

HOBBS OCD

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Amended

FORM APPROVED
OMB NO. 1004-0135
Expires: July 31, 2010

OCT 24 2016

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.

5. Lease Serial No.
NMNM116047

Indian Allottee or Tribe Name

RECEIVED

SUBMIT IN TRIPLICATE - Other instructions on reverse side.

Carlsbad Field Office
OCD Hobbs

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

1. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other		8. Well Name and No. SMALLS FEDERAL 8H
2. Name of Operator COG PRODUCTION LLC		9. API Well No. 30-025-43069-00-X1
3a. Address 2208 W MAIN STREET ARTESIA, NM 88210		10. Field and Pool, or Exploratory WC-025 G06 S223421L
3b. Phone No. (include area code) Ph: 575-748-6945		
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 28 T22S R34E SWSW 190FSL 410FWL		11. County or Parish, and State LEA COUNTY, NM

12. CHECK 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	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original APD
	☐ 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 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 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 Notices shall 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.

BHL Change
From: 330' FNL & 380' FWL Section 28. T22S. R34E
To: 230' FNL & 380' FWL Section 28. T22S. R34E
C102 attached.

Directional Plan attached.
The plan has been updated with the BHL 230' FNL

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

See ATTACHMENTS

14. I hereby certify that the foregoing is true and correct. Electronic Submission #355034 verified by the BLM Well Information System For COG PRODUCTION LLC, sent to the Hobbs Committed to AFMSS for processing by MUSTAFA HAQUE on 10/18/2016 (17MH0004SE)	
Name (Printed/Typed) MAYTE X REYES	Title REGULATORY ANALYST
Signature (Electronic Submission)	Date 10/18/2016

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By MUSTAFA HAQUE	Title PETROLEUM ENGINEER	Date 10/18/2016
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 Hobbs

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.

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

MSB/OCD 11/16/2016



COG Operating L L C
 Project: Lea County, NM (NAD27 NME)
 Site: Sec. 28, T 22 S., R 34 E.
 Well: Smalls Federal 8H
 Wellbore: Wellbore #1
 Plan: Plan #2 (Smalls Federal 8H/Wellbore #1)
 Patriot 2



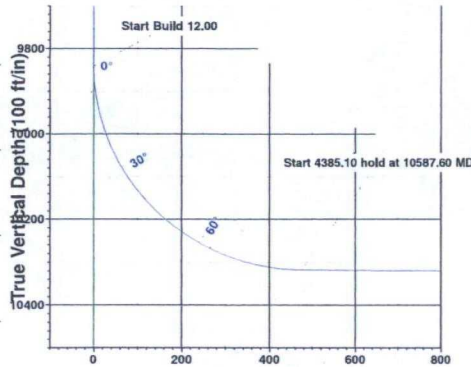
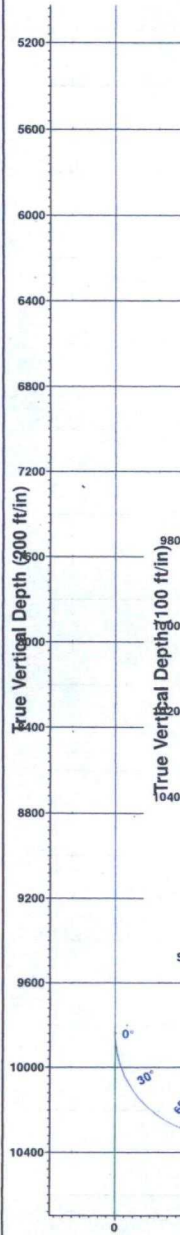
WELL DETAILS: Smalls Federal 8H

Ground Elevation:: 3416.20
 RKB Elevation: KB=20' @ 3436.20ft (Patriot 2)
 Rig Name: Patriot 2

Northing	Easting	Latitude	Longitude
494207.1000	762956.0000	32° 21' 20.937 N	103° 28' 54.416 W

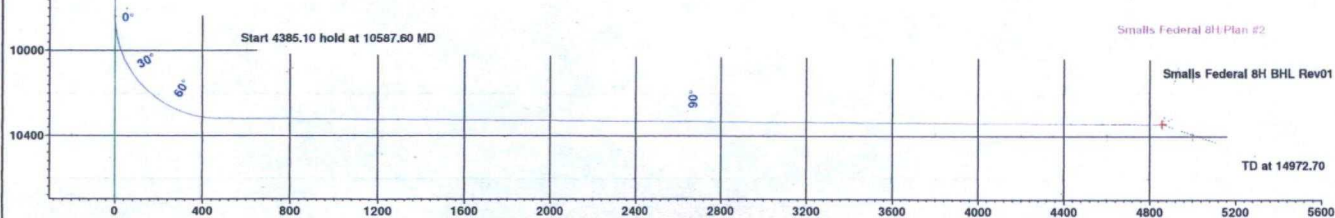
Section Details

Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	9840.54	0.00	0.00	9840.54	0.00	0.00	0.00	0.00	0.00
3	10587.60	89.65	359.23	10318.00	474.48	-6.34	12.00	359.23	474.53
4	14972.70	89.65	359.23	10345.00	4859.11	-64.90	0.00	0.00	4859.54



Vertical Section at 359.23° (100 ft/in)

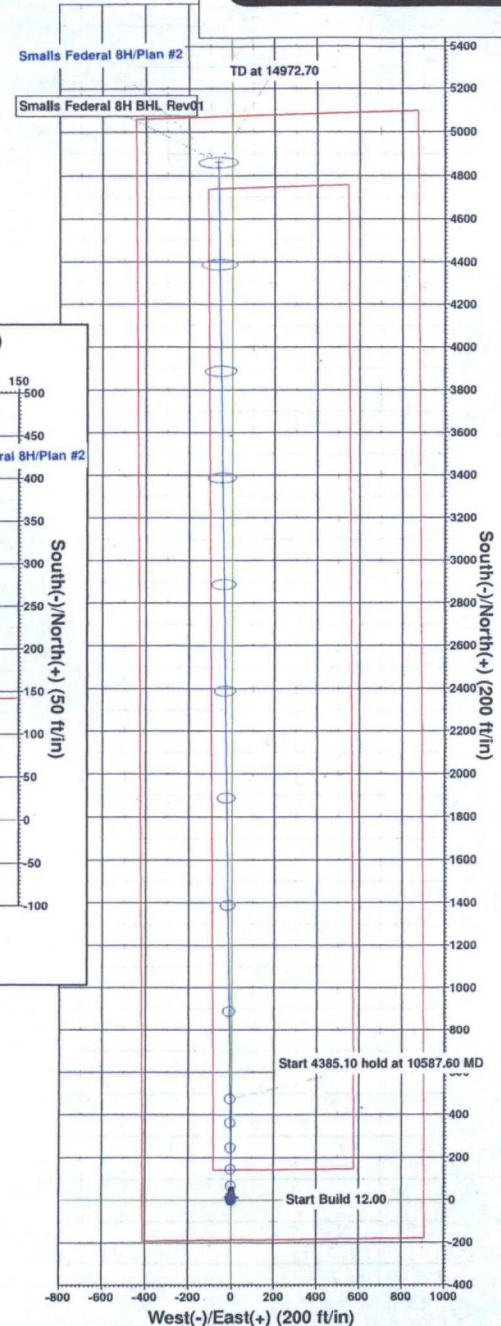
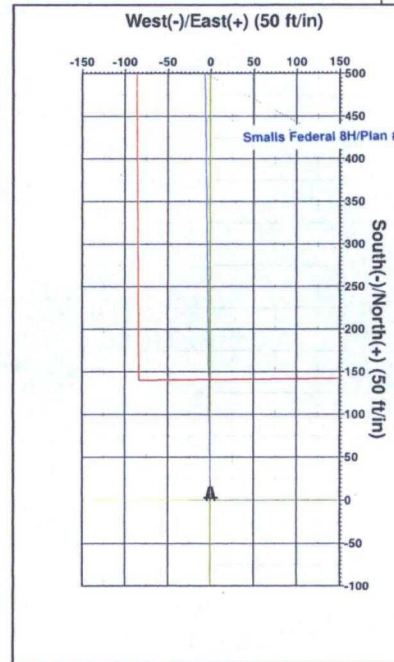
Start Build 12.00



Vertical Section at 359.23° (200 ft/in)



PROJECT DETAILS: Lea County, NM (NAD27 NME)
 Geodetic System: US State Plane 1927 (Exact solution)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1866
 Zone: New Mexico East 3001
 System Datum: Mean Sea Level
 Local North: Grid





COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 28, T 22 S. , R 34 E.

Smalls Federal 8H

Wellbore #1

Plan: Plan #2

Standard Survey Report

17 October, 2016





Integrity Directional Services, LLC

Survey Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Smalls Federal 8H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=20' @ 3436.20ft (Patriot 2)
Site:	Sec. 28, T 22 S. , R 34 E.	MD Reference:	KB=20' @ 3436.20ft (Patriot 2)
Well:	Smalls Federal 8H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #2	Database:	EDM 5000.1 Multi User Db

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	Sec. 28, T 22 S. , R 34 E.		
Site Position:		Northing:	494,207.1000 usft
From: Map		Easting:	762,956.0000 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "
		Latitude:	32° 21' 20.937 N
		Longitude:	103° 28' 54.416 W
		Grid Convergence:	0.46 °

Well	Smalls Federal 8H		
Well Position	+N/-S	0.00 ft	Northing:
	+E/-W	0.00 ft	Easting:
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft
		Latitude:	32° 21' 20.937 N
		Longitude:	103° 28' 54.416 W
		Ground Level:	3,416.20 ft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2015	9/28/2016	7.00
		Dip Angle (°)	60.21
		Field Strength (nT)	48,100

Design	Plan #2		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)
	0.00	0.00	0.00
			359.23

Survey Tool Program	Date 10/17/2016		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name
0.00	14,972.70	Plan #2 (Wellbore #1)	MWD
			Description
			MWD - Standard

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	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	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	



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MD Reference: KB=20' @ 3436.20ft (Patriot 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Buidl Rate (°/100usft)	Turn Rate (°/100usft)
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00



Integrity Directional Services, LLC
Survey Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Smalls Federal 8H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=20' @ 3436.20ft (Patriot 2)
Site:	Sec. 28, T 22 S. , R 34 E.	MD Reference:	KB=20' @ 3436.20ft (Patriot 2)
Well:	Smalls Federal 8H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #2	Database:	EDM 5000.1 Multi User Db

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,100.00	0.00	0.00	6,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,200.00	0.00	0.00	6,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,300.00	0.00	0.00	6,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,400.00	0.00	0.00	6,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,900.00	0.00	0.00	6,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,000.00	0.00	0.00	7,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,100.00	0.00	0.00	7,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,200.00	0.00	0.00	7,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,300.00	0.00	0.00	7,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,400.00	0.00	0.00	7,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,500.00	0.00	0.00	7,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,600.00	0.00	0.00	7,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,700.00	0.00	0.00	7,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,800.00	0.00	0.00	7,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,900.00	0.00	0.00	7,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,000.00	0.00	0.00	8,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,100.00	0.00	0.00	8,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,200.00	0.00	0.00	8,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,300.00	0.00	0.00	8,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,400.00	0.00	0.00	8,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,500.00	0.00	0.00	8,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,600.00	0.00	0.00	8,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,700.00	0.00	0.00	8,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,800.00	0.00	0.00	8,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,900.00	0.00	0.00	8,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
9,000.00	0.00	0.00	9,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
9,100.00	0.00	0.00	9,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
9,200.00	0.00	0.00	9,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
9,300.00	0.00	0.00	9,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
9,400.00	0.00	0.00	9,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
9,500.00	0.00	0.00	9,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
9,600.00	0.00	0.00	9,600.00	0.00	0.00	0.00	0.00	0.00	0.00	



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Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,700.00	0.00	0.00	9,700.00	0.00	0.00	0.00	0.00	0.00	0.00
9,800.00	0.00	0.00	9,800.00	0.00	0.00	0.00	0.00	0.00	0.00
9,840.54	0.00	0.00	9,840.54	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 12.00									
9,900.00	7.14	359.23	9,899.85	3.70	-0.05	3.70	12.00	12.00	0.00
10,000.00	19.14	359.23	9,997.05	26.38	-0.35	26.38	12.00	12.00	0.00
10,100.00	31.14	359.23	10,087.42	68.77	-0.92	68.78	12.00	12.00	0.00
10,200.00	43.14	359.23	10,166.99	129.03	-1.72	129.04	12.00	12.00	0.00
10,300.00	55.14	359.23	10,232.30	204.51	-2.73	204.53	12.00	12.00	0.00
10,400.00	67.14	359.23	10,280.49	291.92	-3.90	291.94	12.00	12.00	0.00
10,500.00	79.14	359.23	10,309.45	387.43	-5.17	387.47	12.00	12.00	0.00
10,587.60	89.65	359.23	10,318.00	474.48	-6.34	474.53	12.00	12.00	0.00
Start 4385.10 hold at 10587.60 MD									
10,600.00	89.65	359.23	10,318.07	486.88	-6.50	486.92	0.00	0.00	0.00
10,700.00	89.65	359.23	10,318.69	586.87	-7.84	586.92	0.00	0.00	0.00
10,800.00	89.65	359.23	10,319.30	686.86	-9.17	686.92	0.00	0.00	0.00
10,900.00	89.65	359.23	10,319.92	786.85	-10.51	786.92	0.00	0.00	0.00
11,000.00	89.65	359.23	10,320.54	886.84	-11.84	886.92	0.00	0.00	0.00
11,100.00	89.65	359.23	10,321.15	986.83	-13.18	986.91	0.00	0.00	0.00
11,200.00	89.65	359.23	10,321.77	1,086.82	-14.52	1,086.91	0.00	0.00	0.00
11,300.00	89.65	359.23	10,322.38	1,186.80	-15.85	1,186.91	0.00	0.00	0.00
11,400.00	89.65	359.23	10,323.00	1,286.79	-17.19	1,286.91	0.00	0.00	0.00
11,500.00	89.65	359.23	10,323.62	1,386.78	-18.52	1,386.91	0.00	0.00	0.00
11,600.00	89.65	359.23	10,324.23	1,486.77	-19.86	1,486.91	0.00	0.00	0.00
11,700.00	89.65	359.23	10,324.85	1,586.76	-21.19	1,586.90	0.00	0.00	0.00
11,800.00	89.65	359.23	10,325.46	1,686.75	-22.53	1,686.90	0.00	0.00	0.00
11,900.00	89.65	359.23	10,326.08	1,786.74	-23.86	1,786.90	0.00	0.00	0.00
12,000.00	89.65	359.23	10,326.69	1,886.73	-25.20	1,886.90	0.00	0.00	0.00
12,100.00	89.65	359.23	10,327.31	1,986.72	-26.54	1,986.90	0.00	0.00	0.00
12,200.00	89.65	359.23	10,327.93	2,086.71	-27.87	2,086.89	0.00	0.00	0.00
12,300.00	89.65	359.23	10,328.54	2,186.70	-29.21	2,186.89	0.00	0.00	0.00
12,400.00	89.65	359.23	10,329.16	2,286.69	-30.54	2,286.89	0.00	0.00	0.00
12,500.00	89.65	359.23	10,329.77	2,386.68	-31.88	2,386.89	0.00	0.00	0.00
12,600.00	89.65	359.23	10,330.39	2,486.66	-33.21	2,486.89	0.00	0.00	0.00
12,700.00	89.65	359.23	10,331.00	2,586.65	-34.55	2,586.88	0.00	0.00	0.00
12,800.00	89.65	359.23	10,331.62	2,686.64	-35.88	2,686.88	0.00	0.00	0.00
12,900.00	89.65	359.23	10,332.24	2,786.63	-37.22	2,786.88	0.00	0.00	0.00
13,000.00	89.65	359.23	10,332.85	2,886.62	-38.55	2,886.88	0.00	0.00	0.00
13,100.00	89.65	359.23	10,333.47	2,986.61	-39.89	2,986.88	0.00	0.00	0.00
13,200.00	89.65	359.23	10,334.08	3,086.60	-41.23	3,086.87	0.00	0.00	0.00
13,300.00	89.65	359.23	10,334.70	3,186.59	-42.56	3,186.87	0.00	0.00	0.00
13,400.00	89.65	359.23	10,335.31	3,286.58	-43.90	3,286.87	0.00	0.00	0.00
13,500.00	89.65	359.23	10,335.93	3,386.57	-45.23	3,386.87	0.00	0.00	0.00
13,600.00	89.65	359.23	10,336.55	3,486.56	-46.57	3,486.87	0.00	0.00	0.00



Integrity Directional Services, LLC

Survey Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Smalls Federal 8H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=20' @ 3436.20ft (Patriot 2)
Site:	Sec. 28, T 22 S. , R 34 E.	MD Reference:	KB=20' @ 3436.20ft (Patriot 2)
Well:	Smalls Federal 8H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #2	Database:	EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,700.00	89.65	359.23	10,337.16	3,586.55	-47.90	3,586.87	0.00	0.00	0.00
13,800.00	89.65	359.23	10,337.78	3,686.53	-49.24	3,686.86	0.00	0.00	0.00
13,900.00	89.65	359.23	10,338.39	3,786.52	-50.57	3,786.86	0.00	0.00	0.00
14,000.00	89.65	359.23	10,339.01	3,886.51	-51.91	3,886.86	0.00	0.00	0.00
14,100.00	89.65	359.23	10,339.62	3,986.50	-53.25	3,986.86	0.00	0.00	0.00
14,200.00	89.65	359.23	10,340.24	4,086.49	-54.58	4,086.86	0.00	0.00	0.00
14,300.00	89.65	359.23	10,340.86	4,186.48	-55.92	4,186.85	0.00	0.00	0.00
14,400.00	89.65	359.23	10,341.47	4,286.47	-57.25	4,286.85	0.00	0.00	0.00
14,500.00	89.65	359.23	10,342.09	4,386.46	-58.59	4,386.85	0.00	0.00	0.00
14,600.00	89.65	359.23	10,342.70	4,486.45	-59.92	4,486.85	0.00	0.00	0.00
14,700.00	89.65	359.23	10,343.32	4,586.44	-61.26	4,586.85	0.00	0.00	0.00
14,800.00	89.65	359.23	10,343.93	4,686.43	-62.59	4,686.84	0.00	0.00	0.00
14,900.00	89.65	359.23	10,344.55	4,786.42	-63.93	4,786.84	0.00	0.00	0.00
14,972.70	89.65	359.23	10,345.00	4,859.11	-64.90	4,859.54	0.00	0.00	0.00
TD at 14972.70									

Design Targets

Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- Shape									
Smalls Federal 8H Bf	0.00	0.00	10,345.00	4,859.11	-64.90	499,066.2000	762,891.1000	32° 22' 9.023 N	103° 28' 54.722 W
- plan hits target center									
- Point									

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
9841	9841	0	0	Start Build 12.00
10,588	10,318	474	-6	Start 4385.10 hold at 10587.60 MD
14,973	10,345	4859	-65	TD at 14972.70

Checked By: _____ Approved By: _____ Date: _____