

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD Artesia

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.***SUBMIT IN TRIPLICATE - Other instructions on reverse side.**

1. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other		5. Lease Serial No. NMNM109748
2. Name of Operator COG PRODUCTION LLC		6. If Indian, Allottee or Tribe Name
3a. Address 2208 W MAIN STREET ARTESIA, NM 88210		7. If Unit or CA/Agreement, Name and/or No.
3b. Phone No. (include area code) Ph: 575.748.6945		8. Well Name and No. ROAD RUNNER FEDERAL COM 11H
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 25 T25S R26E SESE 190FSL 350FEL		9. API Well No. 30-015-413900
		10. Field and Pool, or Exploratory COTTONWOOD DRAW
		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 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.

SHL

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

First take point: 330' FSL + 350' FEL

Last take point: 100' FNL + 330' FEL

BHL

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

C102 attached.

UNORTHODOX NM OIL CONSERVATION
LOCATION ARTESIA DISTRICT
SEP 13 2016

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)		RECEIVED
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 ****

Additional data for EC transaction #348671 that would not fit on the form

32. Additional remarks, continued

Drilling Changes

The operator will drill to a final TD of 17,978? MD

See attached.

NM OIL CONSERVATION

ARTESIA DISTRICT

SEP 13 2016

DISTRICT I
1825 N. FRENCH DR., BOBBS, NM 88240
Phone: (505) 393-6161 Fax: (505) 393-9720

DISTRICT II
811 S. FIRST ST., ARTESIA, NM 88210
Phone: (505) 746-1283 Fax: (505) 746-9720

DISTRICT III
1000 RIO BRAZOS RD., AZTEC, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. ST. FRANCIS DR., SANTA FE, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

RECEIVED

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-	Pool Code 97494	Pool Name Cottonwood Draw; Bone Spring
Property Code	Property Name ROADRUNNER FEDERAL COM	Well Number 11H
GRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3250.2'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	25	25-S	26-E		190	SOUTH	350	EAST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	24	25	26-E		50	NORTH	330	EAST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
320			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

	Y=408305.7 N X=528361.2 E NMNM096835 SECTION 24 SECTION 25 NMNM112907 Y=397718.3 N X=528365.7 E	50' 9" 330' B.H. Y=408299.7 N X=529675.0 E NMNM109748 NAD 27 PROPOSED BOTTOM HOLE LOCATION Y=408251.2 N X=529346.1 E LAT.=32.122363° N LONG.=104.238541° W GRID AZ. - 0°03'24" HORIZ. DIST. - 10345.1' S.L. 350' 190' Y=397715.3 N X=529685.7 E	OPERATOR CERTIFICATION I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. Signature <i>Melanie J Wilson</i> Date <i>8/22/16</i> Printed Name Melanie J Wilson E-mail Address mwilson@concho.com SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. AUGUST 2, 2016 Date of Survey Signature & Seal of Professional Surveyor <i>Chad L. Harcrow</i> 8/3/16 Certificate No. CHAD HARCROW 17777 W.O. #16-624 DRAWN BY: CF
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COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Site: Roadrunner Federal Com #11H
Well: Wellbore: Lateral #1

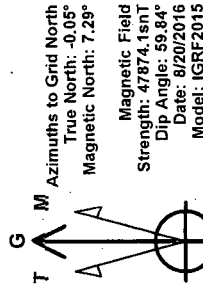
Plan: Design #1 (Roadrunner Federal Com #11H/Lateral #1)

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

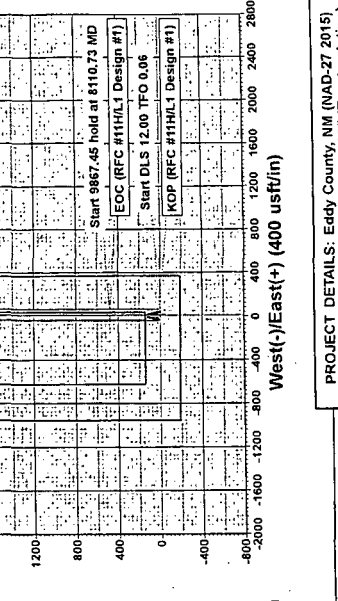
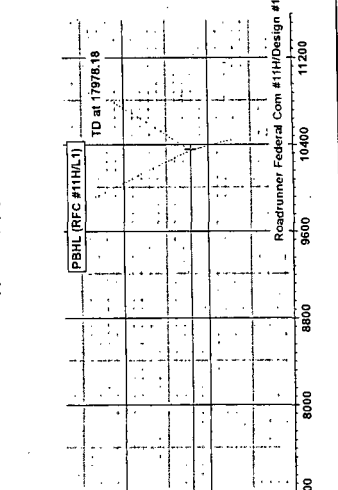
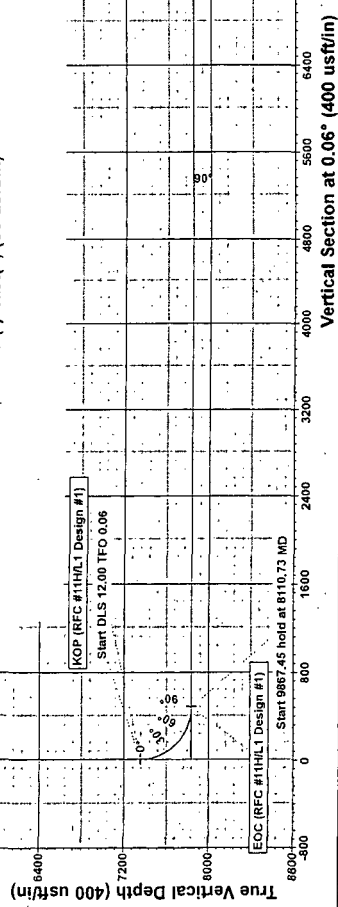
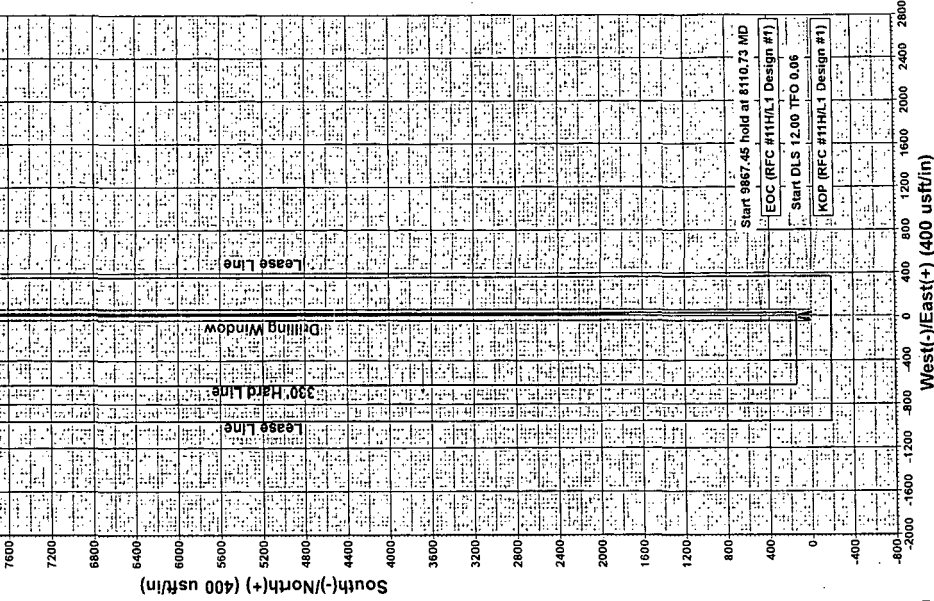
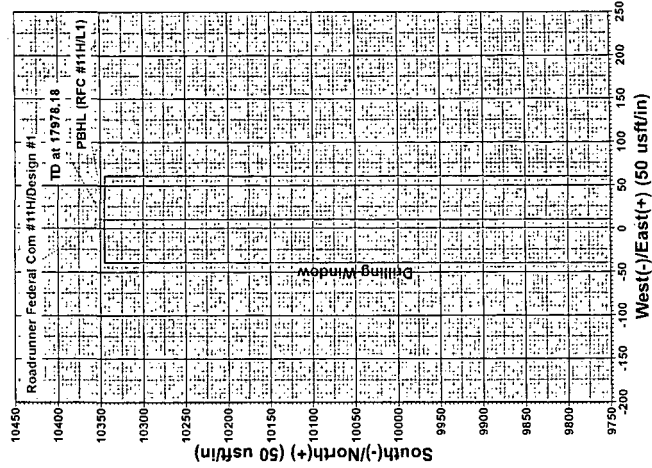
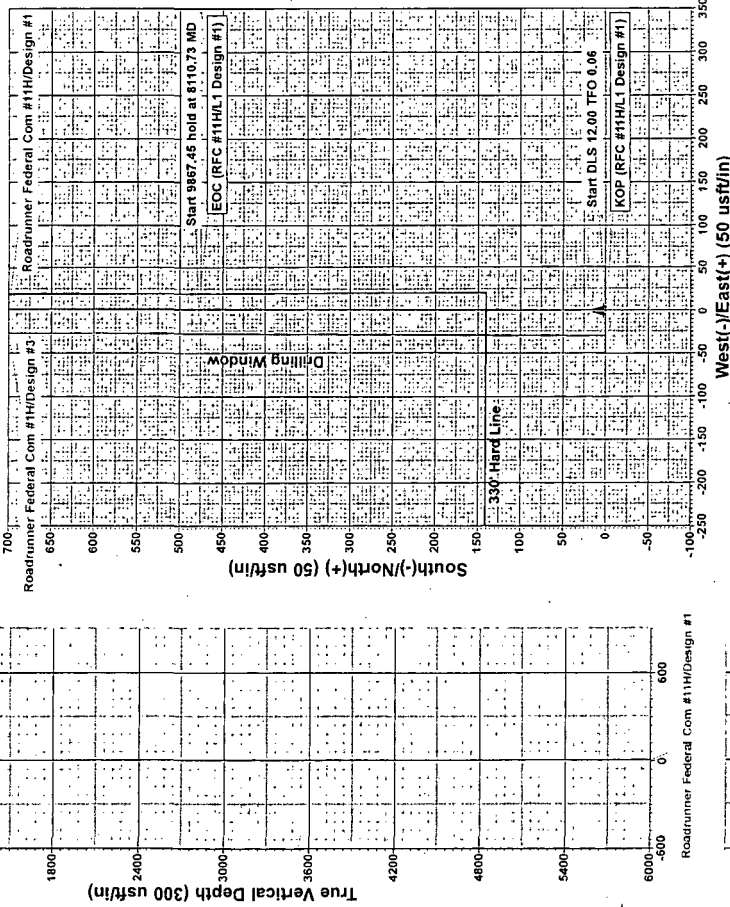
Northings 397906.10 Easting 529335.90
Longitude 104° 14' 18.971 W

Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec
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: 47874.1snT
Dip Angle: 59.84°
Date: 8/20/2016
Model: IGRF-2015



Plan: Design #1 (Roadrunner Federal Com #11H/Lateral #1)
Created By: Well Planner Date: 13:31, August 21 2016

Terra Directional Services
3705 South County Road 1210, Midland, TX 79706
4432.618.1210

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



NM OIL CONSERVATION

ARTESIA DISTRICT

SEP 13 2016

RECEIVED

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

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:	Map	Northing:	397,906.10 usft
From:		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:	397,906.10 usft	Latitude:	32° 5' 38.128 N
	+E/-W	0.00 usft	Easting:	529,335.90 usft	Longitude:	104° 14' 18.971 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	3,250.20 usft

Wellbore		Lateral #1			
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	Direction
	(usft)	(usft)	(usft)	(°)
	0.00	0.00	0.00	0.06

Plan Sections										
Measured Depth	Inclination	Azimuth	Vertical Depth	N/S	E/W	Dogleg Rate	Build Rate	Turn Rate	TFO	Target
(usft)	(°)	(°)	(usft)	(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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Company: COG Operating LLC
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Site: Roadrunner Federal Com #11H
Well: Roadrunner Federal Com #11H
Wellbore: Lateral #1
Design: Design #1

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well Roadrunner Federal Com #11H
KB @ 3275.20usft (Latshaw 44)
KB @ 3275.20usft (Latshaw 44)
Grid
Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
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



Database: EDM 5000.1 Single User Db
Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Site: Roadrunner Federal Com #11H
Well: Roadrunner Federal Com #11H
Wellbore: Lateral #1
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

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



TDS
Planning Report



Database: EDM 5000.1 Single User Db
Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Site: Roadrunner Federal Com #11H
Well: Roadrunner Federal Com #11H
Wellbore: Lateral #1
Design: Design #1

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well Roadrunner Federal Com #11H
KB @ 3275.20usft (Latshaw 44)
KB @ 3275.20usft (Latshaw 44)
Grid
Minimum Curvature

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	N/S (usft)	E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
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
Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Site: Roadrunner Federal Com #11H
Well: Roadrunner Federal Com #11H
Wellbore: Lateral #1
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

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



Database: EDM 5000.1 Single User Db
Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Site: Roadrunner Federal Com #11H
Well: Roadrunner Federal Com #11H
Wellbore: Lateral #1
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

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 - plan hits target center - Point	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
PBHL (RFC #11H/L1) - plan hits target center - Rectangle (sides W100.00 H10,345.11 D0.00)	-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
EOC (RFC #11H/L1 Des - plan hits target center - Point	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 Annotations

Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/-S (usft)	+E/-W (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



NM OIL CONSERVATION
ARTESIA DISTRICT
SEP 13 2016

RECEIVED

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

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: 0-MWD														Offset Well Error: 0.00 usft
Reference	Offset	Semi Major Axis		Reference	Offset	Highside	Offset Wellbore Centre		Distance		Minimum	Separation	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Toolface (°)	N-S (usft)	E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Separation (usft)	Factor		
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	0.62	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	25.69	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
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

Offset Design Roadrunner Federal Com #1H - Roadrunner Federal Com #1H - Lateral #1 - Design #3														Offset Site Error	0.00 usft
Survey Program: 0-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)	Offset Wellbore Centre 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	2.264			
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
Project: Eddy County, NM (NAD-27 2015)
Reference Site: Roadrunner Federal Com #11H
Site Error: 0.00 usft
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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)
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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

Offset Design Roadrunner Federal Com #1H - Roadrunner Federal Com #1H - Lateral #1 - Design #3														Offset Site Error
Survey Program: 0-MWD														Offset Well Error
Reference		Offset		Semi Major Axis		Distance		Warning						
Measured	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre	Between	Between	Minimum	Separation			
Depth	Depth	Depth	Depth	(usft)	(usft)	Toolface	(N-S)	Centres	Ellipses	Separation	Factor			
(usft)	(usft)	(usft)	(usft)			(°)	(usft)	(usft)	(usft)	(usft)				
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	7,498.03	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	21.16	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	285.69	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	7,590.09	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	7,490.72	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	7,836.68	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	7,837.97	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	30.953		
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	30.05	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	36.25	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
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

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)	Offset Wellbore Centre E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
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	10.445	
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	74.09	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	4.978	
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



TDS
Anticollision Report



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

Offset Design: Roadrunner Federal Com #1H - Roadrunner Federal Com #1H - Lateral #1 - Design #3														Offset Site Error: 0.00 usft
Survey Program: 0-MWD														Offset Well Error: 0.00 usft
Reference														
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre N-S (usft)	Offset Wellbore Centre E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
15,600.00	7,834.97	15,134.28	7,317.60	146.18	145.96	-0.76	7,962.91	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	7,301.98	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		

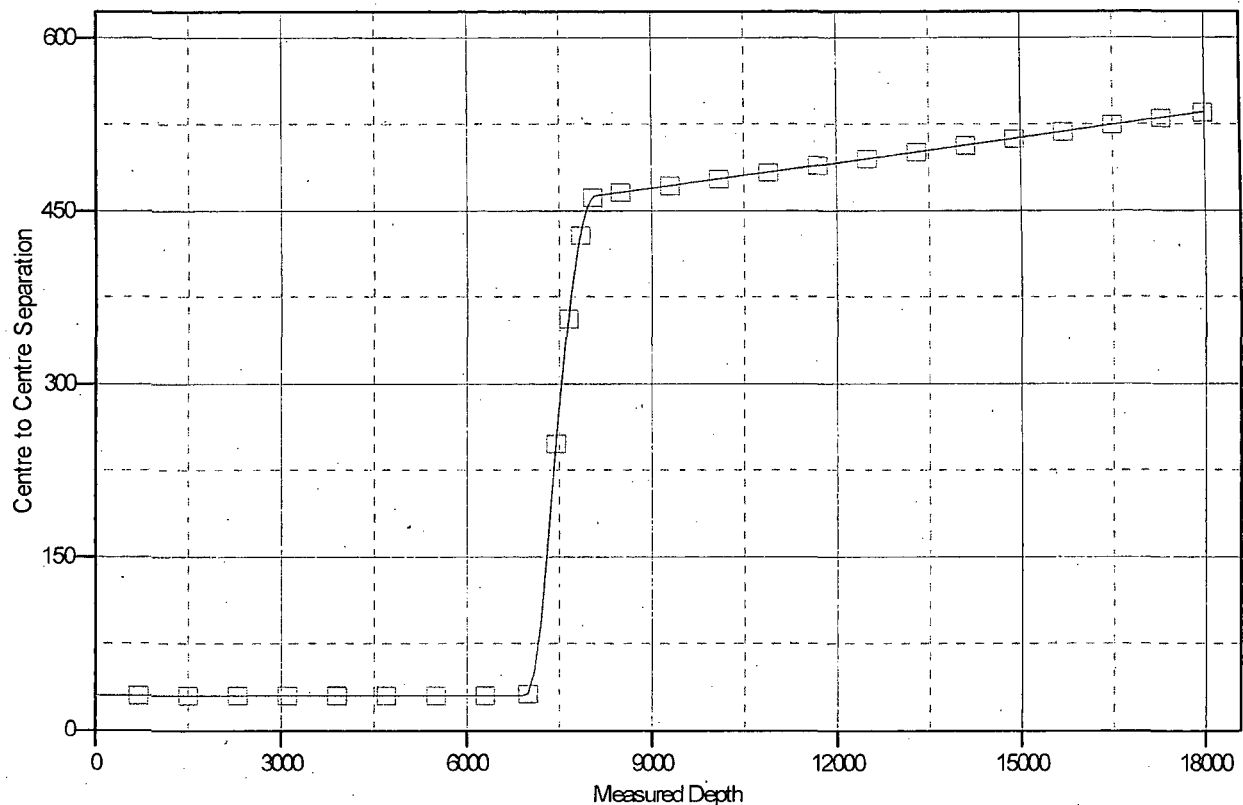
Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Reference Site: Roadrunner Federal Com #11H
Site Error: 0.00 usft
Reference Well: Roadrunner Federal Com #11H
Well Error: 0.00 usft
Reference Wellbore: Lateral #1
Reference Design: Design #1

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°

Ladder Plot



LEGEND

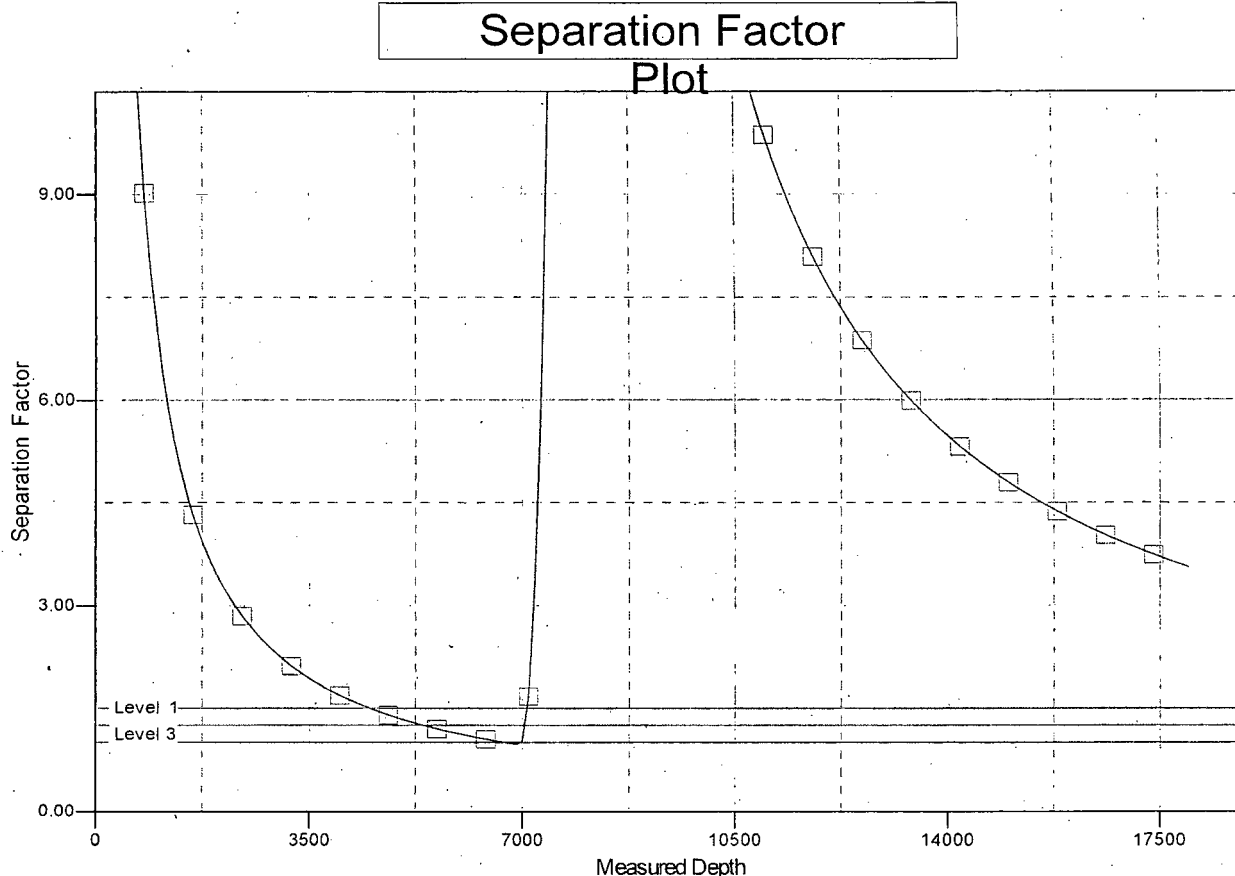
Runner Federal Com #11H, Lateral #1, Design #3 V0

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

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