

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB NO. 1004-0135
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.

5. Lease Serial No.
NMNM109748

6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on reverse side.

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

1. Type of Well
☒ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No. **(316776)**
ROAD RUNNER FEDERAL COM 11H

2. Name of Operator
COG PRODUCTION LLC
Contact: MAYTE X REYES
E-Mail: mreyes1@concho.com

9. API Well No.
30-015-43900

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

3b. Phone No. (include area code)
Ph: 575.748.6945

10. Field and Pool, or Exploratory
COTTONWOOD DRAW

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
Sec 25 T25S R26E SESE 190FSL 350FEL

11. County or Parish, and State
EDDY 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 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 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.

SHL
From: 190' FSL & 380' FEL Section 25, T25S, R26E
To: 190' FSL & 350' FEL Section 25, T25S, R26E

BHL
From: 330' FNL & 330' FEL Section 24, T25S, R26E.
To: 50' FNL & 330' FEL Section 24, T25S, R330E

C102 attached.

NM OIL CONSERVATION
ARTESIA DISTRICT

SEP 06 2016

RECEIVED

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

**Electronic Submission #348671 verified by the BLM Well Information System
For COG PRODUCTION LLC, sent to the Carlsbad**

Committed to AFMSS for processing by MUSTAFA HAQUE on 09/01/2016 (16MH0012SE)

Name (Printed/Typed) MAYTE X REYES

Title REGULATORY ANALYST

Signature (Electronic Submission)

Date 08/22/2016

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By CHARLES NIMMER

Title PETROLEUM ENGINEER

Date 09/01/2016

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.

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



COG Operating LLC

Eddy County, NM (NAD-27 2015)

Roadrunner Federal Com #11H

Roadrunner Federal Com #11H

Lateral #1

Plan: Design #1

Standard Planning Report

21 August, 2016





TDS
Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Roadrunner Federal Com #11H
Company:	COG Operating LLC	TVD Reference:	KB @ 3275.20usft (Latshaw 44)
Project:	Eddy County, NM (NAD-27 2015)	MD Reference:	KB @ 3275.20usft (Latshaw 44)
Site:	Roadrunner Federal Com #11H	North Reference:	Grid
Well:	Roadrunner Federal Com #11H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral #1		
Design:	Design #1		

Project	Eddy County, NM (NAD-27 2015)		
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:	Roadrunner Federal Com #11H		
Site Position:		Northing:	397,906.10 usft
From:	Map	Easting:	529,335.90 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in
		Latitude:	32° 5' 38.128 N
		Longitude:	104° 14' 18.971 W
		Grid Convergence:	0.05 °

Well:	Roadrunner Federal Com #11H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 5' 38.128 N
		Longitude:	104° 14' 18.971 W
		Ground Level:	3,250.20 usft

Wellbore:	Lateral #1		
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Magnetics:	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2015	8/20/2016	7.34	59.84	47,874

Design	Design #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			0.06

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)		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,360.54	0.00	0.00	7,360.54	0.00	0.00	0.00	0.00	0.00	0.00	
8,110.73	90.02	0.06	7,838.00	477.66	0.47	12.00	12.00	0.01	0.06	
17,978.18	90.02	0.06	7,834.00	10,345.10	10.20	0.00	0.00	0.00	0.00	PBHL (RFC #11H/L1)



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Site:	Roadrunner Federal Com #11H	North Reference:	Grid
Well:	Roadrunner Federal Com #11H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral #1		
Design:	Design #1		

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)
0.00	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
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



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Well:	Roadrunner Federal Com #11H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral #1		
Design:	Design #1		

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)
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
7,360.54	0.00	0.00	7,360.54	0.00	0.00	0.00	0.00	0.00	0.00
Start DLS 12.00 TFO 0.06									
7,375.00	1.74	0.06	7,375.00	0.22	0.00	0.22	12.00	12.00	0.00
7,400.00	4.74	0.06	7,399.96	1.63	0.00	1.63	12.00	12.00	0.00
7,425.00	7.74	0.06	7,424.80	4.34	0.00	4.34	12.00	12.00	0.00
7,450.00	10.74	0.06	7,449.48	8.36	0.01	8.36	12.00	12.00	0.00
7,475.00	13.74	0.06	7,473.91	13.65	0.01	13.65	12.00	12.00	0.00
7,500.00	16.74	0.06	7,498.03	20.22	0.02	20.22	12.00	12.00	0.00
7,525.00	19.74	0.06	7,521.77	28.04	0.03	28.04	12.00	12.00	0.00
7,550.00	22.74	0.06	7,545.07	37.10	0.04	37.10	12.00	12.00	0.00
7,575.00	25.74	0.06	7,567.86	47.36	0.05	47.36	12.00	12.00	0.00
7,600.00	28.74	0.06	7,590.09	58.80	0.06	58.80	12.00	12.00	0.00
7,625.00	31.74	0.06	7,611.68	71.39	0.07	71.39	12.00	12.00	0.00
7,650.00	34.74	0.06	7,632.59	85.09	0.08	85.09	12.00	12.00	0.00
7,675.00	37.74	0.06	7,652.75	99.86	0.10	99.86	12.00	12.00	0.00
7,700.00	40.74	0.06	7,672.12	115.67	0.11	115.67	12.00	12.00	0.00
7,725.00	43.74	0.06	7,690.62	132.48	0.13	132.48	12.00	12.00	0.00
7,750.00	46.74	0.06	7,708.23	150.22	0.15	150.22	12.00	12.00	0.00
7,775.00	49.74	0.06	7,724.88	168.87	0.17	168.87	12.00	12.00	0.00
7,800.00	52.74	0.06	7,740.53	188.36	0.19	188.36	12.00	12.00	0.00
7,825.00	55.74	0.06	7,755.14	208.64	0.21	208.64	12.00	12.00	0.00
7,850.00	58.74	0.06	7,768.67	229.66	0.23	229.66	12.00	12.00	0.00
7,875.00	61.74	0.06	7,781.08	251.36	0.25	251.36	12.00	12.00	0.00
7,900.00	64.74	0.06	7,792.33	273.68	0.27	273.68	12.00	12.00	0.00
7,925.00	67.74	0.06	7,802.41	296.56	0.29	296.56	12.00	12.00	0.00
7,950.00	70.74	0.06	7,811.27	319.93	0.32	319.93	12.00	12.00	0.00
7,975.00	73.74	0.06	7,818.90	343.74	0.34	343.74	12.00	12.00	0.00
8,000.00	76.74	0.06	7,825.27	367.91	0.36	367.91	12.00	12.00	0.00
8,025.00	79.74	0.06	7,830.36	392.38	0.39	392.38	12.00	12.00	0.00
8,050.00	82.74	0.06	7,834.17	417.09	0.41	417.09	12.00	12.00	0.00
8,075.00	85.74	0.06	7,836.68	441.96	0.44	441.96	12.00	12.00	0.00
8,100.00	88.74	0.06	7,837.89	466.93	0.46	466.93	12.00	12.00	0.00
8,110.73	90.02	0.06	7,838.00	477.66	0.47	477.66	12.00	12.00	0.00



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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)
Start 9867.45 hold at 8110.73 MD									
8,200.00	90.02	0.06	7,837.97	566.92	0.56	566.92	0.00	0.00	0.00
8,300.00	90.02	0.06	7,837.93	666.92	0.66	666.92	0.00	0.00	0.00
8,400.00	90.02	0.06	7,837.89	766.92	0.76	766.92	0.00	0.00	0.00
8,500.00	90.02	0.06	7,837.85	866.92	0.85	866.92	0.00	0.00	0.00
8,600.00	90.02	0.06	7,837.81	966.92	0.95	966.92	0.00	0.00	0.00
8,700.00	90.02	0.06	7,837.77	1,066.92	1.05	1,066.92	0.00	0.00	0.00
8,800.00	90.02	0.06	7,837.73	1,166.92	1.15	1,166.92	0.00	0.00	0.00
8,900.00	90.02	0.06	7,837.68	1,266.92	1.25	1,266.92	0.00	0.00	0.00
9,000.00	90.02	0.06	7,837.64	1,366.92	1.35	1,366.92	0.00	0.00	0.00
9,100.00	90.02	0.06	7,837.60	1,466.92	1.45	1,466.92	0.00	0.00	0.00
9,200.00	90.02	0.06	7,837.56	1,566.92	1.54	1,566.92	0.00	0.00	0.00
9,300.00	90.02	0.06	7,837.52	1,666.92	1.64	1,666.92	0.00	0.00	0.00
9,400.00	90.02	0.06	7,837.48	1,766.92	1.74	1,766.92	0.00	0.00	0.00
9,500.00	90.02	0.06	7,837.44	1,866.92	1.84	1,866.92	0.00	0.00	0.00
9,600.00	90.02	0.06	7,837.40	1,966.92	1.94	1,966.92	0.00	0.00	0.00
9,700.00	90.02	0.06	7,837.36	2,066.92	2.04	2,066.92	0.00	0.00	0.00
9,800.00	90.02	0.06	7,837.32	2,166.92	2.14	2,166.92	0.00	0.00	0.00
9,900.00	90.02	0.06	7,837.28	2,266.92	2.24	2,266.92	0.00	0.00	0.00
10,000.00	90.02	0.06	7,837.24	2,366.92	2.33	2,366.92	0.00	0.00	0.00
10,100.00	90.02	0.06	7,837.20	2,466.92	2.43	2,466.92	0.00	0.00	0.00
10,200.00	90.02	0.06	7,837.16	2,566.92	2.53	2,566.92	0.00	0.00	0.00
10,300.00	90.02	0.06	7,837.12	2,666.92	2.63	2,666.92	0.00	0.00	0.00
10,400.00	90.02	0.06	7,837.08	2,766.92	2.73	2,766.92	0.00	0.00	0.00
10,500.00	90.02	0.06	7,837.04	2,866.92	2.83	2,866.92	0.00	0.00	0.00
10,600.00	90.02	0.06	7,836.99	2,966.92	2.93	2,966.92	0.00	0.00	0.00
10,700.00	90.02	0.06	7,836.95	3,066.92	3.02	3,066.92	0.00	0.00	0.00
10,800.00	90.02	0.06	7,836.91	3,166.92	3.12	3,166.92	0.00	0.00	0.00
10,900.00	90.02	0.06	7,836.87	3,266.92	3.22	3,266.92	0.00	0.00	0.00
11,000.00	90.02	0.06	7,836.83	3,366.92	3.32	3,366.92	0.00	0.00	0.00
11,100.00	90.02	0.06	7,836.79	3,466.92	3.42	3,466.92	0.00	0.00	0.00
11,200.00	90.02	0.06	7,836.75	3,566.92	3.52	3,566.92	0.00	0.00	0.00
11,300.00	90.02	0.06	7,836.71	3,666.92	3.62	3,666.92	0.00	0.00	0.00
11,400.00	90.02	0.06	7,836.67	3,766.92	3.71	3,766.92	0.00	0.00	0.00
11,500.00	90.02	0.06	7,836.63	3,866.92	3.81	3,866.92	0.00	0.00	0.00
11,600.00	90.02	0.06	7,836.59	3,966.92	3.91	3,966.92	0.00	0.00	0.00
11,700.00	90.02	0.06	7,836.55	4,066.92	4.01	4,066.92	0.00	0.00	0.00
11,800.00	90.02	0.06	7,836.51	4,166.92	4.11	4,166.92	0.00	0.00	0.00
11,900.00	90.02	0.06	7,836.47	4,266.92	4.21	4,266.92	0.00	0.00	0.00
12,000.00	90.02	0.06	7,836.43	4,366.92	4.31	4,366.92	0.00	0.00	0.00
12,100.00	90.02	0.06	7,836.39	4,466.92	4.40	4,466.92	0.00	0.00	0.00
12,200.00	90.02	0.06	7,836.35	4,566.92	4.50	4,566.92	0.00	0.00	0.00
12,300.00	90.02	0.06	7,836.30	4,666.92	4.60	4,666.92	0.00	0.00	0.00
12,400.00	90.02	0.06	7,836.26	4,766.92	4.70	4,766.92	0.00	0.00	0.00
12,500.00	90.02	0.06	7,836.22	4,866.92	4.80	4,866.92	0.00	0.00	0.00
12,600.00	90.02	0.06	7,836.18	4,966.92	4.90	4,966.92	0.00	0.00	0.00
12,700.00	90.02	0.06	7,836.14	5,066.92	5.00	5,066.92	0.00	0.00	0.00
12,800.00	90.02	0.06	7,836.10	5,166.92	5.09	5,166.92	0.00	0.00	0.00
12,900.00	90.02	0.06	7,836.06	5,266.92	5.19	5,266.92	0.00	0.00	0.00
13,000.00	90.02	0.06	7,836.02	5,366.92	5.29	5,366.92	0.00	0.00	0.00
13,100.00	90.02	0.06	7,835.98	5,466.92	5.39	5,466.92	0.00	0.00	0.00
13,200.00	90.02	0.06	7,835.94	5,566.92	5.49	5,566.92	0.00	0.00	0.00
13,300.00	90.02	0.06	7,835.90	5,666.92	5.59	5,666.92	0.00	0.00	0.00
13,400.00	90.02	0.06	7,835.86	5,766.92	5.69	5,766.92	0.00	0.00	0.00



TDS
Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Roadrunner Federal Com #11H
Company:	COG Operating LLC	TVD Reference:	KB @ 3275.20usft (Latshaw 44)
Project:	Eddy County, NM (NAD-27 2015)	MD Reference:	KB @ 3275.20usft (Latshaw 44)
Site:	Roadrunner Federal Com #11H	North Reference:	Grid
Well:	Roadrunner Federal Com #11H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral #1		
Design:	Design #1		

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)
13,500.00	90.02	0.06	7,835.82	5,866.92	5.78	5,866.92	0.00	0.00	0.00
13,600.00	90.02	0.06	7,835.78	5,966.92	5.88	5,966.92	0.00	0.00	0.00
13,700.00	90.02	0.06	7,835.74	6,066.92	5.98	6,066.92	0.00	0.00	0.00
13,800.00	90.02	0.06	7,835.70	6,166.92	6.08	6,166.92	0.00	0.00	0.00
13,900.00	90.02	0.06	7,835.66	6,266.92	6.18	6,266.92	0.00	0.00	0.00
14,000.00	90.02	0.06	7,835.61	6,366.92	6.28	6,366.92	0.00	0.00	0.00
14,100.00	90.02	0.06	7,835.57	6,466.92	6.38	6,466.92	0.00	0.00	0.00
14,200.00	90.02	0.06	7,835.53	6,566.92	6.47	6,566.92	0.00	0.00	0.00
14,300.00	90.02	0.06	7,835.49	6,666.92	6.57	6,666.92	0.00	0.00	0.00
14,400.00	90.02	0.06	7,835.45	6,766.92	6.67	6,766.92	0.00	0.00	0.00
14,500.00	90.02	0.06	7,835.41	6,866.92	6.77	6,866.92	0.00	0.00	0.00
14,600.00	90.02	0.06	7,835.37	6,966.92	6.87	6,966.92	0.00	0.00	0.00
14,700.00	90.02	0.06	7,835.33	7,066.92	6.97	7,066.92	0.00	0.00	0.00
14,800.00	90.02	0.06	7,835.29	7,166.92	7.07	7,166.92	0.00	0.00	0.00
14,900.00	90.02	0.06	7,835.25	7,266.92	7.16	7,266.92	0.00	0.00	0.00
15,000.00	90.02	0.06	7,835.21	7,366.92	7.26	7,366.92	0.00	0.00	0.00
15,100.00	90.02	0.06	7,835.17	7,466.92	7.36	7,466.92	0.00	0.00	0.00
15,200.00	90.02	0.06	7,835.13	7,566.92	7.46	7,566.92	0.00	0.00	0.00
15,300.00	90.02	0.06	7,835.09	7,666.92	7.56	7,666.92	0.00	0.00	0.00
15,400.00	90.02	0.06	7,835.05	7,766.92	7.66	7,766.92	0.00	0.00	0.00
15,500.00	90.02	0.06	7,835.01	7,866.92	7.76	7,866.92	0.00	0.00	0.00
15,600.00	90.02	0.06	7,834.97	7,966.92	7.86	7,966.92	0.00	0.00	0.00
15,700.00	90.02	0.06	7,834.92	8,066.92	7.95	8,066.92	0.00	0.00	0.00
15,800.00	90.02	0.06	7,834.88	8,166.92	8.05	8,166.92	0.00	0.00	0.00
15,900.00	90.02	0.06	7,834.84	8,266.92	8.15	8,266.92	0.00	0.00	0.00
16,000.00	90.02	0.06	7,834.80	8,366.92	8.25	8,366.92	0.00	0.00	0.00
16,100.00	90.02	0.06	7,834.76	8,466.92	8.35	8,466.92	0.00	0.00	0.00
16,200.00	90.02	0.06	7,834.72	8,566.92	8.45	8,566.92	0.00	0.00	0.00
16,300.00	90.02	0.06	7,834.68	8,666.92	8.55	8,666.92	0.00	0.00	0.00
16,400.00	90.02	0.06	7,834.64	8,766.92	8.64	8,766.92	0.00	0.00	0.00
16,500.00	90.02	0.06	7,834.60	8,866.92	8.74	8,866.92	0.00	0.00	0.00
16,600.00	90.02	0.06	7,834.56	8,966.92	8.84	8,966.92	0.00	0.00	0.00
16,700.00	90.02	0.06	7,834.52	9,066.92	8.94	9,066.92	0.00	0.00	0.00
16,800.00	90.02	0.06	7,834.48	9,166.92	9.04	9,166.92	0.00	0.00	0.00
16,900.00	90.02	0.06	7,834.44	9,266.92	9.14	9,266.92	0.00	0.00	0.00
17,000.00	90.02	0.06	7,834.40	9,366.92	9.24	9,366.92	0.00	0.00	0.00
17,100.00	90.02	0.06	7,834.36	9,466.92	9.33	9,466.92	0.00	0.00	0.00
17,200.00	90.02	0.06	7,834.32	9,566.92	9.43	9,566.92	0.00	0.00	0.00
17,300.00	90.02	0.06	7,834.28	9,666.92	9.53	9,666.92	0.00	0.00	0.00
17,400.00	90.02	0.06	7,834.23	9,766.92	9.63	9,766.92	0.00	0.00	0.00
17,500.00	90.02	0.06	7,834.19	9,866.92	9.73	9,866.92	0.00	0.00	0.00
17,600.00	90.02	0.06	7,834.15	9,966.92	9.83	9,966.92	0.00	0.00	0.00
17,700.00	90.02	0.06	7,834.11	10,066.92	9.93	10,066.92	0.00	0.00	0.00
17,800.00	90.02	0.06	7,834.07	10,166.92	10.02	10,166.92	0.00	0.00	0.00
17,900.00	90.02	0.06	7,834.03	10,266.92	10.12	10,266.92	0.00	0.00	0.00
17,978.18	90.02	0.06	7,834.00	10,345.10	10.20	10,345.11	0.00	0.00	0.00
TD at 17978.18									



TDS
Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Roadrunner Federal Com #11H
Company:	COG Operating LLC	TVD Reference:	KB @ 3275.20usft (Latshaw 44)
Project:	Eddy County, NM (NAD-27 2015)	MD Reference:	KB @ 3275.20usft (Latshaw 44)
Site:	Roadrunner Federal Com #11H	North Reference:	Grid
Well:	Roadrunner Federal Com #11H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral #1		
Design:	Design #1		

Design Targets									
Target Name	Dip Angle	Dip Dir	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
KOP (RFC #11H/L1 Des	0.00	0.00	7,360.54	0.00	0.00	397,906.10	529,335.90	32° 5' 38.128 N	104° 14' 18.971 W
- plan hits target center									
- Point									
PBHL (RFC #11H/L1)	-0.02	0.06	7,834.00	10,345.10	10.20	408,251.20	529,346.10	32° 7' 20.509 N	104° 14' 18.747 W
- plan hits target center									
- Rectangle (sides W100.00 H10,345.11 D0.00)									
EOC (RFC #11H/L1 Des	0.00	0.00	7,838.00	477.65	0.47	398,383.75	529,336.37	32° 5' 42.855 N	104° 14' 18.961 W
- plan hits target center									
- Point									

Plan Annotations				
Measured	Vertical	Local Coordinates		
Depth	Depth	+N/-S	+E/-W	Comment
(usft)	(usft)	(usft)	(usft)	
7,360.54	7,360.54	0.00	0.00	Start DLS 12.00 TFO 0.06
8,110.73	7,838.00	477.66	0.47	Start 9867.45 hold at 8110.73 MD
17,978.18	7,834.00	10,345.10	10.20	TD at 17978.18



COG Operating LLC

Eddy County, NM (NAD-27 2015)

Roadrunner Federal Com #11H

Roadrunner Federal Com #11H

Lateral #1

Design #1

Anticollision Report

21 August, 2016





TDS
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Roadrunner Federal Com #11H
Project:	Eddy County, NM (NAD-27 2015)	TVD Reference:	KB @ 3275.20usft (Latshaw 44)
Reference Site:	Roadrunner Federal Com #11H	MD Reference:	KB @ 3275.20usft (Latshaw 44)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Roadrunner Federal Com #11H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Lateral #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Reference	Design #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.98 usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	8/21/2016		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	17,978.18	Design #1 (Lateral #1)	MWD	MWD - Standard	

Summary							
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning	
Offset Well - Wellbore - Design							
Roadrunner Federal Com #1H							
Roadrunner Federal Com #1H - Lateral #1 - Design #3	6,908.87	6,909.07	29.90	-0.88	0.971	Level 1, CC, ES, SF	

Offset Design	Roadrunner Federal Com #1H - Roadrunner Federal Com #1H - Lateral #1 - Design #3											Offset Site Error:	0.00 usft
Survey Program:	D-MWD											Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Warning					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.20	0.20	0.00	0.00	-90.00	0.00	-29.90	29.90				
100.00	100.00	100.20	100.20	0.08	0.08	-90.00	0.00	-29.90	29.90	29.73	0.17	176.898	
200.00	200.00	200.20	200.20	0.31	0.31	-90.00	0.00	-29.90	29.90	29.28	0.52	48.338	
300.00	300.00	300.20	300.20	0.53	0.53	-90.00	0.00	-29.90	29.90	28.83	1.07	27.994	
400.00	400.00	400.20	400.20	0.76	0.76	-90.00	0.00	-29.90	29.90	28.38	1.52	19.702	
500.00	500.00	500.20	500.20	0.98	0.98	-90.00	0.00	-29.90	29.90	27.93	1.97	15.200	
600.00	600.00	600.20	600.20	1.21	1.21	-90.00	0.00	-29.90	29.90	27.48	2.42	12.372	
700.00	700.00	700.20	700.20	1.43	1.43	-90.00	0.00	-29.90	29.90	27.03	2.87	10.432	
800.00	800.00	800.20	800.20	1.66	1.66	-90.00	0.00	-29.90	29.90	26.58	3.32	9.018	
900.00	900.00	900.20	900.20	1.88	1.88	-90.00	0.00	-29.90	29.90	26.13	3.77	7.941	
1,000.00	1,000.00	1,000.20	1,000.20	2.11	2.11	-90.00	0.00	-29.90	29.90	25.68	4.21	7.094	
1,100.00	1,100.00	1,100.20	1,100.20	2.33	2.33	-90.00	0.00	-29.90	29.90	25.24	4.66	6.410	
1,200.00	1,200.00	1,200.20	1,200.20	2.56	2.56	-90.00	0.00	-29.90	29.90	24.79	5.11	5.847	
1,300.00	1,300.00	1,300.20	1,300.20	2.78	2.78	-90.00	0.00	-29.90	29.90	24.34	5.56	5.374	
1,400.00	1,400.00	1,400.20	1,400.20	3.01	3.01	-90.00	0.00	-29.90	29.90	23.89	6.01	4.973	
1,500.00	1,500.00	1,500.20	1,500.20	3.23	3.23	-90.00	0.00	-29.90	29.90	23.44	6.46	4.627	
1,600.00	1,600.00	1,600.20	1,600.20	3.46	3.46	-90.00	0.00	-29.90	29.90	22.99	6.91	4.326	
1,700.00	1,700.00	1,700.20	1,700.20	3.68	3.68	-90.00	0.00	-29.90	29.90	22.54	7.36	4.062	
1,800.00	1,800.00	1,800.20	1,800.20	3.91	3.91	-90.00	0.00	-29.90	29.90	22.09	7.81	3.828	
1,900.00	1,900.00	1,900.20	1,900.20	4.13	4.13	-90.00	0.00	-29.90	29.90	21.64	8.26	3.620	
2,000.00	2,000.00	2,000.20	2,000.20	4.35	4.36	-90.00	0.00	-29.90	29.90	21.19	8.71	3.433	
2,100.00	2,100.00	2,100.20	2,100.20	4.58	4.58	-90.00	0.00	-29.90	29.90	20.74	9.16	3.264	
2,200.00	2,200.00	2,200.20	2,200.20	4.80	4.80	-90.00	0.00	-29.90	29.90	20.29	9.61	3.112	
2,300.00	2,300.00	2,300.20	2,300.20	5.03	5.03	-90.00	0.00	-29.90	29.90	19.84	10.06	2.973	
2,400.00	2,400.00	2,400.20	2,400.20	5.25	5.25	-90.00	0.00	-29.90	29.90	19.39	10.51	2.845	
2,500.00	2,500.00	2,500.20	2,500.20	5.48	5.48	-90.00	0.00	-29.90	29.90	18.94	10.96	2.729	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



TDS
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Roadrunner Federal Com #11H
Project:	Eddy County, NM (NAD-27 2015)	TVD Reference:	KB @ 3275.20usft (Latshaw 44)
Reference Site:	Roadrunner Federal Com #11H	MD Reference:	KB @ 3275.20usft (Latshaw 44)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Roadrunner Federal Com #11H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	Lateral #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Roadrunner Federal Com #1H - Roadrunner Federal Com #1H - Lateral #1 - Design #3													Offset Site Error:	0.00 usft
Survey Program: C-MWD													Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Semi Major Axis Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
2,600.00	2,600.00	2,600.20	2,600.20	5.70	5.70	-90.00	0.00	-29.90	29.90	18.49	11.41	2.621		
2,700.00	2,700.00	2,700.20	2,700.20	5.93	5.93	-90.00	0.00	-29.90	29.90	18.04	11.86	2.522		
2,800.00	2,800.00	2,800.20	2,800.20	6.15	6.15	-90.00	0.00	-29.90	29.90	17.59	12.31	2.430		
2,900.00	2,900.00	2,900.20	2,900.20	6.38	6.38	-90.00	0.00	-29.90	29.90	17.14	12.76	2.344		
3,000.00	3,000.00	3,000.20	3,000.20	6.60	6.60	-90.00	0.00	-29.90	29.90	16.69	13.21	2.254		
3,100.00	3,100.00	3,100.20	3,100.20	6.83	6.83	-90.00	0.00	-29.90	29.90	16.25	13.65	2.190		
3,200.00	3,200.00	3,200.20	3,200.20	7.05	7.05	-90.00	0.00	-29.90	29.90	15.80	14.10	2.120		
3,300.00	3,300.00	3,300.20	3,300.20	7.28	7.28	-90.00	0.00	-29.90	29.90	15.35	14.55	2.054		
3,400.00	3,400.00	3,400.20	3,400.20	7.50	7.50	-90.00	0.00	-29.90	29.90	14.90	15.00	1.993		
3,500.00	3,500.00	3,500.20	3,500.20	7.73	7.73	-90.00	0.00	-29.90	29.90	14.45	15.45	1.935		
3,600.00	3,600.00	3,600.20	3,600.20	7.95	7.95	-90.00	0.00	-29.90	29.90	14.00	15.90	1.880		
3,700.00	3,700.00	3,700.20	3,700.20	8.18	8.18	-90.00	0.00	-29.90	29.90	13.55	16.35	1.829		
3,800.00	3,800.00	3,800.20	3,800.20	8.40	8.40	-90.00	0.00	-29.90	29.90	13.10	16.80	1.780		
3,900.00	3,900.00	3,900.20	3,900.20	8.63	8.63	-90.00	0.00	-29.90	29.90	12.65	17.25	1.733		
4,000.00	4,000.00	4,000.20	4,000.20	8.85	8.85	-90.00	0.00	-29.90	29.90	12.20	17.70	1.689		
4,100.00	4,100.00	4,100.20	4,100.20	9.07	9.08	-90.00	0.00	-29.90	29.90	11.75	18.15	1.647		
4,200.00	4,200.00	4,200.20	4,200.20	9.30	9.30	-90.00	0.00	-29.90	29.90	11.30	18.60	1.608		
4,300.00	4,300.00	4,300.20	4,300.20	9.52	9.52	-90.00	0.00	-29.90	29.90	10.85	19.05	1.570		
4,400.00	4,400.00	4,400.20	4,400.20	9.75	9.75	-90.00	0.00	-29.90	29.90	10.40	19.50	1.533		
4,500.00	4,500.00	4,500.20	4,500.20	9.97	9.97	-90.00	0.00	-29.90	29.90	9.95	19.95	1.499 Level 3		
4,600.00	4,600.00	4,600.20	4,600.20	10.20	10.20	-90.00	0.00	-29.90	29.90	9.50	20.40	1.466 Level 3		
4,700.00	4,700.00	4,700.20	4,700.20	10.42	10.42	-90.00	0.00	-29.90	29.90	9.05	20.85	1.434 Level 3		
4,800.00	4,800.00	4,800.20	4,800.20	10.65	10.65	-90.00	0.00	-29.90	29.90	8.60	21.30	1.404 Level 3		
4,900.00	4,900.00	4,900.20	4,900.20	10.87	10.87	-90.00	0.00	-29.90	29.90	8.15	21.75	1.375 Level 3		
5,000.00	5,000.00	5,000.20	5,000.20	11.10	11.10	-90.00	0.00	-29.90	29.90	7.70	22.20	1.347 Level 3		
5,100.00	5,100.00	5,100.20	5,100.20	11.32	11.32	-90.00	0.00	-29.90	29.90	7.25	22.65	1.320 Level 3		
5,200.00	5,200.00	5,200.20	5,200.20	11.55	11.55	-90.00	0.00	-29.90	29.90	6.80	23.10	1.295 Level 3		
5,300.00	5,300.00	5,300.20	5,300.20	11.77	11.77	-90.00	0.00	-29.90	29.90	6.36	23.54	1.270 Level 3		
5,400.00	5,400.00	5,400.20	5,400.20	12.00	12.00	-90.00	0.00	-29.90	29.90	5.91	23.99	1.246 Level 2		
5,500.00	5,500.00	5,500.20	5,500.20	12.22	12.22	-90.00	0.00	-29.90	29.90	5.46	24.44	1.223 Level 2		
5,600.00	5,600.00	5,600.20	5,600.20	12.45	12.45	-90.00	0.00	-29.90	29.90	5.01	24.89	1.201 Level 2		
5,700.00	5,700.00	5,700.20	5,700.20	12.67	12.67	-90.00	0.00	-29.90	29.90	4.56	25.34	1.180 Level 2		
5,800.00	5,800.00	5,800.20	5,800.20	12.90	12.90	-90.00	0.00	-29.90	29.90	4.11	25.79	1.159 Level 2		
5,900.00	5,900.00	5,900.20	5,900.20	13.12	13.12	-90.00	0.00	-29.90	29.90	3.66	26.24	1.139 Level 2		
6,000.00	6,000.00	6,000.20	6,000.20	13.35	13.35	-90.00	0.00	-29.90	29.90	3.21	26.69	1.120 Level 2		
6,100.00	6,100.00	6,100.20	6,100.20	13.57	13.57	-90.00	0.00	-29.90	29.90	2.76	27.14	1.102 Level 2		
6,200.00	6,200.00	6,200.20	6,200.20	13.80	13.80	-90.00	0.00	-29.90	29.90	2.31	27.59	1.084 Level 2		
6,300.00	6,300.00	6,300.20	6,300.20	14.02	14.02	-90.00	0.00	-29.90	29.90	1.86	28.04	1.066 Level 2		
6,400.00	6,400.00	6,400.20	6,400.20	14.24	14.24	-90.00	0.00	-29.90	29.90	1.41	28.49	1.050 Level 2		
6,500.00	6,500.00	6,500.20	6,500.20	14.47	14.47	-90.00	0.00	-29.90	29.90	0.96	28.94	1.033 Level 2		
6,600.00	6,600.00	6,600.20	6,600.20	14.69	14.69	-90.00	0.00	-29.90	29.90	0.51	29.39	1.017 Level 2		
6,700.00	6,700.00	6,700.20	6,700.20	14.92	14.92	-90.00	0.00	-29.90	29.90	0.06	29.84	1.002 Level 2		
6,800.00	6,800.00	6,800.20	6,800.20	15.14	15.14	-90.00	0.00	-29.90	29.90	-0.39	30.29	0.987 Level 1		
6,900.00	6,900.00	6,900.20	6,900.20	15.37	15.37	-89.99	0.00	-29.90	29.90	-0.84	30.74	0.973 Level 1		
6,908.87	6,908.87	6,909.07	6,909.07	15.39	15.39	-89.78	0.12	-29.90	29.90	-0.88	30.78	0.971 Level 1, CC, ES, SF		
7,000.00	7,000.00	6,998.73	6,998.00	15.59	15.59	-70.68	10.47	-29.86	31.72	0.61	31.11	1.020 Level 2		
7,100.00	7,100.00	7,089.39	7,084.35	15.82	15.80	-38.33	37.63	-29.75	50.53	20.38	30.14	1.676		
7,200.00	7,200.00	7,167.63	7,153.61	16.04	15.97	-21.85	73.84	-29.61	92.19	64.17	28.02	3.290		
7,300.00	7,300.00	7,232.53	7,205.96	16.27	16.13	-14.72	112.12	-29.47	149.40	123.56	25.84	5.781		
7,360.54	7,360.54	7,265.85	7,230.68	16.40	16.23	-12.33	134.44	-29.38	189.35	164.73	24.62	7.692		
7,375.00	7,375.00	7,275.00	7,237.19	16.44	16.26	-11.52	140.87	-29.35	199.22	174.72	24.50	8.131		
7,400.00	7,399.96	7,286.19	7,244.99	16.49	16.29	-10.46	148.90	-29.32	215.93	192.10	23.83	9.062		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



TDS
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Roadrunner Federal Com #11H
Project:	Eddy County, NM (NAD-27 2015)	TVD Reference:	KB @ 3275.20usft (Latshaw 44)
Reference Site:	Roadrunner Federal Com #11H	MD Reference:	KB @ 3275.20usft (Latshaw 44)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Roadrunner Federal Com #11H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Lateral #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Roadrunner Federal Com #1H - Roadrunner Federal Com #1H - Lateral #1 - Design #3														Offset Site Error:	0.00 usft
Survey Program: D-MWD														Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre N-S (usft)	E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
7,425.00	7,424.80	7,300.00	7,254.34	16.55	16.34	-9.48	159.06	-29.28	232.20	208.80	23.40	9.923			
7,450.00	7,449.48	7,311.91	7,262.18	16.61	16.38	-8.72	168.03	-29.25	248.01	225.22	22.79	10.881			
7,475.00	7,473.91	7,325.00	7,270.52	16.66	16.43	-8.04	178.11	-29.21	263.34	241.05	22.29	11.816			
7,500.00	7,499.03	7,337.57	7,278.27	16.72	16.48	-7.47	188.01	-29.17	278.18	256.45	21.73	12.802			
7,525.00	7,521.77	7,350.00	7,285.68	16.78	16.53	-6.97	197.99	-29.13	292.51	271.36	21.15	13.826			
7,550.00	7,545.07	7,363.18	7,293.24	16.83	16.59	-6.54	208.78	-29.09	306.33	295.69	20.64	14.843			
7,575.00	7,567.86	7,375.00	7,299.77	16.89	16.64	-6.17	218.63	-29.05	319.63	299.61	20.01	15.970			
7,600.00	7,599.08	7,388.74	7,307.06	16.94	16.70	-5.83	230.29	-29.01	332.37	312.85	19.53	17.021			
7,625.00	7,611.68	7,400.00	7,312.77	16.99	16.75	-5.55	239.99	-28.97	344.58	325.72	18.86	18.268			
7,650.00	7,632.59	7,414.28	7,319.68	17.04	16.82	-5.28	252.48	-28.92	356.23	337.82	18.41	19.354			
7,675.00	7,652.75	7,425.00	7,324.63	17.11	16.87	-5.06	261.99	-28.88	367.32	349.60	17.71	20.737			
7,700.00	7,672.12	7,439.78	7,331.10	17.17	16.95	-4.84	275.28	-28.83	377.82	360.53	17.29	21.855			
7,725.00	7,690.62	7,450.00	7,335.32	17.25	17.01	-4.67	284.59	-28.80	387.76	371.18	16.58	23.388			
7,750.00	7,708.23	7,465.26	7,341.26	17.32	17.09	-4.50	298.64	-28.74	397.08	380.89	16.19	24.528			
7,775.00	7,724.88	7,475.00	7,344.82	17.41	17.15	-4.37	307.71	-28.71	405.84	390.36	15.48	26.216			
7,800.00	7,740.53	7,480.72	7,350.17	17.50	17.24	-4.23	322.49	-28.65	413.96	398.83	15.13	27.361			
7,825.00	7,755.14	7,500.00	7,353.09	17.60	17.30	-4.12	331.30	-28.62	421.52	407.08	14.44	29.191			
7,850.00	7,768.67	7,516.17	7,357.78	17.70	17.40	-4.01	346.77	-28.56	428.41	414.27	14.14	30.304			
7,875.00	7,781.08	7,525.00	7,360.12	17.82	17.46	-3.93	355.29	-28.52	434.74	421.25	13.49	32.230			
7,900.00	7,792.33	7,541.60	7,364.09	17.94	17.57	-3.84	371.40	-28.46	440.39	427.14	13.24	33.254			
7,925.00	7,802.41	7,550.00	7,365.88	18.07	17.63	-3.78	379.61	-28.43	445.48	432.82	12.66	35.180			
7,950.00	7,811.27	7,567.02	7,369.07	18.21	17.75	-3.72	396.33	-28.36	449.86	437.38	12.49	36.031			
7,975.00	7,818.90	7,575.00	7,370.36	18.36	17.81	-3.67	404.20	-28.33	453.70	441.69	12.00	37.796			
8,000.00	7,825.27	7,592.44	7,372.72	18.51	17.94	-3.62	421.48	-28.27	456.80	444.90	11.90	38.373			
8,025.00	7,830.36	7,600.00	7,373.55	18.68	18.00	-3.59	429.00	-28.24	459.37	447.82	11.55	39.757			
8,050.00	7,834.17	7,617.85	7,375.03	18.85	18.13	-3.56	446.78	-28.17	461.19	449.65	11.54	39.965			
8,075.00	7,838.68	7,625.00	7,375.43	19.03	18.19	-3.55	453.92	-28.14	462.49	451.14	11.35	40.744			
8,100.00	7,837.89	7,643.25	7,375.99	19.22	18.34	-3.53	472.16	-28.07	463.01	451.59	11.42	40.533			
8,110.73	7,838.00	7,652.28	7,376.00	19.30	18.41	-3.53	481.19	-28.03	463.10	451.62	11.48	40.353			
8,114.46	7,838.00	7,652.28	7,376.00	19.33	18.41	-3.53	481.19	-28.03	463.08	451.62	11.46	40.418			
8,200.00	7,837.87	7,734.51	7,375.36	20.05	19.15	-3.50	563.42	-27.72	463.69	451.59	12.09	38.339			
8,300.00	7,837.93	7,834.51	7,374.58	21.01	20.15	-3.45	663.41	-27.33	464.41	451.42	12.99	35.760			
8,400.00	7,837.89	7,934.51	7,373.80	22.08	21.25	-3.41	763.41	-26.94	465.13	451.15	13.98	33.274			
8,500.00	7,837.85	8,034.50	7,373.02	23.24	22.45	-3.37	863.40	-26.55	465.85	450.80	15.05	30.863			
8,600.00	7,837.81	8,134.50	7,372.24	24.48	23.74	-3.33	963.39	-26.17	466.57	450.39	16.18	28.828			
8,700.00	7,837.77	8,234.50	7,371.46	25.80	25.08	-3.29	1,063.39	-25.78	467.29	449.92	17.37	26.902			
8,800.00	7,837.73	8,334.49	7,370.68	27.17	26.49	-3.25	1,163.38	-25.39	468.02	449.42	18.60	25.166			
8,900.00	7,837.68	8,434.49	7,369.89	28.60	27.95	-3.21	1,263.37	-25.00	468.74	448.88	19.86	23.605			
9,000.00	7,837.64	8,534.49	7,369.11	30.08	29.44	-3.17	1,363.37	-24.62	469.46	448.32	21.15	22.202			
9,100.00	7,837.60	8,634.49	7,368.33	31.57	30.98	-3.13	1,463.36	-24.23	470.19	447.73	22.46	20.939			
9,200.00	7,837.56	8,734.48	7,367.55	33.11	32.54	-3.09	1,563.35	-23.84	470.91	447.12	23.78	19.800			
9,300.00	7,837.52	8,834.48	7,366.77	34.67	34.13	-3.05	1,663.34	-23.45	471.63	446.50	25.13	18.769			
9,400.00	7,837.48	8,934.48	7,365.99	36.26	35.74	-3.01	1,763.34	-23.06	472.36	445.87	26.49	17.834			
9,500.00	7,837.44	9,034.47	7,365.21	37.88	37.37	-2.97	1,863.33	-22.68	473.08	445.22	27.85	16.984			
9,600.00	7,837.40	9,134.47	7,364.43	39.51	39.02	-2.93	1,963.32	-22.29	473.80	444.57	29.23	16.208			
9,700.00	7,837.36	9,234.47	7,363.65	41.16	40.69	-2.89	2,063.32	-21.90	474.53	443.91	30.62	15.497			
9,800.00	7,837.32	9,334.46	7,362.87	42.82	42.36	-2.85	2,163.31	-21.51	475.25	443.24	32.01	14.845			
9,900.00	7,837.28	9,434.46	7,362.09	44.49	44.05	-2.81	2,263.30	-21.13	475.98	442.56	33.41	14.245			
10,000.00	7,837.24	9,534.46	7,361.31	46.18	45.75	-2.77	2,363.30	-20.74	476.70	441.88	34.82	13.691			
10,100.00	7,837.20	9,634.45	7,360.53	47.88	47.46	-2.73	2,463.29	-20.35	477.43	441.20	36.23	13.178			
10,200.00	7,837.16	9,734.45	7,359.75	49.58	49.18	-2.70	2,563.28	-19.96	478.15	440.51	37.64	12.702			
10,300.00	7,837.12	9,834.45	7,358.97	51.30	50.91	-2.66	2,663.28	-19.58	478.88	439.82	39.06	12.260			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



TDS
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Roadrunner Federal Com #11H
Project:	Eddy County, NM (NAD-27 2015)	TVD Reference:	KB @ 3275.20usft (Latshaw 44)
Reference Site:	Roadrunner Federal Com #11H	MD Reference:	KB @ 3275.20usft (Latshaw 44)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Roadrunner Federal Com #11H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	Lateral #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design Roadrunner Federal Com #1H - Roadrunner Federal Com #1H - Lateral #1 - Design #3													Offset Site Error:	0.00 usft
Survey Program: O-MWD													Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum		Separation		Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
10,400.00	7,837.08	9,934.44	7,358.19	53.02	52.64	-2.62	2,763.27	-19.19	479.60	439.12	40.48	11.847		
10,500.00	7,837.04	10,034.44	7,357.41	54.75	54.38	-2.58	2,863.26	-18.80	480.33	438.42	41.91	11.462		
10,600.00	7,836.99	10,134.44	7,356.62	56.49	56.12	-2.54	2,963.25	-18.41	481.06	437.72	43.33	11.101		
10,700.00	7,836.95	10,234.43	7,355.84	58.23	57.87	-2.50	3,063.25	-18.03	481.78	437.02	44.76	10.763		
10,800.00	7,836.91	10,334.43	7,355.06	59.97	59.63	-2.47	3,163.24	-17.64	482.51	436.32	46.19	10.446		
10,900.00	7,836.87	10,434.43	7,354.28	61.73	61.39	-2.43	3,263.23	-17.25	483.24	435.61	47.63	10.146		
11,000.00	7,836.83	10,534.43	7,353.50	63.48	63.15	-2.39	3,363.23	-16.86	483.96	434.90	49.06	9.864		
11,100.00	7,836.79	10,634.42	7,352.72	65.24	64.92	-2.35	3,463.22	-16.48	484.69	434.19	50.50	9.598		
11,200.00	7,836.75	10,734.42	7,351.94	67.00	66.68	-2.31	3,563.21	-16.09	485.42	433.48	51.94	9.347		
11,300.00	7,836.71	10,834.42	7,351.16	68.77	68.46	-2.28	3,663.21	-15.70	486.15	432.77	53.37	9.108		
11,400.00	7,836.67	10,934.41	7,350.38	70.54	70.23	-2.24	3,763.20	-15.31	486.88	432.06	54.81	8.882		
11,500.00	7,836.63	11,034.41	7,349.60	72.31	72.01	-2.20	3,863.19	-14.93	487.60	431.35	56.26	8.668		
11,600.00	7,836.59	11,134.41	7,348.82	74.08	73.79	-2.16	3,963.18	-14.54	488.33	430.63	57.70	8.464		
11,700.00	7,836.55	11,234.40	7,348.04	75.87	75.57	-2.13	4,063.18	-14.15	489.06	429.92	59.14	8.269		
11,800.00	7,836.51	11,334.40	7,347.26	77.65	77.36	-2.09	4,163.17	-13.76	489.79	429.20	60.59	8.084		
11,900.00	7,836.47	11,434.40	7,346.48	79.43	79.14	-2.05	4,263.16	-13.37	490.52	428.49	62.03	7.908		
12,000.00	7,836.43	11,534.39	7,345.70	81.21	80.93	-2.02	4,363.16	-12.99	491.25	427.77	63.48	7.739		
12,100.00	7,836.39	11,634.39	7,344.92	83.00	82.72	-1.98	4,463.15	-12.60	491.98	427.06	64.92	7.578		
12,200.00	7,836.35	11,734.39	7,344.14	84.79	84.51	-1.94	4,563.14	-12.21	492.71	426.34	66.37	7.424		
12,300.00	7,836.30	11,834.38	7,343.36	86.58	86.31	-1.91	4,663.14	-11.82	493.44	425.62	67.82	7.276		
12,400.00	7,836.26	11,934.38	7,342.57	88.37	88.10	-1.87	4,763.13	-11.44	494.17	424.90	69.26	7.135		
12,500.00	7,836.22	12,034.38	7,341.79	90.16	89.90	-1.83	4,863.12	-11.05	494.90	424.19	70.71	6.999		
12,600.00	7,836.18	12,134.37	7,341.01	91.96	91.69	-1.80	4,963.12	-10.66	495.63	423.47	72.16	6.868		
12,700.00	7,836.14	12,234.37	7,340.23	93.75	93.49	-1.76	5,063.11	-10.27	496.36	422.75	73.61	6.743		
12,800.00	7,836.10	12,334.37	7,339.45	95.55	95.29	-1.73	5,163.10	-9.89	497.09	422.03	75.06	6.623		
12,900.00	7,836.06	12,434.37	7,338.67	97.35	97.09	-1.69	5,263.09	-9.50	497.82	421.31	76.51	6.507		
13,000.00	7,836.02	12,534.36	7,337.89	99.15	98.89	-1.66	5,363.09	-9.11	498.55	420.59	77.96	6.395		
13,100.00	7,835.98	12,634.36	7,337.11	100.95	100.70	-1.62	5,463.08	-8.72	499.28	419.87	79.41	6.287		
13,200.00	7,835.94	12,734.36	7,336.33	102.75	102.50	-1.58	5,563.07	-8.34	500.02	419.15	80.86	6.184		
13,300.00	7,835.90	12,834.35	7,335.55	104.55	104.30	-1.55	5,663.07	-7.95	500.75	418.43	82.31	6.083		
13,400.00	7,835.86	12,934.35	7,334.77	106.35	106.11	-1.51	5,763.06	-7.56	501.48	417.71	83.77	5.987		
13,500.00	7,835.82	13,034.35	7,333.99	108.16	107.91	-1.48	5,863.05	-7.17	502.21	416.99	85.22	5.893		
13,600.00	7,835.78	13,134.34	7,333.21	109.96	109.72	-1.44	5,963.05	-6.79	502.94	416.27	86.67	5.803		
13,700.00	7,835.74	13,234.34	7,332.43	111.77	111.53	-1.41	6,063.04	-6.40	503.68	415.55	88.12	5.716		
13,800.00	7,835.70	13,334.34	7,331.65	113.57	113.34	-1.37	6,163.03	-6.01	504.41	414.83	89.58	5.631		
13,900.00	7,835.66	13,434.33	7,330.87	115.38	115.14	-1.34	6,263.03	-5.62	505.14	414.11	91.03	5.549		
14,000.00	7,835.61	13,534.33	7,330.09	117.19	116.95	-1.30	6,363.02	-5.24	505.88	413.39	92.48	5.470		
14,100.00	7,835.57	13,634.33	7,329.30	118.99	118.76	-1.27	6,463.01	-4.85	506.61	412.67	93.94	5.393		
14,200.00	7,835.53	13,734.32	7,328.52	120.80	120.57	-1.23	6,563.00	-4.46	507.34	411.95	95.39	5.319		
14,300.00	7,835.49	13,834.32	7,327.74	122.61	122.38	-1.20	6,663.00	-4.07	508.08	411.23	96.84	5.246		
14,400.00	7,835.45	13,934.32	7,326.96	124.42	124.19	-1.17	6,762.99	-3.69	508.81	410.51	98.30	5.176		
14,500.00	7,835.41	14,034.31	7,326.18	126.23	126.00	-1.13	6,862.98	-3.30	509.54	409.79	99.75	5.108		
14,600.00	7,835.37	14,134.31	7,325.40	128.04	127.82	-1.10	6,962.98	-2.91	510.28	409.07	101.21	5.042		
14,700.00	7,835.33	14,234.31	7,324.62	129.86	129.63	-1.06	7,062.97	-2.52	511.01	408.35	102.66	4.976		
14,800.00	7,835.29	14,334.31	7,323.84	131.67	131.44	-1.03	7,162.96	-2.13	511.75	407.63	104.12	4.915		
14,900.00	7,835.25	14,434.30	7,323.06	133.48	133.25	-1.00	7,262.96	-1.75	512.48	406.91	105.58	4.854		
15,000.00	7,835.21	14,534.30	7,322.28	135.29	135.07	-0.96	7,362.95	-1.36	513.22	406.19	107.03	4.795		
15,100.00	7,835.17	14,634.30	7,321.50	137.11	136.88	-0.93	7,462.94	-0.97	513.95	405.46	108.49	4.737		
15,200.00	7,835.13	14,734.29	7,320.72	138.92	138.70	-0.90	7,562.93	-0.58	514.69	404.74	109.94	4.681		
15,300.00	7,835.09	14,834.29	7,319.94	140.73	140.51	-0.86	7,662.93	-0.20	515.42	404.02	111.40	4.627		
15,400.00	7,835.05	14,934.29	7,319.16	142.55	142.33	-0.83	7,762.92	0.19	516.16	403.30	112.86	4.574		
15,500.00	7,835.01	15,034.28	7,318.38	144.36	144.14	-0.80	7,862.91	0.58	516.89	402.58	114.32	4.522		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

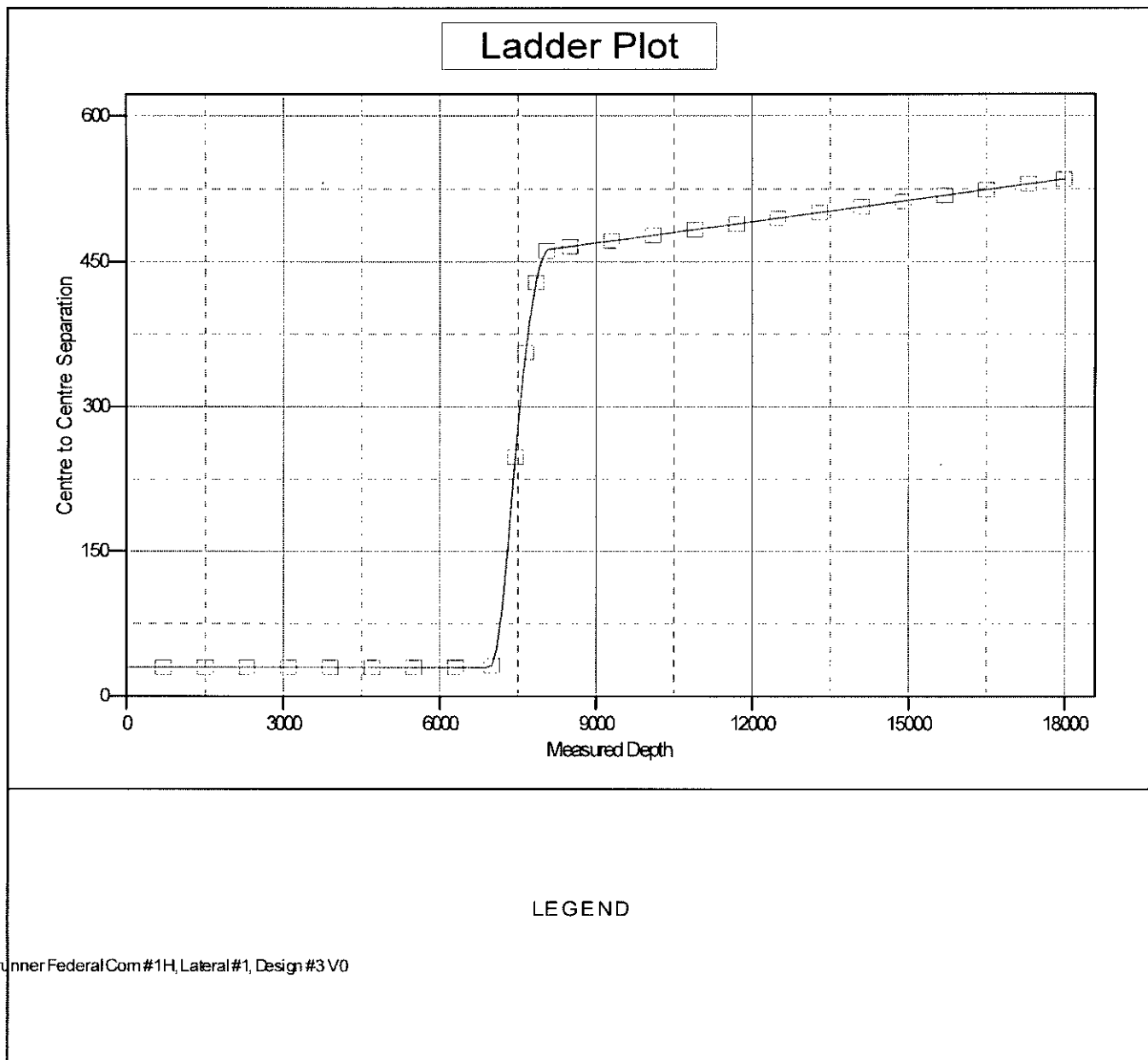
Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Roadrunner Federal Com #11H
Project:	Eddy County, NM (NAD-27 2015)	TVD Reference:	KB @ 3275.20usft (Latshaw 44)
Reference Site:	Roadrunner Federal Com #11H	MD Reference:	KB @ 3275.20usft (Latshaw 44)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Roadrunner Federal Com #11H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	Lateral #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Roadrunner Federal Com #1H - Roadrunner Federal Com #1H - Lateral #1 - Design #3														Offset Site Error:	0.00 usft
Survey Program: C-MWD														Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
15,600.00	7,834.97	15,134.28	7,317.80	146.18	145.96	-0.78	7,982.91	0.97	517.63	401.86	115.77	4.471			
15,700.00	7,834.92	15,234.28	7,316.82	147.99	147.77	-0.73	8,062.90	1.35	518.37	401.14	117.23	4.422			
15,800.00	7,834.88	15,334.27	7,316.04	149.81	149.59	-0.70	8,162.89	1.74	519.10	400.42	118.69	4.374			
15,900.00	7,834.84	15,434.27	7,315.25	151.62	151.40	-0.66	8,262.89	2.13	519.84	399.69	120.15	4.327			
16,000.00	7,834.80	15,534.27	7,314.47	153.44	153.22	-0.63	8,362.88	2.52	520.58	398.97	121.60	4.281			
16,100.00	7,834.76	15,634.26	7,313.69	155.26	155.04	-0.60	8,462.87	2.90	521.31	398.25	123.06	4.236			
16,200.00	7,834.72	15,734.26	7,312.91	157.07	156.86	-0.57	8,562.87	3.29	522.05	397.53	124.52	4.192			
16,300.00	7,834.68	15,834.26	7,312.13	158.89	158.67	-0.53	8,662.86	3.68	522.79	396.81	125.98	4.150			
16,400.00	7,834.64	15,934.25	7,311.35	160.71	160.49	-0.50	8,762.85	4.07	523.52	396.08	127.44	4.108			
16,500.00	7,834.60	16,034.25	7,310.57	162.52	162.31	-0.47	8,862.84	4.45	524.26	395.36	128.90	4.067			
16,600.00	7,834.56	16,134.25	7,309.79	164.34	164.13	-0.44	8,962.84	4.84	525.00	394.64	130.36	4.027			
16,700.00	7,834.52	16,234.25	7,309.01	166.16	165.94	-0.40	9,062.83	5.23	525.74	393.92	131.82	3.988			
16,800.00	7,834.48	16,334.24	7,308.23	167.98	167.76	-0.37	9,162.82	5.62	526.48	393.20	133.28	3.950			
16,900.00	7,834.44	16,434.24	7,307.45	169.80	169.58	-0.34	9,262.82	6.00	527.21	392.47	134.74	3.913			
17,000.00	7,834.40	16,534.24	7,306.67	171.62	171.40	-0.31	9,362.81	6.39	527.95	391.75	136.20	3.876			
17,100.00	7,834.36	16,634.23	7,305.89	173.43	173.22	-0.28	9,462.80	6.78	528.69	391.03	137.66	3.840			
17,200.00	7,834.32	16,734.23	7,305.11	175.25	175.04	-0.24	9,562.80	7.17	529.43	390.30	139.13	3.805			
17,300.00	7,834.28	16,834.23	7,304.33	177.07	176.86	-0.21	9,662.79	7.56	530.17	389.58	140.59	3.771			
17,400.00	7,834.23	16,934.22	7,303.55	178.89	178.68	-0.18	9,762.78	7.94	530.91	388.86	142.05	3.737			
17,500.00	7,834.19	17,034.22	7,302.77	180.71	180.50	-0.15	9,862.77	8.33	531.65	388.14	143.51	3.705			
17,600.00	7,834.15	17,134.22	7,301.99	182.53	182.32	-0.12	9,962.77	8.72	532.39	387.41	144.97	3.672			
17,700.00	7,834.11	17,234.21	7,301.20	184.35	184.14	-0.09	10,062.76	9.11	533.13	386.69	146.44	3.641			
17,800.00	7,834.07	17,334.21	7,300.42	186.17	185.96	-0.06	10,162.75	9.49	533.87	385.96	147.90	3.610			
17,900.00	7,834.03	17,434.21	7,299.64	187.99	187.78	-0.03	10,262.75	9.88	534.61	385.24	149.36	3.579			
17,978.18	7,834.00	17,512.39	7,299.03	189.42	189.20	0.00	10,340.92	10.18	535.18	384.68	150.51	3.556			
17,978.64	7,834.00	17,512.85	7,299.03	189.42	189.21	0.00	10,341.38	10.19	535.19	384.68	150.50	3.556			

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Roadrunner Federal Com #11H
Project:	Eddy County, NM (NAD-27 2015)	TVD Reference:	KB @ 3275.20usft (Latshaw 44)
Reference Site:	Roadrunner Federal Com #11H	MD Reference:	KB @ 3275.20usft (Latshaw 44)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Roadrunner Federal Com #11H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	Lateral #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 3275.20usft (Latshaw 44)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Roadrunner Federal Com #11H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grd Convergence at Surface is: 0.05°

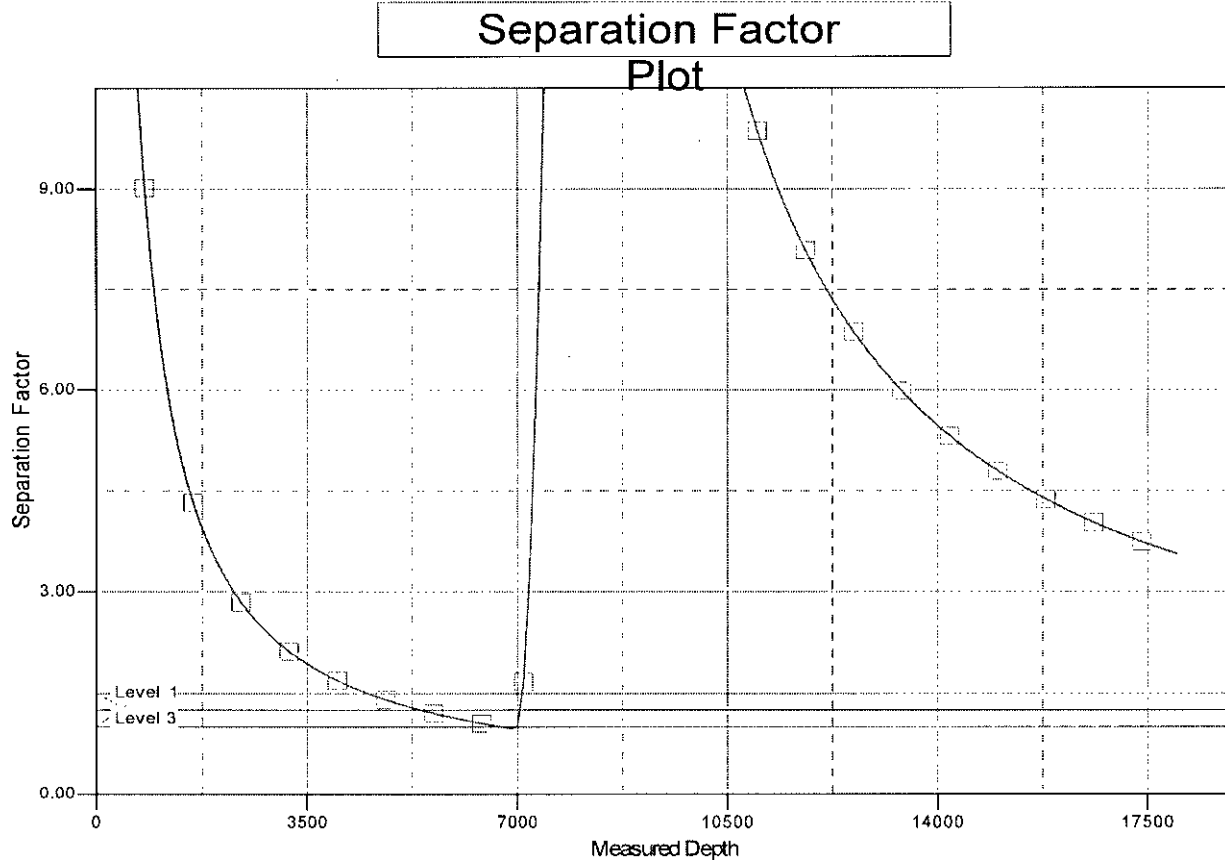


Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Reference Site: Roadrunner Federal Com #11H
Site Error: 0.00 usft
Reference Well: Roadrunner Federal Com #11H
Well Error: 0.00 usft
Reference Wellbore: Lateral #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Roadrunner Federal Com #11H
TVD Reference: KB @ 3275.20usft (Latshaw 44)
MD Reference: KB @ 3275.20usft (Latshaw 44)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 3275.20usft (Latshaw 44)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Roadrunner Federal Com #11H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.05°



LEGEND

runner Federal Com #11H, Lateral #1, Design #3 V0



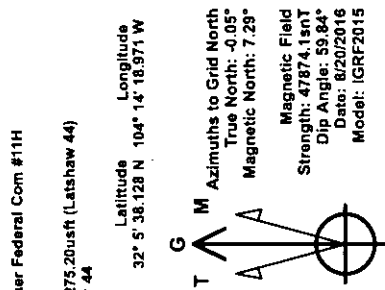
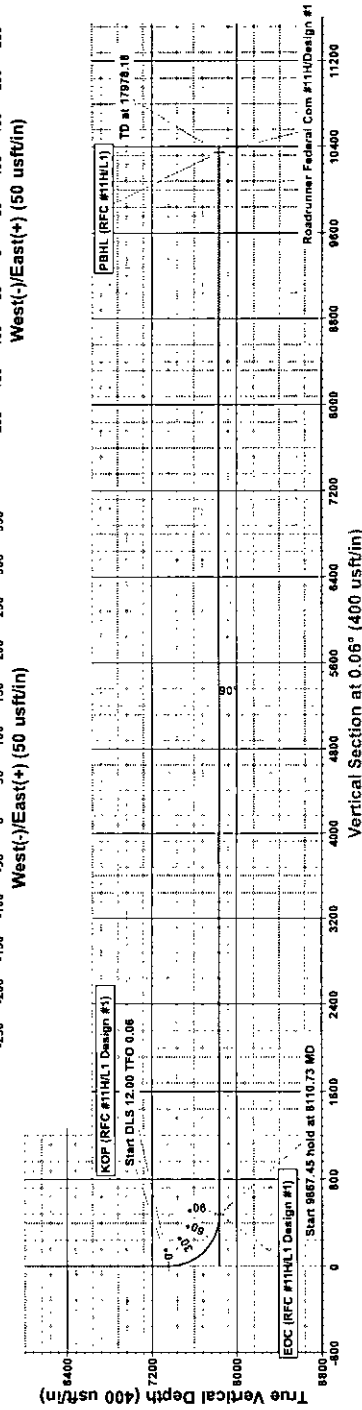
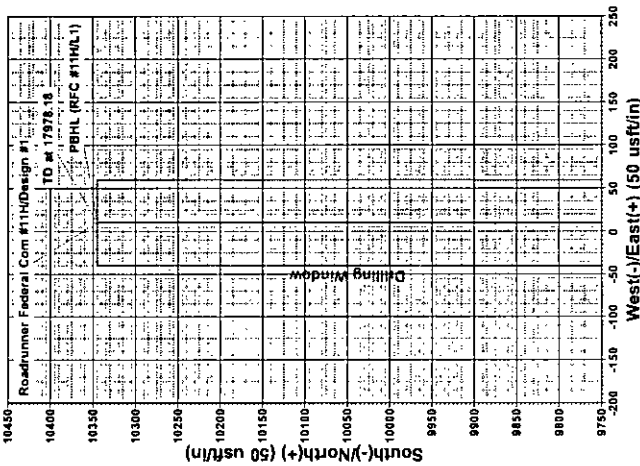
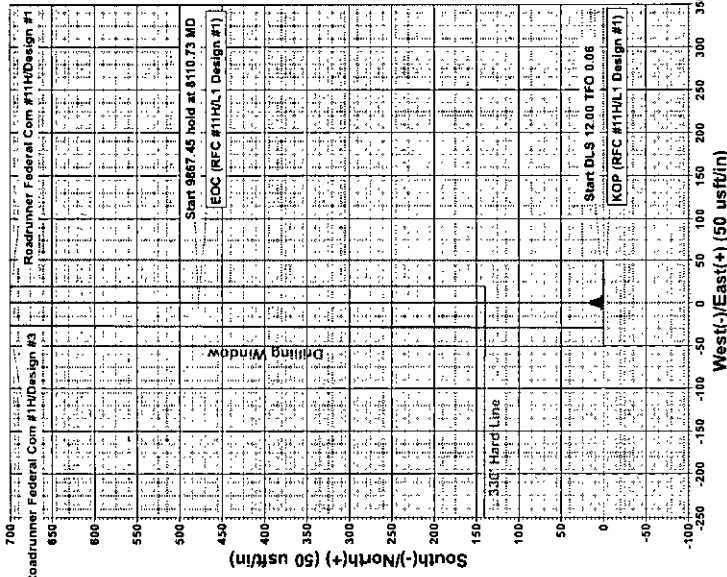
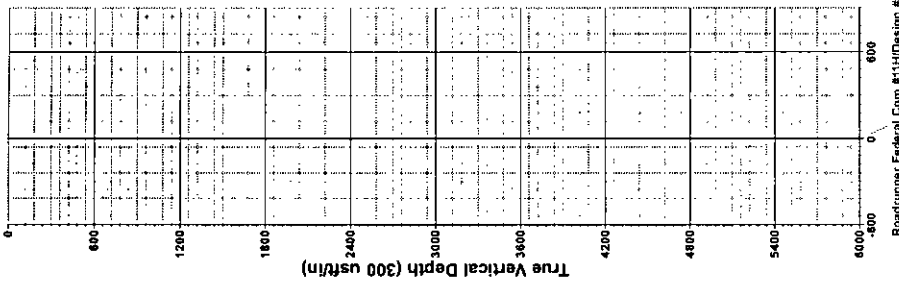
COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Site: Roadrunner Federal Com #11H
Well: Wellbore: Lateral #1

WELL DETAILS: Roadrunner Federal Com #11H
Ground Elevation: 3250.20
RKB Elevation: KB @ 3275.20usft (Latahaw 44)
Rig Name: Latahaw 44

Plan: Design #1 (Roadrunner Federal Com #11H/Lateral #1)

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	7360.54	0.00	0.00	7360.54	0.00	0.00	0.00	0.00	0.00
3	8110.73	90.02	0.06	7838.00	477.66	0.47	12.00	0.06	477.66
4	17978.18	90.02	0.06	7834.00	10345.10	10.20	0.00	0.00	0.00



Magnetic Field
Strength: 47874.1nT
Dip Angle: 59.84°
Date: 8/20/2016
Model: IGRF2015

PROJECT DETAILS: Eddy County, NM (NAD-27 2015)
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

Terra Directional Services
3705 South County Road 1210, Midland, TX 79706
432.618.1210

Plan: Design #1 (Roadrunner Federal Com #11H/Lateral #1)
Created By: Well Planner Date: 12/31, August 21 2016

