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
7,401.5	0.00	0.00	7,401.5	0.0	0.0	371,481.00	573,699.60	32° 1' 15.933 N	104° 5' 43.924 W
7,500.0	11.82	150.00	7,499.3	-8.8	5.1	371,472.23	573,704.66	32° 1' 15.846 N	104° 5' 43.865 W
7,600.0	23.82	150.00	7,594.3	-35.2	20.3	371,445.78	573,719.94	32° 1' 15.584 N	104° 5' 43.689 W
7,700.0	35.82	150.00	7,680.9	-78.2	45.2	371,402.79	573,744.75	32° 1' 15.158 N	104° 5' 43.402 W
7,800.0	47.82	150.00	7,755.3	-135.8	78.4	371,345.16	573,778.03	32° 1' 14.587 N	104° 5' 43.017 W
7,900.0	59.82	150.00	7,814.3	-205.6	118.7	371,275.39	573,818.31	32° 1' 13.895 N	104° 5' 42.550 W
8,000.0	71.81	150.00	7,855.1	-284.5	164.2	371,196.53	573,863.84	32° 1' 13.114 N	104° 5' 42.024 W
8,100.0	83.81	150.00	7,876.2	-369.0	213.0	371,112.03	573,912.63	32° 1' 12.277 N	104° 5' 41.459 W
8,151.6	90.00	150.00	7,879.0	-413.5	238.7	371,067.47	573,938.35	32° 1' 11.835 N	104° 5' 41.161 W
8,200.0	90.02	151.94	7,879.0	-455.9	262.3	371,025.12	573,961.86	32° 1' 11.415 N	104° 5' 40.889 W
8,300.0	90.06	155.94	7,878.9	-545.7	306.2	370,935.30	574,005.79	32° 1' 10.526 N	104° 5' 40.382 W
8,400.0	90.09	159.94	7,878.8	-638.4	343.7	370,842.64	574,043.34	32° 1' 9.608 N	104° 5' 39.948 W
8,500.0	90.13	163.94	7,878.6	-733.4	374.7	370,747.59	574,074.34	32° 1' 8.666 N	104° 5' 39.590 W
8,600.0	90.17	167.94	7,878.3	-830.4	399.0	370,650.61	574,098.63	32° 1' 7.706 N	104° 5' 39.310 W
8,700.0	90.20	171.94	7,878.0	-928.8	416.5	370,552.17	574,116.10	32° 1' 6.732 N	104° 5' 39.110 W
8,800.0	90.24	175.94	7,877.6	-1,028.3	427.1	370,452.75	574,126.66	32° 1' 5.747 N	104° 5' 38.990 W
8,898.8	90.27	179.89	7,877.2	-1,126.9	430.7	370,354.08	574,130.26	32° 1' 4.771 N	104° 5' 38.951 W
8,900.0	90.27	179.89	7,877.2	-1,128.2	430.7	370,352.83	574,130.26	32° 1' 4.758 N	104° 5' 38.951 W
9,000.0	90.27	179.89	7,876.7	-1,228.2	430.9	370,252.83	574,130.46	32° 1' 3.769 N	104° 5' 38.951 W
9,100.0	90.27	179.89	7,876.2	-1,328.2	431.1	370,152.84	574,130.66	32° 1' 2.779 N	104° 5' 38.951 W
9,200.0	90.27	179.89	7,875.8	-1,428.2	431.3	370,052.84	574,130.86	32° 1' 1.790 N	104° 5' 38.951 W
9,300.0	90.27	179.89	7,875.3	-1,528.2	431.5	369,952.84	574,131.05	32° 1' 0.800 N	104° 5' 38.952 W
9,400.0	90.27	179.89	7,874.8	-1,628.2	431.6	369,852.84	574,131.25	32° 0' 59.810 N	104° 5' 38.952 W
9,500.0	90.27	179.89	7,874.4	-1,728.2	431.8	369,752.84	574,131.45	32° 0' 58.821 N	104° 5' 38.952 W
9,600.0	90.27	179.89	7,873.9	-1,828.2	432.0	369,652.84	574,131.65	32° 0' 57.831 N	104° 5' 38.953 W
9,700.0	90.27	179.89	7,873.4	-1,928.2	432.2	369,552.84	574,131.84	32° 0' 56.841 N	104° 5' 38.953 W
9,800.0	90.27	179.89	7,872.9	-2,028.2	432.4	369,452.85	574,132.04	32° 0' 55.852 N	104° 5' 38.953 W
9,900.0	90.27	179.89	7,872.5	-2,128.2	432.6	369,352.85	574,132.24	32° 0' 54.862 N	104° 5' 38.953 W
10,000.0	90.27	179.89	7,872.0	-2,228.2	432.8	369,252.85	574,132.44	32° 0' 53.872 N	104° 5' 38.954 W
10,100.0	90.27	179.89	7,871.5	-2,328.1	433.0	369,152.85	574,132.63	32° 0' 52.883 N	104° 5' 38.954 W
10,200.0	90.27	179.89	7,871.1	-2,428.1	433.2	369,052.85	574,132.83	32° 0' 51.893 N	104° 5' 38.954 W
10,300.0	90.27	179.89	7,870.6	-2,528.1	433.4	368,952.85	574,133.03	32° 0' 50.903 N	104° 5' 38.954 W
10,400.0	90.27	179.89	7,870.1	-2,628.1	433.6	368,852.85	574,133.23	32° 0' 49.914 N	104° 5' 38.955 W
10,500.0	90.27	179.89	7,869.6	-2,728.1	433.8	368,752.85	574,133.42	32° 0' 48.924 N	104° 5' 38.955 W
10,600.0	90.27	179.89	7,869.2	-2,828.1	434.0	368,652.86	574,133.62	32° 0' 47.934 N	104° 5' 38.955 W
10,700.0	90.27	179.89	7,868.7	-2,928.1	434.2	368,552.86	574,133.82	32° 0' 46.945 N	104° 5' 38.956 W
10,800.0	90.27	179.89	7,868.2	-3,028.1	434.4	368,452.86	574,134.02	32° 0' 45.955 N	104° 5' 38.956 W
10,900.0	90.27	179.89	7,867.8	-3,128.1	434.6	368,352.86	574,134.21	32° 0' 44.965 N	104° 5' 38.956 W
11,000.0	90.27	179.89	7,867.3	-3,228.1	434.8	368,252.86	574,134.41	32° 0' 43.976 N	104° 5' 38.956 W
11,100.0	90.27	179.89	7,866.8	-3,328.1	435.0	368,152.86	574,134.61	32° 0' 42.986 N	104° 5' 38.957 W
11,200.0	90.27	179.89	7,866.3	-3,428.1	435.2	368,052.86	574,134.81	32° 0' 41.996 N	104° 5' 38.957 W
11,300.0	90.27	179.89	7,865.9	-3,528.1	435.4	367,952.86	574,135.00	32° 0' 41.007 N	104° 5' 38.957 W
11,400.0	90.27	179.89	7,865.4	-3,628.1	435.6	367,852.87	574,135.20	32° 0' 40.017 N	104° 5' 38.958 W
11,500.0	90.27	179.89	7,864.9	-3,728.1	435.8	367,752.87	574,135.40	32° 0' 39.027 N	104° 5' 38.958 W
11,600.0	90.27	179.89	7,864.5	-3,828.1	436.0	367,652.87	574,135.60	32° 0' 38.038 N	104° 5' 38.958 W
11,700.0	90.27	179.89	7,864.0	-3,928.1	436.2	367,552.87	574,135.79	32° 0' 37.048 N	104° 5' 38.958 W
11,800.0	90.27	179.89	7,863.5	-4,028.1	436.4	367,452.87	574,135.99	32° 0' 36.059 N	104° 5' 38.959 W



COG Operating LLC

Survey Report - Geographic

Company: COG OPERATING LLC
Project: EDDY COUNTY, NM
Site: ATLAS
Well: GRAHAM NASH FED COM #7H
Wellbore: OWB
Design: PWP1

Local Co-ordinate Reference: Well GRAHAM NASH FED COM #7H
TVD Reference: RKB=2989+20 @ 3009.0usft (PATRIOT 2)
MD Reference: RKB=2989+20 @ 3009.0usft (PATRIOT 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
11,900.0	90.27	179.89	7,863.0	-4,128.1	436.6	367,352.87	574,136.19	32° 0' 35.069 N	104° 5' 38.959 W
12,000.0	90.27	179.89	7,862.6	-4,228.1	436.8	367,252.87	574,136.39	32° 0' 34.079 N	104° 5' 38.959 W
12,100.0	90.27	179.89	7,862.1	-4,328.1	437.0	367,152.88	574,136.58	32° 0' 33.090 N	104° 5' 38.959 W
12,200.0	90.27	179.89	7,861.6	-4,428.1	437.2	367,052.88	574,136.78	32° 0' 32.100 N	104° 5' 38.960 W
12,300.0	90.27	179.89	7,861.1	-4,528.1	437.4	366,952.88	574,136.98	32° 0' 31.110 N	104° 5' 38.960 W
12,400.0	90.27	179.89	7,860.7	-4,628.1	437.6	366,852.88	574,137.18	32° 0' 30.121 N	104° 5' 38.960 W
12,500.0	90.27	179.89	7,860.2	-4,728.1	437.8	366,752.88	574,137.37	32° 0' 29.131 N	104° 5' 38.961 W
12,600.0	90.27	179.89	7,859.7	-4,828.1	438.0	366,652.88	574,137.57	32° 0' 28.141 N	104° 5' 38.961 W
12,700.0	90.27	179.89	7,859.3	-4,928.1	438.2	366,552.88	574,137.77	32° 0' 27.152 N	104° 5' 38.961 W
12,800.0	90.27	179.89	7,858.8	-5,028.1	438.4	366,452.88	574,137.97	32° 0' 26.162 N	104° 5' 38.961 W
12,900.0	90.27	179.89	7,858.3	-5,128.1	438.6	366,352.89	574,138.17	32° 0' 25.172 N	104° 5' 38.962 W
13,000.0	90.27	179.89	7,857.8	-5,228.1	438.8	366,252.89	574,138.36	32° 0' 24.183 N	104° 5' 38.962 W
13,100.0	90.27	179.89	7,857.4	-5,328.1	439.0	366,152.89	574,138.56	32° 0' 23.193 N	104° 5' 38.962 W
13,200.0	90.27	179.89	7,856.9	-5,428.1	439.2	366,052.89	574,138.76	32° 0' 22.203 N	104° 5' 38.962 W
13,300.0	90.27	179.89	7,856.4	-5,528.1	439.4	365,952.89	574,138.96	32° 0' 21.214 N	104° 5' 38.963 W
13,400.0	90.27	179.89	7,856.0	-5,628.1	439.5	365,852.89	574,139.15	32° 0' 20.224 N	104° 5' 38.963 W
13,500.0	90.27	179.89	7,855.5	-5,728.1	439.7	365,752.89	574,139.35	32° 0' 19.234 N	104° 5' 38.963 W
13,600.0	90.27	179.89	7,855.0	-5,828.1	439.9	365,652.89	574,139.55	32° 0' 18.245 N	104° 5' 38.964 W
13,700.0	90.27	179.89	7,854.5	-5,928.1	440.1	365,552.90	574,139.75	32° 0' 17.255 N	104° 5' 38.964 W
13,800.0	90.27	179.89	7,854.1	-6,028.1	440.3	365,452.90	574,139.94	32° 0' 16.265 N	104° 5' 38.964 W
13,900.0	90.27	179.89	7,853.6	-6,128.1	440.5	365,352.90	574,140.14	32° 0' 15.276 N	104° 5' 38.964 W
14,000.0	90.27	179.89	7,853.1	-6,228.1	440.7	365,252.90	574,140.34	32° 0' 14.286 N	104° 5' 38.965 W
14,100.0	90.27	179.89	7,852.7	-6,328.1	440.9	365,152.90	574,140.54	32° 0' 13.296 N	104° 5' 38.965 W
14,200.0	90.27	179.89	7,852.2	-6,428.1	441.1	365,052.90	574,140.73	32° 0' 12.307 N	104° 5' 38.965 W
14,300.0	90.27	179.89	7,851.7	-6,528.1	441.3	364,952.90	574,140.93	32° 0' 11.317 N	104° 5' 38.966 W
14,400.0	90.27	179.89	7,851.2	-6,628.1	441.5	364,852.91	574,141.13	32° 0' 10.327 N	104° 5' 38.966 W
14,500.0	90.27	179.89	7,850.8	-6,728.1	441.7	364,752.91	574,141.33	32° 0' 9.338 N	104° 5' 38.966 W
14,600.0	90.27	179.89	7,850.3	-6,828.1	441.9	364,652.91	574,141.52	32° 0' 8.348 N	104° 5' 38.966 W
14,700.0	90.27	179.89	7,849.8	-6,928.1	442.1	364,552.91	574,141.72	32° 0' 7.359 N	104° 5' 38.967 W
14,800.0	90.27	179.89	7,849.4	-7,028.1	442.3	364,452.91	574,141.92	32° 0' 6.369 N	104° 5' 38.967 W
14,900.0	90.27	179.89	7,848.9	-7,128.1	442.5	364,352.91	574,142.12	32° 0' 5.379 N	104° 5' 38.967 W
15,000.0	90.27	179.89	7,848.4	-7,228.1	442.7	364,252.91	574,142.31	32° 0' 4.390 N	104° 5' 38.967 W
15,100.0	90.27	179.89	7,847.9	-7,328.1	442.9	364,152.91	574,142.51	32° 0' 3.400 N	104° 5' 38.968 W
15,200.0	90.27	179.89	7,847.5	-7,428.1	443.1	364,052.92	574,142.71	32° 0' 2.410 N	104° 5' 38.968 W
15,298.7	90.27	179.89	7,847.0	-7,526.8	443.3	363,954.20	574,142.90	32° 0' 1.433 N	104° 5' 38.968 W

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL-Graham Nash	0.00	0.00	7,847.0	-7,526.8	443.3	363,954.20	574,142.90	32° 0' 1.433 N	104° 5' 38.968 W
- plan hits target center									
- Point									

Checked By: _____ Approved By: _____ Date: _____



WELL DETAILS: GRAHAM NASH FED COM #7H

+N/-S 0.0
 +E/-W 0.0
 Northing 371481.00
 Easting 573699.60
 Ground Level: 2989.0
 Latitude 32° 1' 15.933 N
 Longitude 104° 5' 43.924 W
 Slot

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	7401.5	0.00	0.00	7401.5	0.0	0.0	0.00	0.00	0.0	
3	8151.6	90.00	150.00	7879.0	-413.5	238.7	12.00	150.00	426.8	
4	8898.8	90.27	179.89	7877.2	-1126.9	430.7	4.00	89.46	1150.3	
5	15298.7	90.27	179.89	7847.0	-7526.8	443.3	0.00	0.00	7539.8	

LEGEND

□ PWP1

