

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD-HOBBS

FORM APPROVED
OMB No 1004-0137
Expires July 31, 2010

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.

SUBMIT IN TRIPLICATE - Other Instructions on page 2.

1 Type of Well ☒ Oil Well ☐ Gas Well ☐ Other		5 Lease Serial No <u>LC 002300</u> <u>NMNM115422</u>
2 Name of Operator COG Production LLC		6 If Indian, Allottee, or Tribe Name
3a Address 2208 W. Main Street Artesia, NM 88210	3b Phone No (include area code) 575-748-6940	7 If Unit or CA Agreement Name and/or No
4 Location of Well (Footage, Sec., T, R, M, or Survey Description) 440' FSL & 440' FEL Unit Letter P (SESE) Sec 28-25S-32E		8 Well Name and No Sol 28 Federal #1H
Lat. Long.		9 API Well No 30-025-40069
10 Field and Pool, or Tract and Pool WC-025-528-20SP; Wildcat; Bone Spring		11 County or Parish, State Lea County NM

12 CHECK APPROPRIATE BOX(S) 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	☐ Altering Casing ☐ Fracture Treat ☐ Reclamation ☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair ☐ New Construction ☐ Recomplete ☒ Other <u>Change of Operator</u>
	☐ Change Plans ☐ Plug and abandon ☐ Temporarily Abandon
	☐ Convert to Injection ☐ Plug back ☐ 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 or pertinent markers and sands Attach the Bond under which the work will performed or provide the Bond No on file with the BLM/ BIA Required subsequent reports shall 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 shall be filed once testing has been completed Final Abandonment Notice shall be filed only after all requirements, including reclamantion, 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 APD.

Name Change From: Sol 28 Federal Com #1H
To: Sol 28 Federal #1H

BHL Location Change From: 330' FNL & 330' FEL
To: 380 FSL & 330' FWL

Directional Plan and Plats attached.

**SUBJECT TO LIKE
APPROVAL BY STATE**

OPER. OGRID NO. 217955
PROPERTY NO. 38515
POOL CODE 97838
EFF. DATE 12/06/11
API NO. 30-025-40069

HOBBS OCD
JUL 10 2012

RECEIVED

14 I hereby certify that the foregoing is true and correct
Name (Printed/ Typed)

Mayte Reyes

Title
Regulatory Analyst

Signature

Date
3/8/12

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Title

Date

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

JUL 19 2012

/s/ Chris Walls

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 any deposition, false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction

(Instructions on page 2)

BUREAU OF LAND MANAGEMENT
CARLSBAD FIELD OFFICE

JUL 17 2012



COG Operating LLC

Lea County(NAD27)

SOL 28 Federal

1H

OH

Plan: Plan #1

Pathfinder X & Y Report

06 March, 2012



A Schlumberger Company



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 1H
Project:	Lea County(NAD27)	TVD Reference:	KB = 20.6 @ 3393.6usft (Original Well Elev)
Site:	SOL 28 Federal	MD Reference:	KB = 20.6 @ 3393.6usft (Original Well Elev)
Well:	1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Single User Db

Project:	Lea County(NAD27)		
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:	SOL 28 Federal		
Site Position:		Northing:	399,010.043 usft
From:	Map	Easting:	704,671.657 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 5' 42.973 N
		Longitude:	103° 40' 20.687 W
		Grid Convergence:	0.35 °

Well:		1H				
Well Position	+N/-S	0.0 usft	Northing:	399,010.043 usft	Latitude:	32° 5' 42.973 N
	+E/-W	0.0 usft	Easting:	704,671.657 usft	Longitude:	103° 40' 20.687 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,373.0 usft	

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	3/1/2012	7 53	60 06	48,496

Design:	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	268.67

Survey Tool Program:		Date 3/2/2012		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	13,775.7	Plan #1 (OH)	MWD	MWD - Standard



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company: COG Operating LLC
Project: Lea County(NAD27)
Site: SOL 28 Federal
Well: 1H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well 1H
TVD Reference: KB = 20 6 @ 3393.6usft (Original Well Elev)
MD Reference: KB = 20 6 @ 3393 6usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey												
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg ("/100usft)	Northing (usft)	Easting (usft)		
0 0	0 00	0 00	0 0	-3,393 6	0.0	0 0	0 0	0 00	399,010 04	704,671 66		
100.0	0 00	0 00	100.0	-3,293 6	0 0	0 0	0 0	0 00	399,010 04	704,671 66		
200 0	0 00	0 00	200.0	-3,193 6	0.0	0 0	0 0	0 00	399,010.04	704,671 66		
300 0	0.00	0.00	300 0	-3,093.6	0.0	0 0	0 0	0 00	399,010 04	704,671.66		
400.0	0 00	0.00	400.0	-2,993.6	0.0	0 0	0 0	0.00	399,010 04	704,671 66		
500.0	0 00	0 00	500 0	-2,893 6	0 0	0 0	0 0	0 00	399,010 04	704,671 66		
600 0	0 00	0 00	600 0	-2,793 6	0 0	0 0	0 0	0.00	399,010 04	704,671 66		
700 0	0 00	0 00	700.0	-2,693 6	0.0	0 0	0 0	0 00	399,010.04	704,671 66		
800 0	0 00	0 00	800.0	-2,593 6	0 0	0 0	0 0	0 00	399,010 04	704,671 66		
900 0	0 00	0 00	900 0	-2,493.6	0 0	0 0	0 0	0 00	399,010.04	704,671 66		
1,000 0	0 00	0 00	1,000 0	-2,393 6	0.0	0 0	0 0	0.00	399,010 04	704,671 66		
1,100 0	0 00	0 00	1,100.0	-2,293.6	0.0	0 0	0 0	0 00	399,010.04	704,671 66		
1,200 0	0 00	0 00	1,200 0	-2,193 6	0 0	0 0	0 0	0.00	399,010 04	704,671 66		
1,300 0	0 00	0 00	1,300 0	-2,093 6	0 0	0 0	0 0	0 00	399,010 04	704,671 66		
1,400 0	0 00	0 00	1,400 0	-1,993.6	0 0	0 0	0 0	0.00	399,010 04	704,671 66		
1,500.0	0 00	0 00	1,500 0	-1,893 6	0 0	0 0	0 0	0 00	399,010 04	704,671 66		
1,600 0	0.00	0 00	1,600.0	-1,793 6	0.0	0 0	0 0	0 00	399,010 04	704,671.66		
1,700 0	0.00	0 00	1,700 0	-1,693.6	0 0	0 0	0 0	0 00	399,010 04	704,671 66		
1,800.0	0 00	0 00	1,800 0	-1,593 6	0 0	0 0	0 0	0 00	399,010 04	704,671 66		
1,900 0	0.00	0 00	1,900 0	-1,493 6	0 0	0.0	0 0	0 00	399,010 04	704,671 66		
2,000 0	0 00	0.00	2,000 0	-1,393 6	0 0	0 0	0 0	0 00	399,010 04	704,671 66		
2,100 0	0 00	0 00	2,100.0	-1,293 6	0 0	0.0	0 0	0.00	399,010 04	704,671 66		
2,200 0	0 00	0 00	2,200 0	-1,193 6	0 0	0 0	0 0	0 00	399,010 04	704,671 66		
2,300 0	0 00	0.00	2,300.0	-1,093 6	0.0	0 0	0 0	0 00	399,010 04	704,671 66		
2,400 0	0 00	0 00	2,400 0	-993 6	0 0	0 0	0 0	0 00	399,010 04	704,671 66		
2,500 0	0 00	0 00	2,500 0	-893 6	0 0	0 0	0 0	0 00	399,010 04	704,671 66		
2,600 0	0 00	0 00	2,600 0	-793 6	0.0	0 0	0 0	0 00	399,010 04	704,671 66		



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 1H
Project:	Lea County(NAD27)	TVD Reference:	KB = 20.6 @ 3393 6usft (Original Well Elev)
Site:	SOL 28 Federal	MD Reference:	KB = 20.6 @ 3393 6usft (Original Well Elev)
Well:	1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Single User Db

Planned Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
2,700.0	0.00	0.00	2,700.0	-693.6	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
2,800.0	0.00	0.00	2,800.0	-593.6	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
2,900.0	0.00	0.00	2,900.0	-493.6	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
3,000.0	0.00	0.00	3,000.0	-393.6	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
3,100.0	0.00	0.00	3,100.0	-293.6	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
3,200.0	0.00	0.00	3,200.0	-193.6	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
3,300.0	0.00	0.00	3,300.0	-93.6	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
3,400.0	0.00	0.00	3,400.0	6.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
3,500.0	0.00	0.00	3,500.0	106.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
3,600.0	0.00	0.00	3,600.0	206.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
3,700.0	0.00	0.00	3,700.0	306.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
3,800.0	0.00	0.00	3,800.0	406.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
3,900.0	0.00	0.00	3,900.0	506.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
4,000.0	0.00	0.00	4,000.0	606.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
4,100.0	0.00	0.00	4,100.0	706.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
4,200.0	0.00	0.00	4,200.0	806.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
4,300.0	0.00	0.00	4,300.0	906.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
4,400.0	0.00	0.00	4,400.0	1,006.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
4,500.0	0.00	0.00	4,500.0	1,106.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
4,600.0	0.00	0.00	4,600.0	1,206.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
4,700.0	0.00	0.00	4,700.0	1,306.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
4,800.0	0.00	0.00	4,800.0	1,406.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
4,900.0	0.00	0.00	4,900.0	1,506.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
5,000.0	0.00	0.00	5,000.0	1,606.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
5,100.0	0.00	0.00	5,100.0	1,706.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
5,200.0	0.00	0.00	5,200.0	1,806.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	
5,300.0	0.00	0.00	5,300.0	1,906.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66	



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company: COG Operating LLC
Project: Lea County(NAD27)
Site: SOL 28 Federal
Well: 1H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference:
TVD Reference: Well 1H
MD Reference: KB = 20.6 @ 3393 6usft (Original Well Elev)
North Reference: KB = 20.6 @ 3393 6usft (Original Well Elev)
Survey Calculation Method: Grid
Database: Minimum Curvature
EDM 5000 1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
5,400.0	0 00	0 00	5,400.0	2,006.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
5,500.0	0 00	0 00	5,500.0	2,106.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
5,600.0	0 00	0 00	5,600.0	2,206.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
5,700.0	0 00	0 00	5,700.0	2,306.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
5,800.0	0 00	0 00	5,800.0	2,406.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
5,900.0	0 00	0 00	5,900.0	2,506.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
6,000.0	0 00	0 00	6,000.0	2,606.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
6,100.0	0 00	0 00	6,100.0	2,706.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
6,200.0	0 00	0 00	6,200.0	2,806.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
6,300.0	0 00	0 00	6,300.0	2,906.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
6,400.0	0 00	0 00	6,400.0	3,006.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
6,500.0	0 00	0 00	6,500.0	3,106.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
6,600.0	0 00	0 00	6,600.0	3,206.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
6,700.0	0 00	0 00	6,700.0	3,306.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
6,800.0	0 00	0 00	6,800.0	3,406.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
6,900.0	0 00	0 00	6,900.0	3,506.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
7,000.0	0 00	0 00	7,000.0	3,606.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
7,100.0	0 00	0 00	7,100.0	3,706.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
7,200.0	0 00	0 00	7,200.0	3,806.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
7,300.0	0 00	0 00	7,300.0	3,906.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
7,400.0	0 00	0 00	7,400.0	4,006.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
7,500.0	0 00	0 00	7,500.0	4,106.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
7,600.0	0 00	0 00	7,600.0	4,206.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
7,700.0	0 00	0 00	7,700.0	4,306.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
7,800.0	0 00	0 00	7,800.0	4,406.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
7,900.0	0 00	0 00	7,900.0	4,506.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66
8,000.0	0 00	0 00	8,000.0	4,606.4	0 0	0 0	0 0	0 00	399,010.04	704,671.66



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 1H
Project:	Lea County(NAD27)	TVD Reference:	KB = 20.6 @ 3393 6usft (Original Well Elev)
Site:	SOL 28 Federal	MD Reference:	KB = 20.6 @ 3393 6usft (Original Well Elev)
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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
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Planned Survey												
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)		
8,100.0	0.00	0.00	8,100.0	4,706.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66		
8,200.0	0.00	0.00	8,200.0	4,806.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66		
8,300.0	0.00	0.00	8,300.0	4,906.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66		
8,400.0	0.00	0.00	8,400.0	5,006.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66		
8,500.0	0.00	0.00	8,500.0	5,106.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66		
8,600.0	0.00	0.00	8,600.0	5,206.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66		
8,700.0	0.00	0.00	8,700.0	5,306.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66		
8,800.0	0.00	0.00	8,800.0	5,406.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66		
8,900.0	0.00	0.00	8,900.0	5,506.4	0.0	0.0	0.0	0.00	399,010.04	704,671.66		
8,957.5	0.00	0.00	8,957.5	5,563.9	0.0	0.0	0.0	0.00	399,010.04	704,671.66		
8,975.0	2.10	268.67	8,975.0	5,581.4	0.0	-0.3	0.3	12.00	399,010.04	704,671.34		
9,000.0	5.10	268.67	8,999.9	5,606.3	0.0	-1.9	1.9	12.00	399,010.00	704,669.77		
9,025.0	8.10	268.67	9,024.8	5,631.2	-0.1	-4.8	4.8	12.00	399,009.93	704,666.89		
9,050.0	11.10	268.67	9,049.4	5,655.8	-0.2	-8.9	8.9	12.00	399,009.84	704,662.73		
9,075.0	14.10	268.67	9,073.8	5,680.2	-0.3	-14.4	14.4	12.00	399,009.71	704,657.28		
9,100.0	17.10	268.67	9,097.9	5,704.3	-0.5	-21.1	21.1	12.00	399,009.55	704,650.56		
9,125.0	20.10	268.67	9,121.6	5,728.0	-0.7	-29.1	29.1	12.00	399,009.37	704,642.58		
9,150.0	23.10	268.67	9,144.8	5,751.2	-0.9	-38.3	38.3	12.00	399,009.16	704,633.38		
9,175.0	26.10	268.67	9,167.6	5,774.0	-1.1	-48.7	48.7	12.00	399,008.91	704,622.98		
9,200.0	29.10	268.67	9,189.7	5,796.1	-1.4	-60.3	60.3	12.00	399,008.65	704,611.40		
9,225.0	32.10	268.67	9,211.2	5,817.6	-1.7	-73.0	73.0	12.00	399,008.35	704,598.68		
9,250.0	35.10	268.67	9,232.0	5,838.4	-2.0	-86.8	86.8	12.00	399,008.03	704,584.85		
9,275.0	38.10	268.67	9,252.1	5,858.5	-2.4	-101.7	101.7	12.00	399,007.69	704,569.95		
9,300.0	41.10	268.67	9,271.4	5,877.8	-2.7	-117.6	117.7	12.00	399,007.32	704,554.02		
9,325.0	44.10	268.67	9,289.8	5,896.2	-3.1	-134.5	134.6	12.00	399,006.92	704,537.11		
9,350.0	47.10	268.67	9,307.3	5,913.7	-3.5	-152.4	152.4	12.00	399,006.51	704,519.25		
9,375.0	50.10	268.67	9,323.8	5,930.2	-4.0	-171.1	171.2	12.00	399,006.08	704,500.51		



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 1H
Project:	Lea County(NAD27)	TVD Reference:	KB = 20.6 @ 3393.6usft (Original Well Elev)
Site:	SOL 28 Federal	MD Reference:	KB = 20.6 @ 3393.6usft (Original Well Elev)
Well:	1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000 1 Single User Db

Planned Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
9,400.0	53.10	268.67	9,339.3	5,945.7	-4.4	-190.7	190.8	12.00	399,005.62	704,480.92	
9,425.0	56.10	268.67	9,353.8	5,960.2	-4.9	-211.1	211.2	12.00	399,005.15	704,460.55	
9,450.0	59.10	268.67	9,367.2	5,973.6	-5.4	-232.2	232.3	12.00	399,004.66	704,439.45	
9,475.0	62.10	268.67	9,379.5	5,985.9	-5.9	-254.0	254.0	12.00	399,004.16	704,417.68	
9,500.0	65.10	268.67	9,390.6	5,997.0	-6.4	-276.4	276.4	12.00	399,003.64	704,395.30	
9,525.0	68.10	268.67	9,400.5	6,006.9	-6.9	-299.3	299.4	12.00	399,003.11	704,372.36	
9,550.0	71.10	268.67	9,409.2	6,015.6	-7.5	-322.7	322.8	12.00	399,002.56	704,348.94	
9,575.0	74.10	268.67	9,416.7	6,023.1	-8.0	-346.6	346.7	12.00	399,002.01	704,325.09	
9,600.0	77.10	268.67	9,422.9	6,029.3	-8.6	-370.8	370.9	12.00	399,001.45	704,300.89	
9,625.0	80.10	268.67	9,427.9	6,034.3	-9.2	-395.3	395.4	12.00	399,000.88	704,276.39	
9,650.0	83.10	268.67	9,431.5	6,037.9	-9.7	-420.0	420.1	12.00	399,000.31	704,251.67	
9,675.0	86.10	268.67	9,433.9	6,040.3	-10.3	-444.9	445.0	12.00	398,999.73	704,226.79	
9,700.0	89.10	268.67	9,434.9	6,041.3	-10.9	-469.8	470.0	12.00	398,999.15	704,201.82	
9,707.5	90.00	268.67	9,435.0	6,041.4	-11.1	-477.3	477.5	12.00	398,998.98	704,194.32	
9,800.0	90.00	268.67	9,435.0	6,041.4	-13.2	-569.8	570.0	0.00	398,996.84	704,101.85	
9,900.0	90.00	268.67	9,435.0	6,041.4	-15.5	-669.8	670.0	0.00	398,994.52	704,001.87	
10,000.0	90.00	268.67	9,435.0	6,041.4	-17.8	-769.8	770.0	0.00	398,992.20	703,901.90	
10,100.0	90.00	268.67	9,435.0	6,041.4	-20.2	-869.7	870.0	0.00	398,989.89	703,801.93	
10,200.0	90.00	268.67	9,435.0	6,041.4	-22.5	-969.7	970.0	0.00	398,987.57	703,701.95	
10,300.0	90.00	268.67	9,435.0	6,041.4	-24.8	-1,069.7	1,070.0	0.00	398,985.25	703,601.98	
10,400.0	90.00	268.67	9,435.0	6,041.4	-27.1	-1,169.7	1,170.0	0.00	398,982.94	703,502.01	
10,500.0	90.00	268.67	9,435.0	6,041.4	-29.4	-1,269.6	1,270.0	0.00	398,980.62	703,402.03	
10,600.0	90.00	268.67	9,435.0	6,041.4	-31.7	-1,369.6	1,370.0	0.00	398,978.30	703,302.06	
10,700.0	90.00	268.67	9,435.0	6,041.4	-34.1	-1,469.6	1,470.0	0.00	398,975.99	703,202.09	
10,800.0	90.00	268.67	9,435.0	6,041.4	-36.4	-1,569.5	1,570.0	0.00	398,973.67	703,102.11	
10,900.0	90.00	268.67	9,435.0	6,041.4	-38.7	-1,669.5	1,670.0	0.00	398,971.35	703,002.14	
11,000.0	90.00	268.67	9,435.0	6,041.4	-41.0	-1,769.5	1,770.0	0.00	398,969.04	702,902.17	



Pathfinder
Pathfinder X & Y Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 1H
Project:	Lea County(NAD27)	TVD Reference:	KB = 20.6 @ 3393.6usft (Original Well Elev)
Site:	SOL 28 Federal	MD Reference:	KB = 20.6 @ 3393.6usft (Original Well Elev)
Well:	1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Single User Db

Planned Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
11,100.0	90.00	268.67	9,435.0	6,041.4	-43.3	-1,869.5	1,870.0	0.00	398,966.72	702,802.19	
11,200.0	90.00	268.67	9,435.0	6,041.4	-45.6	-1,969.4	1,970.0	0.00	398,964.40	702,702.22	
11,300.0	90.00	268.67	9,435.0	6,041.4	-48.0	-2,069.4	2,070.0	0.00	398,962.09	702,602.25	
11,400.0	90.00	268.67	9,435.0	6,041.4	-50.3	-2,169.4	2,170.0	0.00	398,959.77	702,502.27	
11,500.0	90.00	268.67	9,435.0	6,041.4	-52.6	-2,269.4	2,270.0	0.00	398,957.45	702,402.30	
11,600.0	90.00	268.67	9,435.0	6,041.4	-54.9	-2,369.3	2,370.0	0.00	398,955.14	702,302.33	
11,700.0	90.00	268.67	9,435.0	6,041.4	-57.2	-2,469.3	2,470.0	0.00	398,952.82	702,202.36	
11,800.0	90.00	268.67	9,435.0	6,041.4	-59.5	-2,569.3	2,570.0	0.00	398,950.50	702,102.38	
11,900.0	90.00	268.67	9,435.0	6,041.4	-61.9	-2,669.2	2,670.0	0.00	398,948.19	702,002.41	
12,000.0	90.00	268.67	9,435.0	6,041.4	-64.2	-2,769.2	2,770.0	0.00	398,945.87	701,902.44	
12,100.0	90.00	268.67	9,435.0	6,041.4	-66.5	-2,869.2	2,870.0	0.00	398,943.55	701,802.46	
12,200.0	90.00	268.67	9,435.0	6,041.4	-68.8	-2,969.2	2,970.0	0.00	398,941.23	701,702.49	
12,300.0	90.00	268.67	9,435.0	6,041.4	-71.1	-3,069.1	3,070.0	0.00	398,938.92	701,602.52	
12,400.0	90.00	268.67	9,435.0	6,041.4	-73.4	-3,169.1	3,170.0	0.00	398,936.60	701,502.54	
12,500.0	90.00	268.67	9,435.0	6,041.4	-75.8	-3,269.1	3,270.0	0.00	398,934.28	701,402.57	
12,600.0	90.00	268.67	9,435.0	6,041.4	-78.1	-3,369.1	3,370.0	0.00	398,931.97	701,302.60	
12,700.0	90.00	268.67	9,435.0	6,041.4	-80.4	-3,469.0	3,470.0	0.00	398,929.65	701,202.62	
12,800.0	90.00	268.67	9,435.0	6,041.4	-82.7	-3,569.0	3,570.0	0.00	398,927.33	701,102.65	
12,900.0	90.00	268.67	9,435.0	6,041.4	-85.0	-3,669.0	3,670.0	0.00	398,925.02	701,002.68	
13,000.0	90.00	268.67	9,435.0	6,041.4	-87.3	-3,769.0	3,770.0	0.00	398,922.70	700,902.70	
13,100.0	90.00	268.67	9,435.0	6,041.4	-89.7	-3,868.9	3,870.0	0.00	398,920.38	700,802.73	
13,200.0	90.00	268.67	9,435.0	6,041.4	-92.0	-3,968.9	3,970.0	0.00	398,918.07	700,702.76	
13,300.0	90.00	268.67	9,435.0	6,041.4	-94.3	-4,068.9	4,070.0	0.00	398,915.75	700,602.78	
13,400.0	90.00	268.67	9,435.0	6,041.4	-96.6	-4,168.8	4,170.0	0.00	398,913.43	700,502.81	
13,500.0	90.00	268.67	9,435.0	6,041.4	-98.9	-4,268.8	4,270.0	0.00	398,911.12	700,402.84	
13,600.0	90.00	268.67	9,435.0	6,041.4	-101.2	-4,368.8	4,370.0	0.00	398,908.80	700,302.87	
13,700.0	90.00	268.67	9,435.0	6,041.4	-103.6	-4,468.8	4,470.0	0.00	398,906.48	700,202.89	



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 1H
Project:	Lea County(NAD27)	TVD Reference:	KB = 20.6 @ 3393.6usft (Original Well Elev)
Site:	SOL 28 Federal	MD Reference:	KB = 20.6 @ 3393.6usft (Original Well Elev)
Well:	1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Single User Db

Planned Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
13,775.7	90.00	268.67	9,435.0	6,041.4	-105.3	-4,544.4	4,545.6	0.00	398,904.73	700,127.26

Checked By: _____ Approved By: _____ Date: _____

Sol 28 Federal Com #1H Sundry

COG respectfully request the following changes:

Surface Casing setting depth will be @ 900' as per approved APD.

Cmt to sfc with:

400 sx Class C + 4% Gel + 2% CaCl₂ @ 13.5/1.75 yield

250 sx Class C + 2% CaCl₂ @ 14.8/1.35 yield

50% excess on OH

Intermediate casing section:

Drill 12-1/4" hole to 4600'

Run 9-5/8" 40# J-55 STC csg to 4600'

Cmt to surface in 1 stg with:

Lead: 1000 sx Class C + 4% Gel @ 13.5 ppg/1.75 yield

Tail: 250 sx Class C + 2% CaCl₂ @ 14.8/1.35 yield

35% excess on OH

Production casing section:

Drill 7-7/8" hole to 8850'

Kick off and drill 7-7/8" curve & lateral to +/- 13,692' MD (+/-9345' TVD)

Run 5-1/2" 17# P-110 LTC csg to TD

Cmt in 1 state with:

Lead: 1050 sx 35:65:6 H + Salt + Gilsomite + CF + CFR-3 @ 12.7 ppg/1.89 yield

Tail: 1000 sx 50:50:2 H + Salt + GasStop + CFR-3 @ 14.4/1.25 yield

Minimum tie back to 200' into 9-5/8" csg shoe (designed to circ cmt to sfc)

35% excess on OH