

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM 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.***Carlsbad Field Office**
OCD HobbsNMMLC065710A
State or Tribe Name**SUBMIT IN TRIPLICATE - Other instructions on reverse side.**7. If Unit or CA/Agreement, Name and/or No.
891006783X

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other8. Well Name and No.
LUSK DEEP UNIT A 31H2. Name of Operator
COG OPERATING LLCContact: MAYTE X REYES
E-Mail: mreyes1@concho.com

9. API Well No.

30-025-43124

3a. Address
ONE CONCHO CENTER 600 W ILLINOIS AVENUE
MIDLAND, TX 79701-42873b. Phone No. (include area code)
Ph: 575-748-694510. Field and Pool, or Exploratory
UNKNOWN

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

Sec 20 T19S R32E NENE 0330FNL 190FEL

JUN 06 2016

11. County or Parish, and State

LEA COUNTY, NM

RECEIVED

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.

BHL

From: 380' FNL & 330' FWL Section 20. T19S. R32E

To: 330' FNL & 50' FWL Section 20. T19S. R32E

DRILLING

Final cement volumes for production string are
1000 sks 12.7 (2.0 ft³/sk) lead and
1500 sks 14.4 (1.24 ft³/sk) tail.

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

Electronic Submission #340009 verified by the BLM Well Information System

For COG OPERATING LLC, sent to the Hobbs

Committed to AFMSS for processing by PRISCILLA PEREZ on 06/01/2016 (16PP0672SE)

Name (Printed/Typed) MAYTE X REYES

Title REGULATORY ANALYST

Signature (Electronic Submission)

Date 05/23/2016

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By (BLM Approver Not Specified) Mustafa Hague

Title

PETROLEUM ENGINEER

Date 06/02/2016

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office Hobbs

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

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

KZ

Additional data for EC transaction #340009 that would not fit on the form

32. Additional remarks, continued

Attached
Directional program
Anti-collision program
C102

DISTRICT I
1625 N. FRENCH DR., BOBBS, NM 88240
Phone: (575) 363-0161 Fax: (575) 363-0730

DISTRICT II
511 S. FIRST ST., ARTESIA, NM 88210
Phone: (575) 748-1263 Fax: (575) 748-9720

DISTRICT III
1000 RIO BRAZOS RD., AZTEC, NM 87410
Phone: (505) 334-6176 Fax: (505) 334-6170

DISTRICT IV
1220 S. ST. FRANCIS DR., SANTA FE, NM 87505
Phone: (505) 478-3480 Fax: (505) 478-3482

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

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

☒ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-025-43124	Pool Code 41440	Pool Name Lusk; Bone Spring
Property Code 308161	Property Name LUSK DEEP UNIT A	Well Number 31H
GRID No. 160	Operator Name COG OPERATING, LLC	Elevation 3590.7'

Surface Location

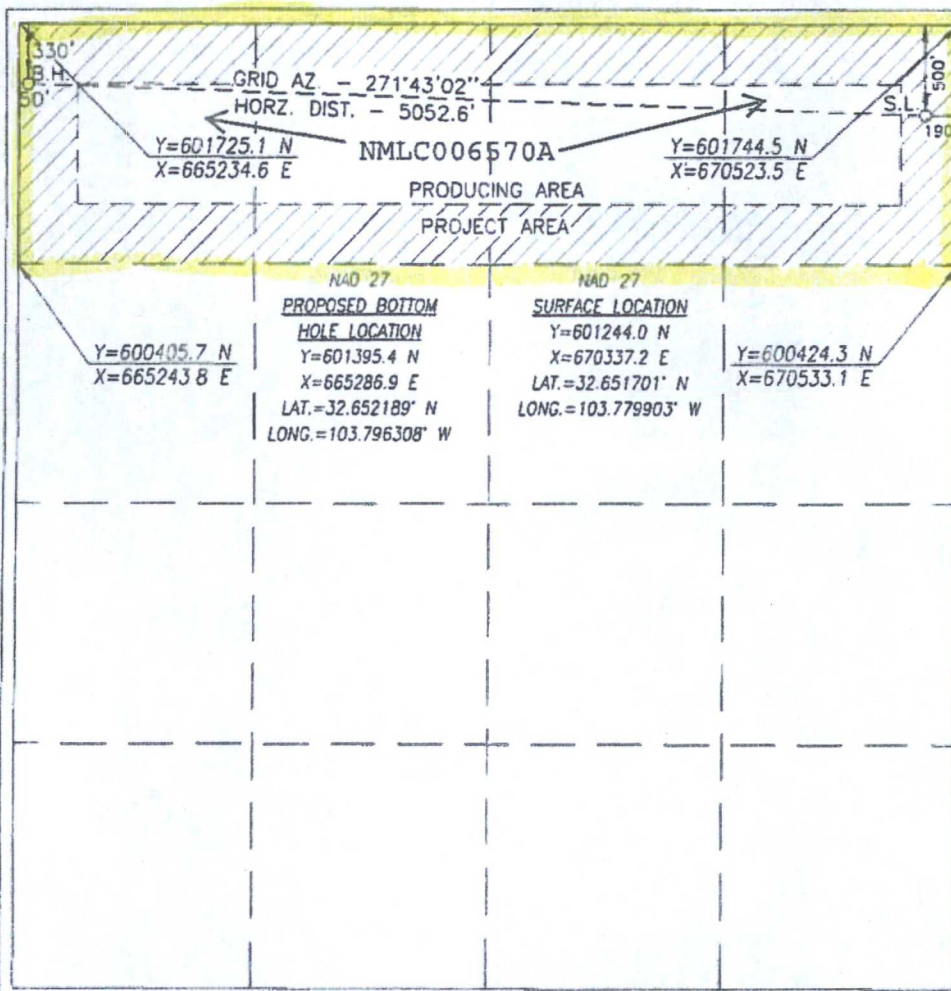
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	20	19-S	32-E		500	NORTH	190	EAST	LEA

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
D	20	19-S	32-E		330	NORTH	50	WEST	LEA

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.

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



OPERATOR CERTIFICATION

I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the Division.

Melanie J Wilson 5/23/2016
Signature Date

Melanie J Wilson
Printed Name

mwilson@concho.com
E-mail Address

SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

MAY 17, 2016
Date of Survey

Signature & Seal of Professional Surveyor



Chad L. Harcrow 5/19/16
Certificate No. CHAD HARCROW 17777
W.O. # 16-390 DRAWN BY: AF



COG Production L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 20, T 19 S., R 32 E
Well: Lusk Deep Unit A 31H
Wellbore: Wellbore #1
Plan: Plan#5 (Lusk Deep Unit A 31H/Wellbore #1)
Patriot 2

WELL DETAILS: Lusk Deep Unit A 31H

Ground Elevation: 3589.81
RKB Elevation: KB=20' @ 3608.81ft (Patriot 2)
Rig Name: Patriot 2

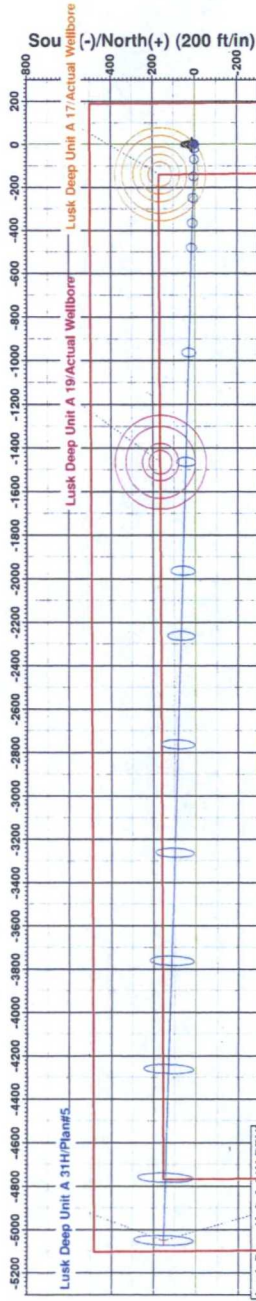
0.00 Northing 601244.00 Easting 670337.20 Latitude 32° 39' 6.125 N Longitude 103° 46' 47.649 W

Section Details

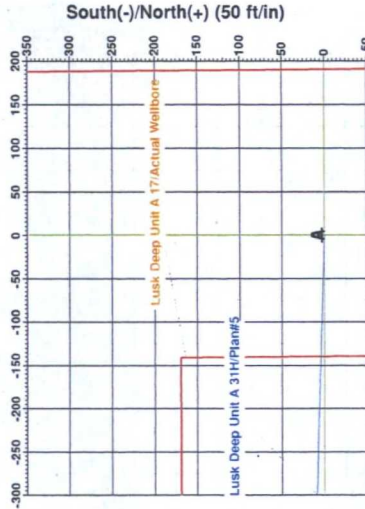
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSecl	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	8862.61	0.00	0.00	8862.61	0.00	0.00	0.00	0.00	0.00	
3	9617.35	90.57	271.72	9340.05	14.45	-481.98	12.00	271.72	482.20	Lusk Deep Unit A 31H PBHL
4	11135.22	90.57	271.72	9325.00	59.93	-1999.10	0.00	0.00	2000.00	
5	11172.72	91.32	271.72	9324.38	61.05	-2036.58	2.00	0.00	2037.49	Lusk Deep Unit A 31H PBHL
6	14188.60	91.32	271.72	9255.00	151.40	-5050.31	0.00	0.00	5052.58	Lusk Deep Unit A 31H PBHL



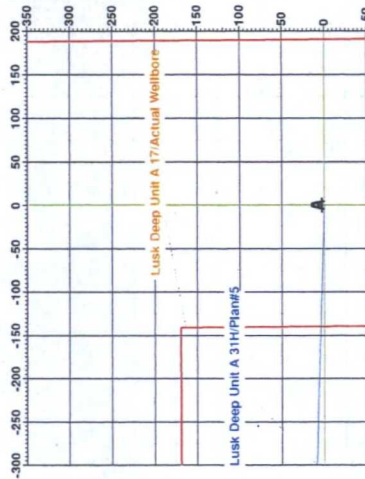
West(-)/East(+) (200 ft/in)



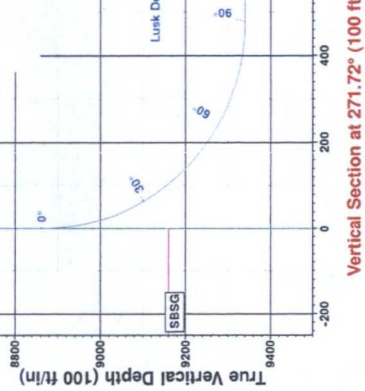
West(-)/East(+) (50 ft/in)



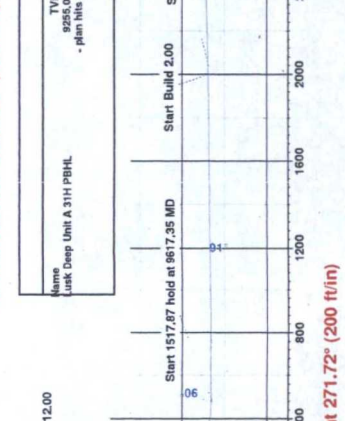
South(-)/North(+) (50 ft/in)



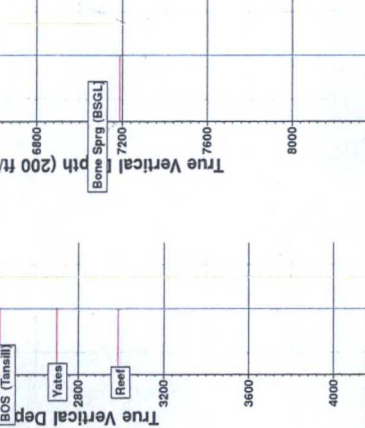
Vertical Section at 271.72° (100 ft/in)



Vertical Section at 271.72° (200 ft/in)



True Vertical Depth (100 ft/in)



True Vertical Depth (200 ft/in)



True Vertical Depth (200 ft/in)

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COG Production L L C

Lea County, NM (NAD27 NME)

Sec. 20, T 19 S. , R 32 E

Lusk Deep Unit A 31H

Wellbore #1

Plan: Plan#5

Standard Survey Report

23 May, 2016

Integrity Directional Services, LLC

Survey Report

Company:	COG Production L L C	Local Co-ordinate Reference:	Well Lusk Deep Unit A 31H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=20' @ 3609.81ft (Patriot 2)
Site:	Sec. 20, T 19 S. , R 32 E	MD Reference:	KB=20' @ 3609.81ft (Patriot 2)
Well:	Lusk Deep Unit A 31H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan#5	Database:	EDM 5000.1 Multi User Db

Project	Lea County, NM (NAD27 NME)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Sec. 20, T 19 S. , R 32 E		
Site Position:		Northing:	601,134.10 usft
From:	Map	Easting:	670,337.90 usft
Position Uncertainty:	5.00 ft	Slot Radius:	13-3/16 "
		Latitude:	32° 39' 5.037 N
		Longitude:	103° 46' 47.648 W
		Grid Convergence:	0.30 °

Well	Lusk Deep Unit A 31H		
Well Position	+N/-S	0.00 ft	Northing: 601,244.00 usft
	+E/-W	0.00 ft	Easting: 670,337.20 usft
Position Uncertainty	5.00 ft	Wellhead Elevation:	0.00 ft
		Latitude:	32° 39' 6.125 N
		Longitude:	103° 46' 47.649 W
		Ground Level:	3,589.81 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	5/4/2016	7.20	60.44	48,284

Design	Plan#5				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	271.72	

Survey Tool Program	Date 5/23/2016				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	14,188.60	Plan#5 (Wellbore #1)	MWD	MWD - Standard	

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.0000	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.0000	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.0000	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.0000	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.0000	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.0000	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
700.00	0.0000	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	
800.00	0.0000	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	
821.80	0.0000	0.00	821.80	0.00	0.00	0.00	0.00	0.00	0.00	
Rustler										

Integrity Directional Services, LLC

Survey Report

Company: COG Production L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 20, T 19 S., R 32 E
Well: Lusk Deep Unit A 31H
Wellbore: Wellbore #1
Design: Plan#5

Local Co-ordinate Reference: Well Lusk Deep Unit A 31H
TVD Reference: KB=20' @ 3609.81ft (Patriot 2)
MD Reference: KB=20' @ 3609.81ft (Patriot 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
900.00	0.0000	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
927.80	0.0000	0.00	927.80	0.00	0.00	0.00	0.00	0.00	0.00
TOS									
1,000.00	0.0000	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.0000	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.0000	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.0000	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.0000	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.0000	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.0000	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.0000	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.0000	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.0000	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.0000	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.0000	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.0000	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.0000	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.0000	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,427.80	0.0000	0.00	2,427.80	0.00	0.00	0.00	0.00	0.00	0.00
BOS (Tansill)									
2,500.01	0.0000	0.00	2,500.01	0.00	0.00	0.00	0.00	0.00	0.00
2,600.01	0.0000	0.00	2,600.01	0.00	0.00	0.00	0.00	0.00	0.00
2,697.81	0.0000	0.00	2,697.81	0.00	0.00	0.00	0.00	0.00	0.00
Yates									
2,700.01	0.0000	0.00	2,700.01	0.00	0.00	0.00	0.00	0.00	0.00
2,800.01	0.0000	0.00	2,800.01	0.00	0.00	0.00	0.00	0.00	0.00
2,900.01	0.0000	0.00	2,900.01	0.00	0.00	0.00	0.00	0.00	0.00
2,984.81	0.0000	0.00	2,984.81	0.00	0.00	0.00	0.00	0.00	0.00
Reef									
3,000.01	0.0000	0.00	3,000.01	0.00	0.00	0.00	0.00	0.00	0.00
3,100.01	0.0000	0.00	3,100.01	0.00	0.00	0.00	0.00	0.00	0.00
3,200.01	0.0000	0.00	3,200.01	0.00	0.00	0.00	0.00	0.00	0.00
3,300.01	0.0000	0.00	3,300.01	0.00	0.00	0.00	0.00	0.00	0.00
3,400.01	0.0000	0.00	3,400.01	0.00	0.00	0.00	0.00	0.00	0.00
3,500.01	0.0000	0.00	3,500.01	0.00	0.00	0.00	0.00	0.00	0.00
3,600.01	0.0000	0.00	3,600.01	0.00	0.00	0.00	0.00	0.00	0.00
3,700.01	0.0000	0.00	3,700.01	0.00	0.00	0.00	0.00	0.00	0.00
3,800.01	0.0000	0.00	3,800.01	0.00	0.00	0.00	0.00	0.00	0.00
3,900.01	0.0000	0.00	3,900.01	0.00	0.00	0.00	0.00	0.00	0.00
4,000.01	0.0000	0.00	4,000.01	0.00	0.00	0.00	0.00	0.00	0.00
4,100.01	0.0000	0.00	4,100.01	0.00	0.00	0.00	0.00	0.00	0.00
4,161.81	0.0000	0.00	4,161.81	0.00	0.00	0.00	0.00	0.00	0.00
Base of Reef									
4,200.01	0.0000	0.00	4,200.01	0.00	0.00	0.00	0.00	0.00	0.00

Integrity Directional Services, LLC

Survey Report

Company: COG Production L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 20, T 19 S. , R 32 E
Well: Lusk Deep Unit A 31H
Wellbore: Wellbore #1
Design: Plan#5

Local Co-ordinate Reference: Well Lusk Deep Unit A 31H
TVD Reference: KB=20' @ 3609.81ft (Patriot 2)
MD Reference: KB=20' @ 3609.81ft (Patriot 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,300.01	0.0000	0.00	4,300.01	0.00	0.00	0.00	0.00	0.00	0.00
4,400.01	0.0000	0.00	4,400.01	0.00	0.00	0.00	0.00	0.00	0.00
4,500.01	0.0000	0.00	4,500.01	0.00	0.00	0.00	0.00	0.00	0.00
4,575.81	0.0000	0.00	4,575.81	0.00	0.00	0.00	0.00	0.00	0.00
Delaware									
4,600.01	0.0000	0.00	4,600.01	0.00	0.00	0.00	0.00	0.00	0.00
4,700.01	0.0000	0.00	4,700.01	0.00	0.00	0.00	0.00	0.00	0.00
4,800.01	0.0000	0.00	4,800.01	0.00	0.00	0.00	0.00	0.00	0.00
4,900.01	0.0000	0.00	4,900.01	0.00	0.00	0.00	0.00	0.00	0.00
5,000.01	0.0000	0.00	5,000.01	0.00	0.00	0.00	0.00	0.00	0.00
5,100.01	0.0000	0.00	5,100.01	0.00	0.00	0.00	0.00	0.00	0.00
5,200.01	0.0000	0.00	5,200.01	0.00	0.00	0.00	0.00	0.00	0.00
5,300.01	0.0000	0.00	5,300.01	0.00	0.00	0.00	0.00	0.00	0.00
5,400.01	0.0000	0.00	5,400.01	0.00	0.00	0.00	0.00	0.00	0.00
5,500.01	0.0000	0.00	5,500.01	0.00	0.00	0.00	0.00	0.00	0.00
5,553.81	0.0000	0.00	5,553.81	0.00	0.00	0.00	0.00	0.00	0.00
Brushy Canyon									
5,600.01	0.0000	0.00	5,600.01	0.00	0.00	0.00	0.00	0.00	0.00
5,700.01	0.0000	0.00	5,700.01	0.00	0.00	0.00	0.00	0.00	0.00
5,800.01	0.0000	0.00	5,800.01	0.00	0.00	0.00	0.00	0.00	0.00
5,900.01	0.0000	0.00	5,900.01	0.00	0.00	0.00	0.00	0.00	0.00
6,000.01	0.0000	0.00	6,000.01	0.00	0.00	0.00	0.00	0.00	0.00
6,100.01	0.0000	0.00	6,100.01	0.00	0.00	0.00	0.00	0.00	0.00
6,200.01	0.0000	0.00	6,200.01	0.00	0.00	0.00	0.00	0.00	0.00
6,300.01	0.0000	0.00	6,300.01	0.00	0.00	0.00	0.00	0.00	0.00
6,400.01	0.0000	0.00	6,400.01	0.00	0.00	0.00	0.00	0.00	0.00
6,500.01	0.0000	0.00	6,500.01	0.00	0.00	0.00	0.00	0.00	0.00
6,600.01	0.0000	0.00	6,600.01	0.00	0.00	0.00	0.00	0.00	0.00
6,700.01	0.0000	0.00	6,700.01	0.00	0.00	0.00	0.00	0.00	0.00
6,800.01	0.0000	0.00	6,800.01	0.00	0.00	0.00	0.00	0.00	0.00
6,900.01	0.0000	0.00	6,900.01	0.00	0.00	0.00	0.00	0.00	0.00
7,000.01	0.0000	0.00	7,000.01	0.00	0.00	0.00	0.00	0.00	0.00
7,100.01	0.0000	0.00	7,100.01	0.00	0.00	0.00	0.00	0.00	0.00
7,187.81	0.0000	0.00	7,187.81	0.00	0.00	0.00	0.00	0.00	0.00
Bone Sprg (BSGL)									
7,200.01	0.0000	0.00	7,200.01	0.00	0.00	0.00	0.00	0.00	0.00
7,300.01	0.0000	0.00	7,300.01	0.00	0.00	0.00	0.00	0.00	0.00
7,400.01	0.0000	0.00	7,400.01	0.00	0.00	0.00	0.00	0.00	0.00
7,500.02	0.0000	0.00	7,500.02	0.00	0.00	0.00	0.00	0.00	0.00
7,600.02	0.0000	0.00	7,600.02	0.00	0.00	0.00	0.00	0.00	0.00
7,700.02	0.0000	0.00	7,700.02	0.00	0.00	0.00	0.00	0.00	0.00
7,800.02	0.0000	0.00	7,800.02	0.00	0.00	0.00	0.00	0.00	0.00
7,900.02	0.0000	0.00	7,900.02	0.00	0.00	0.00	0.00	0.00	0.00
8,000.02	0.0000	0.00	8,000.02	0.00	0.00	0.00	0.00	0.00	0.00

Integrity Directional Services, LLC

Survey Report

Company: COG Production L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 20, T 19 S. , R 32 E
Well: Lusk Deep Unit A 31H
Wellbore: Wellbore #1
Design: Plan#5

Local Co-ordinate Reference: Well Lusk Deep Unit A 31H
TVD Reference: KB=20' @ 3609.81ft (Patriot 2)
MD Reference: KB=20' @ 3609.81ft (Patriot 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,100.02	0.0000	0.00	8,100.02	0.00	0.00	0.00	0.00	0.00	0.00
8,200.02	0.0000	0.00	8,200.02	0.00	0.00	0.00	0.00	0.00	0.00
8,300.02	0.0000	0.00	8,300.02	0.00	0.00	0.00	0.00	0.00	0.00
8,400.02	0.0000	0.00	8,400.02	0.00	0.00	0.00	0.00	0.00	0.00
8,444.82	0.0000	0.00	8,444.82	0.00	0.00	0.00	0.00	0.00	0.00
FBSG									
8,500.02	0.0000	0.00	8,500.02	0.00	0.00	0.00	0.00	0.00	0.00
8,600.02	0.0000	0.00	8,600.02	0.00	0.00	0.00	0.00	0.00	0.00
8,700.02	0.0000	0.00	8,700.02	0.00	0.00	0.00	0.00	0.00	0.00
8,800.02	0.0000	0.00	8,800.02	0.00	0.00	0.00	0.00	0.00	0.00
8,862.61	0.0000	0.00	8,862.61	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 12.00									
8,900.02	4.4868	271.72	8,899.98	0.04	-1.46	1.46	11.99	11.99	0.00
9,000.02	16.4868	271.72	8,998.13	0.59	-19.63	19.64	12.00	12.00	0.00
9,100.02	28.4867	271.72	9,090.36	1.73	-57.79	57.82	12.00	12.00	0.00
9,183.42	38.4968	271.72	9,159.82	3.11	-103.73	103.78	12.00	12.00	0.00
SBSG									
9,200.02	40.4867	271.72	9,172.63	3.43	-114.29	114.34	11.99	11.99	0.00
9,300.02	52.4867	271.72	9,241.35	5.60	-186.65	186.73	12.00	12.00	0.00
9,400.02	64.4867	271.72	9,293.52	8.15	-271.71	271.83	12.00	12.00	0.00
9,500.02	76.4866	271.72	9,326.86	10.96	-365.75	365.91	12.00	12.00	0.00
9,600.02	88.4866	271.72	9,339.91	13.93	-464.67	464.87	12.00	12.00	0.00
9,617.35	90.5682	271.72	9,340.05	14.45	-481.98	482.20	12.01	12.01	0.00
Start 1517.87 hold at 9617.35 MD									
9,700.02	90.5682	271.72	9,339.23	16.93	-564.62	564.87	0.00	0.00	0.00
9,800.02	90.5682	271.72	9,338.24	19.92	-664.57	664.86	0.00	0.00	0.00
9,900.02	90.5682	271.72	9,337.25	22.92	-764.52	764.86	0.00	0.00	0.00
10,000.02	90.5682	271.72	9,336.26	25.92	-864.47	864.86	0.00	0.00	0.00
10,100.02	90.5682	271.72	9,335.27	28.91	-964.42	964.85	0.00	0.00	0.00
10,200.02	90.5682	271.72	9,334.27	31.91	-1,064.37	1,064.85	0.00	0.00	0.00
10,300.02	90.5682	271.72	9,333.28	34.90	-1,164.32	1,164.84	0.00	0.00	0.00
10,400.02	90.5682	271.72	9,332.29	37.90	-1,264.27	1,264.84	0.00	0.00	0.00
10,500.02	90.5682	271.72	9,331.30	40.90	-1,364.22	1,364.83	0.00	0.00	0.00
10,600.02	90.5682	271.72	9,330.31	43.89	-1,464.17	1,464.83	0.00	0.00	0.00
10,700.02	90.5682	271.72	9,329.32	46.89	-1,564.12	1,564.82	0.00	0.00	0.00
10,800.02	90.5682	271.72	9,328.32	49.89	-1,664.07	1,664.82	0.00	0.00	0.00
10,900.02	90.5682	271.72	9,327.33	52.88	-1,764.02	1,764.81	0.00	0.00	0.00
11,000.02	90.5682	271.72	9,326.34	55.88	-1,863.97	1,864.81	0.00	0.00	0.00
11,100.02	90.5682	271.72	9,325.35	58.88	-1,963.92	1,964.80	0.00	0.00	0.00
11,135.22	90.5682	271.72	9,325.00	59.93	-1,999.10	2,000.00	0.00	0.00	0.00
Start Build 2.00									
11,172.72	91.3182	271.72	9,324.38	61.05	-2,036.58	2,037.49	2.00	2.00	0.00
Start 3015.88 hold at 11172.72 MD									
11,200.02	91.3182	271.72	9,323.75	61.87	-2,063.86	2,064.79	0.00	0.00	0.00

Integrity Directional Services, LLC

Survey Report

Company: COG Production L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 20, T 19 S. , R 32 E
Well: Lusk Deep Unit A 31H
Wellbore: Wellbore #1
Design: Plan#5

Local Co-ordinate Reference: Well Lusk Deep Unit A 31H
TVD Reference: KB=20' @ 3609.81ft (Patriot 2)
MD Reference: KB=20' @ 3609.81ft (Patriot 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,300.02	91.3182	271.72	9,321.45	64.87	-2,163.79	2,164.76	0.00	0.00	0.00
11,400.02	91.3182	271.72	9,319.15	67.86	-2,263.72	2,264.74	0.00	0.00	0.00
11,500.02	91.3182	271.72	9,316.85	70.86	-2,363.65	2,364.71	0.00	0.00	0.00
11,600.02	91.3182	271.72	9,314.55	73.85	-2,463.58	2,464.68	0.00	0.00	0.00
11,700.02	91.3182	271.72	9,312.25	76.85	-2,563.51	2,564.66	0.00	0.00	0.00
11,800.02	91.3182	271.72	9,309.95	79.85	-2,663.44	2,664.63	0.00	0.00	0.00
11,900.02	91.3182	271.72	9,307.65	82.84	-2,763.36	2,764.61	0.00	0.00	0.00
12,000.02	91.3182	271.72	9,305.35	85.84	-2,863.29	2,864.58	0.00	0.00	0.00
12,100.02	91.3182	271.72	9,303.05	88.83	-2,963.22	2,964.55	0.00	0.00	0.00
12,200.02	91.3182	271.72	9,300.75	91.83	-3,063.15	3,064.53	0.00	0.00	0.00
12,300.02	91.3182	271.72	9,298.45	94.82	-3,163.08	3,164.50	0.00	0.00	0.00
12,400.03	91.3182	271.72	9,296.15	97.82	-3,263.01	3,264.47	0.00	0.00	0.00
12,500.03	91.3182	271.72	9,293.85	100.82	-3,362.94	3,364.45	0.00	0.00	0.00
12,600.03	91.3182	271.72	9,291.55	103.81	-3,462.87	3,464.42	0.00	0.00	0.00
12,700.03	91.3182	271.72	9,289.25	106.81	-3,562.79	3,564.40	0.00	0.00	0.00
12,800.03	91.3182	271.72	9,286.95	109.80	-3,662.72	3,664.37	0.00	0.00	0.00
12,900.03	91.3182	271.72	9,284.65	112.80	-3,762.65	3,764.34	0.00	0.00	0.00
13,000.03	91.3182	271.72	9,282.35	115.79	-3,862.58	3,864.32	0.00	0.00	0.00
13,100.03	91.3182	271.72	9,280.05	118.79	-3,962.51	3,964.29	0.00	0.00	0.00
13,200.03	91.3182	271.72	9,277.74	121.79	-4,062.44	4,064.26	0.00	0.00	0.00
13,300.03	91.3182	271.72	9,275.44	124.78	-4,162.37	4,164.24	0.00	0.00	0.00
13,400.03	91.3182	271.72	9,273.14	127.78	-4,262.30	4,264.21	0.00	0.00	0.00
13,500.03	91.3182	271.72	9,270.84	130.77	-4,362.23	4,364.19	0.00	0.00	0.00
13,600.03	91.3182	271.72	9,268.54	133.77	-4,462.15	4,464.16	0.00	0.00	0.00
13,700.03	91.3182	271.72	9,266.24	136.76	-4,562.08	4,564.13	0.00	0.00	0.00
13,800.03	91.3182	271.72	9,263.94	139.76	-4,662.01	4,664.11	0.00	0.00	0.00
13,900.03	91.3182	271.72	9,261.64	142.76	-4,761.94	4,764.08	0.00	0.00	0.00
14,000.03	91.3182	271.72	9,259.34	145.75	-4,861.87	4,864.05	0.00	0.00	0.00
14,100.03	91.3182	271.72	9,257.04	148.75	-4,961.80	4,964.03	0.00	0.00	0.00
14,188.60	91.3182	271.72	9,255.00	151.40	-5,050.31	5,052.58	0.00	0.00	0.00
TD at 14188.60									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Lusk Deep Unit A 31H	0.0000	0.00	9,255.00	151.40	-5,050.31	601,395.40	665,286.90	32° 39' 7.879 N	103° 47' 46.709 W
- plan hits target center									
- Point									

Integrity Directional Services, LLC

Survey Report

Company: COG Production L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 20, T 19 S. , R 32 E
Well: Lusk Deep Unit A 31H
Wellbore: Wellbore #1
Design: Plan#5

Local Co-ordinate Reference: Well Lusk Deep Unit A 31H
TVD Reference: KB=20' @ 3609.81ft (Patriot 2)
MD Reference: KB=20' @ 3609.81ft (Patriot 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
821.80	821.80	Rustler		0.00	
927.80	927.80	TOS		0.00	
2,427.80	2,427.80	BOS (Tansill)		0.00	
2,697.81	2,697.81	Yates		0.00	
2,984.81	2,984.81	Reef		0.00	
4,161.81	4,161.81	Base of Reef		0.00	
4,575.81	4,575.81	Delaware		0.00	
5,553.81	5,553.81	Brushy Canyon		0.00	
7,187.81	7,187.81	Bone Sprg (BSGL)		0.00	
8,444.82	8,444.82	FBSG		0.00	
9,183.42	9,159.82	SBSG		0.00	

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
8863	8863	0	0	Start Build 12.00
9617	9340	14	-482	Start 1517.87 hold at 9617.35 MD
11,135	9325	60	-1999	Start Build 2.00
11,173	9324	61	-2037	Start 3015.88 hold at 11172.72 MD
14,189	9255	151	-5050	TD at 14188.60

Checked By: _____ Approved By: _____ Date: _____

COG Production L L C

Lea County, NM (NAD27 NME)

Sec. 20, T 19 S. , R 32 E

Lusk Deep Unit A 31H

Wellbore #1

Plan#5

Anticollision Report

23 May, 2016

AMENDED PROPOSED

Integrity Directional Services, LLC

Anticollision Report

Company:	COG Production L L C	Local Co-ordinate Reference:	Well Lusk Deep Unit A 31H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=20' @ 3609.81ft (Patriot 2)
Reference Site:	Sec. 20, T 19 S. , R 32 E	MD Reference:	KB=20' @ 3609.81ft (Patriot 2)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Lusk Deep Unit A 31H	Survey Calculation Method:	Minimum Curvature
Well Error:	5.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan#5	Offset TVD Reference:	Offset Datum

Reference	Plan#5		
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 10,000.00 ft	Error Surface:	Circular Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date 5/23/2016		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name
0.00	14,188.60	Plan#5 (Wellbore #1)	MWD
			Description
			MWD - Standard

Summary						
	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Site Name						
Offset Well - Wellbore - Design						
Sec. 20, T 19 S. , R 32 E						
Lusk Deep Unit A 17 - Actual Wellbore - Actual Wellbore	7,200.00	7,196.28	215.28	-17.06	0.927	Level 1, CC, ES, SF
Lusk Deep Unit A 19 - Actual Wellbore - Actual Wellbore	7,200.00	7,199.88	1,474.46	1,242.20	6.348	CC, ES
Lusk Deep Unit A 19 - Actual Wellbore - Actual Wellbore	7,300.00	7,220.01	1,476.63	1,243.55	6.335	SF

Offset Design													Offset Site Error:	0.00 ft
Sec. 20, T 19 S. , R 32 E - Lusk Deep Unit A 17 - Actual Wellbore - Actual Wellbore													Offset Well Error:	5.00 ft
Survey Program: 382-Inclinometer only														
Reference		Offset		Semi Major Axis		Distance								
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.00	0.00	0.00	0.00	5.00	5.00	-40.39	163.98	-139.48	215.32					
100.00	100.00	95.90	95.90	5.00	5.72	-40.39	163.98	-139.48	215.28	204.56	10.72	20.087		
200.00	200.00	195.90	195.90	5.01	7.55	-40.39	163.98	-139.48	215.28	202.72	12.56	17.136		
300.00	300.00	295.90	295.90	5.03	9.91	-40.39	163.98	-139.48	215.28	200.34	14.94	14.414		
400.00	400.00	395.90	395.90	5.06	12.50	-40.39	163.98	-139.48	215.28	197.72	17.56	12.261		
500.00	500.00	495.90	495.90	5.10	15.30	-40.39	163.98	-139.48	215.28	194.89	20.39	10.556		
600.00	600.00	595.90	595.90	5.15	18.16	-40.39	163.98	-139.48	215.28	191.98	23.30	9.238		
700.00	700.00	695.90	695.90	5.20	21.06	-40.39	163.98	-139.48	215.28	189.02	26.26	8.197		
800.00	800.00	795.90	795.90	5.27	23.98	-40.39	163.98	-139.48	215.28	186.03	29.25	7.359		
900.00	900.00	895.91	895.90	5.34	26.93	-40.39	163.98	-139.48	215.28	183.01	32.27	6.671		
1,000.00	1,000.00	995.91	995.90	5.43	29.88	-40.39	163.98	-139.48	215.28	179.97	35.31	6.097		
1,100.00	1,100.00	1,095.91	1,095.90	5.52	32.84	-40.39	163.98	-139.48	215.28	176.92	38.36	5.612		
1,200.00	1,200.00	1,195.91	1,195.90	5.62	35.81	-40.39	163.98	-139.48	215.28	173.85	41.43	5.197		
1,300.00	1,300.00	1,295.91	1,295.90	5.72	38.78	-40.39	163.98	-139.48	215.28	170.77	44.51	4.837		
1,400.00	1,400.00	1,395.91	1,395.90	5.84	41.76	-40.39	163.98	-139.48	215.28	167.69	47.59	4.523		
1,500.00	1,500.00	1,495.92	1,495.90	5.96	44.74	-40.39	163.98	-139.48	215.28	164.59	50.69	4.247		
1,600.00	1,600.00	1,595.92	1,595.90	6.08	47.72	-40.39	163.98	-139.48	215.28	161.48	53.80	4.001		
1,700.00	1,700.00	1,695.92	1,695.90	6.21	50.70	-40.39	163.98	-139.48	215.28	158.36	56.92	3.782		
1,800.00	1,800.00	1,795.92	1,795.90	6.35	53.69	-40.39	163.98	-139.48	215.28	155.24	60.04	3.586		
1,900.00	1,900.00	1,895.92	1,895.90	6.49	56.68	-40.39	163.98	-139.48	215.28	152.11	63.17	3.408		
2,000.00	2,000.00	1,995.93	1,995.90	6.63	59.67	-40.39	163.98	-139.48	215.28	148.98	66.30	3.247		
2,100.00	2,100.00	2,095.93	2,095.90	6.78	62.66	-40.39	163.98	-139.48	215.28	145.84	69.44	3.100		
2,200.00	2,200.00	2,195.98	2,195.90	6.94	65.65	-40.39	163.98	-139.48	215.28	142.69	72.59	2.966		
2,300.00	2,300.00	2,295.98	2,295.90	7.10	68.64	-40.39	163.98	-139.48	215.28	139.54	75.74	2.842		

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

Integrity Directional Services, LLC

Anticollision Report

Company: COG Production L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 20, T 19 S., R 32 E
Site Error: 5.00 ft
Reference Well: Lusk Deep Unit A 31H
Well Error: 5.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#5

Local Co-ordinate Reference: Well Lusk Deep Unit A 31H
TVD Reference: KB=20' @ 3609.81ft (Patriot 2)
MD Reference: KB=20' @ 3609.81ft (Patriot 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 20, T 19 S., R 32 E - Lusk Deep Unit A 17 - Actual Wellbore - Actual Wellbore														Offset Site Error:	0.00 ft
Survey Program: 382-Inclinometer only														Offset Well Error:	5.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)							
2,400.00	2,400.00	2,395.98	2,395.90	7.26	71.63	-40.39	163.98	-139.48	215.28	136.39	78.89	2.729			
2,500.00	2,500.00	2,495.98	2,495.90	7.42	74.63	-40.39	163.98	-139.48	215.28	133.23	82.05	2.624			
2,600.00	2,600.00	2,596.06	2,595.90	7.59	77.62	-40.39	163.98	-139.48	215.28	130.07	85.21	2.526			
2,700.00	2,700.00	2,696.09	2,695.90	7.76	80.62	-40.39	163.98	-139.48	215.28	126.90	88.38	2.436			
2,800.00	2,800.00	2,796.09	2,795.90	7.93	83.61	-40.39	163.98	-139.48	215.28	123.74	91.54	2.352			
2,900.00	2,900.00	2,896.14	2,895.90	8.11	86.61	-40.39	163.98	-139.48	215.28	120.56	94.72	2.273			
3,000.00	3,000.00	2,996.14	2,995.90	8.29	89.60	-40.39	163.98	-139.48	215.28	117.39	97.89	2.199			
3,100.00	3,100.00	3,096.14	3,095.90	8.47	92.60	-40.39	163.98	-139.48	215.28	114.21	101.07	2.130			
3,200.00	3,200.00	3,196.16	3,195.90	8.65	95.60	-40.39	163.98	-139.48	215.28	111.04	104.25	2.065			
3,300.00	3,300.00	3,296.16	3,295.90	8.83	98.59	-40.39	163.98	-139.48	215.28	107.85	107.43	2.004			
3,400.00	3,400.00	3,396.20	3,395.90	9.02	101.59	-40.39	163.98	-139.48	215.28	104.67	110.61	1.946			
3,500.00	3,500.00	3,496.20	3,495.90	9.21	104.59	-40.39	163.98	-139.48	215.28	101.49	113.79	1.892			
3,600.00	3,600.00	3,596.20	3,595.90	9.40	107.58	-40.39	163.98	-139.48	215.28	98.30	116.98	1.840			
3,700.00	3,700.00	3,696.20	3,695.90	9.59	110.58	-40.39	163.98	-139.48	215.28	95.11	120.17	1.791			
3,800.00	3,800.00	3,796.20	3,795.90	9.78	113.58	-40.39	163.98	-139.48	215.28	91.92	123.36	1.745			
3,900.00	3,900.00	3,896.20	3,895.90	9.97	116.57	-40.39	163.98	-139.48	215.28	88.73	126.55	1.701			
4,000.00	4,000.00	3,996.20	3,995.90	10.17	119.57	-40.39	163.98	-139.48	215.28	85.54	129.74	1.659			
4,100.00	4,100.00	4,096.21	4,095.90	10.37	122.57	-40.39	163.98	-139.48	215.28	82.35	132.93	1.619			
4,200.00	4,200.00	4,196.21	4,195.90	10.56	125.57	-40.39	163.98	-139.48	215.28	79.15	136.13	1.581			
4,300.00	4,300.00	4,296.21	4,295.90	10.76	128.56	-40.39	163.98	-139.48	215.28	75.95	139.33	1.545			
4,400.00	4,400.00	4,396.21	4,395.90	10.96	131.56	-40.39	163.98	-139.48	215.28	72.76	142.52	1.510			
4,500.00	4,500.00	4,496.21	4,495.90	11.16	134.56	-40.39	163.98	-139.48	215.28	69.56	145.72	1.477 Level 3			
4,600.00	4,600.00	4,596.21	4,595.90	11.36	137.56	-40.39	163.98	-139.48	215.28	66.36	148.92	1.446 Level 3			
4,700.00	4,700.00	4,696.21	4,695.90	11.57	140.56	-40.39	163.98	-139.48	215.28	63.16	152.12	1.415 Level 3			
4,800.00	4,800.00	4,796.22	4,795.90	11.77	143.55	-40.39	163.98	-139.48	215.28	59.96	155.32	1.386 Level 3			
4,900.00	4,900.00	4,896.22	4,895.90	11.97	146.55	-40.39	163.98	-139.48	215.28	56.76	158.52	1.358 Level 3			
5,000.00	5,000.00	4,996.22	4,995.90	12.18	149.55	-40.39	163.98	-139.48	215.28	53.55	161.73	1.331 Level 3			
5,100.00	5,100.00	5,096.23	5,095.90	12.38	152.55	-40.39	163.98	-139.48	215.28	50.35	164.93	1.305 Level 3			
5,200.00	5,200.00	5,196.23	5,195.90	12.59	155.55	-40.39	163.98	-139.48	215.28	47.14	168.14	1.280 Level 3			
5,300.00	5,300.00	5,296.23	5,295.90	12.80	158.55	-40.39	163.98	-139.48	215.28	43.94	171.34	1.256 Level 3			
5,400.00	5,400.00	5,396.23	5,395.90	13.00	161.54	-40.39	163.98	-139.48	215.28	40.73	174.55	1.233 Level 2			
5,500.00	5,500.00	5,496.23	5,495.90	13.21	164.54	-40.39	163.98	-139.48	215.28	37.53	177.75	1.211 Level 2			
5,600.00	5,600.00	5,596.23	5,595.90	13.42	167.54	-40.39	163.98	-139.48	215.28	34.32	180.96	1.190 Level 2			
5,700.00	5,700.00	5,696.23	5,695.90	13.63	170.54	-40.39	163.98	-139.48	215.28	31.11	184.17	1.169 Level 2			
5,800.00	5,800.00	5,796.24	5,795.90	13.84	173.54	-40.39	163.98	-139.48	215.28	27.90	187.38	1.149 Level 2			
5,900.00	5,900.00	5,896.24	5,895.90	14.05	176.54	-40.39	163.98	-139.48	215.28	24.70	190.58	1.130 Level 2			
6,000.00	6,000.00	5,996.24	5,995.90	14.26	179.54	-40.39	163.98	-139.48	215.28	21.49	193.79	1.111 Level 2			
6,100.00	6,100.00	6,096.25	6,095.90	14.47	182.54	-40.39	163.98	-139.48	215.28	18.28	197.00	1.093 Level 2			
6,200.00	6,200.00	6,196.25	6,195.90	14.68	185.53	-40.39	163.98	-139.48	215.28	15.07	200.21	1.075 Level 2			
6,300.00	6,300.00	6,296.25	6,295.90	14.89	188.53	-40.39	163.98	-139.48	215.28	11.86	203.42	1.058 Level 2			
6,400.00	6,400.00	6,396.26	6,395.90	15.10	191.53	-40.39	163.98	-139.48	215.28	8.65	206.64	1.042 Level 2			
6,500.00	6,500.00	6,496.26	6,495.90	15.31	194.53	-40.39	163.98	-139.48	215.28	5.43	209.85	1.026 Level 2			
6,600.00	6,600.00	6,596.26	6,595.90	15.53	197.53	-40.39	163.98	-139.48	215.28	2.22	213.06	1.010 Level 2			
6,700.00	6,700.00	6,696.26	6,695.90	15.74	200.53	-40.39	163.98	-139.48	215.28	-0.99	216.27	0.995 Level 1			
6,800.00	6,800.00	6,796.26	6,795.90	15.95	203.53	-40.39	163.98	-139.48	215.28	-4.20	219.48	0.981 Level 1			
6,900.00	6,900.00	6,896.26	6,895.90	16.17	206.53	-40.39	163.98	-139.48	215.28	-7.41	222.70	0.967 Level 1			
7,000.00	7,000.00	6,996.26	6,995.90	16.38	209.53	-40.39	163.98	-139.48	215.28	-10.63	225.91	0.953 Level 1			
7,100.00	7,100.00	7,096.28	7,095.90	16.59	212.53	-40.39	163.98	-139.48	215.28	-13.84	229.12	0.940 Level 1			
7,200.00	7,200.00	7,196.28	7,195.90	16.81	215.53	-40.39	163.98	-139.48	215.28	-17.06	232.34	0.927 Level 1, CC, ES, SF			
7,300.00	7,300.00	7,224.01	7,223.62	17.02	216.36	-40.39	163.98	-139.48	227.09	-6.29	233.38	0.973 Level 1			
7,400.00	7,400.00	7,224.01	7,223.62	17.24	216.36	-40.39	163.98	-139.48	275.73	42.13	233.60	1.180 Level 2			
7,500.00	7,500.00	7,224.01	7,223.62	17.45	216.36	-40.39	163.98	-139.48	347.10	113.29	233.81	1.485 Level 3			

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

Integrity Directional Services, LLC

Anticollision Report

Company: COG Production L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 20, T 19 S., R 32 E
Site Error: 5.00 ft
Reference Well: Lusk Deep Unit A 31H
Well Error: 5.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#5

Local Co-ordinate Reference: Well Lusk Deep Unit A 31H
TVD Reference: KB=20' @ 3609.81ft (Patriot 2)
MD Reference: KB=20' @ 3609.81ft (Patriot 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 20, T 19 S., R 32 E - Lusk Deep Unit A 17 - Actual Wellbore - Actual Wellbore													Offset Site Error:	0.00 ft
Survey Program: 382-Inclinometer only													Offset Well Error:	5.00 ft
Reference	Offset	Semi Major Axis		Distance		Minimum		Separation		Warning				
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
7,600.00	7,600.00	7,224.01	7,223.62	17.67	216.36	-40.39	163.98	-139.48	430.04	196.01	234.03	1.838		
7,700.00	7,700.00	7,224.01	7,223.62	17.89	216.36	-40.39	163.98	-139.48	519.03	284.78	234.24	2.216		
7,800.00	7,800.00	7,224.01	7,223.62	18.10	216.36	-40.39	163.98	-139.48	611.43	376.97	234.46	2.608		
7,900.00	7,900.00	7,224.01	7,223.62	18.32	216.36	-40.39	163.98	-139.48	705.90	471.23	234.68	3.008		
8,000.00	8,000.00	7,224.01	7,223.62	18.53	216.36	-40.39	163.98	-139.48	801.72	566.83	234.89	3.413		
8,100.00	8,100.00	7,224.01	7,223.62	18.75	216.36	-40.39	163.98	-139.48	898.45	663.34	235.11	3.821		
8,200.00	8,200.00	7,224.01	7,223.62	18.97	216.36	-40.39	163.98	-139.48	995.82	760.50	235.33	4.232		
8,300.00	8,300.00	7,224.01	7,223.62	19.18	216.36	-40.39	163.98	-139.48	1,093.67	858.13	235.54	4.643		
8,400.00	8,400.00	7,224.01	7,223.62	19.40	216.36	-40.39	163.98	-139.48	1,191.88	956.12	235.76	5.055		
8,500.00	8,500.00	7,224.01	7,223.62	19.62	216.36	-40.39	163.98	-139.48	1,290.36	1,054.38	235.98	5.468		
8,600.00	8,600.00	7,224.01	7,223.62	19.84	216.36	-40.39	163.98	-139.48	1,389.06	1,152.87	236.19	5.881		
8,700.00	8,700.00	7,224.01	7,223.62	20.05	216.36	-40.39	163.98	-139.48	1,487.93	1,251.52	236.41	6.294		
8,800.00	8,800.00	7,224.01	7,223.62	20.27	216.36	-40.39	163.98	-139.48	1,586.95	1,350.32	236.63	6.706		
8,862.61	8,862.61	7,224.01	7,223.62	20.41	216.36	-40.39	163.98	-139.48	1,649.00	1,412.23	236.77	6.965		
8,875.00	8,875.00	7,224.01	7,223.62	20.43	216.36	-40.39	163.98	-139.48	1,661.27	1,424.48	236.79	7.016		
8,900.00	8,899.96	7,224.01	7,223.62	20.48	216.36	30.31	163.98	-139.48	1,685.91	1,449.07	236.84	7.118		
8,925.00	8,924.82	7,224.01	7,223.62	20.53	216.36	23.91	163.98	-139.48	1,710.36	1,473.47	236.89	7.220		
8,950.00	8,949.51	7,224.01	7,223.62	20.58	216.36	19.64	163.98	-139.48	1,734.55	1,497.61	236.94	7.321		
8,975.00	8,973.97	7,224.01	7,223.62	20.63	216.36	16.63	163.98	-139.48	1,758.43	1,521.44	236.99	7.420		
9,000.00	8,998.11	7,224.01	7,223.62	20.68	216.36	14.40	163.98	-139.48	1,781.95	1,544.91	237.04	7.518		
9,025.00	9,021.89	7,224.01	7,223.62	20.73	216.36	12.70	163.98	-139.48	1,805.05	1,567.96	237.09	7.613		
9,050.00	9,045.23	7,224.01	7,223.62	20.79	216.36	11.36	163.98	-139.48	1,827.70	1,590.56	237.14	7.707		
9,075.00	9,068.06	7,224.01	7,223.62	20.84	216.36	10.28	163.98	-139.48	1,849.85	1,612.65	237.20	7.799		
9,100.00	9,090.34	7,224.01	7,223.62	20.90	216.36	9.40	163.98	-139.48	1,871.45	1,634.19	237.26	7.888		
9,125.00	9,111.99	7,224.01	7,223.62	20.96	216.36	8.67	163.98	-139.48	1,892.47	1,655.15	237.32	7.974		
9,150.00	9,132.96	7,224.01	7,223.62	21.03	216.36	8.06	163.98	-139.48	1,912.87	1,675.48	237.39	8.058		
9,175.00	9,153.19	7,224.01	7,223.62	21.10	216.36	7.53	163.98	-139.48	1,932.62	1,695.15	237.46	8.139		
9,200.00	9,172.62	7,224.01	7,223.62	21.18	216.36	7.08	163.98	-139.48	1,951.67	1,714.13	237.54	8.216		
9,225.00	9,191.20	7,224.01	7,223.62	21.27	216.36	6.69	163.98	-139.48	1,970.00	1,732.37	237.63	8.290		
9,250.00	9,208.88	7,224.01	7,223.62	21.37	216.36	6.36	163.98	-139.48	1,987.58	1,749.86	237.72	8.361		
9,275.00	9,225.61	7,224.01	7,223.62	21.47	216.36	6.06	163.98	-139.48	2,004.39	1,766.56	237.83	8.428		
9,300.00	9,241.34	7,224.01	7,223.62	21.59	216.36	5.80	163.98	-139.48	2,020.39	1,782.44	237.95	8.491		
9,325.00	9,256.04	7,224.01	7,223.62	21.73	216.36	5.58	163.98	-139.48	2,035.56	1,797.47	238.08	8.550		
9,350.00	9,269.66	7,224.01	7,223.62	21.87	216.36	5.38	163.98	-139.48	2,049.88	1,811.64	238.23	8.605		
9,375.00	9,282.16	7,224.01	7,223.62	22.03	216.36	5.20	163.98	-139.48	2,063.32	1,824.93	238.39	8.655		
9,400.00	9,293.52	7,224.01	7,223.62	22.21	216.36	5.04	163.98	-139.48	2,075.87	1,837.30	238.57	8.701		
9,425.00	9,303.69	7,224.01	7,223.62	22.41	216.36	4.91	163.98	-139.48	2,087.52	1,848.75	238.77	8.743		
9,450.00	9,312.65	7,224.01	7,223.62	22.62	216.36	4.79	163.98	-139.48	2,098.23	1,859.25	238.98	8.780		
9,475.00	9,320.38	7,224.01	7,223.62	22.85	216.36	4.68	163.98	-139.48	2,108.01	1,868.80	239.21	8.812		
9,500.00	9,326.86	7,224.01	7,223.62	23.10	216.36	4.59	163.98	-139.48	2,116.83	1,877.37	239.46	8.840		
9,525.00	9,332.06	7,224.01	7,223.62	23.37	216.36	4.51	163.98	-139.48	2,124.68	1,884.95	239.73	8.863		
9,550.00	9,335.98	7,224.01	7,223.62	23.65	216.36	4.44	163.98	-139.48	2,131.55	1,891.54	240.01	8.881		
9,575.00	9,338.60	7,224.01	7,223.62	23.95	216.36	4.39	163.98	-139.48	2,137.44	1,897.13	240.31	8.895		
9,600.00	9,339.91	7,224.01	7,223.62	24.26	216.36	4.34	163.98	-139.48	2,142.33	1,901.71	240.62	8.903		
9,617.35	9,340.05	7,224.01	7,223.62	24.48	216.36	4.32	163.98	-139.48	2,145.13	1,904.29	240.84	8.907		
9,700.00	9,339.23	7,224.01	7,223.62	25.64	216.36	4.32	163.98	-139.48	2,158.89	1,916.89	242.00	8.921		
9,800.00	9,338.24	7,224.01	7,223.62	27.24	216.36	4.32	163.98	-139.48	2,179.62	1,936.02	243.59	8.948		
9,900.00	9,337.25	7,224.01	7,223.62	29.01	216.36	4.32	163.98	-139.48	2,204.68	1,959.32	245.36	8.985		
10,000.00	9,336.26	7,224.01	7,223.62	30.92	216.36	4.32	163.98	-139.48	2,233.95	1,986.67	247.28	9.034		
10,100.00	9,335.27	7,224.01	7,223.62	32.96	216.36	4.32	163.98	-139.48	2,267.26	2,017.94	249.32	9.094		
10,200.00	9,334.27	7,224.01	7,223.62	35.09	216.36	4.32	163.98	-139.48	2,304.42	2,052.97	251.45	9.164		
10,300.00	9,333.28	7,224.01	7,223.62	37.31	216.36	4.32	163.98	-139.48	2,345.27	2,091.60	253.67	9.245		

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

Integrity Directional Services, LLC

Anticollision Report

Company: COG Production L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 20, T 19 S. , R 32 E
Site Error: 5.00 ft
Reference Well: Lusk Deep Unit A 31H
Well Error: 5.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#5

Local Co-ordinate Reference: Well Lusk Deep Unit A 31H
TVD Reference: KB=20' @ 3609.81ft (Patriot 2)
MD Reference: KB=20' @ 3609.81ft (Patriot 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 20, T 19 S. , R 32 E - Lusk Deep Unit A 17 - Actual Wellbore - Actual Wellbore													Offset Site Error:	0.00 ft
Survey Program: 382-Inclinometer only													Offset Well Error:	5.00 ft
Reference		Offset		Semi Major Axis			Distance		Minimum Separation (ft)	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)				Between Centres (ft)	Between Ellipses (ft)	
10,400.00	9,332.29	7,224.01	7,223.62	39.60	216.36	4.32	163.98	-139.48	2,389.60	2,133.64	255.96	9.336		
10,500.00	9,331.30	7,224.01	7,223.62	41.94	216.36	4.32	163.98	-139.48	2,437.23	2,178.93	258.30	9.436		
10,600.00	9,330.31	7,224.01	7,223.62	44.34	216.36	4.32	163.98	-139.48	2,487.97	2,227.28	260.70	9.544		
10,700.00	9,329.32	7,224.01	7,223.62	46.77	216.36	4.32	163.98	-139.48	2,541.64	2,278.51	263.13	9.659		
10,800.00	9,328.32	7,224.01	7,223.62	49.24	216.36	4.32	163.98	-139.48	2,598.04	2,332.45	265.60	9.782		
10,900.00	9,327.33	7,224.01	7,223.62	51.74	216.36	4.32	163.98	-139.48	2,657.02	2,388.92	268.10	9.911		
11,000.00	9,326.34	7,224.01	7,223.62	54.26	216.36	4.32	163.98	-139.48	2,718.39	2,447.77	270.62	10.045		
11,100.00	9,325.35	7,224.01	7,223.62	56.81	216.36	4.32	163.98	-139.48	2,782.01	2,508.84	273.17	10.184		
11,135.22	9,325.00	7,224.01	7,223.62	57.71	216.36	4.32	163.98	-139.48	2,804.92	2,530.85	274.07	10.234		
11,172.72	9,324.38	7,224.01	7,223.62	58.67	216.36	4.27	163.98	-139.48	2,829.41	2,554.37	275.03	10.288		
11,200.00	9,323.76	7,224.01	7,223.62	59.38	216.36	4.27	163.98	-139.48	2,847.26	2,571.53	275.73	10.326		
11,300.00	9,321.45	7,224.01	7,223.62	61.96	216.36	4.27	163.98	-139.48	2,913.98	2,635.66	278.32	10.470		
11,400.00	9,319.15	7,224.01	7,223.62	64.56	216.36	4.27	163.98	-139.48	2,982.55	2,701.64	280.91	10.617		
11,500.00	9,316.85	7,224.01	7,223.62	67.17	216.36	4.27	163.98	-139.48	3,052.86	2,769.33	283.52	10.768		
11,600.00	9,314.55	7,224.01	7,223.62	69.79	216.36	4.27	163.98	-139.48	3,124.78	2,838.64	286.15	10.920		
11,700.00	9,312.25	7,224.01	7,223.62	72.42	216.36	4.27	163.98	-139.48	3,198.22	2,909.44	288.78	11.075		
11,800.00	9,309.95	7,224.01	7,223.62	75.06	216.36	4.27	163.98	-139.48	3,273.07	2,981.64	291.42	11.231		
11,900.00	9,307.65	7,224.01	7,223.62	77.71	216.36	4.27	163.98	-139.48	3,349.22	3,055.15	294.07	11.389		
12,000.00	9,305.35	7,224.01	7,223.62	80.37	216.36	4.27	163.98	-139.48	3,426.61	3,129.88	296.73	11.548		
12,100.00	9,303.05	7,224.01	7,223.62	83.04	216.36	4.27	163.98	-139.48	3,505.14	3,205.74	299.40	11.707		
12,200.00	9,300.75	7,224.01	7,223.62	85.71	216.36	4.27	163.98	-139.48	3,584.73	3,282.67	302.07	11.867		
12,300.00	9,298.45	7,224.01	7,223.62	88.39	216.36	4.27	163.98	-139.48	3,665.33	3,360.59	304.74	12.028		
12,400.00	9,296.15	7,224.01	7,223.62	91.07	216.36	4.27	163.98	-139.48	3,746.87	3,439.44	307.43	12.188		
12,500.00	9,293.85	7,224.01	7,223.62	93.75	216.36	4.27	163.98	-139.48	3,829.27	3,519.16	310.11	12.348		
12,600.00	9,291.55	7,224.01	7,223.62	96.45	216.36	4.27	163.98	-139.48	3,912.50	3,599.70	312.80	12.508		
12,700.00	9,289.25	7,224.01	7,223.62	99.14	216.36	4.27	163.98	-139.48	3,996.50	3,681.00	315.50	12.667		
12,800.00	9,286.95	7,224.01	7,223.62	101.84	216.36	4.27	163.98	-139.48	4,081.22	3,763.02	318.20	12.826		
12,900.00	9,284.65	7,224.01	7,223.62	104.54	216.36	4.27	163.98	-139.48	4,166.62	3,845.72	320.90	12.984		
13,000.00	9,282.35	7,224.01	7,223.62	107.25	216.36	4.27	163.98	-139.48	4,252.65	3,929.05	323.60	13.142		
13,100.00	9,280.05	7,224.01	7,223.62	109.95	216.36	4.27	163.98	-139.48	4,339.28	4,012.97	326.31	13.298		
13,200.00	9,277.75	7,224.01	7,223.62	112.66	216.36	4.27	163.98	-139.48	4,426.48	4,097.46	329.02	13.453		
13,300.00	9,275.44	7,224.01	7,223.62	115.38	216.36	4.27	163.98	-139.48	4,514.21	4,182.47	331.74	13.608		
13,400.00	9,273.14	7,224.01	7,223.62	118.09	216.36	4.27	163.98	-139.48	4,602.44	4,267.98	334.45	13.761		
13,500.00	9,270.84	7,224.01	7,223.62	120.81	216.36	4.27	163.98	-139.48	4,691.14	4,353.97	337.17	13.913		
13,600.00	9,268.54	7,224.01	7,223.62	123.53	216.36	4.27	163.98	-139.48	4,780.28	4,440.39	339.89	14.064		
13,700.00	9,266.24	7,224.01	7,223.62	126.25	216.36	4.27	163.98	-139.48	4,869.85	4,527.24	342.61	14.214		
13,800.00	9,263.94	7,224.01	7,223.62	128.98	216.36	4.27	163.98	-139.48	4,959.82	4,614.48	345.33	14.362		
13,900.00	9,261.64	7,224.01	7,223.62	131.70	216.36	4.27	163.98	-139.48	5,050.16	4,702.10	348.06	14.510		
14,000.00	9,259.34	7,224.01	7,223.62	134.43	216.36	4.27	163.98	-139.48	5,140.86	4,790.08	350.79	14.655		
14,100.00	9,257.04	7,224.01	7,223.62	137.15	216.36	4.27	163.98	-139.48	5,231.90	4,878.39	353.51	14.800		
14,188.60	9,255.00	7,224.01	7,223.62	139.57	216.36	4.27	163.98	-139.48	5,312.84	4,956.90	355.93	14.927		

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

Integrity Directional Services, LLC

Anticollision Report

Company: COG Production L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 20, T 19 S., R 32 E
Site Error: 5.00 ft
Reference Well: Lusk Deep Unit A 31H
Well Error: 5.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#5

Local Co-ordinate Reference: Well Lusk Deep Unit A 31H
TVD Reference: KB=20' @ 3609.81ft (Patriot 2)
MD Reference: KB=20' @ 3609.81ft (Patriot 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 20, T 19 S., R 32 E - Lusk Deep Unit A 19 - Actual Wellbore - Actual Wellbore													Offset Site Error:	0.00 ft
Survey Program: 489-Inclinometer only													Offset Well Error:	5.00 ft
Reference		Offset		Semi Major Axis		Distance								Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	5.00	5.00	-83.61	164.10	-1,465.30	1,474.46					
100.00	100.00	99.10	99.10	5.00	5.76	-83.61	164.10	-1,465.30	1,474.46	1,463.70	10.76	137.073		
200.00	200.00	199.10	199.10	5.01	7.60	-83.61	164.10	-1,465.30	1,474.46	1,461.85	12.61	116.893		
300.00	300.00	299.10	299.10	5.03	9.95	-83.61	164.10	-1,465.30	1,474.46	1,459.48	14.98	98.415		
400.00	400.00	399.10	399.10	5.06	12.52	-83.61	164.10	-1,465.30	1,474.46	1,456.88	17.58	83.858		
500.00	500.00	499.10	499.10	5.10	15.22	-83.61	164.10	-1,465.30	1,474.46	1,454.15	20.31	72.581		
600.00	600.00	599.10	599.10	5.15	18.08	-83.61	164.10	-1,465.30	1,474.46	1,451.24	23.22	63.490		
700.00	700.00	699.10	699.10	5.20	20.98	-83.61	164.10	-1,465.30	1,474.46	1,448.28	26.18	56.319		
800.00	800.00	799.10	799.10	5.27	23.90	-83.61	164.10	-1,465.30	1,474.46	1,445.29	29.17	50.545		
900.00	900.00	899.10	899.10	5.34	26.84	-83.61	164.10	-1,465.30	1,474.46	1,442.27	32.19	45.808		
1,000.00	1,000.00	999.10	999.10	5.43	29.80	-83.61	164.10	-1,465.30	1,474.46	1,439.24	35.22	41.860		
1,100.00	1,100.00	1,099.10	1,099.10	5.52	32.76	-83.61	164.10	-1,465.30	1,474.46	1,436.18	38.28	38.521		
1,200.00	1,200.00	1,199.10	1,199.10	5.62	35.72	-83.61	164.10	-1,465.30	1,474.46	1,433.12	41.34	35.664		
1,300.00	1,300.00	1,299.10	1,299.10	5.72	38.70	-83.61	164.10	-1,465.30	1,474.46	1,430.04	44.42	33.192		
1,366.63	1,366.63	1,365.74	1,365.73	5.80	40.68	-83.61	164.10	-1,465.30	1,474.46	1,427.98	46.48	31.723		
1,400.00	1,400.00	1,399.00	1,398.99	5.84	41.67	-83.61	164.10	-1,465.30	1,474.46	1,426.95	47.51	31.036		
1,500.00	1,500.00	1,499.11	1,499.10	5.96	44.65	-83.61	164.10	-1,465.30	1,474.46	1,423.85	50.61	29.134		
1,600.00	1,600.00	1,599.11	1,599.10	6.08	47.64	-83.61	164.10	-1,465.30	1,474.46	1,420.74	53.72	27.448		
1,700.00	1,700.00	1,699.11	1,699.10	6.21	50.62	-83.61	164.10	-1,465.30	1,474.46	1,417.63	56.83	25.944		
1,800.00	1,800.00	1,799.11	1,799.10	6.35	53.61	-83.61	164.10	-1,465.30	1,474.46	1,414.51	59.95	24.593		
1,900.00	1,900.00	1,899.12	1,899.10	6.49	56.59	-83.61	164.10	-1,465.30	1,474.46	1,411.38	63.08	23.373		
2,000.00	2,000.00	1,999.12	1,999.10	6.63	59.58	-83.61	164.10	-1,465.30	1,474.46	1,408.24	66.22	22.267		
2,100.00	2,100.00	2,099.12	2,099.10	6.78	62.57	-83.61	164.10	-1,465.30	1,474.46	1,405.10	69.36	21.259		
2,200.00	2,200.00	2,199.12	2,199.10	6.94	65.56	-83.61	164.10	-1,465.30	1,474.46	1,401.96	72.50	20.337		
2,300.00	2,300.00	2,299.12	2,299.10	7.10	68.56	-83.61	164.10	-1,465.30	1,474.46	1,398.81	75.65	19.490		
2,400.00	2,400.00	2,399.12	2,399.10	7.26	71.55	-83.61	164.10	-1,465.30	1,474.46	1,395.65	78.81	18.710		
2,500.00	2,500.00	2,499.15	2,499.10	7.42	74.54	-83.61	164.10	-1,465.30	1,474.46	1,392.50	81.96	17.989		
2,600.00	2,600.00	2,599.15	2,599.10	7.59	77.54	-83.61	164.10	-1,465.30	1,474.46	1,389.34	85.12	17.321		
2,700.00	2,700.00	2,699.21	2,699.10	7.76	80.53	-83.61	164.10	-1,465.30	1,474.46	1,386.17	88.29	16.700		
2,800.00	2,800.00	2,799.27	2,799.10	7.93	83.53	-83.61	164.10	-1,465.30	1,474.46	1,383.00	91.46	16.121		
2,900.00	2,900.00	2,899.29	2,899.10	8.11	86.52	-83.61	164.10	-1,465.30	1,474.46	1,379.83	94.63	15.581		
3,000.00	3,000.00	2,999.29	2,999.10	8.29	89.52	-83.61	164.10	-1,465.30	1,474.46	1,376.66	97.80	15.076		
3,100.00	3,100.00	3,099.29	3,099.10	8.47	92.51	-83.61	164.10	-1,465.30	1,474.46	1,373.48	100.98	14.601		
3,200.00	3,200.00	3,199.29	3,199.10	8.65	95.51	-83.61	164.10	-1,465.30	1,474.46	1,370.30	104.16	14.156		
3,300.00	3,300.00	3,299.31	3,299.10	8.83	98.51	-83.61	164.10	-1,465.30	1,474.46	1,367.12	107.34	13.736		
3,400.00	3,400.00	3,399.31	3,399.10	9.02	101.50	-83.61	164.10	-1,465.30	1,474.46	1,363.94	110.52	13.341		
3,500.00	3,500.00	3,499.31	3,499.10	9.21	104.50	-83.61	164.10	-1,465.30	1,474.46	1,360.75	113.71	12.967		
3,600.00	3,600.00	3,599.31	3,599.10	9.40	107.50	-83.61	164.10	-1,465.30	1,474.46	1,357.57	116.89	12.614		
3,700.00	3,700.00	3,699.31	3,699.10	9.59	110.49	-83.61	164.10	-1,465.30	1,474.46	1,354.38	120.08	12.279		
3,800.00	3,800.00	3,799.31	3,799.10	9.78	113.49	-83.61	164.10	-1,465.30	1,474.46	1,351.19	123.27	11.961		
3,900.00	3,900.00	3,899.38	3,899.10	9.97	116.49	-83.61	164.10	-1,465.30	1,474.46	1,348.00	126.46	11.659		
4,000.00	4,000.00	3,999.38	3,999.10	10.17	119.49	-83.61	164.10	-1,465.30	1,474.46	1,344.80	129.66	11.372		
4,100.00	4,100.00	4,099.38	4,099.10	10.37	122.48	-83.61	164.10	-1,465.30	1,474.46	1,341.61	132.85	11.099		
4,200.00	4,200.00	4,199.38	4,199.10	10.56	125.48	-83.61	164.10	-1,465.30	1,474.46	1,338.42	136.04	10.838		
4,300.00	4,300.00	4,299.38	4,299.10	10.76	128.48	-83.61	164.10	-1,465.30	1,474.46	1,335.22	139.24	10.589		
4,400.00	4,400.00	4,399.38	4,399.10	10.96	131.48	-83.61	164.10	-1,465.30	1,474.46	1,332.02	142.44	10.352		
4,500.00	4,500.00	4,499.38	4,499.10	11.16	134.47	-83.61	164.10	-1,465.30	1,474.46	1,328.82	145.64	10.124		
4,600.00	4,600.00	4,599.49	4,599.10	11.36	137.48	-83.61	164.10	-1,465.30	1,474.46	1,325.62	148.84	9.906		
4,700.00	4,700.00	4,699.49	4,699.10	11.57	140.47	-83.61	164.10	-1,465.30	1,474.46	1,322.42	152.04	9.698		
4,800.00	4,800.00	4,799.49	4,799.10	11.77	143.47	-83.61	164.10	-1,465.30	1,474.46	1,319.22	155.24	9.498		
4,900.00	4,900.00	4,899.49	4,899.10	11.97	146.47	-83.61	164.10	-1,465.30	1,474.46	1,316.02	158.44	9.306		
5,000.00	5,000.00	4,999.59	4,999.10	12.18	149.47	-83.61	164.10	-1,465.30	1,474.46	1,312.81	161.65	9.121		

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

Integrity Directional Services, LLC

Anticollision Report

Company: COG Production L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 20, T 19 S., R 32 E
Site Error: 5.00 ft
Reference Well: Lusk Deep Unit A 31H
Well Error: 5.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#5

Local Co-ordinate Reference: Well Lusk Deep Unit A 31H
TVD Reference: KB=20' @ 3609.81ft (Patriot 2)
MD Reference: KB=20' @ 3609.81ft (Patriot 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 20, T 19 S., R 32 E - Lusk Deep Unit A 19 - Actual Wellbore - Actual Wellbore														Offset Site Error:	0.00 ft
Survey Program: 489-Inclinometer only														Offset Well Error:	5.00 ft
Reference	Offset	Semi Major Axis		Distance		Warning									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
5,100.00	5,100.00	5,099.59	5,099.10	12.38	152.47	-83.61	164.10	-1,465.30	1,474.46	1,309.61	164.85	8.944			
5,200.00	5,200.00	5,199.59	5,199.10	12.59	155.47	-83.61	164.10	-1,465.30	1,474.46	1,306.40	168.06	8.774			
5,300.00	5,300.00	5,299.59	5,299.10	12.80	158.47	-83.61	164.10	-1,465.30	1,474.46	1,303.20	171.26	8.609			
5,400.00	5,400.00	5,399.59	5,399.10	13.00	161.47	-83.61	164.10	-1,465.30	1,474.46	1,299.99	174.47	8.451			
5,500.00	5,500.00	5,499.59	5,499.10	13.21	164.46	-83.61	164.10	-1,465.30	1,474.46	1,296.79	177.67	8.299			
5,600.00	5,600.00	5,599.70	5,599.10	13.42	167.47	-83.61	164.10	-1,465.30	1,474.46	1,293.58	180.88	8.151			
5,700.00	5,700.00	5,699.70	5,699.10	13.63	170.46	-83.61	164.10	-1,465.30	1,474.46	1,290.37	184.09	8.009			
5,800.00	5,800.00	5,799.70	5,799.10	13.84	173.46	-83.61	164.10	-1,465.30	1,474.46	1,287.16	187.30	7.872			
5,900.00	5,900.00	5,899.70	5,899.10	14.05	176.46	-83.61	164.10	-1,465.30	1,474.46	1,283.95	190.51	7.740			
6,000.00	6,000.00	5,999.70	5,999.10	14.26	179.46	-83.61	164.10	-1,465.30	1,474.46	1,280.74	193.72	7.611			
6,100.00	6,100.00	6,099.77	6,099.10	14.47	182.46	-83.61	164.10	-1,465.30	1,474.46	1,277.53	196.93	7.487			
6,200.00	6,200.00	6,199.77	6,199.10	14.68	185.46	-83.61	164.10	-1,465.30	1,474.46	1,274.32	200.14	7.367			
6,300.00	6,300.00	6,299.77	6,299.10	14.89	188.46	-83.61	164.10	-1,465.30	1,474.46	1,271.11	203.35	7.251			
6,400.00	6,400.00	6,399.77	6,399.10	15.10	191.46	-83.61	164.10	-1,465.30	1,474.46	1,267.90	206.56	7.138			
6,500.00	6,500.00	6,499.77	6,499.10	15.31	194.46	-83.61	164.10	-1,465.30	1,474.46	1,264.69	209.77	7.029			
6,600.00	6,600.00	6,599.88	6,599.10	15.53	197.46	-83.61	164.10	-1,465.30	1,474.46	1,261.47	212.99	6.923			
6,700.00	6,700.00	6,699.88	6,699.10	15.74	200.46	-83.61	164.10	-1,465.30	1,474.46	1,258.26	216.20	6.820			
6,800.00	6,800.00	6,799.88	6,799.10	15.95	203.46	-83.61	164.10	-1,465.30	1,474.46	1,255.05	219.41	6.720			
6,900.00	6,900.00	6,899.88	6,899.10	16.17	206.46	-83.61	164.10	-1,465.30	1,474.46	1,251.84	222.62	6.623			
7,000.00	7,000.00	6,999.88	6,999.10	16.38	209.46	-83.61	164.10	-1,465.30	1,474.46	1,248.62	225.84	6.529			
7,100.00	7,100.00	7,099.88	7,099.10	16.59	212.46	-83.61	164.10	-1,465.30	1,474.46	1,245.41	229.05	6.437			
7,200.00	7,200.00	7,199.88	7,199.10	16.81	215.45	-83.61	164.10	-1,465.30	1,474.46	1,242.20	232.26	6.348 CC, ES			
7,300.00	7,300.00	7,220.01	7,219.06	17.02	216.06	-83.61	164.10	-1,465.30	1,476.63	1,243.55	233.08	6.335 SF			
7,400.00	7,400.00	7,220.01	7,219.06	17.24	216.06	-83.61	164.10	-1,465.30	1,485.41	1,252.11	233.30	6.367			
7,500.00	7,500.00	7,220.01	7,219.06	17.45	216.06	-83.61	164.10	-1,465.30	1,500.82	1,267.31	233.51	6.427			
7,600.00	7,600.00	7,220.01	7,219.06	17.67	216.06	-83.61	164.10	-1,465.30	1,522.65	1,288.92	233.73	6.515			
7,700.00	7,700.00	7,220.01	7,219.06	17.89	216.06	-83.61	164.10	-1,465.30	1,550.64	1,316.69	233.94	6.628			
7,800.00	7,800.00	7,220.01	7,219.06	18.10	216.06	-83.61	164.10	-1,465.30	1,584.45	1,350.29	234.16	6.767			
7,900.00	7,900.00	7,220.01	7,219.06	18.32	216.06	-83.61	164.10	-1,465.30	1,623.73	1,389.35	234.38	6.928			
8,000.00	8,000.00	7,220.01	7,219.06	18.53	216.06	-83.61	164.10	-1,465.30	1,668.08	1,433.49	234.59	7.111			
8,100.00	8,100.00	7,220.01	7,219.06	18.75	216.06	-83.61	164.10	-1,465.30	1,717.12	1,482.31	234.81	7.313			
8,200.00	8,200.00	7,220.01	7,219.06	18.97	216.06	-83.61	164.10	-1,465.30	1,770.46	1,535.43	235.03	7.533			
8,300.00	8,300.00	7,220.01	7,219.06	19.18	216.06	-83.61	164.10	-1,465.30	1,827.71	1,592.47	235.24	7.769			
8,400.00	8,400.00	7,220.01	7,219.06	19.40	216.06	-83.61	164.10	-1,465.30	1,888.53	1,653.07	235.46	8.021			
8,500.00	8,500.00	7,220.01	7,219.06	19.62	216.06	-83.61	164.10	-1,465.30	1,952.57	1,716.90	235.68	8.285			
8,600.00	8,600.00	7,220.01	7,219.06	19.84	216.06	-83.61	164.10	-1,465.30	2,019.54	1,783.65	235.89	8.561			
8,700.00	8,700.00	7,220.01	7,219.06	20.05	216.06	-83.61	164.10	-1,465.30	2,089.15	1,853.04	236.11	8.848			
8,800.00	8,800.00	7,220.01	7,219.06	20.27	216.06	-83.61	164.10	-1,465.30	2,161.15	1,924.82	236.33	9.145			
8,862.61	8,862.61	7,220.01	7,219.06	20.41	216.06	-83.61	164.10	-1,465.30	2,207.34	1,970.87	236.47	9.335			
8,875.00	8,875.00	7,220.01	7,219.06	20.43	216.06	4.54	164.10	-1,465.30	2,216.47	1,979.98	236.49	9.372			
8,900.00	8,899.96	7,220.01	7,219.06	20.48	216.06	4.31	164.10	-1,465.30	2,234.31	1,997.77	236.54	9.446			
8,925.00	8,924.82	7,220.01	7,219.06	20.53	216.06	4.10	164.10	-1,465.30	2,251.37	2,014.78	236.59	9.516			
8,950.00	8,949.51	7,220.01	7,219.06	20.58	216.06	3.92	164.10	-1,465.30	2,267.60	2,030.96	236.64	9.583			
8,975.00	8,973.97	7,220.01	7,219.06	20.63	216.06	3.77	164.10	-1,465.30	2,282.99	2,046.30	236.69	9.646			
9,000.00	8,998.11	7,220.01	7,219.06	20.68	216.06	3.63	164.10	-1,465.30	2,297.51	2,060.77	236.74	9.705			
9,025.00	9,021.89	7,220.01	7,219.06	20.73	216.06	3.51	164.10	-1,465.30	2,311.14	2,074.35	236.79	9.760			
9,050.00	9,045.23	7,220.01	7,219.06	20.79	216.06	3.40	164.10	-1,465.30	2,323.85	2,087.00	236.84	9.812			
9,075.00	9,068.06	7,220.01	7,219.06	20.84	216.06	3.31	164.10	-1,465.30	2,335.62	2,098.72	236.90	9.859			
9,100.00	9,090.34	7,220.01	7,219.06	20.90	216.06	3.22	164.10	-1,465.30	2,346.44	2,109.48	236.96	9.902			
9,125.00	9,111.99	7,220.01	7,219.06	20.96	216.06	3.15	164.10	-1,465.30	2,356.30	2,119.28	237.02	9.941			
9,150.00	9,132.96	7,220.01	7,219.06	21.03	216.06	3.09	164.10	-1,465.30	2,365.17	2,128.08	237.09	9.976			
9,175.00	9,153.19	7,220.01	7,219.06	21.10	216.06	3.04	164.10	-1,465.30	2,373.04	2,135.88	237.16	10.006			

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

Integrity Directional Services, LLC

Anticollision Report

Company: COG Production L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 20, T 19 S., R 32 E
Site Error: 5.00 ft
Reference Well: Lusk Deep Unit A 31H
Well Error: 5.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#5

Local Co-ordinate Reference: Well Lusk Deep Unit A 31H
TVD Reference: KB=20' @ 3609.81ft (Patriot 2)
MD Reference: KB=20' @ 3609.81ft (Patriot 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 20, T 19 S., R 32 E - Lusk Deep Unit A 19 - Actual Wellbore - Actual Wellbore													Offset Site Error:	0.00 ft
Survey Program: 489-Inclinometer only													Offset Well Error:	5.00 ft
Reference	Offset	Semi Major Axis		Distance		Warning								
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
9,200.00	9,172.62	7,220.01	7,219.06	21.18	216.06	2.99	164.10	-1,465.30	2,379.91	2,142.67	237.24	10.032		
9,225.00	9,191.20	7,220.01	7,219.06	21.27	216.06	2.95	164.10	-1,465.30	2,385.75	2,148.43	237.33	10.053		
9,250.00	9,208.88	7,220.01	7,219.06	21.37	216.06	2.92	164.10	-1,465.30	2,390.57	2,153.15	237.42	10.069		
9,275.00	9,225.61	7,220.01	7,219.06	21.47	216.06	2.90	164.10	-1,465.30	2,394.36	2,156.83	237.53	10.080		
9,300.00	9,241.34	7,220.01	7,219.06	21.59	216.06	2.88	164.10	-1,465.30	2,397.10	2,159.45	237.65	10.087		
9,325.00	9,256.04	7,220.01	7,219.06	21.73	216.06	2.87	164.10	-1,465.30	2,398.81	2,161.02	237.78	10.088		
9,350.00	9,269.66	7,220.01	7,219.06	21.87	216.06	2.87	164.10	-1,465.30	2,399.46	2,161.53	237.93	10.085		
9,375.00	9,282.16	7,220.01	7,219.06	22.03	216.06	2.87	164.10	-1,465.30	2,399.08	2,160.98	238.09	10.076		
9,400.00	9,293.52	7,220.01	7,219.06	22.21	216.06	2.88	164.10	-1,465.30	2,397.64	2,159.37	238.27	10.063		
9,425.00	9,303.69	7,220.01	7,219.06	22.41	216.06	2.90	164.10	-1,465.30	2,395.16	2,156.69	238.47	10.044		
9,450.00	9,312.65	7,220.01	7,219.06	22.62	216.06	2.92	164.10	-1,465.30	2,391.64	2,152.96	238.68	10.020		
9,475.00	9,320.38	7,220.01	7,219.06	22.85	216.06	2.95	164.10	-1,465.30	2,387.08	2,148.17	238.91	9.991		
9,500.00	9,326.86	7,220.01	7,219.06	23.10	216.06	2.98	164.10	-1,465.30	2,381.50	2,142.34	239.16	9.958		
9,525.00	9,332.06	7,220.01	7,219.06	23.37	216.06	3.02	164.10	-1,465.30	2,374.89	2,135.46	239.43	9.919		
9,550.00	9,335.98	7,220.01	7,219.06	23.65	216.06	3.08	164.10	-1,465.30	2,367.27	2,127.57	239.71	9.876		
9,575.00	9,338.60	7,220.01	7,219.06	23.95	216.06	3.14	164.10	-1,465.30	2,358.66	2,118.65	240.01	9.827		
9,600.00	9,339.91	7,220.01	7,219.06	24.26	216.06	3.20	164.10	-1,465.30	2,349.05	2,108.74	240.32	9.775		
9,617.35	9,340.05	7,220.01	7,219.06	24.48	216.06	3.26	164.10	-1,465.30	2,341.82	2,101.28	240.54	9.736		
9,700.00	9,339.23	7,220.01	7,219.06	25.64	216.06	3.26	164.10	-1,465.30	2,307.43	2,065.73	241.70	9.547		
9,800.00	9,338.24	7,220.01	7,219.06	27.24	216.06	3.26	164.10	-1,465.30	2,269.17	2,025.87	243.29	9.327		
9,900.00	9,337.25	7,220.01	7,219.06	29.01	216.06	3.26	164.10	-1,465.30	2,234.72	1,989.66	245.06	9.119		
10,000.00	9,336.26	7,220.01	7,219.06	30.92	216.06	3.26	164.10	-1,465.30	2,204.28	1,957.30	246.98	8.925		
10,100.00	9,335.27	7,220.01	7,219.06	32.96	216.06	3.26	164.10	-1,465.30	2,178.01	1,928.99	249.02	8.746		
10,200.00	9,334.27	7,220.01	7,219.06	35.09	216.06	3.26	164.10	-1,465.30	2,156.06	1,904.90	251.15	8.585		
10,300.00	9,333.28	7,220.01	7,219.06	37.31	216.06	3.26	164.10	-1,465.30	2,138.56	1,885.19	253.37	8.440		
10,400.00	9,332.29	7,220.01	7,219.06	39.60	216.06	3.26	164.10	-1,465.30	2,125.63	1,869.97	255.66	8.314		
10,500.00	9,331.30	7,220.01	7,219.06	41.94	216.06	3.26	164.10	-1,465.30	2,117.35	1,859.35	258.00	8.207		
10,600.00	9,330.31	7,220.01	7,219.06	44.34	216.06	3.26	164.10	-1,465.30	2,113.77	1,853.38	260.40	8.118		
10,625.68	9,330.05	7,220.01	7,219.06	44.96	216.06	3.26	164.10	-1,465.30	2,113.62	1,852.59	261.02	8.098		
10,700.00	9,329.32	7,220.01	7,219.06	46.77	216.06	3.26	164.10	-1,465.30	2,114.92	1,852.09	262.83	8.047		
10,800.00	9,328.32	7,220.01	7,219.06	49.24	216.06	3.26	164.10	-1,465.30	2,120.79	1,855.49	265.30	7.994		
10,900.00	9,327.33	7,220.01	7,219.06	51.74	216.06	3.26	164.10	-1,465.30	2,131.34	1,863.55	267.80	7.959		
11,000.00	9,326.34	7,220.01	7,219.06	54.26	216.06	3.26	164.10	-1,465.30	2,146.51	1,876.18	270.32	7.941		
11,100.00	9,325.35	7,220.01	7,219.06	56.81	216.06	3.26	164.10	-1,465.30	2,166.18	1,893.31	272.87	7.939		
11,135.22	9,325.00	7,220.01	7,219.06	57.71	216.06	3.26	164.10	-1,465.30	2,174.17	1,900.40	273.77	7.942		
11,172.72	9,324.38	7,220.01	7,219.06	58.67	216.06	3.25	164.10	-1,465.30	2,183.02	1,908.29	274.73	7.946		
11,200.00	9,323.76	7,220.01	7,219.06	59.38	216.06	3.25	164.10	-1,465.30	2,189.67	1,914.24	275.43	7.950		
11,300.00	9,321.45	7,220.01	7,219.06	61.96	216.06	3.25	164.10	-1,465.30	2,216.75	1,938.74	278.02	7.973		
11,400.00	9,319.15	7,220.01	7,219.06	64.56	216.06	3.25	164.10	-1,465.30	2,247.96	1,967.35	280.61	8.011		
11,500.00	9,316.85	7,220.01	7,219.06	67.17	216.06	3.25	164.10	-1,465.30	2,283.12	1,999.90	283.22	8.061		
11,600.00	9,314.55	7,220.01	7,219.06	69.79	216.06	3.25	164.10	-1,465.30	2,322.07	2,036.22	285.85	8.123		
11,700.00	9,312.25	7,220.01	7,219.06	72.42	216.06	3.25	164.10	-1,465.30	2,364.60	2,076.12	288.48	8.197		
11,800.00	9,309.95	7,220.01	7,219.06	75.06	216.06	3.25	164.10	-1,465.30	2,410.53	2,119.41	291.12	8.280		
11,900.00	9,307.65	7,220.01	7,219.06	77.71	216.06	3.25	164.10	-1,465.30	2,459.67	2,165.90	293.77	8.373		
12,000.00	9,305.35	7,220.01	7,219.06	80.37	216.06	3.25	164.10	-1,465.30	2,511.83	2,215.40	296.43	8.474		
12,100.00	9,303.05	7,220.01	7,219.06	83.04	216.06	3.25	164.10	-1,465.30	2,566.83	2,267.74	299.10	8.582		
12,200.00	9,300.75	7,220.01	7,219.06	85.71	216.06	3.25	164.10	-1,465.30	2,624.49	2,322.73	301.77	8.697		
12,300.00	9,298.45	7,220.01	7,219.06	88.39	216.06	3.25	164.10	-1,465.30	2,684.64	2,380.20	304.44	8.818		
12,400.00	9,296.15	7,220.01	7,219.06	91.07	216.06	3.25	164.10	-1,465.30	2,747.11	2,439.99	307.13	8.945		
12,500.00	9,293.85	7,220.01	7,219.06	93.75	216.06	3.25	164.10	-1,465.30	2,811.75	2,501.94	309.81	9.076		
12,600.00	9,291.55	7,220.01	7,219.06	96.45	216.06	3.25	164.10	-1,465.30	2,878.42	2,565.91	312.50	9.211		
12,700.00	9,289.25	7,220.01	7,219.06	99.14	216.06	3.25	164.10	-1,465.30	2,946.97	2,631.77	315.20	9.350		

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

Integrity Directional Services, LLC

Anticollision Report

Company: COG Production L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 20, T 19 S. , R 32 E
Site Error: 5.00 ft
Reference Well: Lusk Deep Unit A 31H
Well Error: 5.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#5

Local Co-ordinate Reference: Well Lusk Deep Unit A 31H
TVD Reference: KB=20' @ 3609.81ft (Patriot 2)
MD Reference: KB=20' @ 3609.81ft (Patriot 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 20, T 19 S. , R 32 E - Lusk Deep Unit A 19 - Actual Wellbore - Actual Wellbore													Offset Site Error:	0.00 ft
Survey Program: 489-Inclinometer only													Offset Well Error:	5.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (ft)	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Between Centres (ft)	Between Ellipses (ft)						
12,800.00	9,286.95	7,220.01	7,219.06	101.84	216.06	3.25	164.10	-1,465.30	3,017.28	2,699.38	317.90	9.491		
12,900.00	9,284.65	7,220.01	7,219.06	104.54	216.06	3.25	164.10	-1,465.30	3,089.22	2,768.62	320.60	9.636		
13,000.00	9,282.35	7,220.01	7,219.06	107.25	216.06	3.25	164.10	-1,465.30	3,162.69	2,839.39	323.30	9.782		
13,100.00	9,280.05	7,220.01	7,219.06	109.95	216.06	3.25	164.10	-1,465.30	3,237.58	2,911.57	326.01	9.931		
13,200.00	9,277.75	7,220.01	7,219.06	112.66	216.06	3.25	164.10	-1,465.30	3,313.80	2,985.08	328.72	10.081		
13,300.00	9,275.44	7,220.01	7,219.06	115.38	216.06	3.25	164.10	-1,465.30	3,391.25	3,059.82	331.44	10.232		
13,400.00	9,273.14	7,220.01	7,219.06	118.09	216.06	3.25	164.10	-1,465.30	3,469.86	3,135.71	334.15	10.384		
13,500.00	9,270.84	7,220.01	7,219.06	120.81	216.06	3.25	164.10	-1,465.30	3,549.54	3,212.68	336.87	10.537		
13,600.00	9,268.54	7,220.01	7,219.06	123.53	216.06	3.25	164.10	-1,465.30	3,630.23	3,290.64	339.59	10.690		
13,700.00	9,266.24	7,220.01	7,219.06	126.25	216.06	3.25	164.10	-1,465.30	3,711.86	3,369.55	342.31	10.844		
13,800.00	9,263.94	7,220.01	7,219.06	128.98	216.06	3.25	164.10	-1,465.30	3,794.37	3,449.34	345.03	10.997		
13,900.00	9,261.64	7,220.01	7,219.06	131.70	216.06	3.25	164.10	-1,465.30	3,877.70	3,529.95	347.76	11.151		
14,000.00	9,259.34	7,220.01	7,219.06	134.43	216.06	3.25	164.10	-1,465.30	3,961.81	3,611.32	350.49	11.304		
14,100.00	9,257.04	7,220.01	7,219.06	137.15	216.06	3.25	164.10	-1,465.30	4,046.63	3,693.42	353.21	11.457		
14,188.60	9,255.00	7,220.01	7,219.06	139.57	216.06	3.25	164.10	-1,465.30	4,122.36	3,766.73	355.63	11.592		

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

Integrity Directional Services, LLC

Anticollision Report

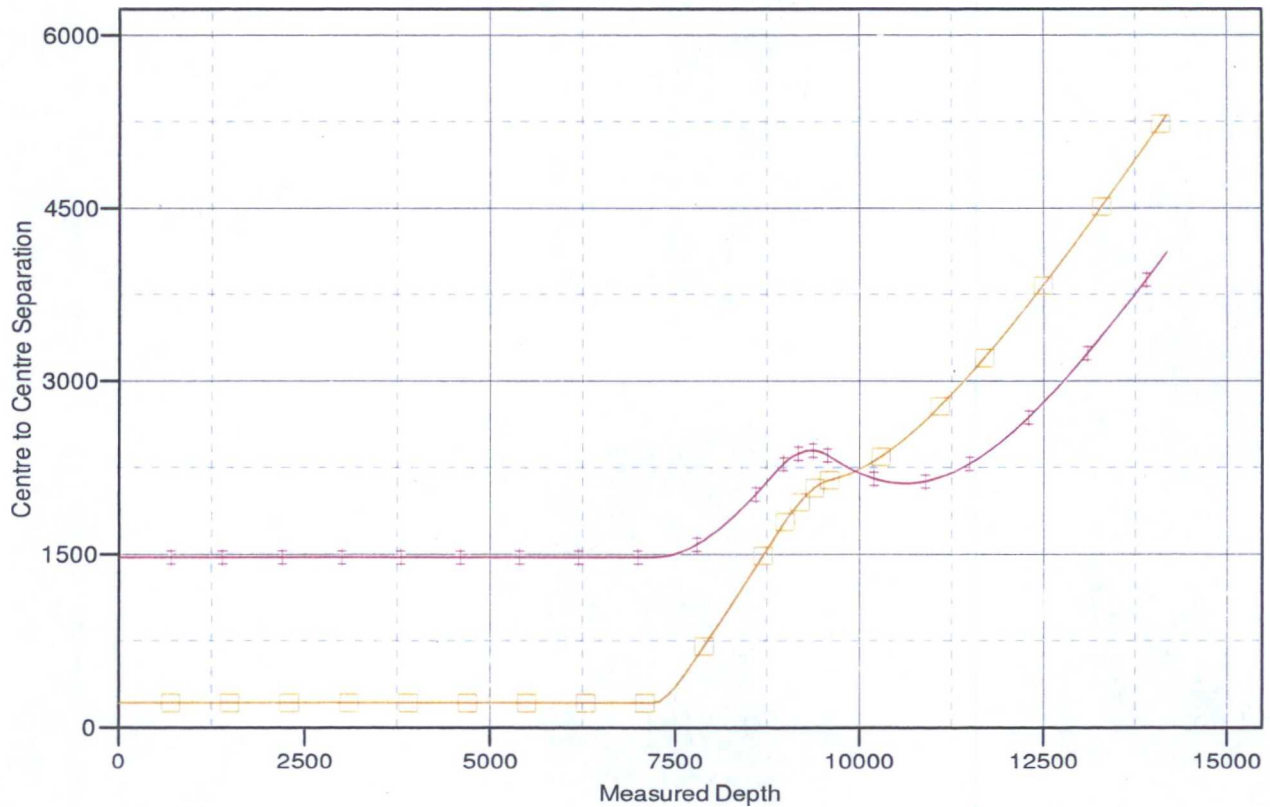
Company: COG Production L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 20, T 19 S. , R 32 E
Site Error: 5.00 ft
Reference Well: Lusk Deep Unit A 31H
Well Error: 5.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#5

Local Co-ordinate Reference: Well Lusk Deep Unit A 31H
TVD Reference: KB=20' @ 3609.81ft (Patriot 2)
MD Reference: KB=20' @ 3609.81ft (Patriot 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB=20' @ 3609.81ft (Patriot 2)
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Lusk Deep Unit A 31H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.30°

Ladder Plot



LEGEND

Jrit A 17, Actual Wellbore, Actual Wellbore V0 — Lusk Deep Unit A 19, Actual Wellbore, Actual Wellbore V0

Integrity Directional Services, LLC
Anticollision Report

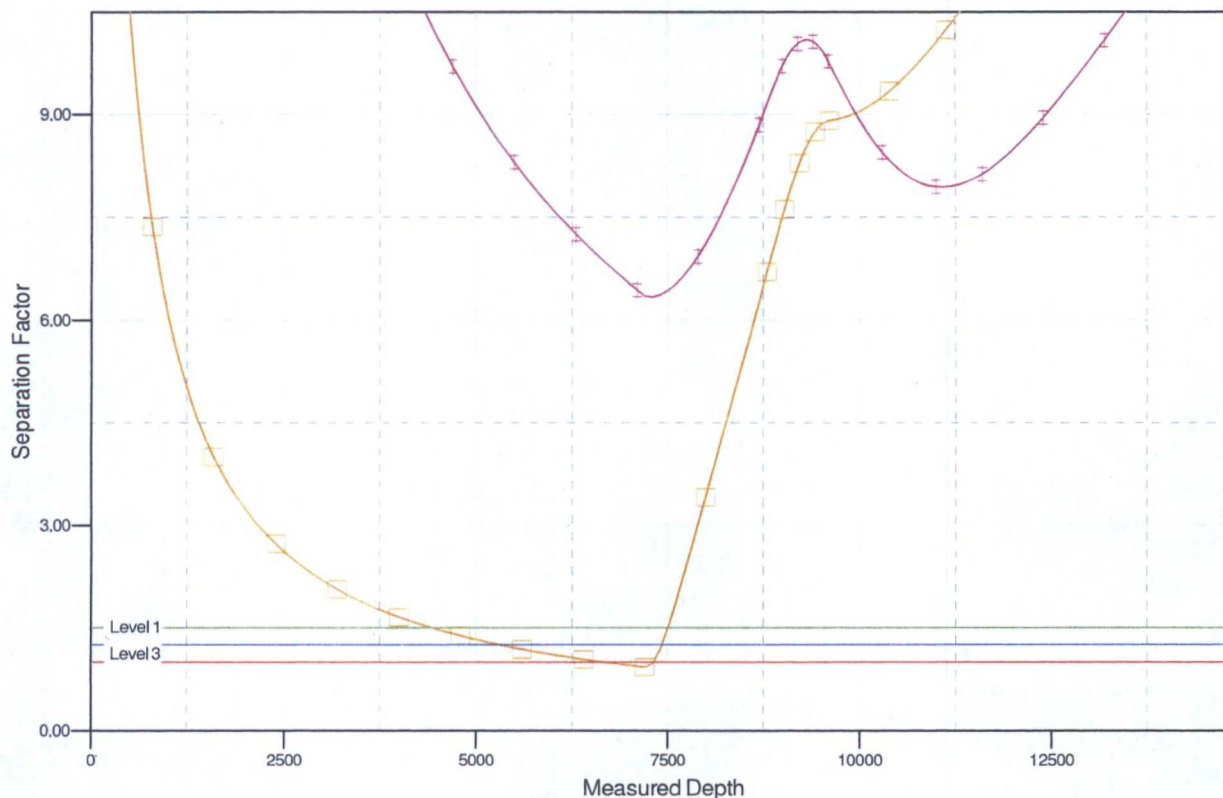
Company: COG Production L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 20, T 19 S., R 32 E
Site Error: 5.00 ft
Reference Well: Lusk Deep Unit A 31H
Well Error: 5.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#5

Local Co-ordinate Reference: Well Lusk Deep Unit A 31H
TVD Reference: KB=20' @ 3609.81ft (Patriot 2)
MD Reference: KB=20' @ 3609.81ft (Patriot 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB=20' @ 3609.81ft (Patriot 2)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Lusk Deep Unit A 31H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.30°

Separation Factor Plot



LEGEND

Jrit A 17, Actual Wellbore, Actual Wellbore V0 — Lusk Deep Unit A 19, Actual Wellbore, Actual Wellbore V0